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ON
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THEEM-2022

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Theem College of Engineering is approved by AICTE, Government of Maharashtra and DTE, and Affiliated to university of Mumbai. The institute's is awarded with B+ grade by NAAC.The institute's is remote centre of IITB-NMEICT(MHRD,Govt.of India).The institute's is emerged as the only premier Engineering college in Boisar (E) with and intake of 420 students in the following graduate engineering program,

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PREFACE

The objective of conference is to inspire engineers, academicians to explore, integrate and evolve in the research direction through a forum. As all of us know that Technology is always a progressive phenomenon, the research can bring the remarkable transformation to cater for the society needs. To achieve this precious goal a national conference "Trends in Engineering Excellence and Metamorphosis-2022" has been scheduled on 10th, 11th June 2022 at Theem College of Engineering, Boisar providing the best avenue for the publication of research and development.

The THEEM- 2022 Conference will surely facilitate the participants to present, discuss and publish their recent research results and approaches which can develops new ideas to achieve the needs of emerging industry.

Without an effective coordination and support from many individuals and institutions, it is not possible to organize such kind of facilitation center for the researchers though which they can present the genuine research work. I would like to express my hearty and sincere thanks to the speakers of invited talks and contributory paper presentations. I wish to acknowledge the time and efforts taken by the expert reviewers of the journal for carrying out review of papers. I also acknowledge to all the members of different committees and co-conveners who carried out a lot of work to make this conference, THEEM-2022 a grand success. I wish all participants fruitful and effective interaction at the conference.

Thanks a lot

DR. SHAH AQUEEL AHMED

Chief Convenor, THEEM- 2022

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NEEDS OF PROFESSIONAL COMMUNICATION IN ENGINEERING

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ABSTRACT
Conventional engineering curriculum is strongly focused on the development in students for technical knowledge and skill. Recognition is one of the most important factor in which communicative skills plays an important role. The purpose of the paper to portray the Impact of English Communication on Rural Area Engineering Students and provide remedies to overcome the problems. Based primarily on the review of some relevant literature available the present article reveals the fact that professional communication is one of the most important parts in the communicative field all over the world and it has a basic tool which is English language.

Keywords: Engineering, Technical Knowledge, Communication Skills, Professional Communication

I) INTRODUCTION
Communication, a process of exchanging ideas and facts for common understanding, helps the participants to share their ideas, thoughts, experience and feelings with each other. It is one of the most important tries of the human being, without this, it is almost impossible for any human being to survive in this complex world. Communication uses a common language as the most important medium and it can be taught to create common understanding among the people. People according to their community, culture and the nature of their professions use different varieties of language as well as professional skills to get success in it.

In the arena of corporate world, especially in the field of engineering, English is used as a global language and it can be the only convenient language in the means of professional communication. The main aim of this paper is to highlight the importance of Professional Communication in engineering and needs of English for communicating to the people of the world. The paper broadly encompasses a wide range or sub headings such as definition of professional communication, communication in workplace and institutes' professional for execution of engineering jobs respectively.

II) LITERATURE REVIEW
The survey of other literature related to this research helped us to bring some related terms to complete the paper. On the review of some relevant literature available the present article reveals the fact that professional communication is one of the most important part any profession. In the communicative field all over the world, professional communication has a basic tool named as English language. Learning this language, helps you to lead yourself in the world and explore your views, ideas and thoughts internationally. The paper which were guided us to define the following points:

1) Developing an awareness of social justice and ethics, teamwork and conflict resolution are must for industry professionals.
2) Promoting these among the engineering students helps to build their recognition on the importance of Professional communication in engineering.
3) Language, Paralanguage and Body language are complement each other in professional communication in order to provide meaningful information (Zimmerman & Uecke, 2012).
4) The quality of life and survival data provided for those who use the technology.

III) What is Communication?
Any professional individual needs the art of good communication skills for enabling him or her to perform the job in a most effective and attractive manner. Professional Communication skills determines the employment opportunity and the sustenance of their job. In engineering jobs, this skill plays an important role and absence of quality communication skills can affect effectiveness of their performance as well as their job maintenance.

As the engineer have international job market, they need to prove that they are deserving candidate for grabbing those job opportunities. Just completing the academic syllabus and scoring marks are insufficient. Multilingual skills are considered as a salient element in the makeup of the new global engineer. Even the candidate who have secured distinct throughout the academic career in engineering may be unsuccessful in executing their job unless they process the high level of expertise in communication in English

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IV) Characteristics of Effective Communication

To ensure understanding between the communicators, they have to apply the 7 Cs of Effective Communication which are as follows:

Sr. No.	7 Cs of Effective Communication	Definition
1	Clear	The main ideas to be easily identified and understood
2	Concise	Present the centre point without using unwanted words or images
3	Concrete	Give the specific explanation or examples
4	Correct	Provide information with suitable words and proper grammar
5	Coherent	Present the information in a logical sequence
6	Complete	Give sufficient information thus the audience can understand
7	Courteous	Use polite and professional tone to show your respect and value

V) What is Professional Communication?

Professional Communication includes oral, written, visual and digital forms of delivering information in the context of a workplace. As engineering is considered professional skills, engineers should have the knowledge of being effective communicators, effective in groups while engaging, considering, listening to the others and asking questions and responding accordingly. They must have the quality of the nature of speak clear, confident and gracious in their interactions. Listening other people's ideas, being able to communicate clearly and effectively can help them building a positive working relationship, team works and more productivity. Their poor communication may lead to creating problems and serious failure in Effective Professional Communication.

VI) Needs of Professional Communication in Engineering

Engineering students, in order to enhance both community engagement and career success, need to acquire the professional communication skills in addition to technical skills. The educated and industry professionals have increasingly articulated it for developing an awareness of social justice and ethics, teamwork and conflict resolution because they improve students' communicative competence in both academic and professional success. Over the past decades, nationally and internationally, a number of tertiary institutions recognized that the examination of interdisciplinary approaches are important in relation to that the interactive approaches for engineering also important for workplace success therefore, they involved this study in engineering education.

In this respect, in engineering, teaching and learning of oral and written communication skills have been examined through teamwork and professional writing skills and their communicative competence is specifically motivated. For example, the ability of writing report, proposal and research articles and presenting individually or group prepare students themselves to go ahead in both technical and non-technical preparation and presentation to become expert in exploring an excellent standard in oral and written skills. It is said that oral communication and presentation skills are "career enhancers" and they are considered as the biggest single factor in determining students' career success or failure.

V) Professional Communication Skills for Workplace

No matter what industry you work in, but the ability to communicate effectively with superiors, colleagues and staff is essential. In the era of digital, workers must know how to effectively present and receive messages in person or via phone, email and social media. The following 10 things are must at workplace communication: 1) Listening, 2) Non-verbal Communication, 3) Clarity, 4) Friendliness, 5) Confidence, 6) Empathy, 7) Open-mindedness, 8) Respect, 9) Feedback, 10) Picking the right medium. Let us look into a short glance of each:

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1) **Listening:** If you are not a good listener, it is going to be hard to explain what you are being asked to do so, being a good listener is one of the best ways to be a good communicator. No one likes communicating with someone who cares only about putting in her two cents and does not take the time to listen to the other person.

2) **Non-Verbal Communication:** Your body language, eye-contact, hand gestures and tone of voice all colour the message you are trying to express. Eye-contact demonstrates that you are focused on them while conversing but make sure not to stare at the person because it can make him or her uncomfortable.

3) **Clarity:** Do not talk too much or too little because saying just enough is good verbal communication. So, try to express your message in a few words and say it clearly and directly. Either in person or on the phone, do not ramble on otherwise your listener will tune you out or will be unsure of exactly what you want.

4) **Friendliness:** It is important to be polite with simply a smile and friendly in nature at your workplace communication because that encourage your co-workers or the other person to engage in open and honest communication with you. This is important in both face-to-face and written communication to make the receiver feel more appreciated.

5. Confidence: It is important to be confident in your interactions with others. Confidence shows your co-workers and colleagues that you believe in what you are saying and will follow through. Of course, be careful not to sound arrogant or aggressive. Be sure you are always listening to and empathizing with the other person.

6**. Empathy:** Using phrases as simple as helps to demonstrate that you have been listening to the other person and respect their opinions. Active listening can help you tune in to what your conversational partner is thinking and feeling, which will, in turn, make it easier to display empathy.

7. Open-Mindedness: A good communicator should enter into any conversation with a flexible, open mind to listen and understand the other person's point of view rather than simply getting your message across. It helps you get easily connect to your audience views and be able to have more honest, productive conversations.

8. Respect: People will be more open to communicating with you if you convey respect for them and their ideas. Simple actions like using a person's name, making eye contact, and actively listening when a person speaks will make the person feel appreciated.

9. Feedback: Being able to give and receive feedback appropriately is an important communication skill. Managers and supervisors should continuously look for ways to provide employees with constructive feedback. Similarly, you should be able to accept and even encourage feedback from others. Listen to the feedback you are given, ask clarifying questions if you are unsure of the issue and make efforts to implement the feedback.

10. Picking the Right Medium: It is important that you should think about the person with whom you wish to speak and know what form of communication to be used in person. If they are a very busy person like your boss, or CEO, you might want to convey your message through email. People will appreciate your thoughtful means of communication and will be more likely to respond positively to you. This situation is like "Give respect take respect".

VI) How It Can Be Done?

1. Developing student's ability to construct foster the ability to communicate problem identification, formulation and solution to diverse audiences.
2. Use development in communicative ability as a vehicle for fostering students insight into and perspective on engineering practice in the community including the sound, cultural, political, international and environmental context of professional engineering pattern and present logical argument discursively.
3. Encouraging the students for participation in curriculum activities to such as class discussion hosting and response to formative feedback.
4. Foster language development from sentence level skill to large document written and oral communication.

VII) CHALLENGES AND OUTCOMES

This empirical evidence indicates that the engineering students are poor communicators. One of the fact is when students undertaking engineering studies, they belief that there is no need of English language skills. Therefore, the courses like discussion and conversation exercises are designed to encourage students to participate and practice skills and learn be flexible in their approach. To develop confidence, their ideas and contribution are respected to build on the strengths and group discussions as well as workshop exercises are used throughout the courses to ensure students regularly practice the skill of communication.

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Students are encouraged to form cross cultural groups during classes, so that a greatest understanding of diversity and its value in engineering is promoted. At the same time, students must also undertake practical mood in developing effective teamwork skill in order to be able to complete tasks and class based exercises. Students discuss and at times challenge the characteristics of English for academic and professional purposes. In doing so, students become increasingly aware of how purpose and socio-cultural factors shape the kind of language used in different contexts rather than viewing language incorrect as simply correct or incorrect.

VII) CONCLUSION

The conclusion of the paper defines that Engineers with the ability to clearly communicate can easily and confidently share their ideas to decision-makers in presentations, meetings, and reports. This statement highlights that the communication skills has equal importance as technical knowledge for engineers which will help them be successful over the course of their career. Learning and practicing excellent communication skills is one of the best ways for engineering managers that brings them value to their companies and building their own career. The study suggest that engineering students should be encourage to train discussion, conversation, participation and practice as well as learn be flexible in their approach.

The Educated and Industry

Although engineering is a technical field, professionals have increasingly articulated development professional communication for awareness of social justice and ethics, teamwork and conflict resolution. So, professional communication in engineering is essential to promote business communication and to succeed in marketing and life-long relationships. They should even adapt ethics to add more colour in their business through engineering design presentation. At the end, the research concludes by using J Paul's quote, "Communication the human connection is the key to personal and career success."

REFERENCES

1) Https. // ro.eu.cdu.au/cedu.com

2) Yong & & Missingham, (2004) Design & communication course Note.

3) Journal of Institute of Engineering, 2016.

4) Thaky P (2014), Importance of English and Communication Skills for Technical Professionals.

5) IJSR International Journal of scientific Research

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IMPACT OF ENGLISH COMMUNICATION ON RURAL AREA ENGINEERING STUDENTS

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ABSTRACT
Coming from a upper class, well to do family, from a tier 1 town, studying in an top rated engineering *college, life looks like a cakewalk but it isn't the same for everyone. Here, using our research paper as a medium, we have tried to portray what obstacles students coming from other side of what we think is "good life" face when they first enter engineering colleges with a ray of hope in their eyes to bring their family out of poverty, to uplift their society! The biggest hurdle that they have to jump through is facing the English language. They need to understand its importance and include it in their lifestyle which is a tough job but once they make themselves comfortable then life will be good! English has its importance spread throughout life likewise it has its share due in engineering both in academics and in workplaces. One needs to understand and apply themselves to gather the knowledge that the beautiful language has to offer. Students coming from not well to do families, rural areas, underdeveloped cities are not comfortable speaking the language due to numerous reasons mainly less exposure, lack of practice but there are lot of ways one can face the language, one can increase their grip in speaking in English and this is what we have tried to explain through our paper.*

Keywords: English Communication, Obstacles, Rural Engineering Students, Comfort to Speak in English

1) INTRODUCTION

Basically, we study English language since schooling but one question that really comes in our thought is "Where does it come of? What is the use of this language? and What is its background?" It is studied that the English is originally a language of the people from England only spoken by some troops but in the present century, this language is become an International Language. It is also said that over 18% of the world population speaks English. Are they really sound and comfortable speaking in English? The answer is 'not everyone' but some really hesitate to speak or express their thoughts in English. The reason behind it is lack of basic knowledge of the language such as grammar, insufficient exposure to vocabulary, and lack of confidence.

English language has the highest importance in the professional fields. Similarly, in the engineering field, English is considered as one of the high profile language to show your personality. An engineer should have English fluency and accuracy with good communication skills to excel in his/her profession. These skills play very important roles in engineers' life to build their team and leadership. Hence, a various measures have been taken for improving this, there are various bridge courses has been declared by the government and various universities declared English as their main language, the pressure to improve English Language Education (ELE) has been steadily increasing.

There are some other measures have also been taken by the students for example, students communicate most probably in English no matter at first they may face grammatical errors but they keep learning. Schools and college teachers should only communicate in English language with students. Vernacular mediums should also give preferences to teach English and many more efforts should be taken place.

2) LITERATURE REVIEW: The survey of other literature related to this research helped us to bring some related terms to complete the paper. The paper which were referred has given many views and thoughts as given below:

1) Understood that this problem has not raised suddenly but it has been passed on from generation to generation.
2) This problem also depends on what level of society one comes from, the geographical location where a student is helped in a way for example, as people from south are relatively good English speakers compared to people from north in the same way people from north east have a good hand on the language compared to people from west.
3) Understood how this can be solved too.

3) IMPORTANCE OF ENGLISH LANGUAGE IN ENGINEERING

Engineering people think all about building big sculptures, huge monuments, crazy tech, humanlike robots all in all taking humankind to a better tomorrow. Talented engineers can make these things and make our world a better place to live. The challenge in this is how to amplify one's invention to the whole world. How the globe will notice what will make in a corner of my drawing room. It is a big question. The answer to this is a paper

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and a pen. It is rightly said "Pen is Mightier than Sword" so to magnify our knowledge, our inventions, we engineers must use English as a tool. It helps us to explore places where we could never be in real life. It takes us to places where we could not imagine even in our wildest dreams! English language has importance in both academic as well as work place and also plays a vital role in engineers' life.

4) IMPORTANCE OF ENGLISH IN ACADEMIC PLACE

The students who pursue engineering take a very bold step in their life. Engineering being one of the most appealing and promising sector not only in our country but around the world attracts an ocean of students.

When we are entering our engineering colleges most of us would have recently turned adult and we would have gone through rigorous studies, preparations for our entrance exams and that impact our communication skills a lot. One could have got selected in any college around the world or country on the basis of their marks. They may have to go to place they would have never heard of completely opposite, no similarities in culture, no similarities in food but in such cases the savior for students is English language.

The beauty of this language is that this language is spoken across the globe and in India from Kashmir to Kanyakumari, from Gujrat to Arunachal Pradesh. It helps students to communicate with their classmates coming from different places having their different local languages. A catalyst is a substance that speeds up chemical reaction similarly, English language helps in giving an adrenaline rush to the academics and social life in college and educational institutions. Being fluent in English adds an extra confidence in a person and he/she gets a motivation and hence it get reflects in their academics.

5) IMPORTANCE OF ENGLISH AT WORKPLACE

Speaking English in one's workplace is a new ball game altogether. It begins even before we enter a company right from the interview process. We are selected based on our fluency in English language, our clarity, our confidence, the words we use, the way we use them, our pronunciation, our enunciation. The way we speak English plays a vital role whether we shall get into a respected organization or not!

In our workplace, we are member of various teams and hence communication skills that we possess are checked here, the way we speak the way we present ourselves will decide whether we shall be taken seriously or not. The English we speak in offices is completely different from the one we speak with our friends and peers. One needs to train themselves in suitable manner to outstand in their workplace. Arranging seminars, taking interviews, meetings, giving presentations all require great communication skills which in turn requires knowledge and practice of the language English!

6) IMPORTANCE OF ENGLISH FOR RURAL AREA ENGINEERING STUDENTS

To study engineering degree is not only taken by the urban students but also by the rural students. Many students from rural areas are also eager in pursue engineering but the only problem they faced is communicating in English. After coming at institute level, there is no differentiation in any language, only English language is given the most preference.

Students coming from rural areas are definitely more familiar with their vernacular language as compare to English language which makes them difficult to communicate in English and henceforth they lay behind. Their understanding level is similar to students of urban areas but the only differentiation is English communication. For example, if any derivative is explain to them they can easily admit it if it is in their own vernacular language but if the same is taught to them in English language they might get some difficulties to adapt it.

7) PROBLEMS FACED BY RURAL ENGINEERING STUDENTS

Basically, 75 precent of the engineering students are from the rural areas and from the underdeveloped cities. These students find barriers and discomfort while speaking English. Maybe this is because of their steady growth in a regional language medium school or any other reasons. There is no doubt that they are not talented as they have qualified in an engineering college, but at every walk of life and career, English becomes an obstacle for rural engineering students. The first problem that a rural engineering student might face English as a trouble.

8) SOCIO ECONOMIC BACKGROUND OF FAMILY

Classroom of a college contains the students from different states of the society who poses grasping power and English communication competence. It is found that the English communication competence of the students belonging to the literate parents or higher middle class family is better than that of the students belonging to the illiterate parents or poor family. The actual fact behind this situation is that the literate parents can provide more facilities and more exposure towards their child to English as they are aware about the importance of English competence in the society. The literate parents give proper guide and care to their children to perform

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better in their life in fact these all things never happened in second group due to the lack of parental supervision and guardians from the higher education department

9) LACK OF SKILLFUL TEACHERS

The other important factor that should be taken in consideration at first is the education system. Here, there is lack of skillful teachers, there are many untrained teachers, that all learning groups are unaware about current trend and advanced techniques of English language teaching. The same condition is there at the primary, secondary and higher secondary schools of rural or semi urban areas. This type of education creates exam-oriented students to their technical subject than to the English communication competent. The teachers have not been scared lead to a poor quality of education.

10) EDUCATION SYSTEM

The Other important factor is practically and cultural system of the college which affect the learning of English language. For learning English language it requires four skills that is listening, speaking, reading and writing (LSRW). The present education system is strange to the students that they have no chance to listen, speak, reading and writing and these LSRW activities are neglected and ignored. Let us take an example of language it is in bio baby start speaking the words which it listens frequently our system neglect the importance of listening with results in the lack of scale of speaking.

11) LACK OF EXPOSURE TO THE ENGLISH COMMUNICATION

The student living in the rural areas lack the exposure to English communication in the society as well as in colleges. Even the meritorious, gold medalist, feel to achieve a success during personal interview but due to the lack of English communication skills, lack of confidence they have inferiority complex and fear of others. As a result, students of rural background keep themselves lonely and do not have the same common sense with all other people.

12) LANGUAGE REDUCED AS THE SUBJECT

The language English is taught for and learnt as one of the subject for examination. Most of the students focus on the writing skills and grammar because the examination process of Boards and Universities. English subject based on writing skills and students' basic concern is to score good marks in examinations not gain knowledge. This attitude of the children reduces their interest in learning English language and the beauty of language is also got lost.

13) MEDIUM OF TEACHING

Medium of teaching English subject in rural areas is most dangerous because they use mother tongue to explain the lessons which creates confusion among students. The construction of sentences in English and in Indian language is different that makes rural students critical to improve English.

14) REMEDIES

14.1. Development of Inner Urge: It is generally observed that the engineering students mainly focus on their technical subjects because they think that the only thing require to get a job is knowledge. While pursuing the other subjects and development of technical skills are totally neglected. Students' communication skills, which is the only one of the greatest aspect for getting jobs, is neglected. Considering the scenario of corporate world, if the candidate has good knowledge and best communication skills, he/she is suitable for that field. So, the engineering students should develop their communication skills to progress in their personal and professional life.

14.2. Need to Enrich Vocabulary and Sentence Construction: Language consists of words and sentence structures. Each day, they must learn at least 5 or more than 5 words and try to use them while having conversation with their friends families or having conversation with themselves by standing in front of mirror and starting a conversation.

14.3. Listening: Listening skills of students must be developed. A habit of careful listening of English news, lectures and explanations during tutorials, practical, seminars, technical presentation, academic discussion, and academic interactions, and zone. Before being a good communicator or speaker, they must have art of being a good listener. One must also have proper knowledge on the language that can only be achieved by listening.

14.4. Speaking: Speaking skills are very important for a person's professional survival and group. It gives image of how could you are at your profession and also boost confidence in speaking. The rural students should be given a chance to have conversational activities, discussion, and question and answer sessions in order to remove their fear and open to accept challenges. It will become a center of attraction or avoids the fun of their mistakes. Opportunities must be given to them to raise their opinions, agreement, disagreement and suggestions.

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The credit should be given for participating discussions, making presentation of projects, products, graph, table, charts, plans, maps. As doing these, they will not only make their moral boost but also they won't hesitate to stand out from others. We must be ensured that speaking skills are the single most important criteria in hiring.

14.5. Reading: Like listening and speaking, the reading is also crucial for good communication skills. Students need to read technical and business documents, reports, magazines, articles, lattice and instructions manuals. They must also read out biography of successful people. It is hard to imagine any academic professional or business work that does not require analysis and efficient reading skills.

14.6. Writing: It is said a reading makes a complete man, speaking makes ready man and writing make a perfect man. Writing is very important for students because it is one way to communicate. Writing skill is seen everywhere in academics and also in professional field. Student should practice writing projects reports, lab reports, summary, synopsis, abstracts, and subject notes.

As they go higher post in the profession, they will require writing business letters, emails, messages, professional summary, and so on. They can also develop their skill by doing a small exercise daily such as reading books for 5 to 10 minutes and then writing down the point that the book contains. It will help enhancing your writing skill as well as memorizing power. Both professional and students need excellent writing skills to survive because there is no profession or academic that does not require writing skills.

15) CONCLUSION

This research concludes that there is a huge difference in the lifestyle of people coming from different places. Students that are from urban cities have an upper hand over ones coming from villages and areas that are deprived of basic facilities. These students have to understand that the English will act as a catalyst and can boost their academics and their confidence once they go to any workplace. Once they understand the importance of the language, in the early stage of their learning period, they may face lot of difficulties, this may be due to numerous reasons that we have mentioned in our paper and can be solved if one has the will.

It is rightly said**,** "Where there is a will there is a way". In today's time, nothing is impossible for anyone irrespective of where they are coming from. As it is the information age, the boundaries that used to separate people, countries and societies have been diluted by the internet and if a student identifies his urge to master the language, then with his hard work, perseverance and dedication he will master it.

REFERENCES

1) Wikipedia: https://en.m.wikipedia.org
2) Sample Papers: https://iosrjournals.org
3) Official Humans of Bombay: Humans of Bombay book by Karishma Mehta (2014), capture the untold stories of the millions of people living in the maximum city. https://humansofbombay.in
4) IJERT (International Journal of Engineering Research of Technology), l. M. Sowmiya (2018).
5) YouTube podcast: Dostcast - Satish Ray
6) Babasaheb Ambedkar interviews: https://dbatu.ac.in

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NEEDS OF ETHICS IN ENGINEERING

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ABSTRACT
This paper emphasizes the "Needs of Ethics in Engineering" and educates engineering students the importance of it for building life-long relationships with stakeholders, suppliers and customers to achieve their goals in personal and professional life. The study also focuses on why people connect Ethics to Engineering and why Engineers should enhance Ethics. The study also highlights the corporate skills such as Personality Development, Communication Skill, Soft Skills, Leadership Skills and views on importance of Values and Ethics and its importance. The conclusion of the study is presented with explanation of Ethics and Benefits and its results.

Keywords: Ethics, Engineering, Life-long Relationships, Corporate Skills, Personality Development, Communication Skill, Soft Skills, Leadership Skills

I) INTRODUCTION
The main objective of this research article is to educate engineering students the "Needs of Ethics in Engineering". Earlier, it is believed that the engineers should have Techno-oriented knowledge and skills to develop their creativity and productivity. In the present years, the universe emphasizes that the engineers should have not only the technical sciences concepts but also the knowledge and experience in communication skills, soft skills, leadership skills and views on importance of Values and Ethics. This article studies the reason of these demands and presents its essences to engineering students.

Fig. 1: Value of Ethics

The study depicts the truth that these skills are important to the engineers because they help them communicate effectively to their stakeholders, suppliers and customers which leads them to build good and life-long relationships with them to achieve their goals in business and in social life. The study exclusively focuses on Ethics and why people connect Ethics to Engineering and why Engineers should enhance Ethics. By the end of this article, the engineers will be familiar with or get the better ideas about the Ethics and applying it in the field of Engineering to get benefits of the Ethics.

II) LITERATURE REVIEW
The literature survey of this research work guided a lot for knowing the value of ethics in social and professional life. It provided more knowledge about it as well as system of engineering in production as well as business. The survey has helped us to target the following points:

- Recognizing the context ethics with a sound knowledge of its usage
- The function of human communication and its importance in personal and professional are clearly understood
- Code of Ethical Conduct in Engineering is learnt
- Professional Communication and Ethics help to promote moral authority to society and to maintain Creativity and Conflict Resolution
- Improves engineers' attributes, presentation skills and life-long relationships
- Implementing ethics leads to gain the skill of assessing the engineering ethics and education reforms and learning achievement of goals

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III) Importance of Ethics in Engineering

A) **Definition of Ethics**

- Ethics is the moral principles that control or influence a person's behavior or a system of moral principles or rules of behavior.
- Overall ethics is a branch of philosophy or specification moral philosophy that studies that evolution of concept such as right and wrong behavior.

B) **Significance of Ethics in Engineering**

- As engineers rely heavily on engineering to provide people safe and reliable goods and services, they must perform under a certain standard of professional behaviour such as the highest principles of ethical conduct.
- Mistakes made by unethical and incompetent engineers do not just cost money, they could cost lives.
- Several notorious cases, that have received a great deal of media attention in the past few years, have led engineers to gain an increased sense of their professional responsibilities.
- These cases have led to an awareness of the important of ethics within the engineering profession as engineers relies how their technical work has far reaching impacts on society.
- The work of engineers can affect public health and safety and can influence business practices and even politics.

C) **Engineering Ethics**

Ethics" Has No Standard Use Either in Ordinary Language or in Philosophy.

- In both, "ethics" can be used in at least one of three senses:

1) As a mere synonym for ordinary morality ("universal ethics");
2) For the special (ostensibly) morally-binding standards of some group ("Hopi ethics"); or
3) For a field of philosophy ("Aristotle's ethics").

- Every discussion of engineering ethics should, I think, include a clear statement about the sense or senses of "ethics" used.

Fig. 2: Engineering Ethics

Philosophers can, of course, agree that "engineering ethics", when used for a field of applied (or practical) philosophy (a specification of my third sense), is concerned with understanding--and helping to make--certain moral choices arising in the practice of engineering. Philosophers evaluate arguments, their own or those of others. Agreement among philosophers on that will, however, not give "ethics" a standard use, even in philosophy for at least two reasons:

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1. One reason is that application this agreed-upon definition of "ethics" is sensitive to theoretic commitments. For a teleologist (whether utilitarian, virtue theorist, or other consequentialist), "ethics" is primarily about "the good life".
2. The (moral) right is a function of the (non-moral) good. For deontologists, however, especially for a Kantian like me, the reverse is true: the right is conceptually prior to the good. Individuals may well disagree about what the good life is and yet agree on standards of conduct. Morality does not presuppose any single theory of the good. "Ethics" merely attempts to understand morality as a **rational** undertaking of those who may share no conception of the "good life".

D) **Professional Approach to Engineering Ethics**

The professional approach to engineering ethics are as follows

1) Resembles the social insofar as both recognize a certain arbitrariness in what may turn out to be "ethical".
2) The professional approach differs from the social in placing that arbitrariness in the profession's decision rather than in society's.
3) For the professional approach, society (like morality or the nature of engineering) is (generally) a mere "side constraint", not the primary (or equal) party in determining the content of engineering ethics.
4) Individuals have a moral right to join a profession because humans have a moral right to associate in any morally permissible way; they do not need "society's" permission.
5) Association in a profession creates moral obligations for those so associated insofar as they exchange commitments--either explicitly by promise or oath or (more often) implicitly by claiming the (morally permissible) benefits of membership in the profession.
6) The both social and professional approaches require standards beyond what law, market, and ordinary morality set everyone, both face a problem of explaining why those special standards are, though special, morally binding.
7) The social approach looks to society for the moral authority to add to an individual's moral obligations.
8) The professional approach looks to the individuals themselves, their power to add to their own moral obligations by express or tacit commitment.
9) The last approach "professional" to emphasize the distinctive place it assigns the profession.

E) **Ethics In Engineering**

- To begin by establishing a position with respect to technology and society, there are people who are considered as critics of technology who take a very dim view of the whole enterprise.
- Listening to them, one-might feel that the world would be better off if we could only return to some pastoral utopia that may have existed in the 13th century.
- I want to disassociate myself at the outset from that point of view.
- There are also people who consider that there is an inexorable movement of technology over which mankind has no control: that is -

- each development proceeds from each preceding development;
- our scientific knowledge advances in sequence as discoveries are made;
- There is a natural order of these developments that we cannot control.

- There is a sense that if it is possible to make percent something it. Will be made if it is possible to put something into production, it will be put into production.

Some More Examples: The study presents here some examples of the ABM defence 11system, which was on track in this country around 1970 but as a to doom result of serious discussions was abandoned. Now course we are witnessing a resurgence of the same issues in another form, and I think we are going to see that debate come up again. It seems clear that these situations could have gone either way in the United States.

The SST might well have been built or the ABM might have become a major defence system, but because some people raised sufficiently strong objections they were not carried out. I think this gives us an indication that we have- at least some control over what is going on. If you do not make the assumption that one can control what is going on, then obviously we will not control what is going on. It is a self-fulfilling prophecy. If we do not

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believe we can do anything about it, then we will not. Even if you are in doubt about whether you can change the course of events, I believe it is more fruitful to assume you can and then just do the best job possible. I take this position: that it is possible to control technology and its applications.

The next point I want to make concerns the responsibility of engineers in the process of controlling technology for the benefit of mankind. We could of course broaden the discussion to consider other kinds of people or to other responsibilities of engineers such as doing a good job for their employers and treating their colleagues ethically, etc., but I am going to focus on the idea of controlling technology for the benefit of humanity.

It is probably not necessary to dwell on the fact that technology has great benefits to bestow or that there are great problems that can also arise due to the misuse of technology in many ways. We only have to look at examples of collapsing bridges and buildings or crashing airplanes to see one aspect of the bad side. As far as the good side goes, all that should be necessary is to compare our lives with those of, people living several hundred years ago, where just staying alive in the winter was no simple matter. They also did not have the leisure that is available to us today, let alone such miracles as television, which of course has its down side.

As an aside, I think this is an example of a misuse of technology for which engineers are in no way responsible. It is clear to me that there are other institutions in our society that are to blame for misusing this miraculous invention by reducing it to a vehicle for selling toiletries and for showing programs that dull the minds of those who watch them.

Achieve and maintain professional competence is not always thought of as an ethical point but in this instance it really is ethical. It does not matter whether a building collapsed because an engineer took a bribe and used inferior materials or because the engineer made an error in specifying the size of a beam. Incompetence and other forms unethical behaviour can have in general indistinguishable results, so competence becomes an ethical point.

If you accept these as three underlying precepts that are not going to be debated by anybody, and it is difficult to see how anybody would argue that these are not important moral points or that each by itself should not be violated without strong counter-arguments based on other considerations, then we can formulate some useful ethical rules. For example, engineers shall regard their responsibility to society as paramount and shall:

1) Inform themselves and others, as appropriate, of the consequences, direct or indirect, immediate and remote, of projects they are involved in. This addresses itself primarily to the question effects. One has an obligation to do a reasonable amount of work, although there are limits as to how far one can go in trying to foresee all possible consequences.
2) Endeavour to direct their professional skills toward conscientiously chosen ends they deem, on balance, to be of positive value humanity; declining to use those skills for purposes they consider, on balance, to conflict with their moral values. Engineers make their decisions on their own set of moral values, which means different engineers could arrive at different conclusions with respect to particular projects. What they are obliged to do is to make the effort. What would be unethical would be to work on a project without having given any thought as to whether on balance it is a good thing.
3) Hold paramount the safety, health, and welfare of the public, speaking out against abuses of the public interest that they may encounter in the course of professional 13 22 activities in whatever manner is best calculated to lead to a remedy.

F) CONCLUSION

There are many interesting and pressing ethical topics that engineering and technology give rise to. This special issue features authors who all make an effort in identifying problems and offering possible solutions. The authors have various backgrounds: moral philosophers, philosophers of science and engineers who have devoted research on ethical aspects of their work. The basis is there for an interdisciplinary, international research community.

REFERENCES

1. Davidson, J. (2003). The complete guide to public speaking. New Jersey: John Wiley & Sons, Inc.
2. Baum, R" The limits of professional responsibility." in schaub J.H.& pavlovic K.
3. Dillenbourg, P. (1999) What do you mean by collaborative learning?. In P. Dillenbourg (Ed), Collaborative-learning: Cognitive and Computational Approaches. (pp.1-19). Oxford: Elsevier.
4. https://images.app.goo.gl/wqsf5yoyz76TnUJJ8
5. https://images.app.goo.gl/5H28hWGdNPi6H6bWA

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IMPACT OF SPEECH ANXIETY ON STUDENTS PUBLIC SPEAKING SKILLS

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ABSTRACT
Public Speaking Skills are important aspect of students in higher education. They have to present their works in the form of assessment and enhance verbally engaged experiential learning in small and large group settings. This research evidences that many students experience speech anxiety and also sought further insight into the six themes namely: fear of being judged, physical symptoms, uncertainty about the topic, negative effect on university experience, practice and preparation, and more needed practical support. The second objective was to determine whether their fear affected their experience in higher education or not. The results of this survey identify the differences between Trait-anxiety, State-anxiety, and Scrutiny fear in public speaking. It provides evidence of the overall negative effect on their higher education experience and suggests that the higher education institutions should admit the presence of speech anxiety among students and guide them by providing more support in oral presentation and assessments for overcoming the issue.

Keywords: Speech Anxiety, Public Speaking Skills, Experiential-learning, Overcome the Fear of Presentation and Assessment

A) INTRODUCTION

Students are very common among them but their performance level is different. Before they begin the practical tasks or activities, why do they feel that they won't be able to deliver a speech or presentation well! They start to feel what people think about me! They are interested in me or not, due to their speech anxiety, stage fear, lack of confidence and negative thoughts in mind. All these start to creep them from inside and leading them to low participants or failure or rejection.

The main purpose of this study is to identify the cause behind the impact of speech anxiety known as glossophobia on students' public speaking skills and to investigate finding a solution to it. "As soon as the fear approaches near, attack and destroy it"- Chanakya.

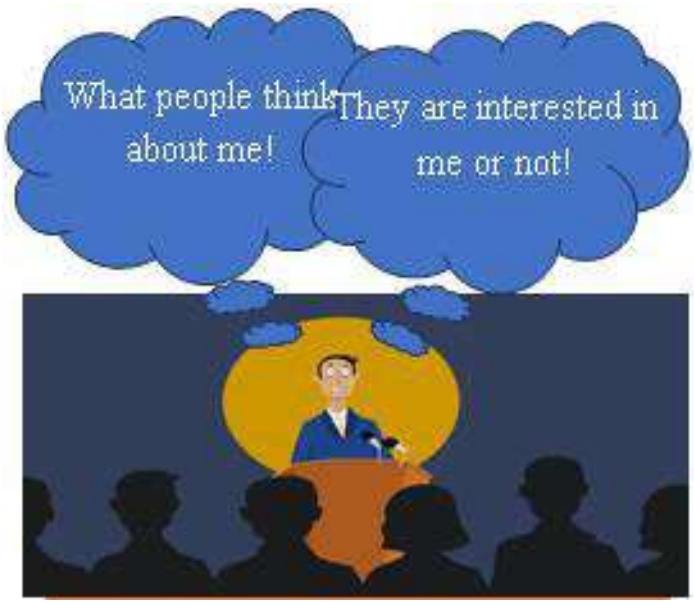

Fig.1: Speaker Thinks on People's View

B) OBJECTIVES

Simply learning what to say is not Effective Public Speaking but developing how to say with confidence so, the study aims to examine the following:

- Understanding the nature of Speech Anxiety (SP) and dealing with it to build your brand
- Analyse objectively the formation of students' habitual frame
- Understand the importance of personal preparation and routine practice in your topic
- Apply Cognitive Restructuring (CR) techniques to create a more positive frame to minimize your anxiety

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C) LITERATURE REVIEW

In today's world, many people do not have the potential to speak in front of the public. Some people have stage fear or shyness, some have a lack of confidence and some have inferiority complex and anxiety so the experts considered it a Social Anxiety Disorder. People's level of anxiety is not the same in every person because speech anxiety affects every seven out of ten people and as much as 77% of the population. The National Institute of Mental Health report says that the reason for speech anxiety in 73% of the population is a judgment or negative evaluation by others.

Fig.2: Level of Anxiety

To study more of the above points, a number of other literature and articles are referred for exploring the reality of students' anxiety. Here you can see the views and ideas of them:

1. In the year 2012, Weissman's review presents the reasons of some speakers' fast speech: 1. they come in front of an audience, 2. the pressure of the situation prompts them to rush and 3. when time wrap that causes them to do it.
2. J. Davidson's book "The Complete Guide to Public Speaking" (2003) covers every aspect from preparation and execution to issues and provides complete guidance to public speaking with professional advice.
3. "Speaking with Confidence" (2011) by Ronald P. Grapsy deals with Communication Apprehension (CA) means the fear of public speaking which is common in our society and it guides to conquer the nervousness associated with public speaking, factors that lead to this anxiety and then take specific steps to overcome this communication apprehension.
4. "Communication Apprehension" can impact many diverse areas; from one's level of self-esteem (Adler, 1980) and how you are perceived by others (Dwyer & Cruz, 1998), to succeed in school, achieving high grade-point averages, and even landing job interview opportunities (Daly & Leth, 1976).
5. Morgan's review (2008) provides tips that hold great importance during speech or presentation:

- ✓ Intent to be passionate about your topic
- ✓ Intent to connect with audience
- ✓ Intent to listen to your audience
- ✓ Intent to open with your audience

D) HYPOTHESIS

1. **Factor 1: Students Face Failures -** In institutions, most of the students are nervous so they face failures in making projects and explanations. These activities require careful planning which is felt like an unpleasant task for them. Speaking in front of peers and higher authorities is the most difficult task and stressful for them which make their presentation skills negative impact and inefficient. Here, students need to realize that they are not the only ones who may go through these emotions but also every speaker. According to Lucas (2011), "Many people who converse become easily in all kinds of everyday situations become frightened at the idea of standing up before a group to make a speech."
2. **Factor 2: Students' Fear and Nervousness -** Many education level staff prepare many types of activities, presentations, demonstrations, etc. to develop students' personalities. Students generally avoid these opportunities due to their fear and nervousness. It can be a serious issue that act as hurdle for developing public speaking skills, and achieving goals both personal and professional. Professionals to have direct contact with the speaker and the audience are expected to regularly keep on improving their communication skills.

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3. **Factor 3: Speech or Communication Anxiety –** Communication Anxiety (CA) or Glossophobia is the fear of public speaking which makes one feel alone in the struggle. It is spread worldwide and become an obstacle to higher education and professional success. McCroskey (1976) indicates that 20% or more of the U.S. population has a high degree of communicative anxiety. When people have higher levels of CA, they avoid interaction in personal important classrooms, professional relationships and social situations which results from miscommunication and misunderstanding. One must conquer it by taking specific steps to recognize the factors of the anxiety and overcome that. "I learned that courage was not the absence of fear, but the triumph over it." – Nelson Mandela.
4. **Factor 4: Classification and Symptoms of Speech Anxiety -** Speech Anxiety includes fear, shyness, nervousness, feelings and worries. The most common mental health disorders symptoms encountered by public speakers are: shaking, trembling, sweating, dry mouth, creaky voice, dizziness, butterflies in the stomach, shortness of breath and rapid heartbeat.
5. **Factor 5: Negative Impact of Glossophobia -** Many students can't express their emotions even though they deliver speeches on daily basis. They may still experience anxiety about talking in front of others. Generally, the glossophobia students feel isolated and have a higher than normal risk of developing anxiety disorders which can make them become hindered by their thoughts on what to say, how to say, how to attract an audience, how to keep the audience's interest and how to gain their interest of hearing and be calm.
6. **Factor 6: Cognitive Reformation -** Cognitive Reformation means nurturing a change in attitude by self-reflective routine and it has three steps internal process: 1. Identify objectively what you think 2. Identify any inconsistencies between perception and reality 3. Replace destructive thinking with supportive thinking. These are very easy to understand but the execution is possibly a bit difficult! An individual who follows three steps of cognitive restructuring can deliberately adjust how one perceives an action or experience (Mattick et al., 1989).

E) METHODOLOGY

1) **Introduction:** A fieldwork is undertaken by studying 20 engineering fellow classmates and investigating their cognitive reformation before and after the activities of the subject Professional Communication & Ethics-I (PCE-I). It deploys analysis and assessment of the way students can understand their speech anxiety and find a solution to overcome it. Nelson Mandela said, "The brave man is not he who does not feel afraid, but he who conquers that fear."
2) Students habitually adopt some kinds of behaviour later it could be very difficult to break so the research methodology educates them by inculcating the knowledge of understanding the differences among Trait-anxiety, State-anxiety, Scrutiny fear and Cognitive Reformation which help them deal with their "personal brand" of Communication Anxiety. It also guides them to conquer their fear and become brave by providing the knowledge - the importance of paralanguage in the flow of speech, tips for improving public speaking skills, fight against glossophobia and the benefit of cognitive behavioural therapy.
3) The knowledge of the above employing cognitive reformation helps them to know about how people develop habitual frames of reference, the way they approach an anticipated experience and change habits into counterproductive and delivering effective presentations. They were investigated in the following ways:

a) Trait Anxiety
b) State Anxiety
c) Scrutiny Fear
d) Cognitive Reformation

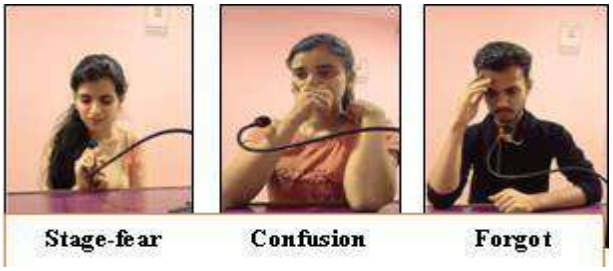

Fig.3: Trait-Fear Reactions

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a) **Trait-Anxiety:** It is associated with an individual's personality that makes a person feel **"shy"** and leads to frequently avoiding interaction with others and becoming undefined on perception and persuasion. Researchers say generally this type of judgement is not difficult but it becomes a pattern of behaviour expressing themselves publicly with disbelief and hesitation. The above figure presents the anxiety of students: stage fear, confusion and forgot at the stage performance.

b) **State-Anxiety:** Individuals find the state anxiety themselves from the external situation. In this image, everyone has a good eye-contact except the girl due to some personal trait or social anxiety associated with scrutiny and negative evaluation or experience at an early age like forgetting a line in a speech on poorly performing in a play in front of their class which result a bit of public awkwardness.

Fig.4: Avoid Eye-contact (State-anxiety)

c) **Scrutiny Fear:** A scrutiny fear sprouts out while undertaking an activity in a situation. Students often worry more about their grade rather than what is contained in their presentation where one is being observed or one see himself or herself as being watched. Students usually develop a combination of personal and witness from student-oriented experiences which are considered as a habitual frame of reference that involves not interacting with other people. Studies have even shown that the possibility of a negative experience can lead many students to skip assignments or drop a class – even when that class is required for graduation (Pelias, 1989).

d) **Application of Cognitive Reformation (CR):** Everyone is unique. Each case of speech anxiety is personal and different. To deal effectively with CA, the first step is finding its primary cause and recognising different forces connected to different situations and then minimising the cause means overcoming the condition. Cognitive Reformation helps you effectively address the both presence of state anxiety and the appearance of scrutiny fear and alert the experience. It involves the development of one's skills as a speaker and one's attitude about the situation either "presenting" to a public audience or to a small group of close friends or both.

4. Importance of Paralanguage in Flow of Speech: Action speaks louder than words like that Paralanguage is the component of spoken communication that uses non-verbal cues to reveal emotions and sentiment. It involves voice variation accompanying words to make the audience fully understand the essence of speech. The four major elements of the paralanguage are presented in this figure which makes your presentation interesting:

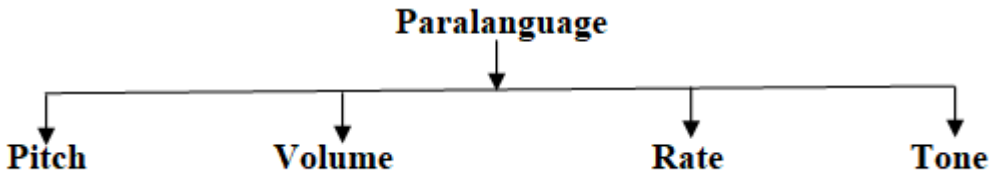

Fig. 5: Major Elements of Paralanguage

The following points help you present your topic in a very understandable manner:

Table 1: Description of Four Major Elements of Paralanguage

Four Major Elements of Paralanguage	Descriptions
1. Pitch	It represents the high and low of your voice. It is used according to the topic in public speaking, if you handle it perfectly; it makes your speech effective.
2. Volume	It represents how loudly or softly you can speak in public speaking. Your

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	loud voice makes audience irritated and soft voice not listen anything. So, it is important to manage your volume to make audience listen clearly and understand your speech.
3. Rate	This represents the speed at which you speak. Your too fast speech make your audience not understand anything and your too slow speech make them. So, it is important to manage your speed of speech depend on topic.
4. Tone	It represents how pleasant or unpleasant your voice which means you need to follow better rhythm of speech for effective public speaking.

5. **Tips for Improving Public Speaking Skills:** The fear of public speaking is a common form of anxiety that make many people suffer through shaking hands and a quavering voice and avoid the public speaking situation. It can range from slight nervousness to paralyzing fear and panic. The main question is, "How can you overcome your fear of public speaking?" You can overcome your speech anxiety by the following points:

Fig. 6: Tips for Improving Public Speaking

- **Understand of the Topic:** The how better you understand what you have to talk about is very important. It helps you make less mistakes and if you get off your track, you will be able to recover quickly.
- **Be Organized:** It is a manner of carefully planning what you want to present it and how you want to present. The more organized makes you less nervous. Visit the venue and review available equipment before your presentation.
- **Practice more and More:** The several time's hands-on practice keeps you in your comfort zone and afraid sometimes leads you to overestimate and bad things to be happen. List your specific worries and then identify the possible alternatives to overcome it by doing a speech in front of a mirror or with family and friends and asking for feedback. Make a video of your speech, watch it to work on your mistakes and bring modifications. All will help you to present who are less familiar.
- **Think Positive:** Imagine the positive thought like your presentation will go well. It can help you decrease your speech anxiety and negativity at some level and can improve your social performance. Here, when you are before the podium, take a deep breath which can make you very calm and relaxed.
- **Focus on Your Presentation, not on Your Audience:** Usually, people look for new information only not how it is presented. So, don't fear losing track or start to feeling nervous if you do, your mind goes blank and makes you silent. In that case, just take a few slow, deep breaths. Your audience may not notice your nervousness even if they do notice, they may root for you and want your presentation to be a success.
- **Recognize your success:** Everyone makes mistakes so after speaking, look at any mistakes you made as an opportunity to improve your skills. Join a group that offers support and focuses on training people in public speaking and leadership skills.

6. **Cognitive Behavioral Therapy**: It is a skills-based approach used for reducing the fear of public speaking and resulted as a successful treatment. People become nervous when they do public speaking which is called Performance Anxiety. It happens because of the mistakes done by people in previous speech which is called a habitual frame of reference. To solve this issue, we can use cognitive behavioural therapy or medications sometimes both. Students' habitual frame of reference is given in the following table:

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Table 2: Cognitive Behavioural Therapy for Habitual Frame of Reference

Habitual Frame of Reference	Descriptions
1. Fear of being judged	Fear of being judged means students when deliver a public speech worried about what people will think about them and they are interested on them or laugh at them and then they are not able to make eye-contact, shy to talk in front of a large number of audience and many more things which result the speech anxiety.
2. Physical symptoms	When students feel anxiety while speaking it can be seen physically by shaking hand and tongue tied speech which directly affect their confidence low.
3. Uncertainty of the Topic	It emphasizes the understanding of the topic well and fluency in speech avoid mistakes while speaking and forgetting some parts that need to say.

7. Tips For Fight Against Glossophobia

Some experts say that glossophobia is remarkably common as much as 77% of the population. To overcome this, they have to follow these steps:

Table 3: Steps to Overcome Glossophobia

Sr. No.	Steps to be Followed
1	Know your topic
2	Get organized
3	Practice, and then practice some more
4	Challenge specific worries
5	Visualize your success
6	Do some deep breathing
7	Focus on your material, not on your audience
8	Don't fear a moment of silence

Process Results: One of the basic ways of maximizing performance is becoming aware of going into any activity with a positive attitude. The study started with 20 first-year engineering students over eight-weeks practice. It conducted a workshop and provided training for on-stage personalities such as dressing and grooming, body language (eye contact, facial expression, gesture and posture), walking towards the dais and back to the seat, handling card and cardless microphone on the podium, etc. Each student has got hands-on practice to overcome stage fear while presenting the following activities: dialogue, speech, role-play and case study. The mentor tested students' Cognitive Reformation and assessed each of the respondent's flow of speech, language, body language and paralanguage. The findings draw the conclusion and presented the tailored data in table 1:

Table 4: Impact of Cognitive Restructuring

Sr. No.	Various Training & Practical Activities	Before Cognitive Restructuring	After Cognitive Restructuring
1	Walking towards dais and back to seat	Each one feared coming to dais and positioning at the centre	Each one recognizes that it attracts audience to pay attention to the speaker.
2	Handling card and cardless microphone on podium	Don't have idea about it and worried to use it.	Each one recognizes that audio provides clear and loud sound to audiences that lead to get success.
3	Body language (eye-contact, facial expression, gesture and posture)	One is worried about being judged harshly about making an embarrassing mistake.	One recognizes that audiences look at who is speaking and understand the communication to become a success.
4	Use of three approaches: language, body language and paralanguage	Each one worried about how to use these in proper ratio.	Each one recognized the proportionate of these three approaches makes effective communication.

Treatment of Results: Students identified and analyzed the benefit of this practice and realized the importance of each case. Results reflect the relative strength and the relative importance of the different approaches of training and hands-on practice and different methods of sharing ideas and information. The findings are

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classified according to the number of respondents chose an option and the critical reviews are analyzed and reviewed to draw the conclusions on whether the hypothesis is valid or not.

RESULTS AND DISCUSSION

1. Many students have a humble nature and they tend to feel uncomfortable while speaking in front of others due to the habitual frame of reference.
2. This habit leads them to gain a lack of confidence which is the most common reason for fear of public speaking.
3. Burgess (2013, October 30) reports that according to a survey on common phobias, fear of public speaking was found to be a more pressing concern than death.
4. The study discovered that students who had a good command over debates and speeches performed better in presentations.
5. Even if a student fears public speaking, he can perform well in it through continuous rehearsal and tremendously improve upon this skill.
6. The mentors play a major role in giving support and confidence to the students and they can help them to overcome speech anxiety.

CONCLUSION

This study carried out the information about the speech anxiety of the students which is very common among people. The research proves that public speaking is a learning skill and the fear of public speaking can be overcome by doing rehearsal and hands-on practice. It concludes that students' cognitive reformation helps them to gain all the required skills that lead them to get success in their personal and professional life.

REFERENCES

1. Csoti, M. (2003). School phobia, panic attacks and anxiety in children. London: Jessica Kingsley Publishers Ltd.
2. Davidson, J. (2003). The complete guide to public speaking. New Jersey: John Wiley & Sons, Inc.
3. Dillenbourg, P. (1999) What do you mean by collaborative learning?. In P. Dillenbourg (Ed), Collaborative-learninghs: Cognitive and Computational Approaches. (pp.1-19). Oxford: Elsevier.
4. Grapsy, R. P. (2011). Speaking with confidence. Retrieved on September 10, 2018, http:// www. Publics peaking project.org/PDF%20Files/confidence%20web%201.pdf.
5. Ingalls, R. G. (2008). Introduction to simulation. Retrieved on September 10, 2018, from https:// www. informs-sim.org/wsc08papers/005.pdf.
6. Morgan, N. (2008). How to become an authentic speaker. Harvard Review, 11(86), 115-119.
7. Weissman, J. (2012, February). When presenting, remember to pause. R from https://hbr.org/2012/02/when-presenting-remember-to-pa
8. https://www.amazon.com/Speak-Fear-nauseated-energized-passionate-dp1733980008/ dp/ 1733980008/ ref= mt_paperback?_encoding=UTF8&me=&qid1568736819

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APACHE ZOOKEEPER AN OPEN SOURCE SERVER

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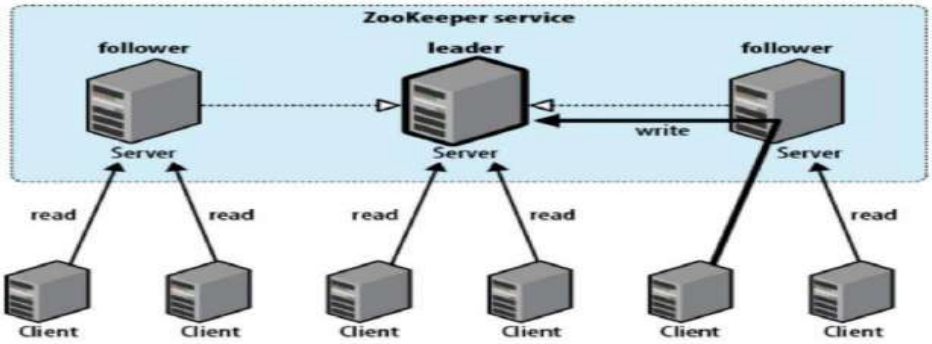
ABSTRACT
The main purpose of this paper is to introduce apache application and give some information about it. For the readers who are not familiar with Apache Zookeeper, We hope that this paper will be a useful map for researchers who are going to explore further about Apache Zookeeper, an open server, although some parts of the map are very rough and other parts are empty, and waiting for the readers to fill in.

I. INTRODUCTION

In the Hadoop ecosystem, Apache Zookeeper plays an important role in coordination amongst distributed resources. Apart from being an important component of Hadoop, it is also a very good concept to learn for a system design interview.

In very simple words, it is a central data store of key-value using which distributed systems can coordinate. Since it needs to be able to handle the load, Zookeeper itself runs on many machines.Zookeeper provides a simple set of primitives and it is very easy to program to.

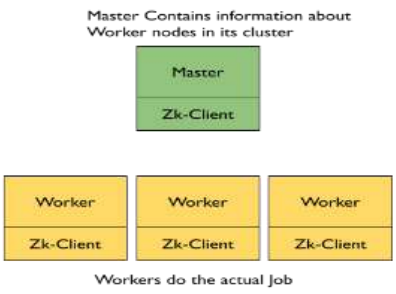


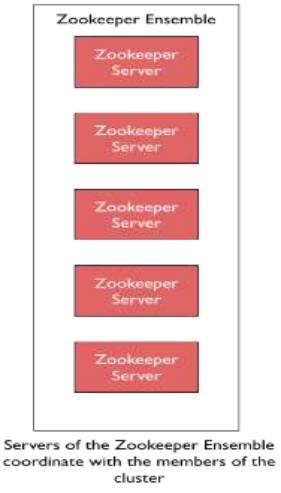
II. Zookeeper Coordination

Say, there is an inbox from which we need to index emails. Indexing is a heavy process and might take a lot of time. So, you have multiple machines which are indexing the emails. Every email has an id. You can not delete any email. You can only read an email and mark it read or unread. Now how would you handle the coordination between multiple indexer processes so that every email is indexed? If indexers were running as multiple threads of a single process, it was easier by the way of using synchronization constructs of programming language.

But since there are multiple processes running on multiple machines which need to coordinate, we need central storage. This central storage should be safe from all concurrency-related problems. This central storage is exactly the role of Zookeeper.

III. Zookeeper Architecture





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Zookeeper Architecture within the Cluster

In standalone mode, it is just running on one machine and for practical purposes we do not use stanalone mode. This is only for testing purposes as it doesn't have high availability.

In production environments and in all practical use cases, the replicated mode is used. In replicated mode, zookeeper runs on a cluster of machines which is called an ensemble. Basically, zookeeper servers are installed on all of the machines in the cluster. Each zookeeper server is informed about all of the machines in the ensemble.

The zookeeper client is installed with the machines in the cluster, and each of the clients gets connected with one of the servers in the zookeeper ensemble.

These clients request and get response from the zookeeper servers they are connected to. Also, these clients keep sending signals(technically known as heartbeats) to mark their presence to the zookeeper servers. If one or more machines are not active(or they fail), they would no longer be able to send their heartbeats. This is an indication for zookeeper that those machine(which didn't send heartbeats) have failed and there is a need for backup. In such a case, zookeeper notifies a responsible component(like YARN) so that the necessary actions could be taken and make the cluster resilient and highly available.

So basically, Zookeeper acts as a monitoring tool which keeps with it all the configuration data of the cluster.

IV. Zookeeper Data Model

The way we store data in any store is called a data model. In case of zookeeper, it uses a data model like a directory tree. Think of the data model as if it is a highly available file system with few differences. We store data in an entity called znode. The data that we store should be in JSON format which Java script object notation. The znode can only be updated. It does not support append operations. The read or write is an atomic operation meaning either it will be full or would throw an error if failed. There is no intermediate state like half-written. znode can have children. So, znodes inside znodes make a tree like heirarchy. The top level znode is "/". The znode "/zoo" is child of "/" which top level znode. duck is child znode of zoo. It is denoted as /zoo/duck. Though "." or ".." are invalid characters as opposed to the file system.

V. Election & Majority

As soon as the zookeeper servers on all of the machines in ensemble are turned on, the phase 1 that is leader selection phase starts. This election is based on Paxos algorithm. The machines in ensemble vote other machine based on the ping response and freshness of data. This way a distinguished member called leader is elected. The rest of the servers are termed as followers. Once all of the followers have synchronized their state with newly elected leader, the election phase finishes.

The election does not succeed if majority is not available to vote. Majority means more than 50% machines. Out of 20 machines, majority means 11 or more machines. If at any point the leader fails, the rest of the machine or ensemble hold an election within 200 millseconds. If the majority of the machines aren't available at any point of time, the leader automatically steps down.

The second phase is called Atomic Broadcast. Any request from user for writing, modification or deletion of data is redirected to leader by followers. So, there is always a single machine on which modifications are being accepted. The request to read data such as ls or get is catered by all of the machines.

Once leader has accepted a change from user, leader broadcasts the update to the followers – the other machines. [Check: This broadcasts and synchronization might take time and hence for some time some of the followers might be providing a little older data. That is why zookeeper provides eventual consistency no strict consistency.]

When majority have saved or persisted the change to disk, the leader commits the update and the client or users is sent a confirmation. The protocol for achieving consensus is atomic similar to two phase commits. Also, to ensure the durability of change, the machines write to the disk before memory.

If you have three nodes A, B, C with A as Leader. And A dies. Will someone become leader? Either B or C will become the leader.

If you have three nodes A, B, C with C being the leader. And A and B die. Will C remain Leader?

C will step down. No one will be the Leader because majority is not available.

As we discussed that if 50% or less machines are available, there will be no leader and hence the zookeeper will be readonly. Don't you think zookeeper is wasting so many resources?

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The question is why does zookeeper need majority for election?

Say, we have an ensemble spread over two data sources. Three machines A B C in one data center 1 and other three D E F in another data center 2. Say, A is the leader of the ensemble. And say, The network between data centres got disconnected while the internal network of each of the centers is still intact.

If we did not need majority for electing Leader, what will happen?

Each data center will have their own leader and there will be two independent nodes accepting modifications from the users. This would lead to irreconcilable changes and hence inconsitency. This is why we need majority for election in paxos algorithm.

VI. Sessions in Zookeeper

Lets try to understand how do the zookeeper decides to delete ephermals nodes and takes care of session management.

A client has list of servers in the ensemble. The client enumerates over the list and tries to connect to each until it is successful. Server creates a new session for the client. A session has a timeout period – decided by the client. If the server hasn't received a request within the timeout period, it may expire the session. On session expire, ephermal nodes are deleted. To keep sessions alive client sends pings also known as heartbeats. The client library takes care of heartbeats and session management.

The session remains valid even on switching to another server. Though the failover is handled automatically by the client library, application can not remain agnostic of server reconnections because the operation might fail during switching to another server.

VII. Application of Zookeeper

Let us say there are many servers which can respond to your request and there are many clients which might want the service. From time to time some of the servers will keep going down. How can all of the clients can keep track of the available servers?

It is very easy using ZooKeeper as a central agency. Each server will create their own ephermal znode under a particular znode say "/servers". The clients would simply query zookeeper for the most recent list of servers.

Lets take a case of two servers and a client. The two server duck and cow created their ephermal nodes under "/servers" znode. The client would simply discover the alive servers cow and duck using command ls /servers.

Say, a server called "duck" is down, the ephermal node will disappear from /servers znode and hence next time the client comes and queries it would only get "cow". So, the coordinations has been made heavily simplified and made efficient because of ZooKeeper.

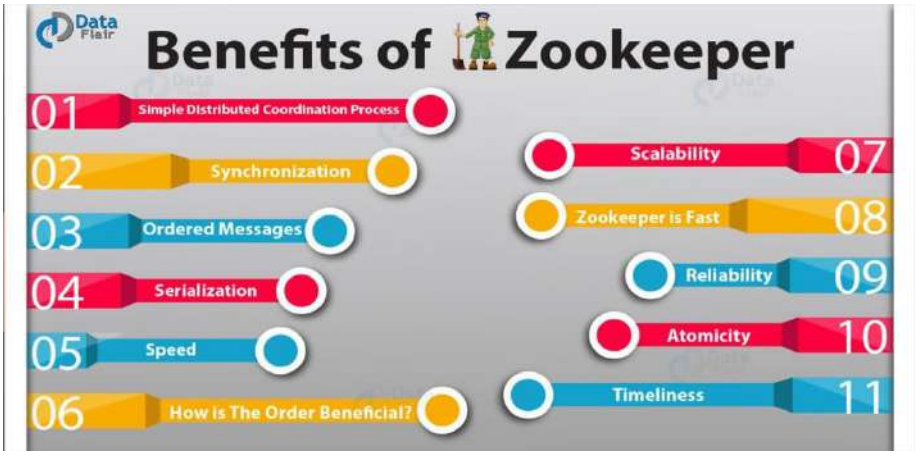
VIII. Zookeeper APIs

You can use the ZooKeeper from within your application via APIs – application programming interface. Though ZooKeeper provides the core APIs in Java and C, there are contributed libraries in Perl, Python, REST.

For each function of APIs, synchronous and asynchronous both variants are available. While using synchronous APIs the caller or client will wait till ZooKeeper finishes an operation. But if you are using asynchronous API, the client provides a handle to the function that would be called once zooKeeper finishes the operation.

IX. Benefits of ZooKeeper

Here is the list of various Advantages of using Apache ZooKeeper:



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a. The Simple Distributed Coordination Process
The coordination process between all nodes in Zookeeper is very simple.

b. Synchronization
Working of Zookeeper is highly synchronized, that means there is mutual exclusion as well as co-operation between server processes. Basically, this synchronization helps in Apache HBase for the purpose of configuration management.

c. Ordered Messages
Zookeeper track with a number, by denoting its order with the stamping of each update, through all the messages are ordered here.

d. Serialization
According to specific rules, Zookeeper encodes the data. Additionally, it ensures that our application is running consistently or not. Though, in MapReduce, we use this method (Serialization) to coordinate queue to execute running threads.

e. Speed
In the cases where 'Reads' are more common, it runs with the ratio of 10:1, which is great speed.

f. Scalability
Furthermore, it is possible to intensify the performance of Zookeeper by deploying more machines.

g. How is the Order Beneficial?
As we know, Messages in Zookeeper is in perfect order. So, in order to implement higher-level abstractions that order is required. That's how the order is beneficial for us.

h. ZooKeeper is fast
In the cases of "read-dominant" workloads, Apache Zookeeper works very Fast.

i. Reliability
Also, we can say that Zookeeper is very reliable. It is because as soon as it applies the update until a client overwrites the update, that will persist from that time forward.

j. Atomicity
There are only two cases possible, either data transfer succeed or rather fail completely. Though there is no case of the partial transaction.

k. Timeliness
In simple words, up-to-date, that means in some definite time amount, system's client's view is up-to-date or on time.

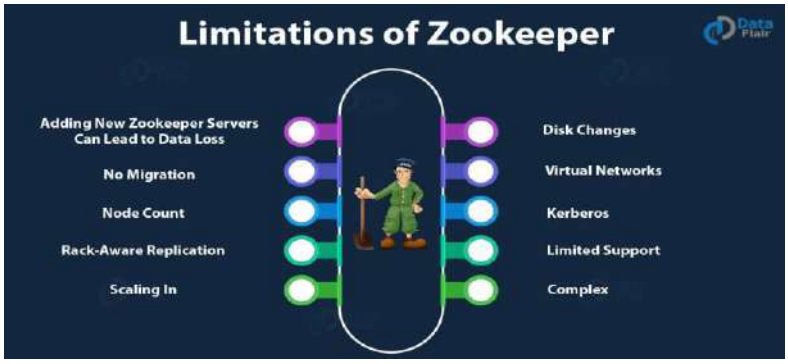
X. Limitations of Zookeeper

Since, every coin have two sides, in the same way after so many advantages of Zookeeper there are few disadvantages also. So, here is the list of several Cons of Zookeeper:

a. Adding New ZooKeeper Servers Can Lead to Data Loss
In existing server, Data Loss occurs at the time when the number of new ZooKeeper servers exceeds the number which already exists in the ZooKeeper service. At the same time, the Start command is issued to the ZooKeeper service, and the new servers can form a quorum.

b. No Migration
Without user intervention, the ZooKeeper server cannot be migrated from version 3.4 to 3.3, then back to 3.4.

c. Node Count
Make sure that only 3 or 5 ZooKeeper nodes are allowed.



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d. Rack-Aware Replication
Currently, it does not supports Rack placement and awareness.

e. Scaling In
The service does not support reducing the number of pods, to prevent accidental data loss.

f. Disk Changes
Also, the service does not support changing volume requirements after initial deployment, to prevent accidental data loss from reallocation.

g. Virtual Networks
One more loss is the service may not be switched to host networking without a full re-installation when the service is deployed on a virtual network. In addition, for attempting to switch from host to virtual networking their is the same case.

h. Kerberos
On virtual networks, it does not support enabling Kerberos, currently.

i. Limited Support
There is such limited support for cross-cluster scenarios. However, no CP system will support cross-cluster all the way. Though we can say consul seems to do better at this.

j. Complex
Moreover, we can say for the faint of heart, ZooKeeper is not right. Since it pretty heavy that's why also it will require us to maintain a fairly large stack.

So, this was all in Apache ZooKeeper Pros and Cons. Hope you like our explanation.

XI. CONCLUSION

In Conclusion, we briefly understood some of the nitty-gritty details on various concepts included in the Zookeeper technology. Thus, our understanding of zookeeper with the help of a case study where will be able to appreciate the significance of zookeeper in a given distributed computing scenario.

XII. REFRENCES

1. ^ "Apache ZooKeeper - Releases". Retrieved 20 March 2022.
2. ^ "Apache Zookeeper4". Retrieved 31 January 2021.
3. ^ "Index - Apache ZooKeeper - Apache Software Foundation". cwiki.apache.org. Retrieved 2016-08-26.
4. ^ "Zookeeper Overview".
5. ^ "ZooKeeper/Powered By". Archived from the original on 2013-12-09. Retrieved 2012-01-25.
6. ^ "Why Reddit was down on Aug 11".
7. ^ "5 Big DaaS Challenges and How to Overcome Them | NetApp Newsroom". NetApp Newsroom. 2016-06-20. Retrieved 2017-05-24.[permanent dead link]
8. ^ "Location-Aware Distribution: Configuring servers at scale". Facebook Code. 2018-07-19. Retrieved 2018-07-20.
9. ^ "ZooKeeper at Twitter". Twitter Engineering Blog. 2018-10-11. Retrieved 2018-12-08.
10. ^ "SolrCloud".
11. ^ Burrows Mike (2006). "The Chubby lock service for loosely-coupled distributed systems". 7th USENIX Symposium on Operating Systems Design and Implementation (OSDI).
12. ^ Chandra, Tushar Deepak; Griesemer, Robert; Redstone, Joshua (2007). "Paxos Made Live - An Engineering Perspective (2006 Invited Talk)". Google Research. Retrieved 2020-03-03.

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ODERISTA: ONLINE FOOD ORDERING WITH QR CODE

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ABSTRACT

The purpose of this project is to develop an online food ordering system. It is a system that enables customer of Food to place their order online at any anytime at any place.

The reason to develop the system is due to the issues of facing by Food Industry. These issues are such as peak hour-long queue issues, increase of take away than visitors ,speed major request of Food management , limited promotion, and quality control of food management.

Therefore this system enhances the speed and standardization of taking orders from the customers and display it to the staff in the kitchen accordingly.

Since the onset of the COVID-19 pandemic, restaurants and other small businesses worldwide have looking for ways to adopt contact-free strategies that cultivate a healthier and safer dining Experience.

Since the onset of the COVID-19 pandemic, restaurants and other small businesses worldwide have been looking for ways to Adopt contact free statergies that cultivate a healthier and safer dining experience QR codes that take customers to a personalized menu where they can peruse their options, order directly from their smartphone and pay, all from their phone. This kind of contact-free technology will completely alter how we view experience as a whole, not just during this global pandemic but also beyond it.

It's going to change the trajectory of how we approach restaurants and restaurant technology at its Core.

This kind of contact-free technology will completely alter how we view the restaurant experience as a whole, not just during this global pandemic but also beyond it.

It's going to change the trajectory of how we approach restaurants and restaurant technology at its very Core.

Keywords:

INTRODUCTION

Food ordering system means it an application which will help restaurants to optimized and control over their restaurants. And my project "Food ordering system" {Oderista} is also based on the same point.

Through this website user can do a lot of things from anywhere from home, from office, from train and many more places.

User can order his/her favourite food from desired restaurant and enjoy them with his/her loved ones. and through this website only the admin who has the contraption power of this website can look up to every activities of user and can guide or help them whenever a user is needed for help.

As you open the website Oderista animated page will load and it will have two options one i.e log-in and other i.e sign-up.

If a user is new to the website then he has to sign-up first then he will get a user id and password , through which he can then

Login into the website easily, and if he has that user id and password from previously so he can direct switch on to login area.

After login the user will be redirected to home page where he will get to see a navbar containing options like about section, menu section , cart section, contact section, logout section .

Scrolling down there he will get option to explore our website. Then if he want to book order for food then he will get option of verities of foods options user have to go down the website where the option will be available.

User can book his favourite foods and can cancel it also , after booking the page will redirect to add to cart he will get a message that his order has been placed after that it will lead to the payment option , where user has to pay the required amount through Cash on Delivery or Wallet.

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And all these activities can be controlled by admin he will get notification whenever any user will login into the website and place any order. Admin can add, delete and update foods and drinks option and can handle the database options also.

All over the world wide, the food delivery account for the 93 milion, the one percent is form total food market and including the 4 percent restaurant and fast food chains in many countries this no growth rate will continually to increase at 3.5 percent in the next five yrs.

Most of the restaurant in India still use the waiter to take customer orders. This method is still consider efficient if the restaurant are not crowded, but however if the restaurant are crowded with the customers, it will arise a lot of human error that made by the waiter such as missing of order papers, mistake in jot down the order, did not have a waiter to take the order from customers and others. Therefore, this project proposes a Food Ordering System Using QR Code (FOSuQC) to address the stated problem.

This application will be use a mobile application for the customers and web application for the staff of the restaurant. The customers need to use their phone with the application that has been installed to scan the QR code from the menu. Then, the customers must submit the order to make a confirmation and it will directly send to the kitchen. The staff at the restaurant can manage the menu such add a new items, delete the items of the food or update the menu easily.

By using this system, the staff of the restaurant can make a change of the menu easily. Besides, the ordered menu list also will be view in this system. The staff will prepared the food based on the ordered menu that will be listed out on the screen

I. LITERATURE REVIEW

In [1] an automated food ordering system is proposed which will keep track of user orders smartly. Basically, they implemented a food ordering system for different type of restaurants in which user will make order or make custom food by one click only. By means of android application for Tablet PCs this system was implemented. The front end was developed using HTML ,CSS, Javascript and at the backend MySQL database was used. In [2] Customer using a Smartphone is considered as a basic assumption for the system. When the customer approach to the restaurant, the saved order can be confirmed by touching the Smartphone. The list of selected preordered items shall be shown on the kitchen screen, and when confirmed, order slip shall be printed for further order processing. The solution provides easy and convenient way to select pre-order transaction form customers. In [3] there was an attempt to design and implementation of digital dining in restaurants using android technology. This system was a basic dynamic database utility system which fetches all information from a centralized database. This application improved the accuracy and efficiency of restaurants as well as human errors. Earlier drawbacks of automated food ordering systems were overcome by this system and it requires a onetime investment for gadgets. In [4] an application of integration of hotel management systems by web services technology is presented. Ordering System Kitchen Order Ticket (KOT), Billing System, Customer Relationship Management system (CRM) are held together by the Digital Hotel Management. Add or expand of hotel software system in any size of hotel chains environment was possible with this solution.In [5] research work aims to design and develop a wireless food ordering system in the restaurant. Technical operations of Wireless Ordering System (WOS) including systems architecture, function, limitations and recommendations were presented in this system. By providing higher quality customer service and reducing human errors to improve the management aspect for restaurants, pervasive application will be a valuable tool due to the high demands of handheld devices such as PDAs.In [6] along with customer feedback for a restaurant a design and execution of wireless food ordering system was carried out. It enables restaurant owners to setup the system in wireless environment and update menu presentations easily. Smart phone has been integrated in the customizable wireless food ordering system with real-time customer feedback implementation to facilitate real-time communication between restaurant owners and customers.

In Paper [7], the purpose of this study was to investigate the factors that influence the attitude of internet users towards online food ordering in Turkey among university students. A Technology Acceptance Model (TAM) developed by Davis in 1986 was used to study adoption of Web environment for food ordering. Trust, Innovativeness and External Influences are added to the model as main factors along with TAM. In Paper [8], the research work aims to automate the food ordering process in restaurant and also improve the dining experience of customers. Design implementation of food ordering system for restaurants were discuss in this paper. This system implements wireless data access to servers. The android application on user's mobile will have all the menu details. Kitchen and cashier receives the order details from the customer mobile wirelessly. These order details are updated in the central database. The restaurant owner can manage the menu

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modifications easily.In Paper [9], this research works on efforts taken by owners of restaurants to adopt information and communication technologies such as PDA, wireless LAN, costly multi-touch screens, etc. to enhance dining experience. This paper highlights some of the limitations of the conventional paper based and PDA-based food ordering system and proposed the low-cost touch screen-based Restaurant Management System using an android Smartphone or tablet as a solution.

PROJECT DESIGN AND IMPLEMENTATION

3.1 Overview

Food ordering system means it an application which will help restaurants to optimized and control over their restaurants. And my project "Food ordering system" {Oderista} is also based on the same point.

Through this website user can do a lot of things from anywhere from home, from office, from train and many more places.

User can order his/her favourite food from desired restaurant and enjoy them with his/her loved ones. and through this website only the admin who has the contraption power of this website can look up to every activities of user and can guide or help them whenever a user is needed for help.

3.2 Proposed System

To overcome the restrictions of above system, based on Internet of Things an Online Food Ordering System is proposed. The use of mobile technology has revolutionized as the Android devices have gained popularity in the automation of routine task in wireless environment.

For mobile devices such as smart-phones and tablets android is a Linux built operating system. As a general Objective of the study to develop a reliable, convenient and accurate Food Ordering System is considered. As an objective, a system that will surely satisfy the customer service will be considered.

To design a system that can accommodate huge amount of orders at a time and automatically compute the bill is one of the key objectives. One of the important objective is to evaluate its performance and acceptability in terms of security, user-friendliness, accuracy and reliability. One of key objective is to improve the communication between the client and customer.

II. TECHNOLOGY STACK

Technologies Used

Front End

1. Html

Hypertext Markup Language (HTML) is the standard markup language for documents designed to be displayed in a web browser. It can be assisted by technologies such as Cascading Style Sheets (CSS) and scripting languages such as JavaScript. Web browsers receive HTML documents from a web server or from local storage and render the documents into multimedia web pages. HTML describes the structure of a web page semantically and originally included cues for the appearance of the document.

2. Css

Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation of a document written in a markup language like HTML.CSS is a cornerstone technology of the World Wide Web, alongside HTML and JavaScript.CSS is designed to enable the separation of presentation and content, including layout, colors, and fonts.This separation can improve content accessibility, provide more flexibility and control in the specification of presentation chracteristics, enable multiple web pages to share formatting by specifying the relevant CSS in a separate .css file, and reduce complexity and repetition.

3. Javascript

JavaScript s a high-level, interpreted scripting language that conforms to the ECMAScript specification. JavaScript has curly-bracket syntax, dynamic typing, prototype-based object-orientation, and first-class functions.Alongside HTML and CSS, JavaScript is one of the core technologies of the World Wide Web.JavaScript enables interactive web pages and is an essential part of web applications. The vast majority of websites use it,and major web browsers have a dedicated JavaScript engine to execute it.As a multi-paradigm language, JavaScript supports event-driven, functional, and imperative (including object-oriented and prototype-based) programming styles.

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Back End

1 Php

PHP is a server side scripting language that is used to develop Static websites or Dynamic websites or Web applications. PHP stands for Hypertext Pre-processor, that earlier stood for Personal Home Pages. PHP scripts can only be interpreted on a server that has PHP installed. The client computers accessing the PHP scripts require a web browser only. A PHP file contains PHP tags and ends with the extension ".php".

Database

Database A database management system (DBMS) is computer software designed for the purpose of managing databases, a large set of structured data, and run operations on the data requested by numerous users.

Typical examples of DBMSs include Oracle, DB2, Microsoft Access, Microsoft SQL Server, Firebird, PostgreSQL, MySQL, SQLite, FileMaker and Sybase Adaptive Server Enterprise. DBMSs are typically used by Database administrators in the creation of Database 24 systems. Typical examples of DBMS use include accounting, human resources and customer support systems. SQL Structured Query Language (SQL) is the language used to manipulate relational databases. SQL is tied very closely with the relational model. In the relational model, data is stored in structures called relations or tables

1. Mysql

My SQL is an open source relational database management system (RDBMS) based on Structured Query Language (SQL). It is one part of the very popular LAMP platform consisting of Linux, Apache, My SQL, and PHP. Currently My SQL is owned by Oracle. My SQL database is available on most important OS platforms. It runs on BSD Unix, Linux, Windows, or Mac OS. Wikipedia and YouTube use My SQL. These sites manage millions of queries each day. My SQL comes in two versions: My SQL server system and My SQL embedded system.

Testing

Testing is the process of executing a program with the intent of detecting an error. Testing is a critical element of software quality assurance and presents ultimate review of specification, design and coding. System testing is an important phase. Testing represents an fascinating anomaly for the software. Therefore, a series of testing are performed for the proposed system before the system is ready for stoner accepting testing.

A good test case is one that has a high probability of chancing an undiscovered error. A successful test is one that bare an as undiscovered error.

The primary objective for test case design is to derive a set of tests that has the highest livelihood for expose defects in the software. To accomplish the objective two different categories of test case design techniques are used. They are

- White box testing
- Black box testing

III. CONCLUSION AND FUTURE SCOPE

Oderista (Food ordering System with QR scanner) has been computed successfully and was also tested successfully by taking "Test Cases". It is user friendly, and has required options, which can be utilized by the user to perform the desired operations.

Food ordering System is developed using HTML, CSS, JS as front end and PHP, My SQL as back end on windows environment.

Finally, in Online Food Ordering system, we have developed secure, user-friendly food ordering Management System. This System can take care of each member whether it is an Administrator or Customer.This System will help them to properly manage the meals of the customers, the delivery boy's data and help in growth without creating any hassle. In Education, replicating the voices of literal numbers offers new chances for interactive tutoring and dynamic liar. For illustration, on November 22, 1963 President Kennedy was on his way to give a speech in Dallas when he was assassinated. We can now hear that speech in his own words using this technology.

The epidemic sparked a surge in content consumption. One of the mediums that availed from this boom was podcasting, which has grown exponentially year of year and reaching indeed broader, more different cult. In addition, synthetic voice is formerly being used to help restate content in demand into different languages. Advertisers seeking voices that reverberate with their target followership, synthetic voices help advertisers produce further engaging content without having to coordinate as numerous moving pieces similar as trip and studio time.

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Customize orders: Allow customers to customize food orders Enhance User Interface by adding more user interactive features. Provide Deals and promotional Offer details to home page. Provide Recipes of the Week/Day to Home Page Payment Options: Add different payment options such as PayPal, Cash, Gift Cards etc. Allow to save payment details for future use.

Allow to process an order as a Guest Order Process Estimate: Provide customer a visual graphical order status bar Order Status: Show only Active orders to Restaurant Employees.

Order Ready notification: Send an Order Ready notification to the customer Restaurant Locator: Allow to find and choose a nearby restaurant Integrate with In store touch screen devices like iPad

REFERENCES

[1] Home KFCKU. Available: http://www.kfcku.com. Accessed on June 15, 2015.

[2] Sercan O Arik, Jitong Chen, Kainan Peng, Wei Ping, and Yanqi Zhou. Neural voice cloning with a few samples. ArXiv preprint arXiv: 1802.06006, 2018.

[3] "Tacotron: Towards end-to-end speech synthesis" Yuxuan Wang∗, RJ Skerry-Ryan∗, Daisy Stanton, Yonghui Wu, Ron J. Weiss†, Navdeep Jaitly, Zongheng Yang, Ying Xiao∗, Zhifeng Chen, Samy Bengio†, Quoc Le, Yannis Agiomyrgiannakis, Rob Clark, Rif A. Saurous∗ arxiv.org/pdf/1703.10135

[4] "Generalized end-to-end loss for speaker verification" Li Wan Quan Wang Alan Papir Ignacio Lopez Moreno arxiv.org/pdf/1710.10467

[5] Andrew Gibiansky, Sercan Arik, Gregory Diamos, John Miller, Kainan Peng, Wei Ping, Jonathan Raiman, and Yanqi Zhou. Deep Voice 2: Multi-speaker neural text-to-speech. In I. Guyon, U. V. Luxburg, S. Bengio, H. Wallach, R. Fergus, S. Vishwanathan, and R. Garnett, editors, Advances in Neural Information Processing Systems 30, pages 2962–2970. Curran Associates, Inc., 2017

[6] Jonathan Shen, Ruoming Pang, Ron J. Weiss, Mike Schuster, Navdeep Jaitly, Zongheng Yang, Zhifeng Chen, Yu Zhang, Yuxuan Wang, RJ Skerry-Ryan, Rif A. Saurous, Yannis Agiomyrgiannakis, and Yonghui. Wu. Natural TTS synthesis by conditioning WaveNet on mel spectrogram predictions. In Proc. IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2018.

[7] List of devices with assisted GPS. Available : http:// en. wikipedia. org/ wiki/ List_ of_ devices_ with_Assisted_GPS

[8] Google Maps API Web Services. Available : http:// code. google. com/ apis/ maps/ documentation/ webservices. Accessed.

[9] Android. "Android Developer". Available: http://developer.android.com/. Accessed on April .

[10] C. Nilsson. "Heuristics for the Traveling Salesman Problem". Available: https://web.tuke.sk/fei-cit/ butka/hop/htsp.pdf.

[11] S. Lin, B. W. Kernighan, "An Effective Heuristic Algorithm for the Travelling-Salesman Problem". Available : http://www.seas.gwu.edu/~simhaweb/champalg/tsp/papers/LinKernigha

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WEATHER APPLICATION

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ABSTRACT
We aim to create a mobile application specifically for real-time weather checking status across the globe. Mobiles are handy and load with different features. Thus, Mobile application gain the popularity and its popularity is increasing day by day. We have use Flutter as our front-end and Android Studio to edit the code. The results show that even if the advances in mobile communication technologies could, in principle, improve the effectiveness of weather communication enormously, the expectations created around weather forecasts appear to be inconsistent with current forecasting capabilities, particularly with their inherent uncertainties in space and time, as well as in the nature of the predicted weather events.

Weather is the state of the atmosphere at a given place and time in regards to heat, cloudiness, dryness, sunshine, wind, and rain. Of all the geophysical phenomena weather is the most significant one that influences us. Weather can vary greatly and largely depends on climate, seasons and various other factors. The chief goal of this work is to get the weather forecast of any city throughout the world through an application. This paper aims at creating a web application using Flutter.

I. INTRODUCTION

In recent times, the advancement in the wireless technology and the growth in market potentials have led to an increase in the number of mobile device users. The emergence of this technology has given rise to rapid development of mobile e-commerce technologies. This brings on-the-go Internet access to the general online market world without geographical and time constraints.

Mobile application development is the process to making software for smartphones and digital assistants, most commonly for Android and iOS. The software can be preinstalled on the device, downloaded from a mobile app store or accessed through a mobile web browser. The programming and markup languages used for this kind of software development include Java, Swift, C# and HTML5. Mobile app development is rapidly growing.

From retail, telecommunications and ecommerce to insurance, healthcare and government, organizations across industries must meet user expectations for real-time, convenient ways to conduct transactions and access information. Today, mobile devices— and the mobile applications that unlock their value—are the most popular way for people and businesses to connect to the internet. To stay relevant, responsive and successful, organizations need to develop the mobile applications that their customers, partners and employee demand.

The app consists of a single screen, on which the user can enter the name of a city. The weather for the current day is displayed and a 3-day daily forecast. The app appearance also adapts for day-time and night-time weather conditions.

The motivation for doing this project was that A weather app can bring you the latest conditions, any breaking alerts, and forecasts for what to expect next. A weather app can bring you the latest conditions, any breaking alerts, and forecasts for what to expect next. There's a lot of competition among the best weather apps, which deliver extensive forecasts, radar images of weather patterns and lots of data to study. It allows users to see the conditions, forecast, temperature, and other related metrics of the device's current location, as well as a number of other cities. Locations can be added or removed by pressing the list icon in the bottom right corner of the application, which allows the user to type in the city's name, ZIP code or postal code or airport code.

For each city, the app will display the current, highest, and lowest temperatures, a 10-day forecast, time of sunrise and sunset, current wind direction and speed, rainfall measurements, current humidity, outdoor visibility range, and barometric pressure. In some locations, the app will also display an air quality report and show next-hour precipitation when raining or snowing.

In this project, we design and development mobile application for a Weather app. The application provides exact information for users, while offering a way of knowing their weather report. With this application, users can directly search any city, town and country name. We can enable users to search for nearby areas or their selective locations. They can also search the area that they want to read next, based on different areas and region. User will be provided with enough description of the weather report, there will also be a report search functionality. User might also be able to bookmark their favorite places. In nutshell this app will be a total blast for those who like to know the weather before heading off somewhere.

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II. RELATED WORK

III. A weather instrument is equipment used to acquire weather information. Some examples of weather instruments are thermometer, to measure temperature, barometer, to measure atmospheric pressure, and anemometer, to measure wind speed. The gathering of those instruments in a same equipment constitutes a weather station [1]. The data collected by weather stations are used in many different areas, like agriculture, aviation, navigation, construction, sports and recreation.

IV. It's given the name Free Software to every software that ensures that the end users have freedom in using, studying, sharing and modifying that software [2]. Free hardware or open-source hardware is a term for tangible artifacts — machines, devices, or other physical things — whose design has been released to the public in such a way that anyone can make, modify, distribute, and use those things [3].

Weather is generally the change in atmospheric conditions in a short period of time which affects human activities. It is usually thought of in terms of temperature, humidity, precipitation, cloudiness, brightness, visibility, wind, and atmospheric pressure, as in high and low pressure. Weather is also composed of sunshine, rain, cloud cover, winds, hail, snow, sleet, freezing rain, flooding, blizzards, ice storms, thunderstorms, steady rains, and heat waves all of which will last for a few minutes to a few hours.

'Mausam' is available both on Google's Play Store and Apple's App Store. The app will offer different services. It will provide current weather information, including temperature, humidity, wind speed and direction, for 200 cities. The information will be updated eight times a day.

Earth Sciences Minister Harsh Vardhan on Monday launched a mobile application which will provide city-wise weather forecasts, nowcasts and other warnings. The mobile application, 'Mausam', has been designed and developed jointly by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), the Indian Institute of Tropical Meteorology (IITM), Pune and the India Meteorological Department (IMD).

Speaking at the event, Vardhan said huge financial investments are needed, at least twice the present budget, to augment observational networks, replace old ships and procure new computing resources.

AccuWeather Forecasts for Android Devices Including Nexus 7. AccuWeather released an update to its free AccuWeather for Android weather app today that includes an even more informative home screen widget featuring severe weather notices, current and two-day forecasts for saved home locations, and a convenient time clock.

AccuWeather for Android forecasts for 2.7 million locations. It includes pushed severe weather alerts for U.S. locations and severe weather notices for inclement weather worldwide. It also has forecasts for the next 15 days updated every hour, weather videos, lifestyle forecasts, and weather radar for all of North America with worldwide satlite overlaying interactive Google Maps.

Dark Sky became one of the top weather apps by predicting imminent local weather conditions using current data readings and clever algorithms, but it also offers longer-term forecasts and can cover a range of geographic areas.

Flicking between radar views, daily and weekly forecasts, temperature and wind levels, and other meteorological data is straightforward, and we really like the time machine feature that lets you explore weather conditions at a specific point in time in either the past or future

But where Apple's recent acquisition really impresses is with its short-term forecasts and alerts about approaching storms. Use it, and you'll always know how long it's going to be before the next bout of showers.

PROPOSED METHODOLOGY

A system architecture is the conceptual model that defines the structure, behavior, and more views of a system. An architecture description is a formal description and representation of a system, organized in a way that supports reasoning about the structures and behaviors of the system.

A system architecture can consist of system components and the sub-systems developed, that will work together to implement the overall system. There have been efforts to formalize languages to describe system architecture, collectively these are called architecture description languages.

In our Weather Application there are four screen which is very user interactive and has four different weather icon that will be very understandable by anyone for example children and old person. The user needs to install the application in his/her mobile for better experience of our App. By clicking on the app, they will be able to see the home page of the App where they have to allow access of the location for the App. By default, the app

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will take GPS location of the user mobile. After that they can see the temperature, humidity, speed of winds, 24 hours of temperature in the interval of 1 hour each and next seven days temperature on their mobile screen.

The cool feature of our app is that if temperature is hot or sunny then the app will recommend or show that is it is ice-cream time to user. Likewise for cold and rainy days.

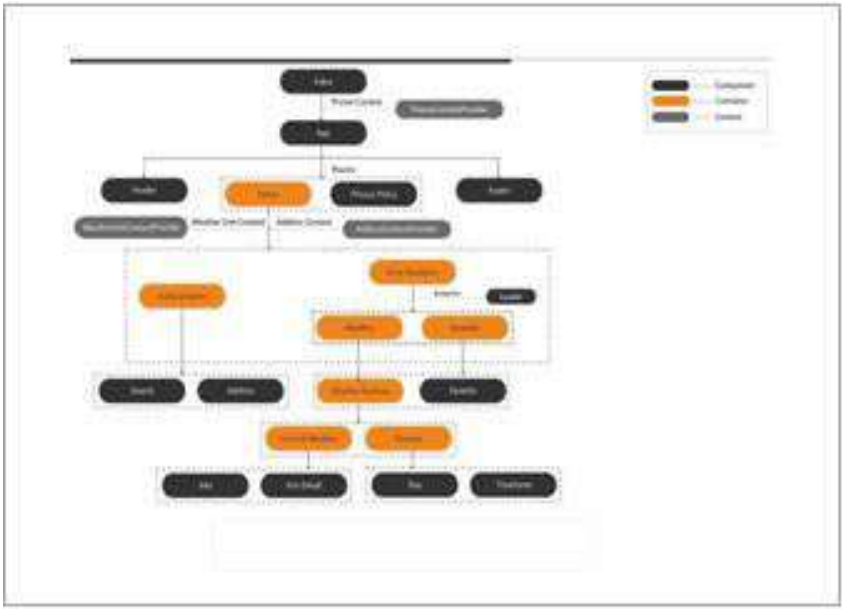

Fig. 1: Proposed architecture

Data Flow Diagram

Data Flow Diagram (DFD) is a pictorial representation, which shows the data passes various stages one by one during the processing. DFD has some in defined symbols using, which we can denote input, data flow and storing database files.

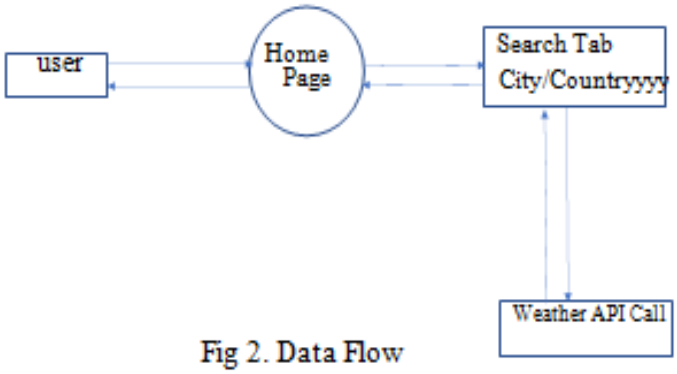

Fig 2. Data Flow

User Case Diagram

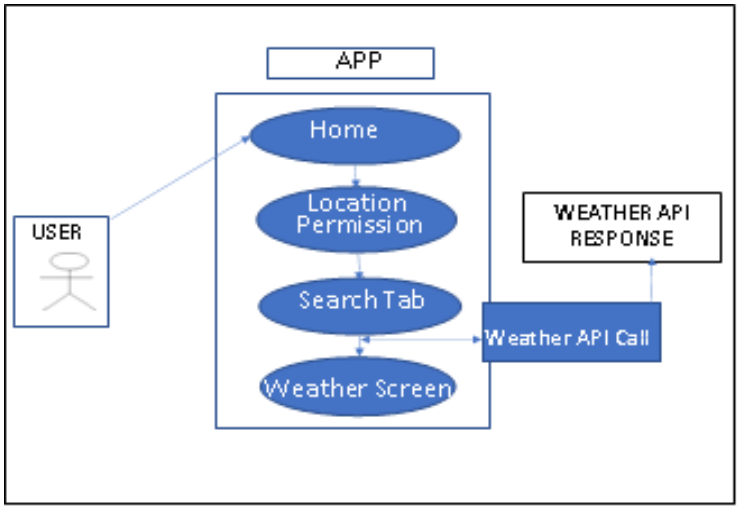

Fig 3: UCD – Weather App

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Live Implementation Uses and Advantages

1. **Home Page**

Fig 4: Home screen

Fig 5: Search page of app

Fig 6: Output of user's query

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Uses and Advantage

- Instant information availability
- Improved Weather forecast
- Easy Flow of Information
- Widget Support
- Interactive Maps for better weather information
- Free availability

This interactive UI will display the different, different climate while loading or opening the home page. Then the home page of the app which will ask your GPS location of Mobile for first from the user who is opening this APP for the first time. It will take the current GPS location of Mobile and display the weather details on the screen. Fig 5 is screenshot of search tab where user can search by country or city name and get the weather details of the searched country or city. Fig 6 is the UI that will show detailed information of weather posed by user or search by user in search field.

PROJECT SCOPE

In some Ways it needs further more enhancements in this project. The Security, Password authentication should be more enhanced.

There are some features that are still need to be added in this project such as; recommend user for weather related news, update user for his/her surrounding data, etc.

PROBLEM STATEMENT

In this project, we design and development mobile application for a Weather app. The application provides an exact information for users, while offering a way of knowing their weather report. With this application, users can directly search any city, town and country name. We can enable users to search for nearby areas or their selective locations. They can also search the area that they want to read next, based on different areas and region. User will be provided with enough description of the weather report, there will also be a report search functionality. User might also be able to bookmark their favorite places. In nutshell this app will be a total blast for those who like to know the weather before heading off somewhere.

CONCLUSION

The project was carried out to develop a mobile application for a weather application. The goal of the project was to create mobile application that would allow users to register an account, login, search for particular area of interest, reading a particular report. In addition, users can log out from the online report and can even recommend the application to friends within the application. The objectives of the project were achieved by observing software development procedures and principles for software designs and implementation. In achieving the goal of this project, three major parts were designed and implemented, Firstly, the design of the UI is attractive, intuitive, responsive and with good user experience in mind. This was achieved and implemented by following the Android design guidelines for Android devices. Secondly, the design. Thirdly, the implementation of actual project with all functionalities. In conclusion, it is important to know that this application could still be improved upon by adding more interesting features.

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REFERENCES

[1] Document https://ieeexplore.ieee.org/document/8448971

[2] Literature Survey https://www.scribbr.com/dissertation/literature-review/

[3] Use Case https://www.ibm.com/docs/en/rational-soft-arch/9.6.1?topic=diagrams-use-case

[4] Dart https://en.wikipedia.org/wiki/Dart_(programming_language)

[5] Android https://www.gizmochina.com/2020/01/01/best-weather-apps-for-android-and-ios/

[6] Massimo Banzi. Getting Started with Arduino. Make Books - Imprint of: O’Reilly Media, Sebastopol, CA, ill edition, 2008.

ISSN 2394 - 7780

[7] Hernando Barragan.´ Wiring: Prototyping Physical Interaction Design. PhD thesis, Interaction Design Institute Ivrea, Ivrea, Italy, 6 2004.

[8] Ltd Aosong Electronics Co. Datasheet digital output relative humidity temperature sensor/module - dht22. In https://www.sparkfun.com/datasheets/Sensors/Temperature/DHT22.pdf. Acessado em 24 de maio de 2017, mar 2017.

[9] "Analysis of free space optical link in Ahmedabad weather conditions"

[10] Anil J. Kshatriya,Department of Electronics and Communication, VGEC, Ahmedabad, India

[11] Y. B. Acharya,Physical Research Laboratory, Ahmedabad, India, Akshai Aggarwal, Gujarat technological University, Ahmedabad, India

[12] Document https://ieeexplore.ieee.org/document/6558104/authors#authors

[13] S. Sheikh Muhammad, P. Khldorfer, E. Leitgeb,"Channel Modeling for Terrestrial Free Space Optical Links,"ICTON ,pp. 407-410,2005

[14] Ivan B. Djordjevicr, Stojan Denic, Member, Jaime Anguita, Bane Vasic and Mark A. Neifeld,"LDPC-Coded MIMO Optical Communication Over the Atmospheric Turbulence Channel,"Journal of lightwave Technology, Vol. 26, No. 5, pp. 478-487,2008.

[15] Ahmed A. Farid and Steve Hranilovic,"Outage Capacity Optimization for Free-Space Optical Links With Pointing Errors,"Journal of lightwave Technology, Vol. 25, pp. 1702-1710,2007.

[16] "Effects of Weather and Climate on Renewable Energy Resources in a Distributed Generation System Simulated in Visayas, Philippines" Antoni Martiniano A. Acuzar, Ian Paulo E. Arguelles, Jim Cedric S. Elisan, Jason Kevin D. Gobenciong, Alexandra M. Soriano - 25 January 2018

[17] Electronics Engineering Department, University of Santo Tomas, Manila, Philippines

[18] S.Jeong, "Climate Change Risk Assessment Method for Electrical Facility", pp. 184-188, 2016.

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TRAFFIC SIGN RECOGNITION

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ABSTRACT
There are a few unique kinds of traffic signs like speed restricts, no access, traffic lights, turn left or right, youngsters crossing, no going of substantial vehicles, and so forth. Traffic signs order is the way toward recognizing which class a traffic sign has a place with. You more likely than not found out about oneself driving vehicles in which the traveler can completely rely upon the vehicle for voyaging. Yet, to accomplish level 5 self-sufficient, it is vital for vehicles to comprehend and adhere to all traffic rules. In the realm of Artificial Intelligence and progression in advanzcements, numerous specialists and huge organizations like Tesla, Uber, Google, Mercedes-Benz, Toyota, Ford, Audi, and so on are taking a shot at self-governing vehicles and self-driving vehicles. Along these lines, for accomplishing precision in this innovation, the vehicles ought to have the option to decipher traffic signs and settle on choices likewise. The exact acknowledgment rate and normal preparing time are particularly improved. This improvement is critical to diminish the mishap rate and upgrade the street traffic wellbeing circumstance, giving a solid specialized assurance to the consistent advancement of astute vehicle driving help. Many scientific methods of traffic signs recognition involving digital image analysis have been proposed. Most of them are appearance-based approaches, employing template matching. In most cases they work on color images (or videos) and deal with all types of signs, regarding their shape and color. On the other hand, commercial systems, installed in higher-class cars, detect only the round speed limit signs and overtaking restrictions found all across Europe. The main disadvantage of visual recognition of traffic signs is associated with difficult conditions of image acquisition and hence problems with noise, blurring, scale and orientation changes should be solved.

Keywords: Convolution Neural Network (CNN), Tensorflow, Traffic Sign Recognition, Machine Learning, Tkinter.

IV. INTRODUCTION
There are several different types of traffic signs like speed limits, no entry, traffic signals, turn left or right, children crossing, no passing of heavy vehicles, etc. Traffic signs classification is the process of identifying which class a traffic sign belongs to. Each individual, regardless of whether a traveler, driver, walker would have seen 8along the side of the road different sign board that fill significant needs. These significant street gear help us as course aides, admonitions and traffic controllers. As control gadgets for traffic, signs need complete consideration, regard and suitable driver's reaction.

With the approach of mechanized traffic and its expanding pressure on street, many have received pictorial signs and normalized their signs to encourage global travel, where language contrasts would make hindrances. In unfavorable rush hour gridlock conditions, the driver may not see traffic signs, which may cause mishaps. In such situations, programmed street sign recognition becomes effective.

Road and traffic signs considered in this thesis are those that use a visual/symbolic language about the road(s) ahead that can be interpreted by drivers. The terms are used interchangeably in this thesis, and elsewhere might also appear in combination, as “road traffic signs”. They provide the driver with pieces of information that make driving safe and convenient. A type of sign that is NOT considered in this thesis is the direction sign, in which the upcoming directions for getting to named towns or on numbered routes are shown not symbolically but essentially by text.

Road and traffic signs must be properly installed in the necessary locations and an inventory of them is ideally needed to help ensure adequate updating and maintenance. Meetings with the highway authorities in both Scotland and Sweden revealed the absence of but a need for an inventory of traffic signs.

An automatic means of detecting and recognizing traffic signs can make a significant contribution to this goal by providing a fast method of detecting, classifying and logging signs. This method helps to develop the inventory accurately and consistently. Once this is done, the detection of disfigured or obscured signs becomes easier for human operator.

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LITERATURE REVIEW

The first research on traffic sign recognition can be traced back to 1987; Akatsuka and Imai [2] attempted to make an early traffic sign recognition system. A system capable of automatic recognition of traffic sign could be used as assistance for drivers, alerting them about the presence of some specific sign (e.g. a one-way street) or some risky situation (e.g. driving at a higher speed than the maximum speed allowed).

Shihavuddin c, Muhammad Abul Hasan [1] describe the A novel lightweight CNN architecture for traffic sign recognition without GPU requirements. Author focused on Main challenges in detecting traffic signs in real time scenarios includes distortion of images, speed factor, motion effect, noise, faded color of signs. Training only on grayscale images gives average accuracy.

YuefengSonga [2] describe the efficient convolutional neural network for small traffic sign detection. In this paper, researcher focused on issues for small object detection and proposed efficient convolutional neutral network for small traffic sign detection and compared accuracy against R-CNN and Faster R-CNN.

Ghica et al. [26] carried out recognition by a neural network which consisted of three sub-networks, a classification sub-network, winner-takes-all sub-network (Hopfield network), and a validation sub-network.

Kellmeyer and Zwahlen [57] used back propagation neural network to recognize warning signs. The input to the network which was a 10x10 boundary square representing the yellow region inside the warning sign, is fed to a 100 neuron input layer. The output-layer contains two outputs either “sign” or “non-sign”. A hidden layer of 30 nodes was used.

Sandoval et al. [43] developed a method to detect traffic signs by using angle dependent edge detection. The method is based on the generation of position dependent convolution mask, which uses the angular position of the pixels under consideration. The method is applied as a filter and used to detect circular edges.

Debasis Sarkar, Deepak Muddegowda, Phanish Hanagal [3] describe the Traffic Sign Detection and Recognition using a CNN Ensemble. Proposed system in this paper is divided into two modules detection and recognition and it is evaluated on Belgium Data Set and the German Traffic Sign Benchmark. Detection involves capturing images of traffic sign and locating object from image and in recognition stage convolutional neural network ensemble is used which will assign label to detected sign.

Ohara et al. [54] used a small and simple neural network (NN) to detect the colour and the shape of road signs. The original colour image is first treated by a Laplacian of Gaussian filter (LOG). A colour NN classifier is then used to segment the image according to the colour under recognition in RGB colour space.

DomenTabernik; DanijelSkoaj [4] describe the Deep Learning for Large-Scale Traffic-Sign Detection and Recognition. In this paper convolutional neural network (CNN), the mask R- CNN is used for traffic sign detection and recognition. Authors used CNN for full feature extraction rather than Hough transform, scale invariant feature transform, local binary patterns. In order to solve real time problems of traffic sign appearance and distortion they also implemented data augmentation method. Swedish traffic-sign dataset (STSD) is used for evaluation of Faster R- CNN and Mask R-CNN.

PROJECT DESIGN AND IMPLEMENTATION

3.3 Overview

A system to detect and recognize road and traffic signs should be able to work in two modes; the training mode in which a database can be built by collecting a set of traffic signs for training and validation, and a prediction mode in which the system can recognize a traffic sign which has not been seen before. A system to recognize road and traffic signs is depicted. It consists of a number of modules which work together to perform this recognition.

Traffic Sign Recognition ensures that the current speed limit and other road signs are displayed to the driver on an ongoing basis. Automatic recognition functions through a link between images captured by a camera and the speed limit information stored in the navigation system. In this way, even speed limits that are not explicitly visible, like within a city, will be displayed to the driver.

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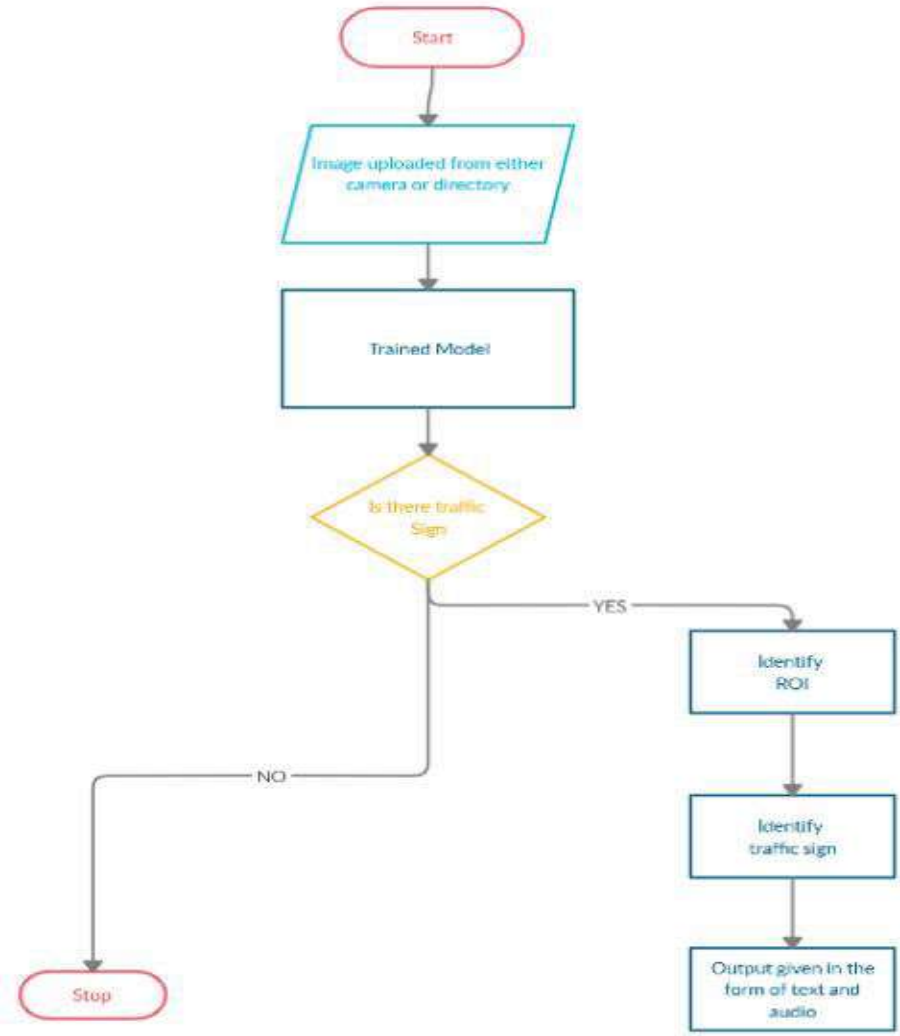

Fig 3.1 Flow Chart of Traffic Sign Recognition

3.4 Existing System

For making auto-working and smart vehicles lot of efforts are already made in form of convolution network trained models with different proposed methodologies for detection and recognition. A recent approach having wide applications for traffic sign detecting and recognizing intelligent transportation systems that informs driver about precaution measures and sign related information, uses color, shape and ML algorithm-based methods, and provided comparative information on the same. Color space, segmentation method, features, and shape detection method are the terms considered in the review of the detection module. The paper presents a comparison between these methods and used datasets from different countries. In the area of traffic sign detection and recognition, a considerable amount of work has been put forward. As two global characteristics of traffic signs, several authors concentrated on the color and shape attributes of image for detection. These features can be used to detect and trace a moving object in a series of frames. This approach is helpful when the target to be identified is a special color that is distinct from the background color. To detect an object with a certain shape, object borders, corners, and contours may be used. However authors only focused on the detection and recognition measures, ignoring the voice feature, which is an essential driver warning system. In addition, hyper parameter tuning has received less attention. As a result, the proposed system would concentrate on different parameters of the CNN algorithm in order to improve accuracy without requiring additional computing resources.

3.5 Proposed System

We will build a deep neural network model that can classify traffic signs present in the image into different categories. With this model, we are able to read and understand traffic signs which are a very important task for all autonomous vehicles. We will build a model for the classification of traffic signs available in the image into many categories using a convolutional neural network (CNN) and Keras library. The

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framework we proposed is categorized into three stages: Detection and feature extraction and recognition. The detection stage is just used to find a road sign. At the point when a vehicle is travelling at a specific speed, the camera catches the road sign in nature, and our calculation verifies whether a sign is available in that outline or not available in that perimeter. Distinguishing the traffic sign depends on shape and color. In the feature extraction stage, the proposed calculation characterizes the distinguished road sign. This is accomplished with the assistance of "Convolutional Neural Network" algorithm which classifies the image into sub classes.

The steps followed in this work, right from the dataset preparation to obtaining results are presented. The paper includes a tested approach along with a suggested approach for traffic sign detection and recognition.

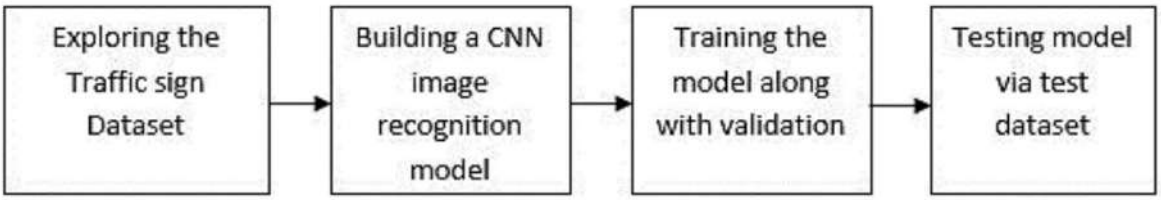

Fig 3.3 Steps followed for obtaining results

3.4 System Architecture

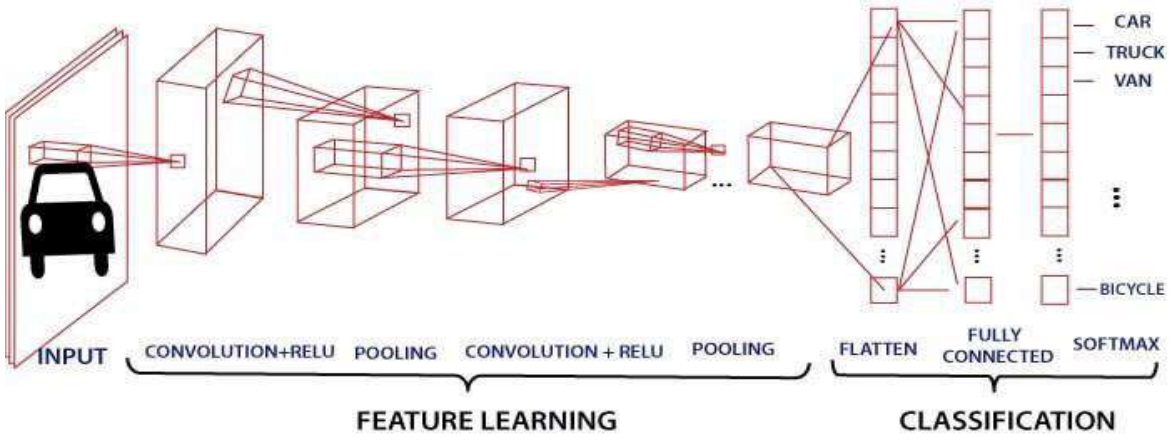

Figure 3.4 System Architecture

3.5 Traffic Sign Classifier Graphical User Interface:

We are build a graphical user interface for our traffic signs classifier with Tkinter. Tkinter is a GUI toolkit in the standard python library. Make a new file in the project folder and copy the below code. Save it as gui.py and you can run the code by typing python gui.py in the command line.In this file, we have first loaded the trained model 'traffic_classifier.h5' using Keras. And then we build the GUI for uploading the image and a button is used to classify which calls the classify () function. The classify() function is converting the image into the dimension of shape (1, 30, 30, 3). This is because to predict the traffic sign we have to provide the same dimension we have used when building the model. Then we predict the class, the model.predict_classes(image) returns us a number between (0-42) which represents the class it belongs to. We use the dictionary to get the information about the class. Here's the code for the gui.py file.

Algorithm

1. Upload the image either from camera or from directory.
2. The uploaded image will be sent through trained model.
3. Analyze the image for required parameters and classify the image accordingly.
4. If it is a traffic sign, it will identify the particular traffic sign and the output will be given in the form of text and voice notification will be given.
5. Else it will not give the output.

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V. TECHNOLOGY STACK

We created a CNN model to identify traffic signs and classify them with 95% accuracy. We had observed the accuracy and loss changes over a large dataset. GUI of this model makes it easy to understand how signs are classified into several classes. Convolutional neural networks or ConvNets or CNN's are very important to learn if you want to pursue a career in the computer vision field. CNN help in running neural networks directly on images and are more efficient and accurate than many of the deep neural networks. ConvNet models are easy and faster to train on images comparatively to the other models.

Technologies used

1. **Python 3.10**: Python 3.10.0 is the newest major release of the Python programming language, and it contains many new features and optimizations. Python's simple, easy to learn syntax emphasizes readability and therefore reduces the cost of program maintenance. Python supports modules and packages, which encourages program modularity and code reuse. The Python interpreter and the extensive standard library are available in source or binary form without charge for all major platforms, and can be freely distributed.

2. **Matplotlib**: Matplotlib is a comprehensive library for creating static, animated, and interactive visualizations in Python. Matplotlib makes easy effects easy and hard effects possible. Matplotlib is a putting up library for the Python programming language and its numerical mathematics extension NumPy. It provides an object-acquainted API for rooting plots into operations using general- purpose GUI toolkits like Tkinter, wxPython, Qt, or GTK. There's also a procedural"pylab"interface grounded on a state machine (like OpenGL), designed to nearly act that of MATLAB, though its use is discouraged. SciPy makes use of Matplotlib. Pyplot is a Matplotlib module which provides a MATLAB-suchlike interface. Matplotlib is designed to be as usable as MATLAB, with the capability to use Python, and the advantage of being free and open- source.

3. **Tensorflow**: TensorFlow is Google Brain's second-generation system. Version 2.8.0 was released on 3rd March 2022. While the reference implementation runs on single devices, TensorFlow can run on multiple CPUs and GPUs (with optional CUDA and SYCL extensions for general-purpose computing on graphics processing units). TensorFlow is available on 64-bit Linux, macOS, Windows, and mobile computing platforms including Android and iOS.

4. **Scikit- Learn**: Scikit- learns (formerly scikits.learn and also known as sklearn) is a free software machine literacy library for the Python programming language. It features colorful bracket, retrogression and clustering algorithms including support-vector machines, arbitrary timbers, grade boosting, k- means and DBSCAN, and is designed to interoperate with the Python numerical and scientific libraries NumPy and SciPy. Scikit- learn is a community trouble and anyone can contribute to it. Colorful associations likeBooking.com, JP Morgan, Evernote, Inria, AWeber, Spotify and numerous further are using Sklearn .

5. **Pillow**: Python Imaging Library is a free and open- source another library for the Python programming language that adds support for opening, manipulating, and saving numerous different image train formats. Development of the original design, known as PIL, was discontinued in 2011. Latterly, a successor design named Pillow branched the PIL repository and added.

6. **Numpy**: NumPy is a library for the Python programming language, adding support for large,multi-dimensional arrays and matrices, along with a large collection of high- ranking accurate functions to operate on these arrays. The ancestor of NumPy, Numeric, was firstly created by Jim Hugunin with benefactions from several other inventors. NumPy addresses the slowness problem incompletely by furnishing multidimensional arrays and functions and drivers that operate efficiently on arrays; using these requires rewriting some law, substantially inner circles, using NumPy.

7. **Keras:** Keras is an open-source neural-network library written in Python. Keras is one of the most widely used frameworks for deep learning. It's a vast and central system within Tensorflow for machine learning workflow, training done on hyper parameters and deploying various problems with solutions. Some functions of Keras include classification of image and text, support during data loading and providing a range of utilities for converting raw data into a proper dataset, accurate feature normalization and, rescaling images and applying transformations on them. It is capable of running on top of TensorFlow, Microsoft Cognitive Toolkit, Theano, or PlaidML. Designed to enable fast experimentation with deep neural networks, it focuses on being user-friendly, modular, and extensible.

Dataset

The CIFAR-10 dataset used was collected by German data scientists and is found to be containing more than 45,000 images which are collection of different traffic signs in various size and clarity ranges. A reasonable

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amount of varying nature is noticed in the dataset as some traffic signs are provided with many images as compared to others having fewer images in the records. Images are classified in different classes in our folder from where data is extracted into our Python module with Tensorflow background environment. ETL (Extract, Transform, and Load) tools are used here, by virtue of which, the data is converted into suitable format for transforming sample raw data into understandable format. The train dataset used consists of 43 folders within the range of 0-42 over which iteration is done using OS module. The function of conversion of image content into array is provided by the Python Imaging Library (PIL), in which all labels associated which images are appended in data lists. One-Hot Encoding and conversion to categorical labels of train and test dataset is done by the keras.utils packages. The shape of dataset is (39209, 30, 30, 3) signifying the number of images, their height x width values and RGB (red, green and blue) notations respectively. Splitting is done via train_test_split() method provided by Sklearn package. If image data is normalized by making pixel values ranging in mid of -1 and +1, numerical instabilities are reduced. For better model performance, some transformations can also be performed on the generated augmented and finely refined data, by changing the brightness, rotation of image etc., by using OpenCV library.

RESULT

Fig Result

CONCLUSION AND FUTURE SCOPE

A traffic sign recognition method on account of deep learning is proposed, which mainly aims at circular traffic signs. By using image preprocessing, traffic sign detection, recognition and classification, this method can effectively detect and identify traffic signs. Through this work, a model for traffic sign recognition system is successfully implemented using convolutional neural networks, needed for vehicles as a measure for ensuring road safety. The whole task is implemented using Python programming for machine learning and its strong libraries of deep learning. The parameters of the designed neural network model are finely tuned in order to get good accuracy results with precision of 97.8% and recall to be 98.06%. Accuracy on training set was 95% and 90.3% on testing set. Important point to be noted is that taking a large number of CNNs can increase learning rate of model and images for training are generally augmented but real time image capturing can't be augmented much fast so quick reliability is needed. This research has given us an insight into how well deep learning can be utilized to create intelligent systems.

As a part of future work, we were planning on integrating our model into a real time camera, which would further improve its functionality and application. This can further be included in industrial level products such as driverless cars in the future, provided we integrate our research work into a real time system. From the perspective of traffic sign acknowledgment exactness and calculation tedious, the proposed traffic sign identification and acknowledgment calculation has astounding points of interest.

While the model proposed in this system does bring a step closer to achieving the ideal Advanced Driver Assistance System or even a completely driverless system, there is a lot that can be improved. For identification of a sign, this system depends on color and shape of the sign. This is a problem if there is a reflection on the sign which impacts its color. Similarly, if the sign is chipped or cut off, the shape of the sign is impaired, thus resulting in no detection of the sign.

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Another important issue to consider is detection in the night. If the camera is not able to capture the environment in the night due to the darkness, the sign, cannot be detected and classified. A text to speech, module can also be added to this application. In the current application, the driver would have to read the text printed on the classified sign, but with the help of a, voice module, more comfort is guaranteed. The overall performance could also be improved and customized, with the help of more datasets and from different, countries.

REFERENCES

[1] CNN Design for Real-Time Traffic Sign Recognition Alexander Shustanova 2017

[2] C. Liu, F. Chang, and C. Liu, "Occlusion-robust traffic sign detection via cascaded colour cubic feature," IET Intell. Transp. Syst., vol. 10, no. 5, pp. 354–360, 2015

[3] D. Karthikeyan , Enitha C, Bharathi S, Durkadevi K. "Traffic Sign Detection and Recognition using Image Processing". International Journal of Engineering Research & Technology (IJERT), 8(8), NCICCT–2020, 2020

[4] Møgelmose, D. Liu, and M. M. Trivedi, "Detection of U.S. traffic signs," IEEE Trans. Intell. Transp. Syst., vol. 16, no. 6, pp. 3116–3125, Dec. 2015.

[5] Shikha Gupta "Traffic Signs Recognition using CNN and Keras in Python" Beginner Deep Learning Python

[6] Hasan, Nazmul & Anzum, Tanvir & Jahan, Nusrat. (2020). Traffic Sign Recognition System (TSRS): SVM and Convolutional Neural Network. 10.1007/978-981-15-7345-3_6.

[7] Z. He, Z. Xiao, and Z. Yan, "Traffic Sign Recognition Based on Convolutional Neural Network Model," Chinese Automation Congress (CAC) , 2020.

[8] Hasan Fleyeh "Traffic and Road Sign Recognition" Napier University for the degree of Doctor of Philosophy July 2008

[9] D. Michie, D. J. Spiegelhalter, & C. C. Taylor, "Machine learning, neural and statistical classification", (1994)

[10] Yeswanth Sinha, Blessy Hadassa, Gopi Krishna "Traffic Sign Recognition Using Convolutional Neural Networks" International Journal of Electrical Engineering and Technology (IJEET) Volume 11, Issue 3, May 2020, pp. 210-217,

[11] Rongqiang Qian, Yong Yue "Traffic Sign Recognition with Convolutional Neural Network" 2016 12th International Conference on Natural Computation, Fuzzy Systems and Knowledge Discovery (ICNC-FSKD)

[12] Rongqiang Qian, Yong Yue, Frans Coenen and Bailing Zhang, "Traffic Sign Recognition with Convolutional Neural Network Based on Max Pooling Positions", 2016 12th International Conference on Natural Computation, Fuzzy Systems and Knowledge Discovery (ICNC-FSKD)

[13] A. W. Harley, "An Interactive Node-Link Visualization of Convolutional Neural Networks," Advances in Visual Computing Lecture Notes in Computer Science, pp. 867–877, 2015.

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STUDENT ATTENDANCE SYSTEM USING FINGERPRINT

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ABSTRACT
A student attendance system using fingerprint is a hand-held device that aims to automate the attendance procedure of an educational institution using biometric techniques. This will save time spent on calling out roll no., and names and it gives a fool-proof method of attendance marking. This system operates on a rechargeable battery. This system can be passed to students during lecture time to mark their attendance in the class. The system communicates with the host computer with the help of a USB interface. The system is connected with a GUI application to manage the system and attendance tracking. The fingerprint scanning, retrieving data, and attendance checking management platform were established on the teacher's computer, and the attendance information was stored in the database whichever can be inquired about on the server. The test results show that the attendance system can manage the student's attendance conveniently, and the system is stable.

Keywords: Biometric techniques, GUI, Hand-held device, MySQL Database, Server

I. INTRODUCTION
The traditional attendance system in which the teacher calls out the name of each and every student and marks their attendance was causing a waste of time during the lecture hours. It takes around 10 - 15 minutes. This situation gets more time-consuming when there are more students in a class. Managing a large amount of data is also very difficult. Students may also mark fake or proxy attendance of absent students which is another disadvantage of the traditional system. In the last few decades, student enrollment in schools, colleges, and universities has increased and is continuously growing. In view of the above problems and the needs of college teachers for the attendance system, the system implemented a special attendance management system for college students based on fingerprint identification. The system completes fingerprint information storage, transmission, check-in information query, statistics, and other functions, which through fingerprint collection, comparison, identification, database establishment, data transmission, and the design of upper and lower computer interfaces.

II. LITERATURE SURVEY
[1] L. X. LI Jian-po, ZHU Xu-ning, and Z. Chi-ming, "Wireless fingerprint attendance management system based on Zigbee technology," in 2nd International Workshop on Intelligent Systems and Applications (ISA), May 2010, pp. 1 – 4. The author created a database in a remote system and the fingerprint data is transmitted to the host using Zigbee wireless technology. But if the classroom is not in the range of Zigbee, the device was unable to access.

[2] Z. C. A. Kassem, M. Hamad, and S. E. Dahdah, "An RFID attendance system for university applications," in 17th IEEE International Conference on Electronics, Circuits, and Systems (ICECS), 2010, pp. 851 – 854. The users have to carry RFID tags to mark attendance. The database was introduced on the computer and students have to carry the RFID tags to the reader. Because of this system, students can also mark proxy or fake attendance of absent students with RFID tags.

[3] L. Kamelia, E. A. D. Hamidi, W. Darmalaksana and A. Nugraha, "Real-Time Attendance System Based On Fingerprint and Global Positioning System(GPS) in the Smartphone," 2018 4th International Conference on Wireless and Telematics (ICWT), Nusa Dua, 2018, pp. 1-4. To prevent proxy attendance marking, the author implemented a real-time attendance system using GPS technology. If a student is located on the premises of a school or college, then only the attendance will be marked, or else it will reject the entry. One of the main issues of using GPS is to detect employees' locations; attendance can be done by sending MMS messages between users and the system is accurate to identify the real-time locations.

[4] S. B. Oo, N. H. M. Oo, S. Chainan, A. Thongniam, and W. Chongdarakal, "Cloud-based web application with NFC for employee attendance system, " 2018 International Conference on Digital Arts, Media and Technology (ICDAMT), Phayao, 2018, pp. 162-167. The author proposed Near Field Communication (NFC) technology which is integrated with the user's device rather than RFID tags. The issue with this technology is that they proposed their NFC time attendance system based on a web application that can be accessed at any time showing the arrival time, leave, and many other report fields

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III. METHODOLOGY

The student attendance system consists of three parts, the Student's fingerprint information collection, and attendance, the login interface, and the design of the database. Information collection is divided few processes, fingerprint template collection, feature extraction, and fingerprint recognition. Fingerprint template collection is to collect a user's fingerprint image by fingerprint instrument, extract fingerprint information from the fingerprint image to form a fingerprint template, and store it in a database. Fingerprint identification consists of two processes, the registration process, and the identification process. In the process of registration, users need to collect fingerprints first, and then the computer system will automatically extract the information which one will save as Id in the database. The information compared with the template of the database and the comparison results will be given. The procedure is general-purpose, which is applicable to all biometrics. In the beginning, the teacher opens the teacher's login interface and enters the correct account number and password. After that, enter the student fingerprint collection or attendance interface. Next, students fill in personal information according to the prompt information which includes student number, name, gender, major, and class. After giving in, three fingerprint acquisitions are combined to form a string template. A text box pops up in the interface to prompt "registration succeeded", and the corresponding student information is written into the MySQL database to complete fingerprint acquisition

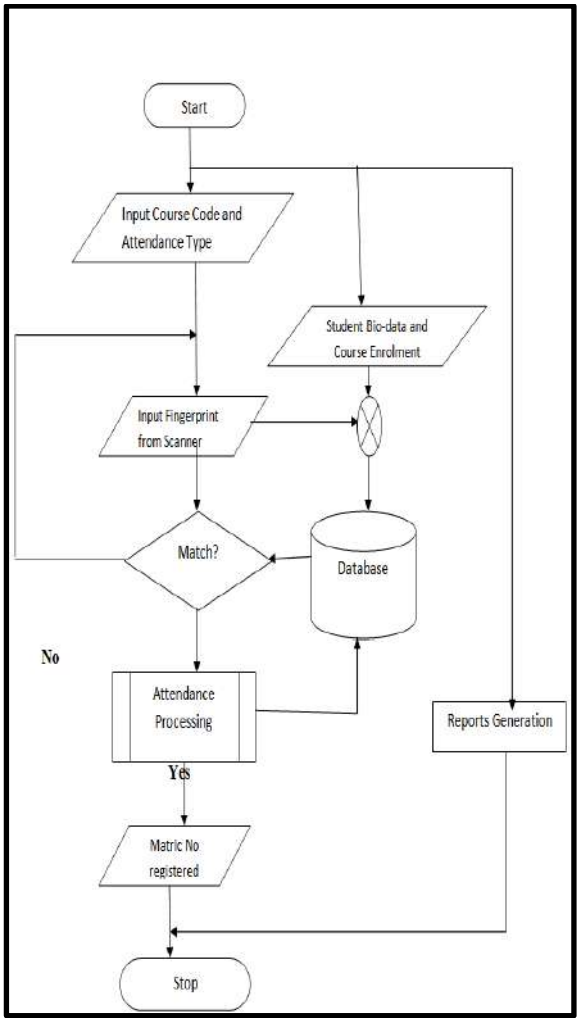

Fig 1: Flowchart of the proposed system

IV. RESULTS

At the initial stage, you have to register a student in the system. So for this, the user has to provide details such as course details, student name, roll number, etc. After providing the details, the data will get stored in the database. Then, you have to register your fingerprint with the help of a fingerprint sensor. The fingerprint will get stored in the database with a particular code. The data stored in the database is used to match and mark users' attendance. SO after registration, just verify that your details are stored by marking his/her attendance. If it fails to do so, then the user has to repeat the above steps again. After the registration process, the student just has to mark their attendance by providing their fingerprint to the system and marking their attendance.

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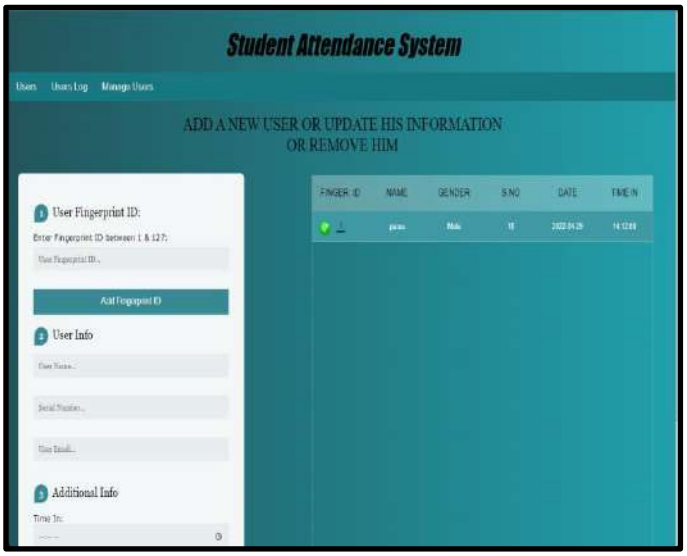

Fig 2: GUI of the registration page

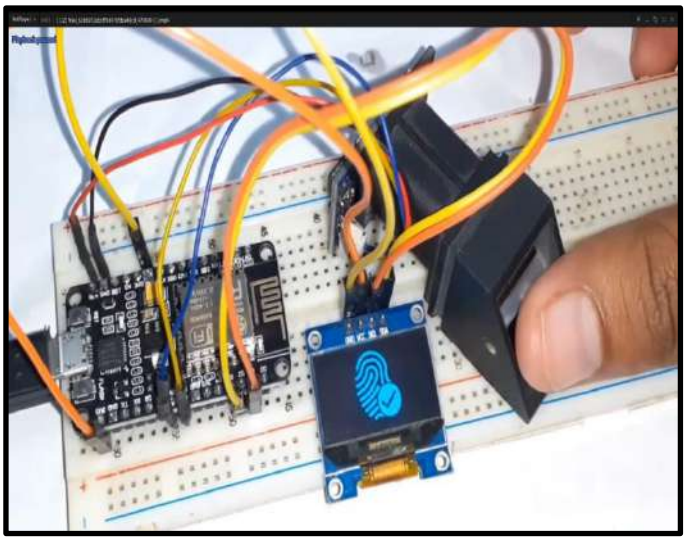

Fig 3: Connection of fingerprint sensor

V. Applications & Advantages

A. APPLICATIONS

The system can be used by schools, colleges, or universities for taking down attendance.

It can also be implemented in firms and organizations for attendance purposes.

B. ADVANTAGES

Teachers do not need to waste their time, approximately 15min of 1hour for taking attendance of students. Students will be more motivated in attending their classes since there will be no password or no attendance sheet signature required, so no friend or any other student can mark attendances of others as fingerprints are unique for each and every one. This system will be helpful to the faculty to easily find out defaulters. Students can easily get the attendance history of a particular student.

VI. CONCLUSION

This system meets the needs of college teachers and designs a class attendance system composed of a fingerprint instrument, upper computer, and lower computer. Students only need to scan their fingerprint information once, and then they can carry out fingerprint attendance for permanent. The academic affairs office can easily query and manage the student's attendance problems that save the teacher's manual roll call in class and report attendance after class, which is also convenient, faster, and time-saving. Strength, greatly enhancing the supervision of students. The system has the advantages of strong practicability, a wide range of use, easy expansion, low cost of installation and maintenance, and has a long-term development prospect. The original system is compact, portable, and easy to operate. So that, It can be widely used in many fields, such as public security, banking, computer network information security, and so on.

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VII. FUTURE SCOPE

The GLCD can be replaced by a touch screen GLCD so that buttons can be removed. So, pushbuttons can be removed. A feature may be provided to download whole fingerprint templates to the computer from the device. So, the students need not register for another semester. We can reduce the size of the device by using SMD components.

REFERENCES

[1] L. X. LI Jian-po, ZHU Xu-ning, and Z. Chi-ming, “Wireless fingerprint attendance management system based on zigbee technology,” in 2nd International Workshop on Intelligent Systems and Applications (ISA), May 2010, pp. 1 – 4.

[2] Z. C. A. Kassem, M. Hamad, and S. E. Dahdah, “An RFID attendance system for university applications,” in 17th IEEE International Conference on Electronics, Circuits, and Systems (ICECS), 2010, pp. 851 – 854.

[3] L. Kamelia, E. A. D. Hamidi, W. Darmalaksana and A. Nugraha, "Real-Time Online Attendance System Based On Fingerprint and Global Positioning System(GPS) in the Smartphone," 2018 4th International Conference on Wireless and Telematics (ICWT), Nusa Dua, 2018, pp. 1-4.

[4] S. B. Oo, N. H. M. Oo, S. Chainan, A. Thongniam and W. Chongdarakal, "Cloud-based web application with NFC for employee attendance management system," 2018 International Conference on Digital Arts, Media and Technology (ICDAMT), Phayao, 2018, pp. 162-167.

[5] “Pic18f4550 datasheet,” Microchip corporation, USA.

[6] “Sm-630 manual,” Miaxis Biometrics Co., China.

[7] “Jhd12864e datasheet,” JHD Electronics Co., Ltd, China.

[8] “Two-wire serial eeprom at24c1024,” Atmel Corporation., USA.

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SOCIAL MEDIA WEB FILTERING

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ABSTRACT
With the continuous uprising of social media, users especially adolescents are spending significant amount of time on various social networking sites to connect with others, to share details, and to pursue common interests. OSNs gives minimum support to prevent undesirable messages on user walls. A main part of social network content is formed by short text, a notable example are the messages permanently written by OSN users on particular public or private areas, called in general walls. With the lack of classification or filtering tools, the user receives all messages posted by the users he follows. In most cases, the user receive a noisy stream of updates. More security mechanisms need to be developed for various communication technologies, especially social networks. Therefore, the main task of modern social networks (OSNs) is information filtering.

This web application is designed to be provided free of charge to its users. This allows you to control who has access to your information and who has access to your application's principle statements. Being personally involved in the online space is our main goal. Our site avoid undesirable messages from being written to the user's wall. System selects detailed items based on the correlation between the content of the items and the user preferences as opposed to a collaborative filtering system that chooses items based on the correlation between people with similar preferences.

Keywords: Online Social Network(OSN); Offensive words; Lexical Syntactic Feature(LSF); Bag of Words (BoW); ngram algorithms; data filtration; short text classification.

I. INTRODUCTION
With the continuous uprising of social media, users especially adolescents are spending significant amount of time on various social networking sites to connect with others, to share details, and to pursue common interests. OSN gives minimum support to prevent undesirable messages on user walls. A main part of social network content is formed by short text, a notable example are the messages permanently written by OSN users on particular public or private areas, called in general walls. With the lack of classification or filtering tools, the user receives all messages posted by the users he follows. In most cases, users will receive a noisy update stream. More security mechanisms need to be developed for various communication technologies, especially social networks. Therefore, the main task of online social networks (OSNs) today is information filtering.

This web application is designed to be provided free of charge to its users. Consistent with your app's statement of principles, you should provide control over who has access to information and who has access to it. Personal participation in the online space is the main goal. Our site avoid undesirable messages from being written to the user's wall. Unlike collaborative filtering systems, which select items based on correlations between people with similar preferences, this system selects items of information based on correlations between item content and user preferences. The system provides advanced image captcha that prevents spammers from registering on the site.

Provides automatic filtering for users via administrator to automatically control spam messages between users. We will implement a filtering rule (FR) in our system. A blacklist (BL) is also maintained in this system. A sophisticated filtering system includes multi-level text classification that automatically classifies posts into partial topic categories. There is a filter graph showing how many bad words each user used.

II. LITERATURE SURVEY
Ying Chen, Yilu Zhuo, “Detection of Aggressive Language in Social Media to Protect Youth Online Safety”, International Conference on ASE/IEEE Social Computing, 2012 on the detection of aggressive language at the often flawed message level Existing research Unable to accurately identify objectionable content. On the other hand, user-level detection of abusive behavior appears to be a more realistic approach, but is an area that has not been studied much. To fill this gap, we propose a Lexical Syntax Function (LSF) architecture to detect offensive content on social media and identify potential aggressive users. Experimental results show that our LSF structure outperforms traditional secure content detection methods. Detecting offensive sentences achieves 98.24% accuracy and 94.34% recall, and detecting user abuse achieves 77.9% accuracy and 77.8% recall. Therefore, you can refer to the ngram method based on this article.

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Marco Vanetti, Elisabetta Binaghi, Elena Ferrari, Barbara Carminati, and Moreno Carullo, "OSN User Wall Spam Filtering System", IEEE Transactions on Knowledge and Data Engineer, February 2013. One of the fundamental problems of modern online social networks (OSNs) is to provide: Users have the authority on the messages posted in their personal space to prevent displaying inappropriate content. Up to now, OSNs provide little support to this requirement. To fill the gap, in this paper, we propose a system allowing OSN users to have a direct control on the messages posted on their walls. This is achieved through a flexible rule based system that allows users to customize the filtering criteria to be applied to their walls, and a Machine Learning based soft classifier automatically labelling messages in support of content based filtering concept, therefore we can refer Machine learning based short text classifier.

Ramnath Balasubramanyan, Aleksander Kolcz," "wOOt! Feeling great today!" Chatter in Twitter: Identification and Prevalence", IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining, 2013. Microblogging services like Twitter are used for a wide variety of purposes and in different modes. Here, we focus on the usage of Twitter for "chatter" i.e., the production and consumption of tweets that are typically non-topical and contain personal status updates or conversational messages which are usually intended and are useful only to the immediate network of the producers of the tweets. We study the prevalence of chatter tweets in Twitter and present techniques to detect them using machine learning techniques that require minimal supervision. From this paper we have referred the following concept taking example of twitter as a "chatter", we are able to study or classify tweets as per their ranks and then filtering out the ones that are of high relevance.

Filtering unwanted messages from osn walls 2016 1st International Conference on Innovation and Challenges in Cyber Security (ICICCS 2016) today various social networking sites are available which Make people remain in constant touch with each other. Sharing any type of data has become easy. There are great advantages of such social networking sites excepting a few minor drawbacks like poor security which create huge problems to people when they were active on such sites. As we have seen Facebook allows users to post comment on another user's wall even when they were unknown to each other. But if that comment is a vulgar one then it may cause serious problem to user reputation. To avoid such a problem Information filtering is used to filter the content of the message. So we have analysed various Information filtering methods like content based filtering, policy based filtering, and collaborative filtering in this paper. The content-based filtering method is superior to any other filtering method because it filters out bad or non-nervous words from the entered posts and only posts pleasant comments on the bulletin board. This will help us avoid unwanted messages and permanently damage our most important reputation in the socialized world

III. DESIGN AND IMPLEMENTATION

In our proposed system, there are three methods: message filtering by administrator, message filtering by user, and short text classifier. When you filter messages in the manager's way, the messages are filtered by the manager, who sets the categories of words. When filtering messages by user, messages are filtered by user and the user sets the category of words. In short text classifiers, short text words are set by the administrator of the database. Message Filtering This module filters out unwanted messages. Other users who can send vulgar messages to OSN users have been temporarily blocked by OSN users. If a user sends more than a specified threshold of vulgar messages that match a filter pattern specified by an OSN user, that user is not permanently friended.

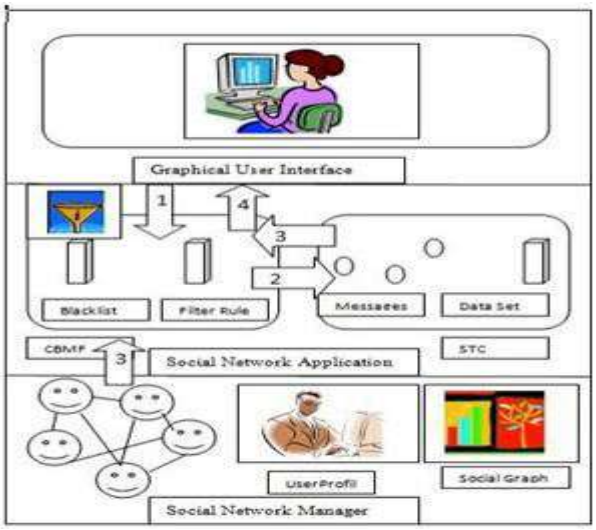

Figure 1: Block diagram of Social Media Web Filtering

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Process of Filteration

There are three main questions to consider when identifying the Filtering Process FR. First of all, in online platforms where we communicate with each other in our daily life, the exact word may have different meanings depending on the context. Derivatives allow users to form conditions that restrict text producers. Manufacturers can choose based on a variety of benchmarks. This means the status, the depth and importance of the relationship to the classification. The input message goes through word classification properties to classify words based on bad, forbidden, and valid words. This will further filter out bad words and provide the correct word format in the output.

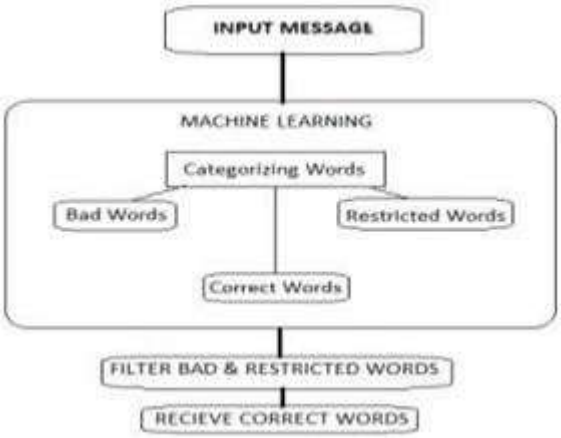

Figure 2: Filteration process diagram

Blacklisting Process

The Filtering process is moved to a future Blacklisting process. An additional part of this system is a BL (blacklist) mechanism that can ignore texts from unrecognized manufacturers. Obscene and unwanted words are blacklisted and only the rest of the message is displayed. These rules are not defined by the NPS and are not intended to be used as high-level guidelines for the entire community. Instead, I decided to provide the user myself. Clarify the rules for the owner of the wall, base camp management, and how long and for how long they must be expelled from the wall.In this way, the user is excluded from the wall and can post to another wall at the same time. As with MRF, our rules create owner walls. Like the filtering rule, the blacklist rule makes the wall immune to unwanted words.

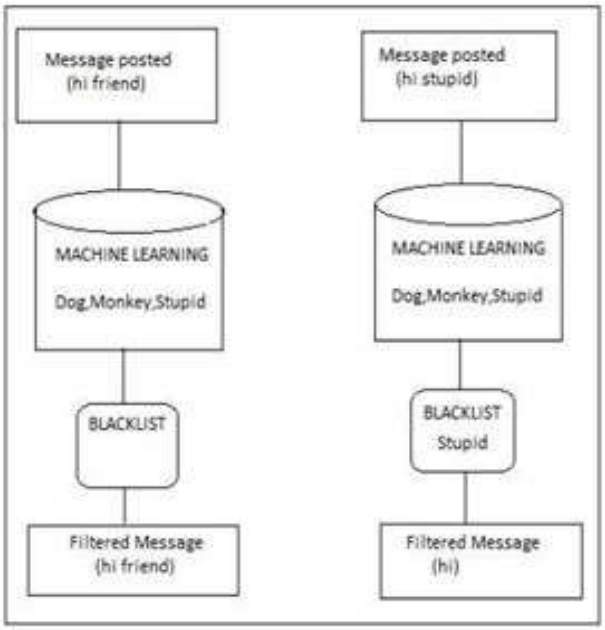

Figure 3: Blacklisting Process

Algorithm

Main algorithm:

Step 1: Run Application

Step 2: User posts text, image to online platform.

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Step 3: The user adds a comment to the user's post.

Step 4: Each and every part of the user post and the comment on it will be processed using NLP.

Step 4: If the machine after processing found out that the comment or the posts resemble any kind of vulgar attribute then go to step 6.

Step 5: if after processing it is found out that there is no objectionable content then it will be posted as an output on the wall.

Step 6: Using blacklisting process it will filter out each and every words which indulges in any kind of vulgar act.

Step 7: Stops the process. NLP is an arrangement which learns and formulate on the data it reads and on this basis it will draw conclusion. Like it filters out the spam or non-spam content from the email inbox.

IV. RESULT

The Web Application

Figure 4: Admin Panel

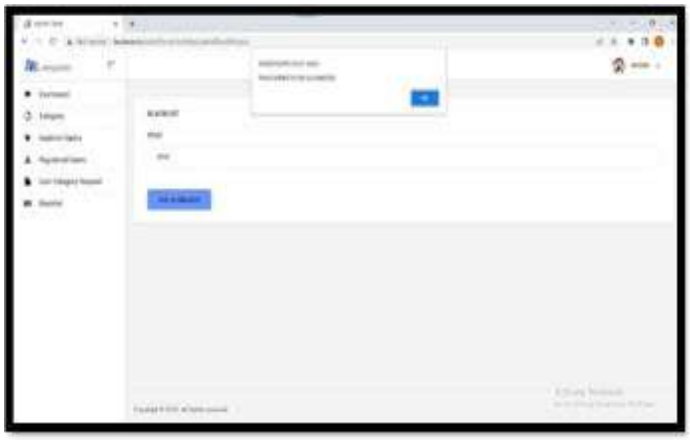

Figure 5: Blacklisted Words.

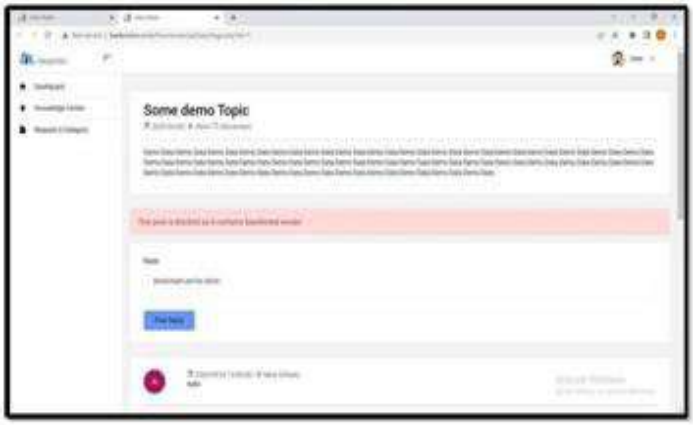

Figure 6: Blocked posts

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1. The User would Login/Signup to the web page.
2. After login the user will come to the home page where he can read thevarious articles available on the web page.
3. User can also suggest custom category of his liking.
4. After the request is accepted by the admin the new category will shown on the knowledge and the user can further ask for sub topicsrelated to it.
5. The user can then browse through the accepted topics and categoriesavailable on the website.
6. After reading the contents on our webpage user can also post a comment.
7. You cannot comment on a post that contains indecent or unethical content..
8. A list of categories and topics appears on the admin panel.
9. The Administrators will also have data about the number of registered users on the site.
10. Administrators can also disable users.
11. There is a place where admins can set up a list of blacklisted words that users cannot post when used in comments.

V. CONCLUSION

Every aspect of social technology usage should be traceable back to an objective which supports a meaningful goal. The objective is "to give people the power to share and make the world more open and connected. It believes that increased connection between people through their site will lead to better understanding between disparate groups. The site has ability to produce beneficial results from social technology usage which is highly correlated with the ability to create meaningful goals and objectives. This web application is designed to be free for its users; it should give them control of their information and who can access it, according to the application's statement of principles. Being personally involved in the online space is our main goal. Our site prevents unwanted messages from being written to the user's wall. Unlike collaborative filtering systems, which select items based on correlations between people with similar preferences, this system selects items of information based on correlations between item content and user preferences. Automated control of spam messages between users by providing automatic filtering for users through the administrator. We will implement a filtering rule (FR) in our system. Blacklisting (BL) is also supported on this system. A sophisticated filtering system includes multi-level text classification that automatically classifies posts into partial topic categories. There is a filter graph showing how many bad words each user used.

So basically it can be said that his app is useful for ordinary people who post unwanted messages like vulgar, political, sexual posts on their wall from third parties and don't want OSN default access control.

VI. REFERENCES

[1] T. Johnson, R. Shapiro, and R. Tourangeau, "National survey on American attitudes on substance abuse XVI: Teens and parents." in The National Center on Addiction and Substance Abuse.

[2] J. Cheng, "Report on 80 percent of blogs contain "offensive" content,"inarstechnica.

[3] S.O.K Gwenn, C.-P. Kathleen, "Clinical report--the impact of social media on children, adolescents, and families,"

[4] K. Babu, P.Charles,"A System to Filter Words Using Blacklists In Social Networks".

[5] A. Mahmud, Ahmed, KaziZubair, and Khan, Mumit "Detecting flames and insults in text," in Proc. of 6th International Conference on Natural Language Processing.

[6] N..Pendar, "Toward spotting the pedophile telling victim from predator in text chats," in Proceedings of the First IEEE InternationalConference on Semantic Computing.

[7] A. Kontostathis, L. Edwards, and A. Leatherman, "Chatcoder: Toward the tracking and categorization of internet predators," In Proc. Text Mining workshop 2009 held in conjunction with the Ninth SIAM International conference on Data Mining.

[8] E. Spertus, "Smokey: Automatic recognition of hostile messages, "Innovative Applications of Artificial Intelligence.

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FRAUD MINER: CREDIT CARD FRAUD DETECTION USING FREQUENT ITEMSET

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ABSTRACT
Now-a-days, as we are going through pandemic condition, 90% of people preferto do online transaction for any purpose .Such as online shopping, bank to bank transaction, etc. As credit card hold large share of these transaction. So, Most of time there is possibility of Fake or Fraud transaction using credit card , which can cause a large amount of financial loseto financial institutions as well as individual. The fraud people do not use same techniques for stealing money or conducting fraud each time. As new technology are getting introduced, frauds also switch to new patterns everytime . So most of the financial institutions and banks use credit fraud detection system to reduce losses. In credit card fraud detection, both supervised and unsupervised learning is used. But in this system, we are going to use unsupervised learning technique to understand the different fraud patterns. The aim of this system is to classify the normal transaction and fraud transaction and stop the fraud one. It uses auto-encoder and other deep learning algorithms to detect fraud transaction. The auto-encoder compress the availabledata and convert it into small representation and then algorithms such as random forest algorithm, logistic regression and many other algorithms on compressed data to carry on detection process.

We load the data in the data frame of pandas .Pandas is open source package of python .It alsoprovides high performance to use the data structure and data analysis tools. We have also created app which is going to detect fraud and normal transactions .Django is used to make appfor its interface and logic .This app has many more features like getting analysis of transactionsand many more.

Keywords: Autoencoder, Django, Fraud Transaction, Normal Transaction, Pandas.

I.INTRODUCTION
Due to developing modernization, people also get switch to new technologies, which are more efficient , comfortable and make our life easy .In past, people use to do all business, money transactions, payments, buying and selling and shopping using cash. But now there is change .Everycountry has their own currency ,such as dollar ,pound etc. So people find it difficult to use cash. Nowa day and as now covid condition is there , people avoid to give and take cash. Due to this most of the people fuse to do online transaction using cards for online shopping account to account transfer, etc. In this online transaction ,25% of online transaction is done using Credit cards. Credit cards is mostly used credit payment instruments as they allow you to easily avail an instant line of short term credit while making transactions. This help us to Increase our purchasing power and also provide usbenefits like ease of use, reward Points and cashbacks. So transactions using credit card are an rapid speed.

But as use of credit cards is increasing for money transaction, the credit cards frauds is also increasing day-by-day .There are many types of credit cards frauds . In this fraud person ,use your information and issue a credit cards on your name and use it and for that you have to pay. Another way is stealing others credit card details such as credit card number, expiration date and three digitsecurity code and use it for online transaction. This act will increase your credit card bill even thought you have not spend single rupee. Some credit card fraud cause huge amount of loses to many financial institution , banks as well as individual. This also causes damage to the reputation of creditcard companies.

According to a survey, credit card fraud raise by 44.7% over 2019 and 3,93,207 credit card fraud complaints were filled .So to avoid this , almost all financial institution, banks credit cards companies use advance credit cards companies use advance credit card fraud detection system such that they can classify between genuine transaction and fake transaction to avoid their own as well ascustomer losses. Credit card fraud detection system use first only supervised learning which was based on only assumptions. But now due to new advance technology fraud switch from one fraud techniques to another. So to tackle this problem , we use unsupervised learning in this credit card fraud detection system . The supervised learning technique help the found detection system to find anomalies. This credit card fraud detection system also use on auto- encoder. It is a main part of thesystem. Autoencoder is basically a technique which is used to compress vast data into small one.

Auto- encoder has two important component that is encoder and decoder . Encoder is used to compress large data into smaller representation, where as decoder is used for reverse process meansconverting the compressed the data into decoder original one. In this credit fraud detection system ,the auto-encoder compress the vast of

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credit card transaction and later on this compress small data various deep learning algorithm are applied in different ways to detect fraud transactions.

Deep learning algorithms are also very important part of this system. Deep learning is basically a partof family of machine learning method based on artificial intelligence. Deep learning is mostly used for accurate classification. This deep learning technique are most famous than other as it perform better than other machine learning algorithm. The deep learning algorithm include logistic regression , linear discriminant analysis multiple discriminant analysis, k-nearest neighbour, decision tree, random Forest classifier, etc. All this algorithm help us to classify between normal and fake transactions. The main aim of deep learning is extracting important feature from each.

Available data for this extraction and data transformation. purpose, the deep learning uses cascade of multiple layer of uses non-linear processing units. Deep learning algorithms considered as robustalgorithm for credit card fraud detection system.

II. LITERATURE SURVEY

Today, credit card fraud has become a great thread which cause fall down of economy in all parts ofworld . So, lot of research is done on the credit card fraud detection system. Many advanced techniques are generated to avoid credit card fraud. Many people have introduced new strategy to control credit card fraud and reduce loses and some are mention below.

1) Karl Tuyls and Sam Maes proposed credit card fraud detection technique which was doneusing Bayesion and Neural Network. In this, the basic concept was that, they provide set of trainingdata offinancial transaction to the computational learner which is uploaded to the system in which we want to perform fraud detection. After this process, the program will be able to classify normal transactionand fraud transaction. In this method, the advantage was that the 68% of fraud transactionwas recognized accurately without any error but it detects 10% of genuine transaction as fraud transaction.

2) Salvatore J. Stulfo, David W. Fan, Wenkee and Andreas L. Prodramidis and Philip K Chanintroduced a credit card fraud detection technique which uses meta-learning to detect fraud transaction.This techniques consist of bcal Fraud detection agent that detect fraud and provide intrusion. Detection service than meta-learning system bring together the knowledge gathered by local agent.This meta-learning system enables financial corporation to share their models of fraudulent transactions by exchanging agent in secured infrastructure. This technique give meta- classification hierarchy thathas given best performance. But still here we do not able to recognize current selection metric forselecting classifier agent for meta-learning technique.

3) K.R. seeja and masoumeh zarcapoor has proposed a credit card fraud detection system which was based on frequent itemset mining. The technique consist of vector support machine which classifies between normal and anamolous transaction by using different algorithms. The technique has ability to handle the imbalance data. But this technique is no longer effective now as user and fraudulent behaviour is changing.

4) Anuruddha thennakoon, chee bhagyan, sasitha premadasa, shalitha mihiranga , nuwan kuruvitaarchchi introduced a new real time credit card fraud detection using machine Learning. In this technique focus on predictive analysis which is carried out through implemented machine learning model and an API modules to recognize fraud and genuine transaction. These technique tellus the bestalgorithm to stop credit card fraud in various areas. But still this system have only averagelevel of accuracy

II. DESIGN AND IMPLEMENTATION

In this experiment we are using various modules like Data Loading, Class wise analysis, Data modelling, Model training, Build the model, model evaluation. There are various Deep Learning Algorithms, but we are specifically going to use Auto encoder. Auto encoder is category of feed forward neural networks which is use to learn efficiency of the training data. In first stage, the proposed model an auto encoder it is trained by using same transaction attributes. It produces encoded representation of attributes. Representative features are smaller dimension than original features. In second stage classifier is trained with labelled transaction where we represent each transaction by Z for testing.

Autoencoders

The size of the input is reduced into smaller unit.

Autoencoder has two parts that is encoder and decoder they can be defined as Φ and Ψ. It compresses the data into smaller size. Four parameters are required before starting or training the auto encoder:

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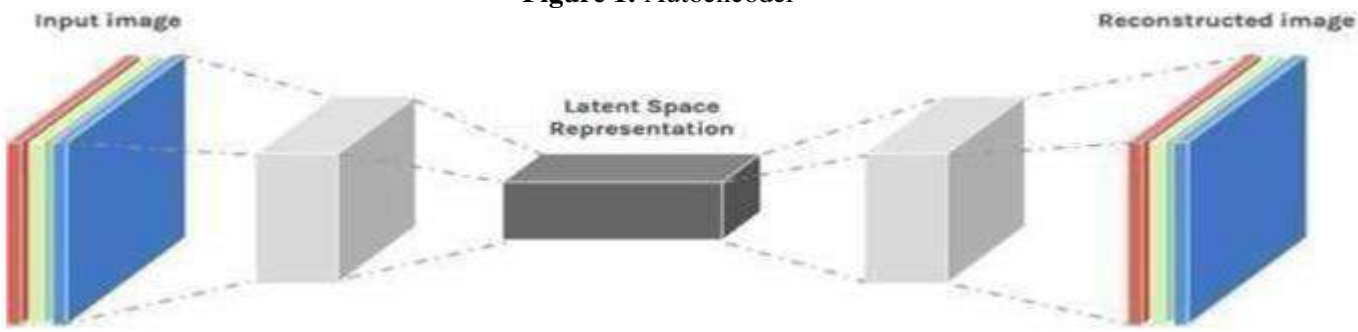
1) Code size: nodes in the middle layer.
2) Number of layers: It has many layers.
3) Number of nodes per layers: Number decreases in care of encoder and increasestowards decoder.

Figure 1: Autoencoder



Algorithm:
The basic algorithm that will be implemented for working of this proposedsystem is as follows:

Step 1: Start.

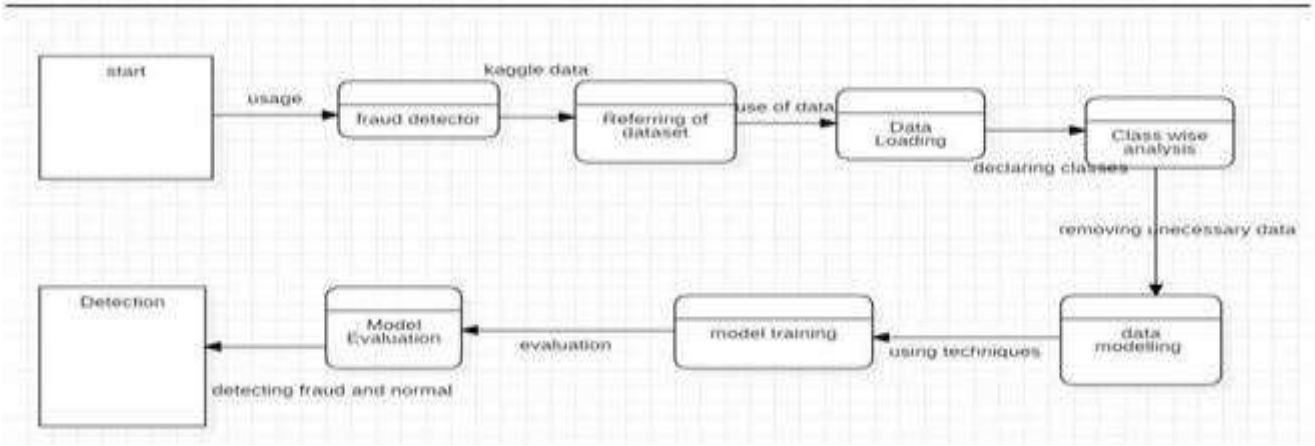
Step 2: Load the dataset Step 3: Class wise analysis

Step 4: class is created as fraud and normalStep5: data modelling

Step 6: model training Step 7: model evaluation

Step 8: Use of AutoencoderStep 9: Result is displayed Step 10: Exit

Figure2: Data Flow chart.



1) **Data Loading**
Our dataset is loaded. It has various attributes but we have considered only 3 attributesthat is time, Account class.

Dataset is loaded in data frame of pandas python. As it is a package of python whichgives high Performance.

2) Class Wise Analysis
The class is divided into two class that is fraud and normal. In this we also display numberof fraud and normal cases.

Bag, graph is made for Time vs Amount using Matlab library of python.

3) Data Modelling
It removes, unnecessary data like time is not needed for classification of fraud andnormal. It also divides the date for training and testing. In this 80% is used for trainingand 20% for testing.

4) Model Training
In this the input is encoded or compressed into vector ‘h’. It is the lower dimension vector than the input later it is passed through networks. The data is given by decoder layer. It gives output dimension = input dimension.

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5) Building the Model:
Auto encoder uses 4 fully connected Layer with 14, 7, 17 and 29number. First two layer used by encoder. Last two Layer is used by decoder. Later on the model is trained for 100 epoch and 32 Sample Best model is Saved.

6) **Model Evaluation**:
Various algorithms, are used in this section. Some terms used here are adopted by credit card fraud detection researcher to calculate the accuracy of different approaches.

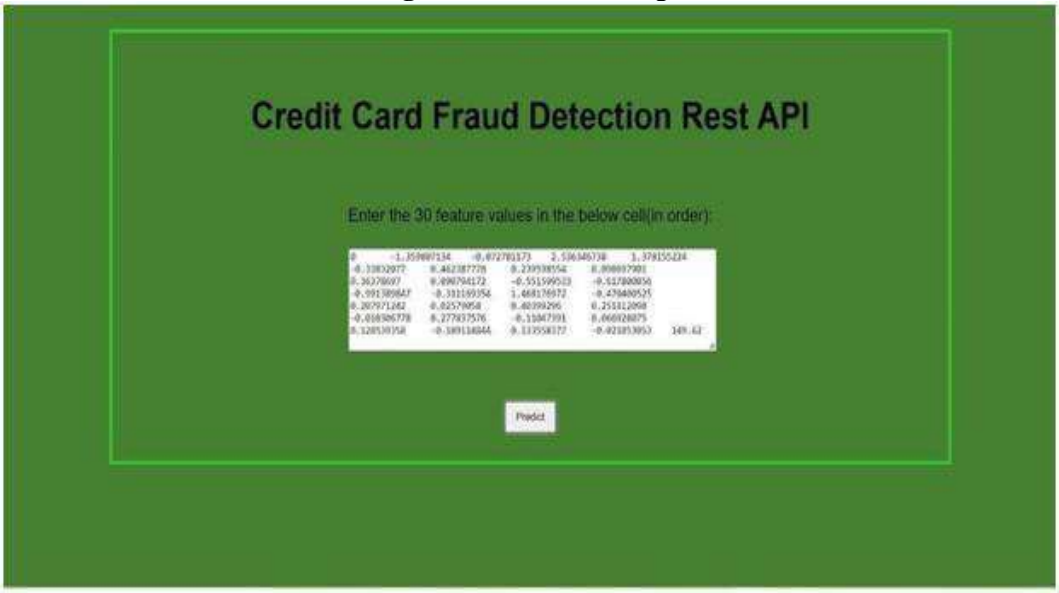
III. Result
The Credit Card Fraud Detection System Home page:

Figure 3: Home Page

This is the home page of credit card fraud detection web application which is displayed after the user get access by entering correct user name and password. It consist of various tabs such as about,contact, login, dashboard and fraud detection.

The Detection Page:

Figure 4: Prediction Page



This is mainly for classifying whether the credit card transaction as fraud or normal. On clicking this, we go to web page which contains a text area and ask for transaction details. In this after, putting 28 attributes of credit card transaction, when we click on predict button someanalyses take place in backend and result is printed on the screen that whether the transaction is normal or fraud and if transaction is fraud, credit card is block and transaction is not allowedto take place and if transaction is normal, it is allowed to continue.

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Figure 5: Validation Page

This page display the result that whether the transaction is fraud or valid.

IV. CONCLUSION

In this project we have prepared fraud detector which detects whether the transaction is fraud or normal .We have used various modules like data modelling ,class analysis , build model , model evaluation etc. For dataset we have used Kaggle dataset .Dataset is the one which consist of all attributes .Attributes are class time, amount ,etc. We have also made confusion matrix and bar graph. Bar graph is made for time versus amount . There are various technique that can be used to detectfraud .Genetic algorithm, Artificial neural network , etc can be used .But in this we have used Autoencoder . we proposed a Real-time model for credit card fraud detection, for a real-life datasetof Credit Card transactions, using Autoencoder.Deep Neural Network with Auto-encoder has very promising results,with the best F1 score.The autenocoder model has more accuracy as compared toothers .It can remove noise like unwanted data to get necessary parametres.Evaluation is also checked for this algorithm .Precision recall,accuracy ,FP,NP and many parameters are indentified and performed in deep.

V. REFERENCES

[1] KhyatiChaudhary, JyotiYadav, BhawnaMallick, " A review of Fraud Detection Techniques: Credit Card", International Journal of Computer Applications Volume 45– No.1 2012.

[2] Michael Edward Edge, Pedro R, Falcone Sampaio, "A survey of signature based methods for financial fraud detection", journal of computers and security, Vol. 28, pp 3 8 1 – 3 9 4, 2009.

[3] Linda Delamaire, Hussein Abdou, John Pointon, "Credit card fraud and detection techniques: a review", Banks and Bank Systems, Volume 4, Issue 2, 2009.

[4] Salvatore J. Stolfo, David W. Fan, Wenke Lee and Andreas L. Prodromidis; "Credit Card Fraud Detection Using Meta-Learning: Issues and Initial Results"; Department of Computer ScienceColumbia University; 1997.

[5] Maes S. Tuyls K. Vanschoenwinkel B. and Manderick B.; "Credit Card Fraud Detection Using Bayesian and Neural Networks"; Vrije University Brussel – Belgium; 2002.

[6] Andreas L. Prodromidis and Salvatore J. Stolfo; "Agent-Based Distributed Learning Applied to Fraud Detection"; Department of Computer Science- Columbia University; 2000.

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PROMOTING HEALTHCARE IN RURAL AREAS

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ABSTRACT
Today's healthcare environment encourages patients to take an active role in their health management. Young adults are seeking health information online and regard it as a reliable source of health advice. Due to this, health care institutions are making significant restructuring and coordination to meet the growing demand for access to quality care and cost savings. Urban areas have medicine and medical facilities that differ from rural areas in medical terms. Accessibility to health services is a major concern in rural areas since they are more difficult to reach. In the Covid-19 crisis, health care in rural areas is inefficient and feels useless. Web-enabled information technology can increase the accessibility and effectiveness of Health Services Integration in the event of a lack of heterogeneous resources. Blogs have become an excellent content medium for healthcare institutions to demonstrate their knowledge, and understanding, it also increases awareness of current issues which affect the general population. There are many advanced technologies for web building. One of them is the MERN stack which is a Javascript-based technology. It increases security, and scalability and improves the UI of the website. We came up with developing a healthcare website that provides various services like video calling, chat app, doctor's appointments, and blogs on MERN stack technology.

Keywords: Healthcare, Blogs, Rural areas, Awareness, MERN.

I. INTRODUCTION
The global Internet continues to grow exponentially, providing innovative ways to act, communicate, learn, connect and transform almost every aspect of our daily lives. Also, with the use of medical information on the Internet, the expansion of health information on the Internet is affecting the relationship between doctors and patients. With the rapid development of smartphones and mobile devices, it is becoming more and more common for people to access information in this flexible way. The Internet can change a user's information-seeking behavior and attitude. People are 2 looking for ways to get information about their health by searching online for information that will help them decide whether to see a doctor in the post-pandemic world. The public healthcare system in rural India has a great impact on rural society due to its cost-effectiveness and availability. We have developed a website that provides various medical services. It's easy to use and low in cost. It's built on the MERN stack which makes it secure and responsive. MERN (MongoDB, Express, React, and NodeJS) Stack is a collection of powerful and robust technologies, used to develop scalable master web applications comprising backend, front-end, and database components. JavaScript is used to build full-stack web applications faster and easier. MERN Stack is a technology that is a user-friendly full-stack JavaScript framework for building applications and is dynamic and secure.

II. LITERATURE SURVEY
In June 2021, [1] Jahnvi Gupta, Vinay Singh, and Ish Kumar, in this research, explained how chatbots may predict user's diseases. This research will utilize the RASA framework to create a chatbot. The chatbot, like any other person, can connect with others and acquire the user's symptoms. It will then determine the most likely disease and predict it, as well as the treatment options.

In July 2007, [2] D.S. Venkateswarlu, K.S. Verma and K.S.R.A. Murthy, this paper examined healthcare issues in India and potential solutions from the standpoint of information and communication technology (ICT). It starts with the needs of the rural population, the elderly, chronic patients, and accident victims, and then moves on to. Healthcare requires an integrated solution to convey voice, video, and other data.

In August 2010, [3] Zui Chih Lee, Jenniffer, Yurchisin, and Chih Te Lin, In this paper we evaluated how to make a website more attractive and trustworthy. The causes of consumers' willingness to purchase from apparel retail websites, such as website attractiveness, consumer website identification, and website trustworthiness, were investigated in this research study. Theories developed from social identity theory and earlier research on online customer behavior were tested using a structural equation model.

In September 2020, [4] Ajay Rana, Nitin Pandey, Vinod Kumar Shukla, and Lekha Athota, in this paper we evaluated how healthcare chatbot is important. Healthcare is critical to a healthy lifestyle. But, getting a doctor's appointment for every health issue is quite tough. The concept is to use Artificial Intelligence to construct a medical chatbot that can diagnose diseases and provide basic information about them before contacting a doctor. The use of a medical chatbot will help to minimize healthcare expenses and enhance access to medical knowledge.

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In April 2021,[5] Mohammad Monirujjaman Khan and Rezaul Karim, In this paper, looked at how significant healthcare chatbots are. The construction of a smart e-health system for the Covid-19 pandemic is presented in this research. It's a cutting-edge Telemedicine technology that allows patients to consult with doctors from the comfort of their own homes. Opentok, Twillo, and 7 WebRTC were used to test video calling APIs. The key features are real-time online doctor-patient contact and prescription. Due to the growing popularity of online systems and the need to save time, people from far away will readily take advantage of this.

In December 2018, [6] Ashley Williams and Austen Rainer, in this article, identified benefits and challenges to the use of blogs, considered quality criteria, and described methodology, based on the case survey, to gather and analyze blog-based evidence. To ensure that large volumes of higher-quality blog content can be used effectively in research.

III. Proposed System

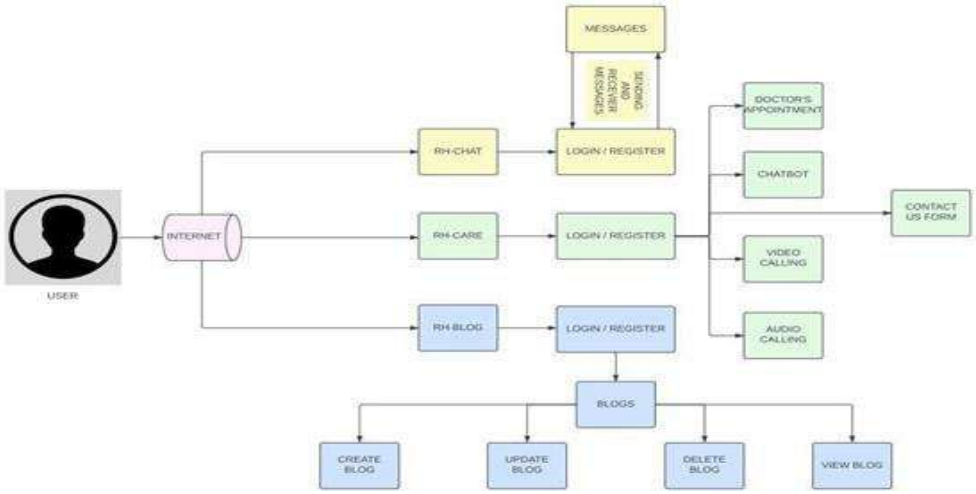

Fig 1: Proposed System

There are medical and health care facilities in urban areas, which are different from rural areas in terms of medical care. Health services in the rural areas are the most concern for its residents since accessibility is quite challenging. In the Covid-19 crisis, health care in rural areas is inefficient and feels useless. So, we have come up with a website, which is RH-Care and it provides basic health information and services. On our website, a user is required to login or register. After that, users can use various features. Users can also talk to chatbot and chatbot will help users by predicting whether the user is positive for that disease or not. After that users can book an appointment with a doctor. Doctors will use our inbuilt video calling app and send a link to that video call to the user. Users will get the link through our inbuilt chat app which is RH-Chat. We also have RH-Blogs in which users can create, update, delete and view blogs. The RH-Blogs categories section is also available. The blogs will also have free health camp updates, diseases and symptoms, and other healthcare information for awareness.

IV. TECHNOLOGY USED

The website is developed using MERN technology and python. Javascript Stack MERN Stack enables faster development of full-stack web applications. There are four technologies comprising MERN Stack, which are MongoDB, Express, React, and Node.js. It is designed to streamline the development process. This powerful combination of technologies provides a complete framework for developers to work with, contributing to the development of web applications.

MongoDB: - For the backend we used MongoDB which is a NoSQL database. MongoDB is a document-type database that is easy to use and understand.

Express:- Using Express, you can develop both web and mobile applications with a robust set of Node.js features. Node-based Web development can be done more quickly with Express. In our system, the express acts like a middleware. Express simplifies and simplifies writing back-end code.

React: - Our frontend is built with React, a platform that supports JavaScript and allows users to create components in UI.

Node.js:- A back-end JavaScript runtime environment running on the V8 engine, Node.js helps to execute JavaScript code outside of a web browser. Developers can use JavaScript to write command-line tools and to

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run server-side scripts to produce dynamic web page content before the page is sent to the user's browser. We also use Bcrypt, which is a Node.js library, for encrypting the user password.

V. RESULT AND DISCUSSION

Fig 2: Login Page

Login Page consists of Email-Id and Password, forget password and register if the users do not register.

Fig 3: RH-Blogs Page

The RH-Blog homepage displays various blogs with their author name, date, and time. There is also a section about us on this site that gives a few details about RH-Blogs. In the write section, a user can also create a blog by adding an image, title, and description. After that, the user is required to click on submit.

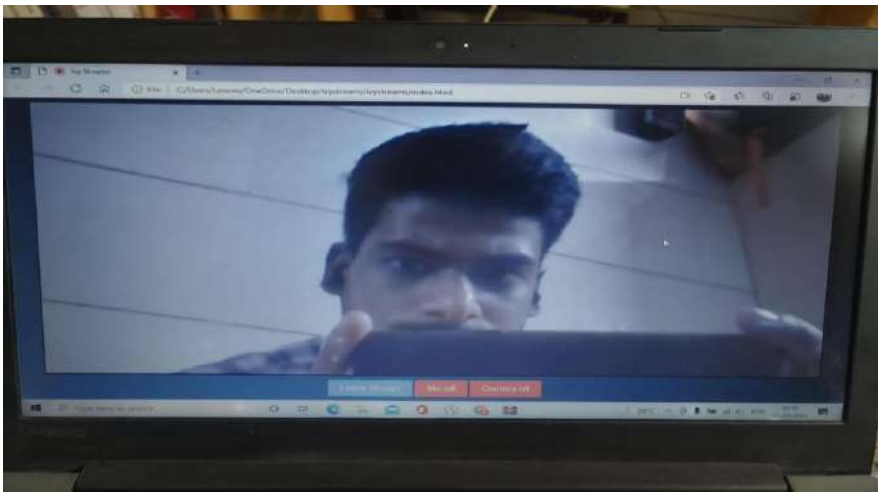

Fig 4: Video-Calling Page

The Video-Calling page consists of a mute/ unmute button, an End meeting button, a Turn on /off camera button, and a user's screen. A doctor can send the meet link to the patient.

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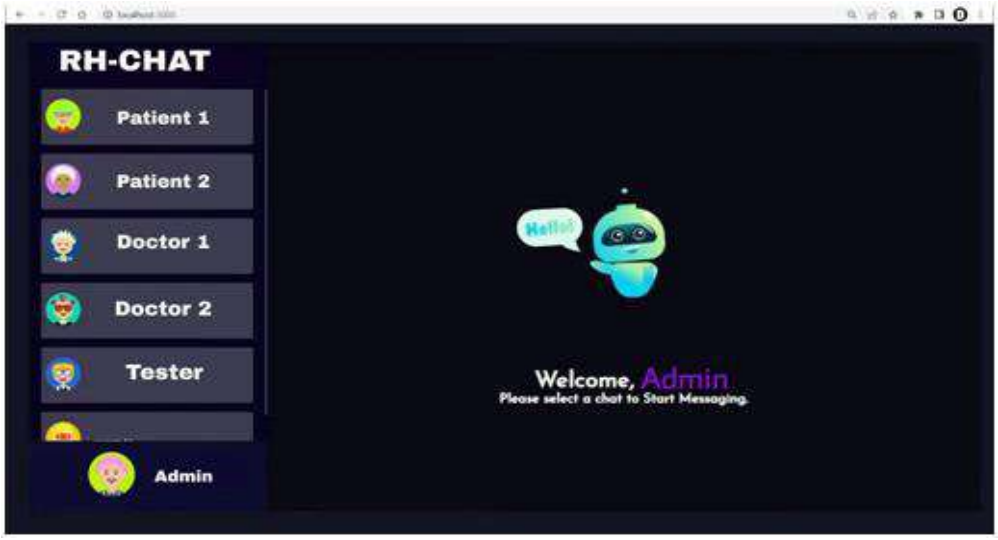

Fig 5: RH-Chat page

In RH-Chat a user needs to first Register or Login to access the Chatting Page. Patients and doctors can communicate through RH-Chat, where reports and prescriptions can be shared.

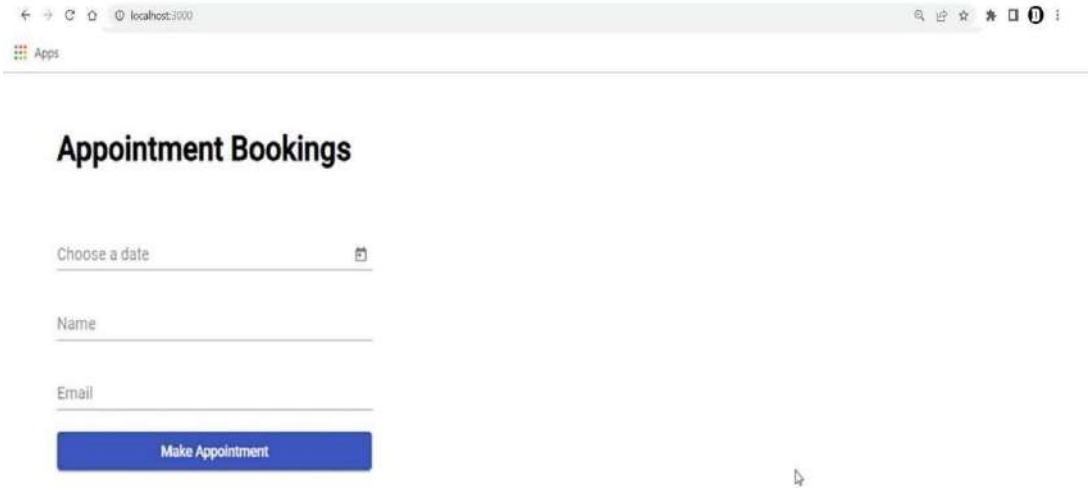

Fig 6: Doctor's Appointment Page

When booking the appointment with a doctor, the patient must select the date and enter the details such as his name and email address. Patients' appointments can be viewed by physicians in the appointment view section.

Fig 7: Contact Us Page

On the Contact Us page, the user is asked to enter its query along with its name and email address.

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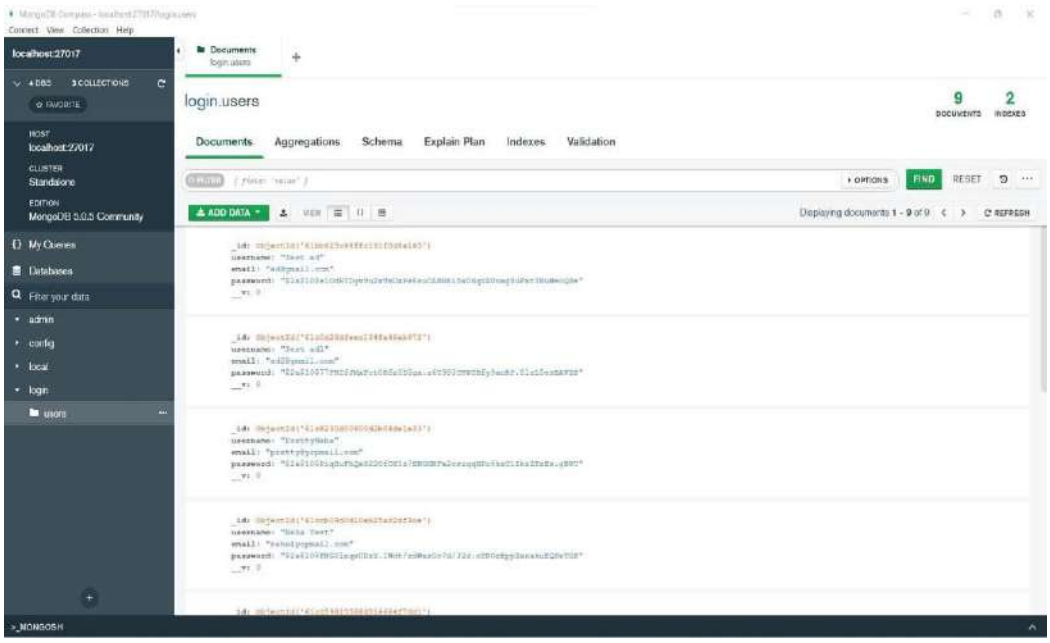

Fig 8: Login Database

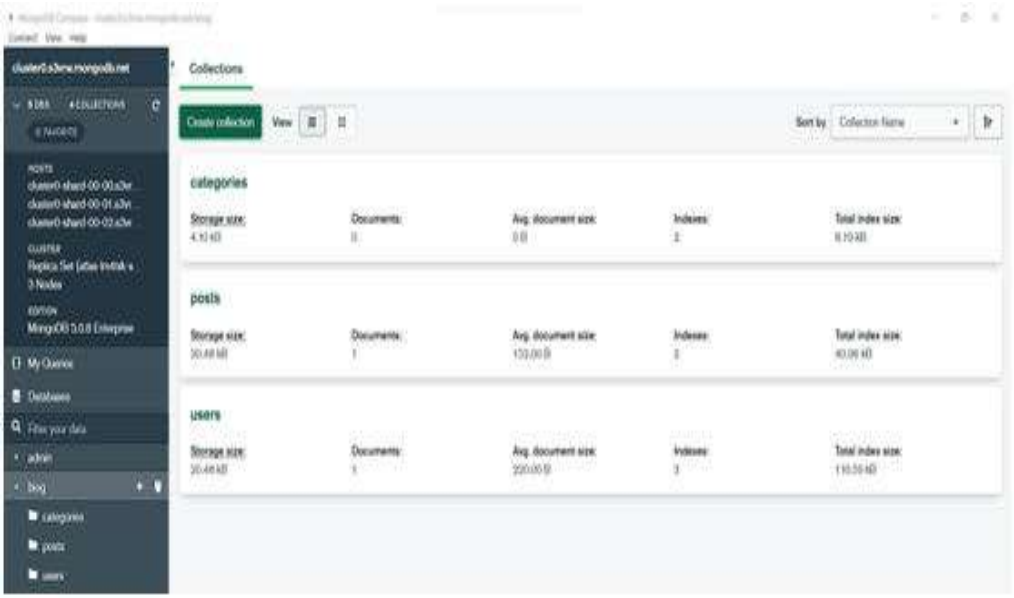

Fig 9: RH-Blogs Database

In the above two figures, you can see the Login/Register page and RH-Blogs database. However, the user password is in hash form, so even the admin can see it which improves the protection of the user password.

VI. CONCLUSION

In the Covid-19 crisis, health care in rural areas is inefficient and feels useless. So, we came up with the idea of developing a healthcare website. We develop the website using MERN stack technology. RH-Care, RH-Chat, and RH-Blogs are 3 major components of our website. It will reduce the gap between the doctor and the patient. RH-Care fills the gap between a doctor and patient by providing services like video calling, doctor's appointments, and contact us. RH-Blogs help users get aware of various health issues in the general population. RH-Chat helps users to communicate with their doctor via chat. Through this, we have tackled some issues and reduced the gap between the patient and doctor.

REFERENCE

[1] Jahnvi Gupta, Vinay Singh, Ish Kumar "Florence- A Health Care Chatbot", 2021 7th International Conference on Advanced Computing and Communication Systems (ICACCS), June 2021.

[2] D.S. Venkateswarlu, K.S. Verma, K.S.R.A. Murthy "e-Health networking to cater to Rural Health Care and Health Care for the Aged", 2007 9th International Conference on e-Health Networking, Application and Services, July 2007.

ISSN 2394 - 7780

[3] Zui Chih Lee, Jenniffer Yurchisin, Chih Te Lin "The Impact of Website Attractiveness, Consumer-Website Identification, and Website Trustworthiness on Purchase Intention", 2010 IEEE/ACIS 9th International Conference on Computer and Information Science, September 2010.

[4] Lekha Athota, Vinod Kumar Shukla, Nitin Pandey, Ajay Rana "Chatbot for Healthcare System Using Artificial Intelligence", 2020 8th International Conference on Reliability, Infocom Technologies and Optimization (Trends and Future Directions) (ICRITO), September 2020.

[5] Mohammad Monirujjaman Khan, Rezaul Karim "Development of Smart e-Health System for Covid-19 Pandemic", 2020 23rd International Conference on Computer and Information Technology (ICCIT), April 2021.

[6] Austen Rainer, Ashley Williams "Using Blog Articles in Software Engineering Research: Benefits, Challenges and Case–Survey Method", 2018 25th Australasian Software Engineering Conference (ASWEC), December 2018.

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ORGAN DONATION APPLICATION AND WEB SERVICE

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ABSTRACT
This Application acts as a vital role in saving the lives of individuals and that is additionally its main aim is to assist the user to urge the desired organs at the right time. And it's a mobile-based Application developed within the Android Studio. This Android Studio application provides a simple and quick thanks to look for organs. This app permits users to search out organs in an emergency. Users have to register with the application that is accessible on the app. And also, they'll get transient data on the donor's contact details including their location. The Objective of this Mobile Application is to style associate Android Studio Application to take care of necessary data of the Patients, Donors, and report details for any bio-related organization. Project Organ Donation App was developed in order that users will read the knowledge concerning registered Organ donors like Name, Address, and different such personal details in conjunction with their details of people and different Medical Details of the donor. This Mobile Application conjointly incorporates a login page wherever the user is needed to register and solely then they'll read the supply of organ, if he/she needs to the most aim of developing this Application is to scale back the time to an excellent extent to avoid outlay time in looking for the correct donor and therefore the convenience of organ needed.
This Android Application will store the details of the donor in firebase and allow patients to see the available donors. It also provides high performance of the health of donors.

Keywords: Android Studio, Donor, Firebase, Organ, Donation, Web application.

I.INTRODUCTION
The demand of the organ has increased year by year and this has caused a lot of problems because of the common sense that the organ cannot be harvested like plants. An organ should have been used by a human to get confirmation that the organ is good to use in another human. But human are confused that are they good donator to give organ and which organ can be donate. Humans are going lazy day by day and this makes them fail to understand what good deeds can be done if they work a little more. In the case of organ donation if humans find out how this organ donation works and what are the steps. They will be making a big change in people's minds and life.

It is said that on an average day, there are nearly 300 deaths every day Roughly 5 lakh people die annually in India due to lack of an organ donor but with less than one per million people opting to donate, the organ donation rate in the country is one of the lowest in the world, according to estimates in India the statistics are even worse as quite 8000 people suffer per annum without the right acquisition of a donor, why do these fallacies occur? These mistakes occur as a scarcity of proper connection between a willing donor and a needful patient, however this also hasn't stopped the illegal processes of organ transplants, where certain organizations kidnap people and perform organ trafficking, there has always been a requirement to place a check of control on of these issues. The Transplantation of human organ act (THO) was passed in India in 1994 to monitor and coordinate organ donation and transplantation activities, there are certain higher authority bodies that were commissioned thereunder , Appropriate Authority (AA): inspects and grants registration to hospitals for transplantation, Advisory Committee (AC) : consisting of experts within the domain who shall advise the acceptable authority , Medical board (Brain Death Committee): Panel of doctors responsible for brain death certification. The main idea of this proposition is to possess a mobile application that provides people the selection to be a donor when a hospital near them is in need of an organ, the application named as ' Organ Donation App' will be able to fetch the authorizations from the above-mentioned bodies, and connect the donors with the most needful patient of the hour. The application is about bent start as an Android based one, but eventually aimed toward reaching bent devices of all types , the appliance allows any normal civilian user to register, but only the authorized admin from the opposite end can validate the credentials and user information before they will tend to the necessity of a patient, in case of an organ donation, the hospital sends request for the particular blood type and waits for a potential donor to respond.

Looking at the people who need help humans on the other side of the wall want to help these people with the imagination of a new future taking part with more humans who want to come to the other side of the wall where people are healthy with no physical drawbacks. So when they are on this side of the wall they will help others as one did to them. People want to help others in need in the hope that they might be doing good even after they are dead. But in most cases people have a lack of knowledge of how it is done or where to go for such things and lots more.

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II.LITERATURE SURVEY

Solid organ transplantation is one among the foremost remarkable and dramatic therapeutic advances in medicine during the past 60 years. This field has progressed initially from what can accurately be termed a "clinical experiment" to routine and reliable practice, which has proven to be clinically effective, life-saving and cost-effective. This remarkable evolution stems from a serial confluence of: cultural acceptance; legal and political evolution to facilitate organ donation, procurement and allocation; technical and cognitive advances in organ preservation, surgery, immunology, immunosuppression; and management of infectious diseases. a number of the main milestones of this multidisciplinary clinical science are reviewed during this article [1].

This study sought to gauge the effectiveness of Project ACTS: About Choices in Transplantation and Sharing, which was developed to extend readiness for organ and tissue donation among African American adults. Nine churches were randomly assigned to receive donation education materials currently available to consumers or Project ACTS educational materials. the first outcomes assessed at 1-year follow-up were readiness to precise donation intentions via one's driver's license, card , and discussion with family. Results indicate a big interaction between condition and time on readiness to speak to family such participants within the intervention group were 1.64 times more likely to be in action or maintenance at follow-up than were participants within the control group ($p = .04$). there have been no significant effects of condition or condition by time on readiness to be identified as a donor on one's driver's license and by carrying a card. Project ACTS could also be an efficient tool for exciting family discussion of donation intentions among African Americans although additional research is required to explore the way to more effectively affect written intentions [2].

The importance of choosing more human leukocyte antigen (HLA)-compatible recipients for deceased donor kidneys has declined because the donor and recipient demographics have changed, and because the await transplants has grown in recent years. Although the general difference in 10-year graft survival rates between the simplest and worst matched kidney transplants remains at about 18%, only about 15% of candidates can expect to receive a HLA-matched kidney. Larger gains in survival are often realized by matching donors and recipients more closely for age and other factors that are projected to extend the years of graft function for every deceased donor kidney. For several patients, however, who are sensitized against HLA antigens by pregnancies or previous graft failures, a more histocompatibility organ is that the only option for transplantation [3].

III. DESIGN AND IMPLEMENTATION

There are many people within the world facing issues which will only cause two ways: Death or Cure. The cure is removing the organ and replacing it with a working one. But this will happen only some is prepared to offer. Organ donation takes healthy organs from one person and transplants them into another person, allowing the recipient a far better quality of life

The application asks you to enter your medical records and therefore the report has been created by us which mention the social information of the user. It also mentions the organ or a part of the organ which may be donated. After the results collected, it's uploaded to the user account then the user is given a form to fill certain the confirmation of Donation with the acceptable

User Information

• User registration: the appliance shall allow users to register and make a profile

• User authentication: When registering, the appliance shall allow users to authenticate using their username and password.

o User Log in

o Users shall be able deactivate their account

o Users shall be able sign off

• Profile Management

The profiles of users shall contain the following:

First name, Last name, telephone number, Location, Email ID

The organ the donor decides to donate.

Algorithm

1. The application starts with Registration.
2. If the user is new, then he will be following the Sign in Page

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3. Once he has entered the valid credential, the user will be directed to the Login page.
4. After filling the form, user will be directing to Data Review page.
5. After review page, they will be directed to Dashboard
6. Dash board is where user can choose to update information if gets wrong or review the Data review page.
7. If the user is existing user then they will be directed to the dash board.
8. Step 6 again
9. This loop can only be close if user decide to click on log out button in the dashboard.

There is also an information page where the user is motivated in to donate their organ, in form of text as well as videos from celebrities explaining why it is important.

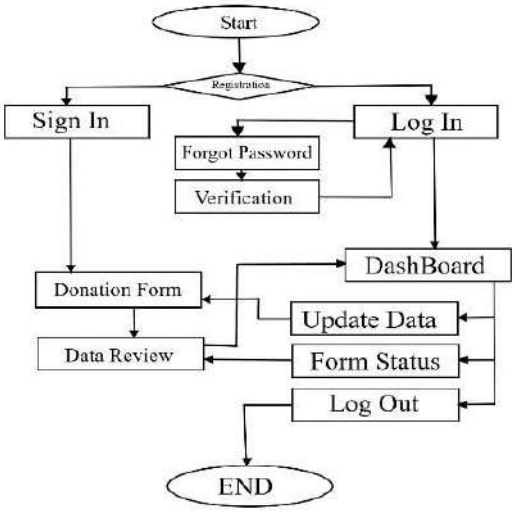

Figure 1: Data Flow chart.

The above diagram represents the way how the application is used in order to collect information from the user and save it in the database. The application also provide user to change or update the filled form in situation of incorrect information.

IV.Result

The Android Application

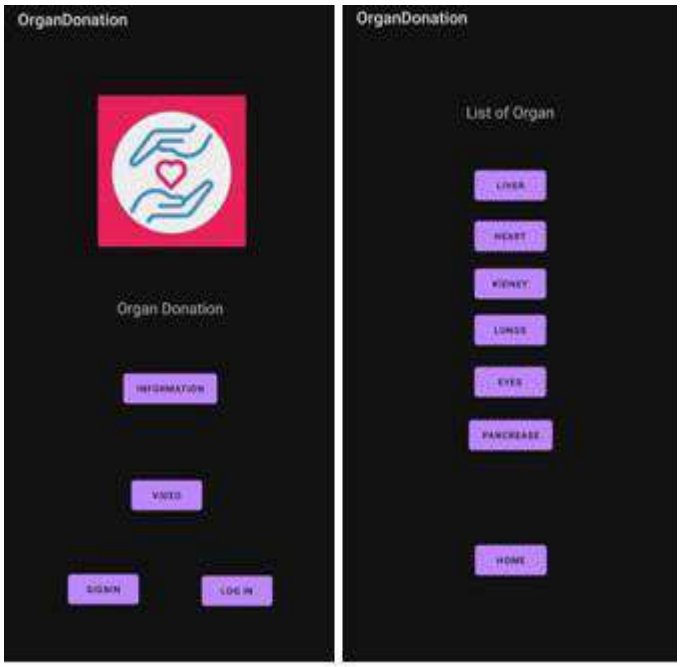

Figure 2: Home and Information page

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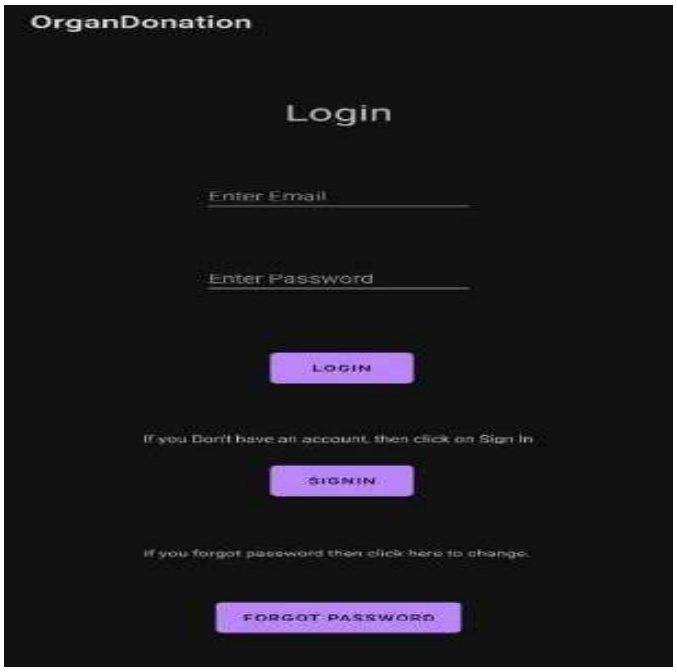

Figure 3: Login page.

The Web Application

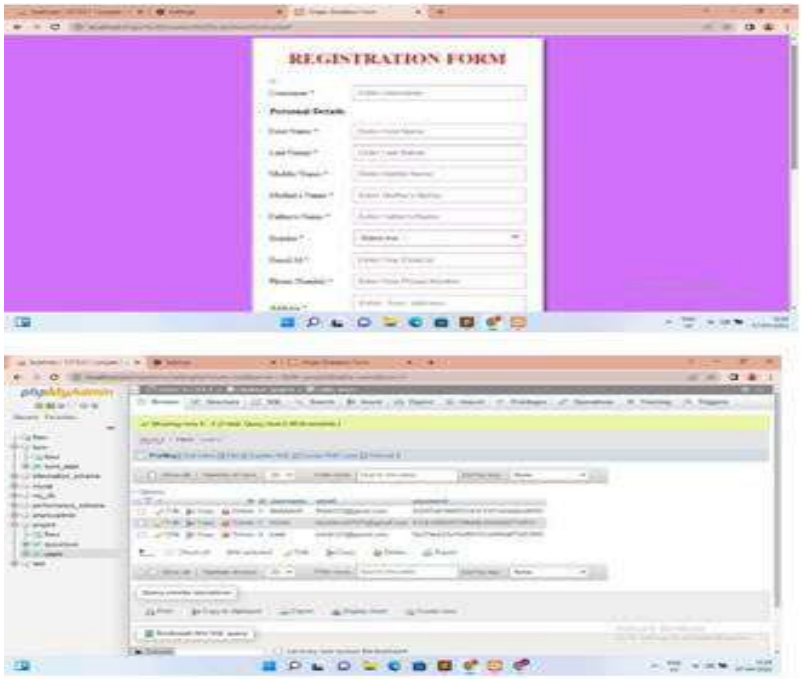

Figure 4: Form and Database Page.

V.CONCLUSION

We trust that the use that is grown on account of these ideas hopeful advantageous and adept in today's realm, and would to serve those in utter need of tools.

Finding the nearest hospital and donor banks through an android app helps in increasing the chance of saving the patient's life especially in rural areas.

There is a phase in every human's life where they think about doing something good and pure. And during this phase they sometimes think of donating their organs. This is the time our application covers the maximum distance to make things clear and easy. It is user-friendly to work with users. They will be educated and a small path will be shown in order to make them a donor. After the application of the donor is completed and verified, they will receive a Donor card.

This will be the motto of our application to inspire and make sure to add new people to fill up for organ donation and help others with related doubts.

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VI. REFERENCES

[1] K.Pathrakali, V.Rupika Thangam, B.Selva Lakshmi, Dr.V.Kavitha (Asso.Professor) Computer Science and Engineering department National Engineering College, Kovilpatti 2019.

[2] Deep Jhaveri , Shilpy Kumar , Sayali Naik, Sneha Sankhe , Mohammad Zakir Shaikh, (2015),"Content Based Image Retrieval", International Journal of Scientific Engineering and Technology Research, ISSN 2319-8885, Vol.04, Issue.09, April-2015,Pages:1626-1629

[3] "Promoting and assisting eye donations using mobile application", ICCIC, Dec.2013, 10. 1109/ ICCIC .2013.6724275.

[4] "Blood bank information system using Android application", (RDCAPE), Oct. 2017, 10.1109/ RDCAPE .2017.8358280

[5] "Mobile Application Interface to Register Citizen Complaint: E-Police Complaint", International Journal of Advanced Research in Computer Engineering & Technology, ISSN: 2278 – 1323, Vol. 6, Issue 4, April-2017, Pages 510-514.

[6] Neetu Mittal, Karan Snotra, "Blood bank information system using Android application", Recent Developments in Control, Automation & Power Engineering(RDCAPE), Oct. 2017, 10.1109/ RDCAPE.2017.8358280

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CREDIT CARD SCAM DETECTION USING MACHINE LEARNING

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ABSTRACT
Credit cards are the most convenient means of payment in today's society, both online and offline. It contributes to cashless buying all across the world, every people are using ATM cards and credit cards, so fraud is also increasing. Fraud occurs only when making an online payment since the credit card information is sufficient to conduct the transaction, which will be on the credit card. Frauds tend to follow a pattern. It's tough to analyze each credit card transaction separately when there are billions of them. We have used a machine learning-based algorithm, predictive algorithms that can assist in the detection of fraudulent transactions. Due to confidentiality issues, the dataset of credit card transactions is sourced from European cardholders containing 284,807 transactions. We employed random forest algorithms to analyze and predict fraud events, and so determined the number of fraud transactions. The random forest algorithm's accuracy and amount of errors have been calculated. This work is implemented in Python using the Tkinter framework and streamlit done by the implemented machine learning model.

Keywords: Credit Cards, Machine learning, Predictive, Python, Random forest, Streamlit, Tkinter

1. INTRODUCTION
As credit card usage is rising all over the world such as in government offices, finance, and corporate industries, and many other organizations, fraud is also increasing. Mostly the online transaction takes place under bank operations through credit cards or debit cards. There are many different types of credit card fraud that occur when the credit card information of the individual is stolen and used to make unauthorized purchases and or withdrawals from the original holder's account and, account takeover, misplace card, account bankruptcy, device intrusion, application fraud, counterfeit card, telecommunication fraud. all banks and financial institute needs a system to detect scam transaction because the credit card is issued by the financial institute and people used credit card funds for any purpose if unknown people use a credit card then additional charges are added to the cardholder's account. it is important that credit card companies should be able to recognize which transaction is fraudulent and which is legitimate so that customers are not charged for items that they do not purchase.

In credit card fraud detection systems many data mining and machine learning algorithms are used to solve this fraud detection problem. In this project, we are exactly going to use a machine learning algorithm deployed to analyze all the authorized transactions and fraud with high accuracy. Using a Kaggle dataset of nearly 284,800 credit card transactions dataset is labeled then it comes under a supervised learning-based algorithm, supervised algorithms consist of a predetermined set of data that is provided for training the system and the system tries to predict the results based on the previous examples or training data. Also, using metrics such as Accuracy, precision, recall, and F1 scores. In addition, we will explore the use of data visualization techniques common in data science, such as correlation matrices and confusion matrices, to gain a better understanding of the underlying distribution of data in our data set. We implement a model using the Random forest algorithm, which is a supervised classification algorithm. It is used for both regressions as well as classification kinds of problems. For user convenience, we create a Graphical User Interface (GUI) to analyze and check the accuracy of the legitimate and fraudulent transactions of the given dataset and predict the transaction using Web App (Streamlit).

2. LITERATURE SURVEY
In a survey of many papers, all authors have focused on pre-processing and analyzing data sets as well as the deployment of multiple anomaly detection algorithms such as Local Outlier Factor, Isolation Forest algorithm, Random Forest algorithm, Adaboost algorithm, Support Vector Machine, Naive Bayes, K-Nearest Neighbor, and Logistic Regression. To detect frauds, they compared one of two algorithms for better accuracy. On the basis of better outcomes, they worked with that algorithm. In most of the papers participants using a Kaggle dataset that is depending on the numeric value of probability between 0 and 1, a transaction will be classified into one of the following categories: Non-Fraudulent, Doubtful, Suspicious, and Fraudulent on the PCA transformed Credit Card Transaction data.

In [5] they have researched two techniques for credit card fraud detection as random forest algorithm and the Adaboost algorithm. They have concluded that both give the same accuracy, but they consider the precision,

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recall, and the F1-score the Random Forest algorithm has the highest value than the Adaboost algorithm. Paper [1] and [6] both have mentioned two algorithms that are local outlier factor and the random forest algorithm. In [3] they have investigated the comparative performance of Naïve Bayes, K-nearest neighbor, and Logistic regression models in the binary classification of imbalanced credit card fraud data, these three techniques are due to the less comparison they have attracted in past literature. In paper [2] they have highlighted real-time credit-card fraud detection by using predictive analytics and an API module the end-user is notified over the GUI the second a fraudulent transaction is taken place, they also focused on location-based fraud detection in a future enhancement. Paper [7] consider the histogram of each parameter, they have implement two algorithms that is Isolation forest and local outlier factor to do anomaly detection. they specially focused on importance of understanding the data and precision. All authors have worked on some king of machine learning algorithm to get the better accuracy of the system.

3. SYSTEM DESIGN

In designing, we implement a Graphical User Interface (GUI) using Integrated Development Environment (IDE) that provides a user-friendly environment understood by a non-technical person such as a bank manager and authorized person in the banking system. A credit card fraud detection system is a project based on supervised learning, supervised learning is the learning in which we teach or train the machine by using some data which is well labeled which means some data is already tagged with the correct answer. In the supervised machine learning technique, we have calculated the different machine learning algorithms such as Logistic Regression, Decision Trees, and Random Forest, to determine which algorithm gives suits best and can be identifying fraud transactions. For credit card fraud detection, we implement different types of diagram which represents the whole project in a better and easier way. It focused on the input and output of the system which provides a high-level overview of major system components, key process participants, and important working relationships. We need to determine the main features and the framework. When we are constructing the framework, we determine the main purpose of our system.

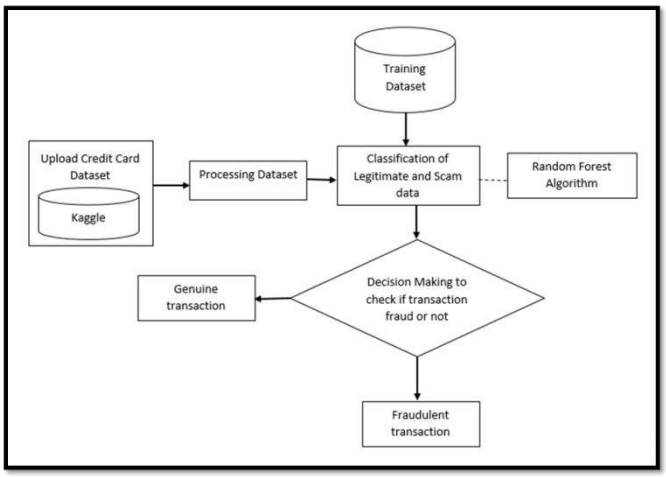

Fig – 1: System Block Diagram

In the collection of data, we need to see from where we can collect the data and what is the various feature in this data set. so, in this system, we had used a data set from Kaggle which contains transactions made by the credit cards by European cardholders. The dataset contains numerical input variables as PCA (Principal Component Analysis) transformation. Due to confidentiality, conversion is done so that the user's personal details remain hidden and the user's security is maintained. Columns having heads as V1 to V28 show PCA transformed numeric values but time, amount, and class features show their real values. After the data collection, Data Pre-Processing observe that the data is highly unbalanced. For balancing this dataset, we used the under-sampling technique. under-sampling is a technique to balance uneven data sets by keeping all of the data in the minority class as it is and decreasing the size of the majority class. Here, we will build a sample data set from the original data set which contains a similar amount of normal transactions and fraudulent transactions. Here we have 492 fraudulent transactions and almost more than 2 lakh legitimate transactions, For the balancing dataset, we take 492 fraud transactions as it is and take randomly 492 legitimate transactions from that 2 lakh. so now our data set will become balance data set because we have 50% fraudulent transactions and 50% legitimate transactions. When data is balanced, we split data into training data and testing data. Training is 80% of our data whereas 20% is testing data. We feed this training data to our machine learning model and once we trained our model, we will evaluate our model or find the accuracy of our model by testing it with test data. Once we split the data we will feed our training data to our random forest model. After that, we filled different

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evaluating parameters like precision, Accuracy, Recall, and F1-Score. Lastly, we draw a confusion Matrix for our model. A confusion matrix is structured data (table) that is used to describe the overall performance of a classification model (or "classifier") on a set of test data for which the true values are known.

A. Random Forest Algorithm

The random forest is a supervised machine learning algorithm that built different decision trees instead of relying on one decision tree the random forest takes the prediction from each tree and based on the majority votes of predictions and it predicts the final output. It uses more t trees to reduce the risk of overfitting. There are two assumptions in a random forest, there are some actual values in feature variables of the dataset, and prediction from each tree must have a very low correlation. The decision tree is constructed by the source test and is split into subsets based on an attribute value test. For each and every derived subset, this process is repeated. When splitting no longer adds value to the predictions, recursion is completed.

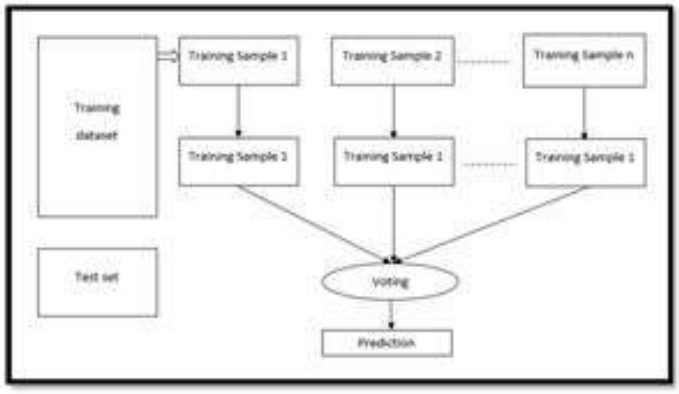

Fig – 2: Random Forest Algorithm

The basic algorithm that will be implemented for working of this proposed system is as follows:

1. Take the random dataset that is trained and randomly select some data points from training set.
2. Using the randomly created sample data now build the Decision Trees that are used to classify the cases into the fraud and legitimate cases.
3. The Decision Trees are formed by splitting the data points, the data points which have the highest Information gain make it as the root node and classify the fraud and non-fraud cases.
4. Now the majority vote is performed and the decision Trees may result in 0 as output which includes that these are the legitimate cases.
5. At last, we find the accuracy, precision, recall, and F1 -score for both the fraud and legitimate cases.

4. SOFTWARE IMPLEMENTATION

First of all, we upload our dataset from the local repository in the CSV format. The dataset contains 31 columns out of which 28 are named V1-V28 to protect sensitive data. The other columns represent Time, Amount, and Class. Time represents the gap between the first transaction and the following one. The amount is the amount of money transacted. Class 0 represents a legitimate transaction and 1 represents a fraudulent one. After uploading the dataset, System give us permission to analyze the data, in the analysis GUI displayed the total number of transactions, counts of frauds and normal transactions, and percentage of fraud transactions.

Time	V1	V2	V3	V4	V5	V6	V7	V8	V9	V11	V19	V20	V25	V26	V27	V28	Amount	Class
0	-1.35981	-0.07278	2.536347	1.378155	-0.33832	0.462388	0.239599	0.098698	0.363787	-1	0.403993	0.251412	0.128539	-0.18911	0.133558	-0.02105	149.62	0
0	1.191857	0.266151	0.16648	0.448154	0.060018	-0.08236	-0.0788	0.085102	-0.25543	1.6	-0.14578	-0.06908	0.16717	0.125895	-0.00898	0.014724	2.69	0
1	-1.35835	-1.34016	1.773209	0.37978	-0.5032	1.800499	0.791461	0.247676	-1.51465	0.6	-2.26186	0.52498	0	-0.32764	-0.1191	-0.06535	-0.05975	378.66	0
1	-0.96627	-0.18523	1.792993	-0.86329	-0.01031	1.247203	0.237609	0.377436	-1.38702	-0	-1.23262	-0.20804	0.647376	-0.22259	0.062723	0.061458	123.5	0
2	-1.15823	0.877737	1.548718	0.403034	-0.40719	0.095921	0.592941	-0.27053	0.817739	-1	0.803487	0.408542	-0.26901	0.502292	0.219422	0.215153	69.99	0
2	-0.42597	0.960523	1.141109	-0.16825	0.420987	-0.02973	0.476201	0.260314	-0.56867	1.3	-0.03319	0.084968	-0.23279	0.105915	0.253844	0.08108	3.67	0
4	1.229658	0.141004	0.045371	1.202613	0.191881	0.272708	-0.00516	0.081213	0.46496	-1	-0.04558	-0.21963	0.750137	-0.25724	0.034507	0.005168	4.99	0
7	-0.64427	1.417964	1.07438	-0.4922	0.948934	0.428118	1.120631	-3.80786	0.615375	-1	0.324505	-0.15674	2	-0.41527	-0.05163	-1.20892	-1.08534	40.8	0
7	-0.89428	0.286157	-0.11319	-0.27153	2.669599	3.721818	0.370145	0.851084	-0.39205	-1	0.570328	0.052736	0.373255	-0.38416	0.011747	0.142404	93.2	0
9	-0.33826	1.119593	1.044367	-0.22219	0.499361	-0.24676	0.651583	0.069539	-0.73673	1	0.451773	0.203711	-0.06973	0.094199	0.246219	0.083076	3.68	0
10	1.449044	-1.17634	0.91386	-1.37567	-1.97138	-0.62915	-1.42324	0.048456	-1.72041	1.2	-0.22137	-0.38723	0.251367	-0.12848	0.04285	0.016253	7.8	0
10	0.384978	0.616109	-0.8743	-0.09402	2.924584	3.317027	0.470455	0.538247	-0.55889	-0	0.787664	0.125992	0	-0.26791	-0.48221	0.042472	-0.05434	9.99	0
10	1.249999	-1.22164	0.38393	-1.2349	-1.48542	-0.75523	-0.6894	-0.22749	-2.09401	0.2	-0.68328	-0.10276	0	0.161185	-0.35499	0.026436	0.042422	121.5	0
11	1.069374	0.287722	0.828613	2.71252	-0.1784	0.337544	-0.09972	0.115982	-0.22128	-1	-0.98292	-0.1582	0	0.548265	0.104094	0.021491	0.021293	27.5	0
12	-2.79185	-0.32777	1.64175	1.767473	-0.13659	0.807596	-0.42291	-1.90711	0.755713	0.8	2.221888	-1.58212	1	-0.23275	-0.23556	-0.18478	-0.03915	58.8	0
12	-0.75242	0.345485	2.057323	-1.46864	-1.15839	-0.07785	-0.60858	0.003603	-0.43617	-1	0.412535	0.263451	0	-0.03912	-0.08709	-0.181	0.129394	15.99	0
12	1.103215	-0.0403	1.267332	1.289091	-0.736	0.288069	-0.58606	0.18938	0.782333	-0	-0.57568	-0.11191	0	0.364298	-0.38226	0.092809	0.037051	12.99	0
13	-0.43491	0.910966	0.924591	-0.72722	0.915679	-0.12287	0.707642	0.087962	-0.66527	0.3	0.025436	-0.04702	0	-0.34241	-0.04963	0.079692	0.131024	0.89	0

Fig – 3: Kaggle Dataset

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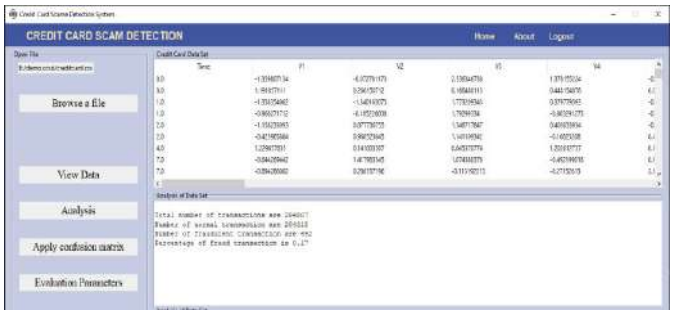

Fig – 4: Data Analysis

After analyzing data using GUI, we plot a heatmap to get a representation of the data and to study the correlation between our predicting variables and the class variable. This heat map is shown below:

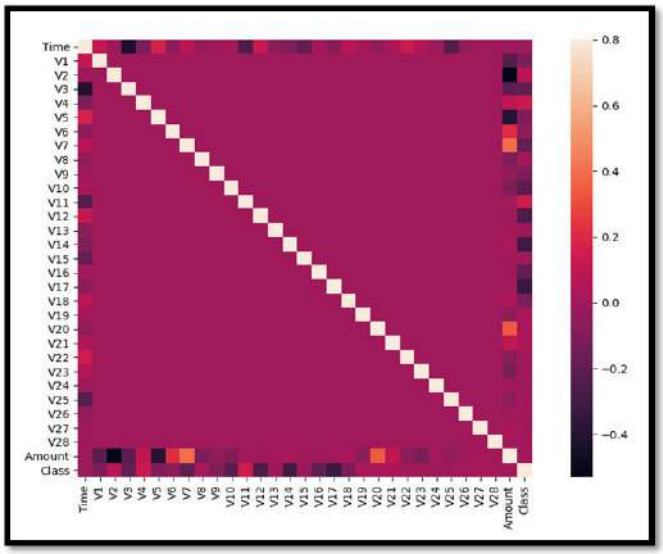

Fig – 5: Showing correlation matrix with a heat map

This heat map shows that the majority of the features do not correlate with one another. The dataset is now formatted and processed. The time and amount column are consistent and the Class column is eliminated to ensure fairness of evaluation. The following module diagram explains how these algorithms work together, this data is fit into a model and the following algorithms are a part of sklearn. The ensemble module in the sklearn package includes ensemble-based methods and functions for classification, regression, and outlier detection. There is some python library using NumPy, SciPy, and matplotlib modules that provides a lot of simple and efficient tools which can be used for data analysis and machine learning, and it is free and open source. we have used Python (Tkinter framework) to make a GUI. Jupyter Notebook platform to make a program in Python to predict the approach that this paper suggests. This program can also be executed on the cloud using the Google Collab platform which supports all python notebook files. To predict the individual transaction, we have used a Streamlit library to show the normal transaction and fraud transactions.

6. RESULTS

The confusion matrix derives basic performance measures; it contains four outcomes for a 2 by 2 matrix table. To evaluate the result of the classification algorithm there are various parameters

Such as Accuracy, recall, precision, and F1 score. There are some following 4 important terminologies that will help us in determining the metrics we are looking for:

- In True Positives (TP), the actual value is Positive and the predicted is also Positive.
- In True negatives (TN), the actual value is Negative and the prediction is also Negative.
- In False positives (FP), the actual is negative the prediction is Positive.
- In False negatives (FN), the actual is Positive but the prediction is Negative.

A. Accuracy: In accuracy, the number of correct predictions is divided by the total number of input samples.

Accuracy=TP+TN/TP

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B. **Confusion Matrix:** In the confusion matrix, the classification model performs on a set of test data for which true values are known in a table format.

		Actual Values	
		Positive(1)	Negative(0)
Predictive Values	Positive(1)	TP	FP
	Negative(0)	FN	TN

Fig – 6: Confusion matrix table.

C. **Precision:** In Precision, the number of correct positive outcomes is divided by the classifier's projected number of positive findings.

Precision=TP/TP+FP

D. **Recall:** In recall, calculated by dividing the number of correct positive results by the total number of relevant samples.

Recall=TP/TP+FN

E. **F1-score:** In F1-score, unify precision and recall into one measure, we take their harmonic mean.

F1score=2*(Recall*Precision)/

(Recall+Precision)

Our system obtained a confusion matrix for the random forest classifiers are as follows:

```
The model used is Random Forest classifier
The accuracy is  0.9995611109160493
The precision is 0.9866666666666667
The recall is 0.7551020408163265
The F1-Score is 0.8554913294797689
```

Fig – 7: Output of the confusion matrix

From the confusion matrix, the model was correctly able to classify 56861 records as valid and 78 records as fraudulent. However, it incorrectly identified a valid transaction as a fraudulent transaction 3 times and incorrectly identified a fraudulent transaction as a valid transaction 20 times.

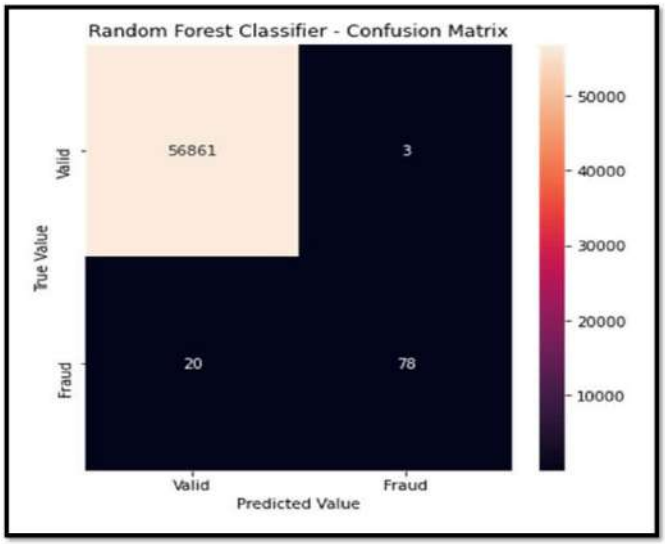

Fig – 8: Confusion matrix for random forest algorithm

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After creating the confusion matrix, we got the accuracy as well as the error rate that is 0.3% only. To predict the individual transaction, we have used a Streamlit library to show the normal transaction and fraud transactions.

7. CONCLUSIONS

From our analysis, we can conclude that the accuracy of the Random Forest algorithm is best compared to another algorithm. When we consider the precision, recall, and the F1-score the Random Forest algorithm has the highest value than the Adaboost algorithm. Credit Card Fraud Detection systems have become essential for banks and financial institutions, to minimize their losses. By comparing other methods, we found that a random forest classifier with boosting technique will be the best technique for classification. If these algorithms are applied to bank credit card fraud detection systems, the probability of fraud transactions can be predicted soon after credit card transactions.

8. FUTURE SCOPE

This model can further be improved with the addition of features like real-time detection of frauds. The model should be able to detect fraud before doing any transaction. While we could not reach our goal of 100% accuracy in this system. We did end up creating a system that can, with any such projects, there is some improvement here. We will also include the alarming system when an unauthorized person accesses a credit card. This model can be improved with the addition of more algorithms into it.

REFERENCES

[1] Abhilasha Kulkarni, Priyanka Ghare, Apoorva Dharadhar, Anushka Dhekne, Aditi Helaskar (2019), “Credit Card Fraud Detection Using Random Forest and Local Outlier Factor” IJRASET - ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 6.887 Volume 7 Issue IV.

[2] Anuruddha Thennakoon, Chee Bhagyani, Sasitha Premadasa, ShalithaMihiranga, Nuwan Kuruwitaarachchi (2019), “Real-time Credit Card Fraud Detection Using Machine Learning”, 9th International Conference on Cloud Computing, Data Science & Engineering (Confluence), 978-1-5386-5933-5/19/$31.00 2019 IEEE.

[3] John O Awoyemi, Adebayo O. Adetunmbi, Samuel A. Oluwadare (2017), “Credit card fraud detection using Machine Learning Techniques”, 978-1-5090-4642-3/17/$31.00 ©2017 IEEE 2017.

[4] Munira Ansari, Hashim Malik, Siddhesh Jadhav, Zaiyyan Khan (2021), “Credit Card Fraud Detection”, Research & Technology (IJERT) ISSN: 2278-0181, Volume 9, Issue 4.

[5] Ruttala Sailusha, V. Gnaneswar, R. Ramesh, G. Ramakoteswara Rao (2020), “Credit Card Fraud Detection Using Machine Learning” International Conference on Intelligent Computing and Control Systems (ICICCS 2020) IEEE Xplore.

[6] S P Maniraj, Aditya Saini, Swarna Deep Sarkar Shadab Ahmed (2019), “Credit Card Fraud Detection using Machine Learning and Data Science”, International Journal of Engineering Research & Technology (IJERT), Vol. 8, 2278-0181.

[7] Swaroop K, Amruta D, Sanath J, Pooja G (2019), “Credit Card Fraud Detection Using Machine Learning”, International Journal of Engineering Research & Technology (IJERT), 2278-0181.

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AI BASED VIRTUAL KEYBOARD

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ABSTRACT
A keyboard requires a great deal of resources and is restricted by its physical features. Additionally, discarded keyboards also inevitably contribute to environmental pollution. Consequently, the touch screen is designed replace the physical keyboard and thus reduces these flaws. However, the internal digital keyboard on the touch screen takes up a substantial amount of space, which causes some content to be covered. Moreover, the touch screen can be dirtied by fingerprints and become worn over time by human fingernails through frequent use. Hence, it is necessary to develop a new type of environment-friendly virtual keyboard with fewer flaws. The user's fingertip has remained on a key for a long time; the program will regard this key as an input. Typing without touching the keyboard is fulfilled to ignore obstructions covering the paper keyboard.

Keywords: Hand Motion; Vision; Webcam; Finger recognition; gesture based;

I. INTRODUCTION

In this day and age, the PCs have become a significant part of life and are utilized in different fields notwithstanding, the frameworks and strategies that used to collaborate with PCs are obsolete and have different issues, which will talk about somewhat later right now. Consequently, an extremely new field attempting to defeat these issues has developed to be specific Human Computer Interactions (HCI). Despite the fact that, PCs have made various progression in the two fields of Software Hardware, Still the essential manner by which Humans collaborate with PCs continues as before, utilizing fundamental pointing gadget (mouse) and Keyboard or propelled Voice Recognition System, or possibly Natural Language handling in truly propelled cases to make this correspondence progressively human and simple for us.

Our proposed venture is the Hand motions acknowledgment framework to supplant the essential pointing gadgets utilized in PC to portray hand motions. Last, the affirmation of hand movements is rehearsed by evaluating the closeness of the component data.The input devices giving the main picture information fuses standard camera, sound framework camera, and ToF (time of flight) camera. The sound framework camera and ToF camera likewise give the significance information so it is definitely not hard to parcel the hand region from the establishment to the extent the significance map.

A virtual keyboard is software that is used to emulate a standard keyboard. To control machines, we generally need a controller equipped with a number of keys. As we all know, a keyboard takes up a large amount of space. In order to improve portability, an alternative to the physical keyboard must be found. A touch screen virtual keyboard is the most popular solution for portable devices such as iPads and smart phones. A picture of a keyboard is displayed on a computer screen and the user points and clicks on the pictures of keys to enter text. But our project is based on AI we will use a camera which will detect your hand and by clicking on the keyboard on the screen you can easily type what you want. This will help to reduce the space required for keyboard and it will be easy to use

Virtual keyboards are commonly used as an on-screen input method in devices with no physical keyboard, where there is no room for one, such as a pocket computer, personal digital assistant (PDA), tablet computer or touch screen-equipped mobile phone. Text is commonly inputted either by tapping a virtual keyboard or finger-tracing. Virtual keyboards are also used as features of emulation software for systems that have fewer buttons than a computer keyboard would have.

AI is much more about the process and the capability for super powered thinking and data analysis than it is about any particular format or function. Although

AI brings up images of high-functioning. AI has become a catchall term for applications that perform complex tasks that once required human input such as communicating with customer's online or playing chess. The term is often used interchangeably with its subfields, which include machine learning and deep learning. There are differences, however. For example, machine learning is focused on building systems that learn or improve their performance based on the data they consume. It's important to note that although all machine learning is AI, not all AI is machine learning.

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II. RELATED WORK

Most recent advancements in augmented reality (VR) innovation give amazing number of uses about wellbeing, amusement, restoration, instruction, and furthermore account. The main idea behind these

Applications is to boost the Sagayam et al [10] propose some movement acknowledgment systems were concentrated on accessible movements with emphasis. Additionally, Hidden Markov model and variable classifier procedures over hand motion were given. Over the world, for conveying, gesture based communication is generally utilized by the hard of hearing network. For the hard of hearing individuals who experience the ill effects of hearing misfortune, it is extremely hard to speak with hearing individuals. In this manner, gesture based communication acknowledgment (SLR) was introduced to improve the correspondence.

Hassan et al. [11] explains Arabic SLR (ArSLR) was taken a shot at with Modified k- Nearest Neighbor and Hidden Markov Models (HMMs) methodology. In like manner, with Polhemus G4 development tracker and a camera, two new ArSLR datasets that have 40 Arabic sentences were gathered. Sign sentences assembled by development tracker were differentiated and sentences accumulated by sensor gloves on portrayal precision. As per the correlation, their grouping precision were fundamentally the same as. In Hasanuzzaman et al. [12], day by day exercises and medicine admission of elderly individuals was observed with radio recurrence ID (RFID) sensors and a camcorder at home. RFID perusers observed jugs. A camcorder checked the move of making medication with utilizing face discovery, foundation subtraction, action location and mouth identification. Another logical classifier was introduced to delineate vector to a character together with incline varieties identification in air- composing through a fingertip or deliver Mohammadi et al. [13]. Close by motion acknowledgment, neural systems are generally utilized for hand joints-based motion acknowledgment

In Mary gladence et al [16], A new model called (L, M, S, K) based on the Flexible and Accurate Motif Detector (FLAME) was introduced. FLAME is a versatile suffix- tree-based algorithm which can be used with a variety of meanings to find frequent patterns.

V. PROPOSED METHODOLOGY

Picture handling is a technique for conducting such procedures on a picture in order to get an improved picture or to retrieve any useful data from it. It is a kind of sign handling where information is a picture and yield may be image or attributes / highlights relevant to that picture.

Right now, against robbery gadget which would be sufficiently proficient to recognize burglary utilizing movement detecting camera utilizing AI and caution the proprietor with ready message alongside the caught picture of that occasion of movement.The Haar Cascade calculation is utilized to prepare information. The gadget will be a continuous framework alongside simple to utilize interface, which will be demonstrated helpful as far as security of individuals just as their important things/objects. Haar Cascade is an AI object discovery calculation used to distinguish protests in a picture or video.

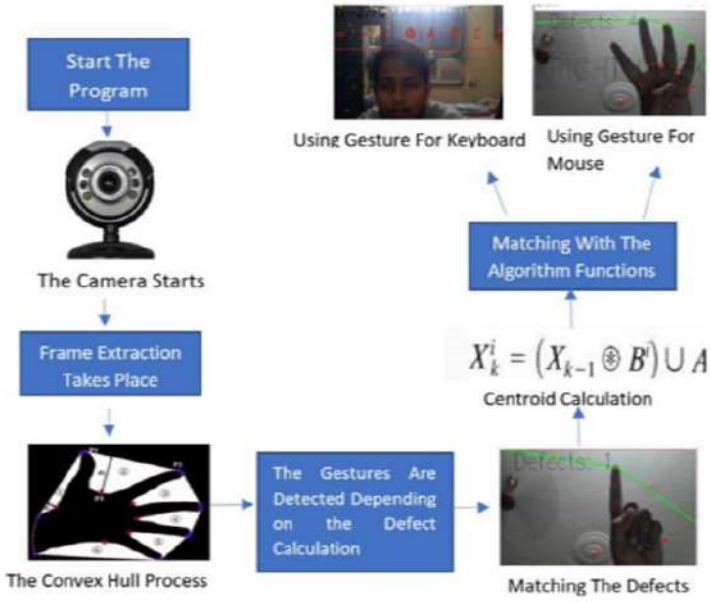

Fig. 1: Proposed architecture

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In Ma et al. [14], to build up the precision close by signal acknowledgment from loud datasets, a settled interim unscented Kalman channel (UKF) together with long momentary memory (NIUKFLSTM) organize was introduced. Along these lines, the commotion in the consecutive hand skeletal information was rethought and the acknowledgment exactness was created. In the computer generated reality region, interoperability of virtual articles in augmented reality can be furnished by a Leap Motion with Interfacing over an augmented simulation head- mounted Presentation (VR HMD). Since Leap Motion can distinguish hand motions or precise finger positions. In any case, for an augmented experience application, it is uncomfortable to decide the specific situation of the real client's hands. Hence, mistakes develop during the cooperation of genuine client's hands and the virtual hands. In Park et al. [15], a strategy was introduced for organizing and planning the yield territory in VR HMD and detecting region in Leap Motion.

In Sivasangari et al .[15], The proposed architecture consists of a large convolutionary neural system (DCNN), where photographs and sketches1 are used to link exchange learning to enable the system to be comfortable with the connection between the two modalities.

METHODOLOGY

Problem Description The aim of this paper is to implement a computer application which uses alternative methods to control keyboard and mouse cursors for rehabilitation of people who are suffered from stroke so that they can recover the side effects. Therefore, we propose a new keyboard and mouse cursor control system based on vision and color recognition technique, utilizing hand gestures recorded from a webcam.

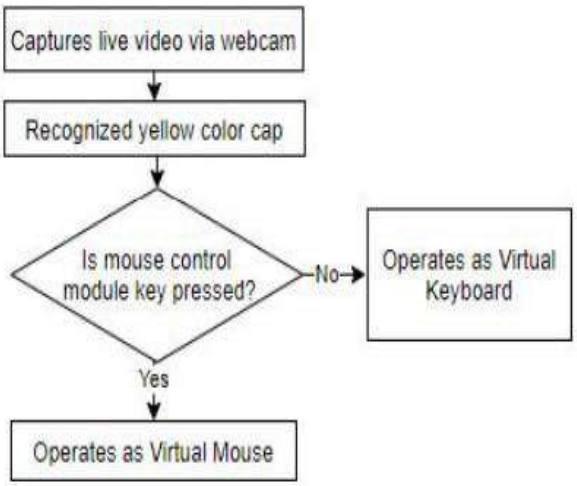

Fig. 1. Overview of proposed interactive computer system

Figure 1: shows the overview of the process of interactive keyboard and mouse controlling system. This work aims at creating a system that recognizes the colors

Working of Keyboard

We used the following procedure to type on virtual keyboard using our fingertip:

Step 1: Capturing real time video using computer's webcam

Step 2: Processing individual image frame from the captured video

Step 3: Converting image frames into HSV format

Step 4: Creating a filter which can create the mask for yellow color

Step 5: Draw contours from the mask. We will loop through all the contours and put a rectangle over it for object tracking

Step 6: Find position of yellow color object over the virtual keyboard

Step 7: Print the character which is pointed by yellow colored cap

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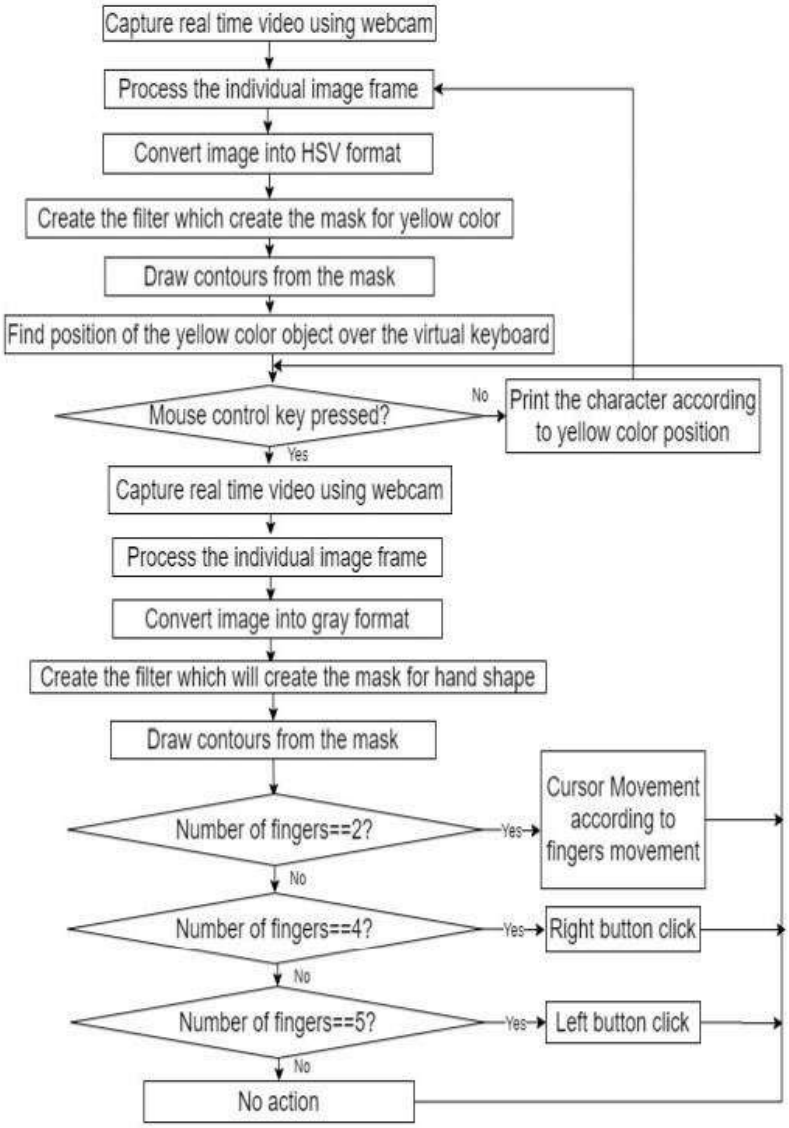

Fig. 2. Procedure of gesture-based mouse and keyboard

LIVE IMPLEMENTATION **USES AND ADVANTAGES**

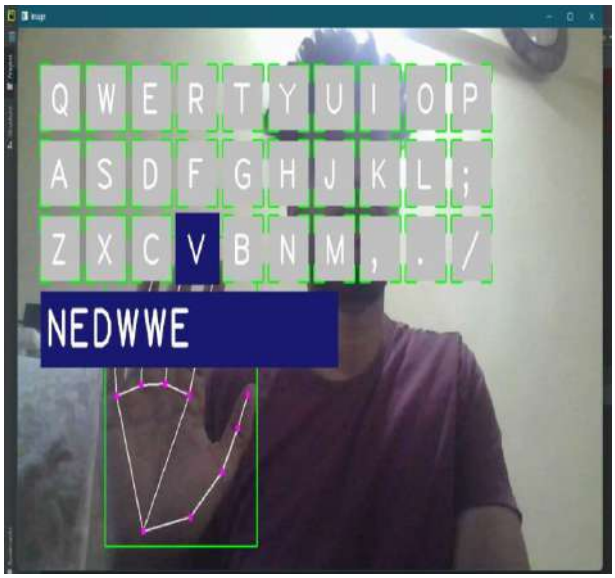

Figure 3: displays a live demonstration of typing using fingertip

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The mask creates some specific region of the image according to certain rules.

Instead we draw contours from the mask. For object tracking, we loop through all the contours. Convex hull of a set X of points in any space is defined as the smallest convex set that contains X. Any deviation of the object from this convex hull can be considered as convexity defect. The convex hull of a finite point set S can be defined as the set of all convex combinations of its points.To find the contours in the image, we have used cvFindContours () function of OpenCV which uses an order finding method to detect edges. We are interested in extracting the hand contour in the contour extraction process so that shape analysis can be done to determine hand gestures. The hand contour convexity defects were measured using OpenCV's cvConvexityDefects() function. Convex hull of an object can be defined using the convex combination of all its points.

Convexity defects are identified when there is any deviation of the object from its convex hull [9]. After the convexity defects are acquired, two major tasks are considered to determine mouse control functions:

– Identifying fingertip and

– Counting number of fingers from the number of convexity defects

– If it detects two fingers, it will move the mouse cursor in the four directions (left, right, up and down) according to the movement of the fingers

USES AND ADVANTAGE

- It can be used on any platform Like Word, Excel, Different internet search engines.
- Can be Accessed On any device.
- Using the Software Is Easy we have Converted the pyton program into an executable file.
- Which makes it more convienent and easy to use

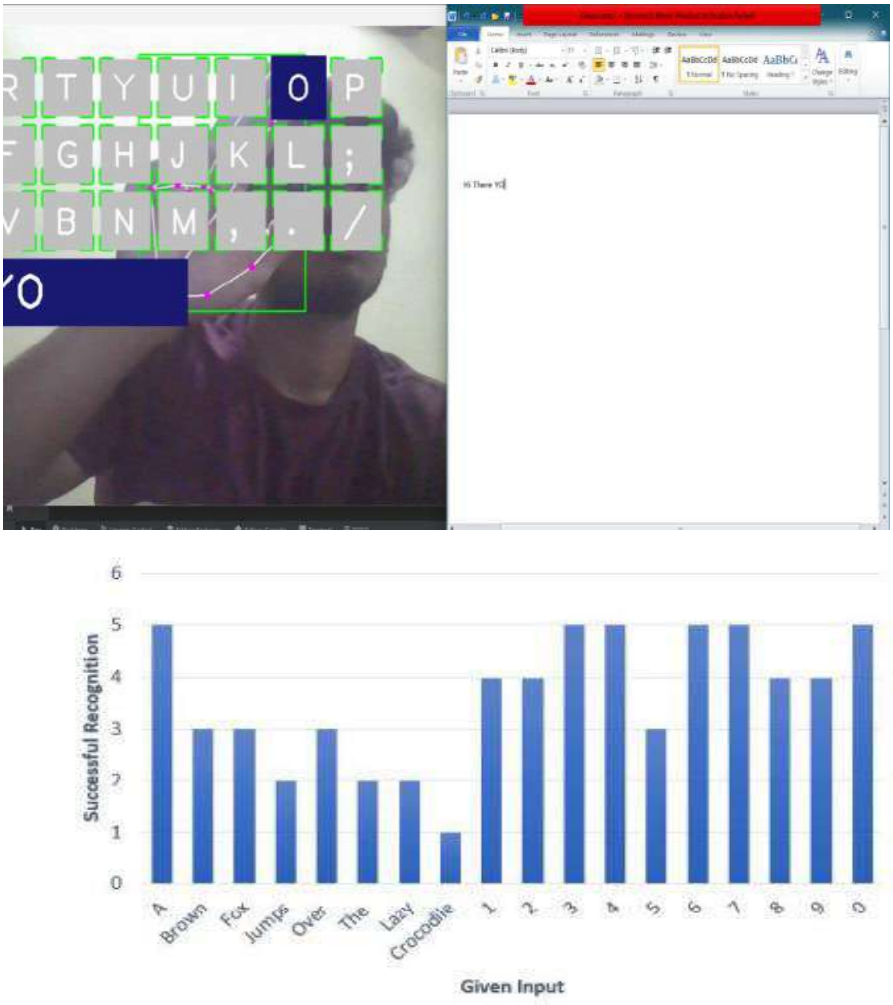

Fig. 8. Experimental result of virtual keyboard

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The above figures shows that the how the gestures has bbeen used for control the video player. By using Background substraction method implementing the several filters to get the features of the original image. By showing single fingure to the webcam of the computer the action of the video player will be backward. BY showing Two fingers the action is volume decreased by showing three fingers the video will play forward and by showing five fingers the volume will be increased.

PROJECT SCOPE

In some Ways it needs further more enhancements in this project. The Distance from webcam and us should be appropriate that needs to be fixed. It should be much more stable. It require some additional feature such as remembering the last word used and recognize proper spelling which can be improved by using Natural language processing.

PROBLEM STATEMENT

In today's world technology is more advanced. All the things are done digitally with help of devices like mobile phones, laptops, computers etc. But today also to access the device like laptops, computers we used standard keyboards that required space and also the cost of maintains is high. These keyboards can be easily getting damaged. To use the technology and find solution to replace the standard keyboard we try virtual keyboard that is quite better solution to solve these problem. with the help of virtual keyboard we can achieve goals that we want in today's world with help of our technology.

CONCLUSION

The vision based cursor control utilizing hand motion framework was created in the C++ language, utilizing the OpenCV library. The framework had the option to control the development of a Cursor by following the client's hand. Cursor capacities were performed by utilizing distinctive hand motions. The framework has the capability of being a practical trade for the PC mouse, anyway because of the imperatives experienced; it can't totally supplant the PC mouse. The significant requirement of the framework is that it must be worked in a sufficiently bright room. This is the principle motivation behind why the framework can't totally supplant the PC mouse, since it is normal for PCs to be utilized in open air situations with poor lighting condition. The precision of the hand motion acknowledgment could have been improved, if the Template Matching hand motion acknowledgment technique was utilized with an AI classified.Here, what did is, simply open our content document it will consequently dispatch a video player. Here picked VLC Media Player. At that point content stops execution for predefined time to stack the media player. After video document is being played then framework summons the instruments that required to run it for example OpenCV, Camera, pyautogui.

Presently, prepared to do simply kick back and control without utilizing any conventinal technique.

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REFERENCES

[1] R. Zaman, K. Noor, A. Ibraheem, "Hand Gesture Recognition: A Literature Review", International Journal of Artificial Intelligence & Applications (IJAIA), Vol.3, No.4, July 2012.

[2] L.Yun, Z. Lifeng, Z. Shujun, " A Hand Gesture Recognition Method Based on Multi- Feature Fusion and Template Matching", Procedia Engineering, Vol. 29, pp 1678-1684, 2012.

[3] S.S. Rautaray, A. Agrawal, "Real Time Gesture Recognition System for Interaction in Dynamic Environment," Procedia Technology, Vol. 4, pp 595- 599, 2012.

[4] Q. D. Smedt, H. Wannous, J.P.Vandeborre, " Heterogeneous hand gesture recognition using 3D dynamic skeletal data," Computer Vision and Image Understanding, Vol. 181, pp. 60-72, 2019.

[5] P. Caserman, A. Garcia-Agundez, R. Konrad, " Real- time body tracking in virtual reality using a Vive tracker", Virtual Reality (2019) 23: 155.

[6] K.M. Sagayam, D.J. Hemanth, "Hand posture and gesture recognition techniques for virtual reality applications: a survey", Virtual Reality, 2017, 21: 91.

[7] M. Hassan, K. Assaleh, T. Shanableh," Multiple Proposals for Continuous Arabic Sign Language Recognition", Sens Imaging, 2019, 20: 4.

ISSN 2394 - 7780

[8] F.M. Hasanuzzaman, X. Yang, Y. Tian, et al.," Monitoring activity of taking medicine by incorporating RFID and video analysis", Netw Model Anal Health Inform Bioinforma, 2013, 2: 61.

[9] S. Mohammadi, R. Maleki,"Real-time Kinect-based airwrit ing system with a novel analytical classifier", International Journal on Document Analysis and Recognition (IJDAR), 2, 2019.

[10] C. Ma , A. Wang , G. Chen, C. Xu, " Hand joints-based gesture recognition for noisy dataset using nested interval unscented Kalman filter with LSTM network", Vis. Comput. 2018, 34:1053–1063.

[11] C. Yang, J. Luo, Y. Pan, Z. Liu, and C.-Y. Su, " Personalized variable gain control with tremor attenuation for robot teleoperation," IEEE Transactions on Systems, Man, and Cybernetics: Systems, vol. 48, no. 10, pp. 1759- 1770, October 2018.

[12] V.I. Pavlovic, R. Sharma, T.S. Huang, " Visual interpretation of hand gestures for human- computer interaction: A review," IEEE Transactions on Pattern Analysis and Machine Intelligence, vol. 19, issue 7, pp 677- 695, 1997.

[13] F.S. Chen, C.M. Fu, C.L. Huang, " Hand gesture recognition using a real- time tracking method and hidden Markov models", Image and Vision Computing , vol. 21, issue 8, pp 745-758, 2003.

[14] M. Donmez, S. Dogan, E. Baran, " Sinyal İlkesinin Öğrenme Üzerindeki Etkileri: Bir Göz Hareketleri İzleme Çalışması," Mersin University Journal of the Faculty of Education, vol. 14 , issue 2, pp 700 – 713, 2018.

[15] Sivasangari, A., Poonguzhali, S., Rajkumar, I., Maheshwari," Face photo recognition using sketch image for security system ", International Journal of Innovative Technology and Exploring Engineering, Vol. Volume-8, Issue- 9S2, July 2019.

[16] Devaraj, A., Rathan, K., Jaahnavi, S., Indira, K, "Identification of Plant Disease using Image Processing Technique", 2019 International Conference on Communication and Signal Processing (ICCSP).

[17] L.Mary Gladence. Detection of Contiguous Pattern with Pattern Shift String Matcher. Research Journal of Pharmaceutical Biological and Chemical Sciences. 2017 Mar 1; 8(2):2449- 56.

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CANCER PREDICTION USING NAIVEBAYES

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ABSTRACT
Cancer is the greatest cause of death worldwide. By the time of the pandemic, an estimated 1,735,350 additional cancer cases had been diagnosed in just one country. In just one year, 609,640 people died as a result of the sickness. Cancer comes in a variety of forms, including: Cancers include skin melanoma, lung bronchus cancer, breast cancer, prostate cancer, colon cancer, and rectum cancer. Bladder, kidney, and renal pelvis cancers, to name a few. With the prevalence of so many different types of cancer on the rise, it's critical to be well-informed and knowledgeable about it. Cancer affects a significant number of people and has a large number of victims. It has progressed in the field of research.

Keywords: Bayes Theorem, Cancer, Data Mining, Naïve Bayes, Predictive.

1. INTRODUCTION
Cancer has been characterized as a heterogeneous disease consisting of many different subtypes. The early diagnosis and prognosis of a cancer type have become a necessity in cancer research, as it can facilitate the subsequent clinical management of patients. The importance of classifying cancer patients into high or low risk groups has led many research teams, from the biomedical and the bioinformatics field, to study the application of machine learning (ML) methods. Therefore, these techniques have been utilized as an aim to model the progression and treatment of cancerous conditions. In addition, the ability of ML tools to detect key features from complex datasets reveals their importance. A variety of these techniques, including Artificial Neural Networks (ANNs), Bayesian Networks (BNs), Support Vector Machines (SVMs) and Decision Trees (DTs) have been widely applied in cancer research for the

development of predictive models, resulting in effective and accurate decision making. Even though it is evident that the use of ML methods can improve our understanding of cancer progression, an appropriate level of validation is needed in order for these methods to be considered in the everyday clinical practice. In this work, we present a review of recent ML approaches employed in the modelling of cancer progression. The predictive models discussed here are based on various supervised ML techniques as well as on different input features and data samples. Given the growing trend on the application of ML methods in cancer research, we present here the most recent publications that employ these techniques as an aim to model cancer risk or patient outcomes.

2. LITERATURE SURVEY
[1] Rajshree Dash; “A hybridized K-means clustering approach for high dimensional dataset”; International Journal of Engineering, science, and technology; 2010; Volume 2 As a first phase for K-means clustering, the Principal Component Study (PCA) method will facilitate the analysis and presentation of multi-dimensional data sets. We've also developed a novel way for locating the initial centroids in order to improve the algorithm's effectiveness and efficiency.

[2]AdaandRajneet Kaur; “Using some data mining techniques to predict the survival year of lung cancer patient”; International Journal of computer science and mobile computing; 2013; Volume Due to the nature of cancer cells, where the majority of the cells are overlapped with each other, early diagnosis of lung cancer is a difficult challenge. This study explains how to use a feature extraction procedure and a neural network classifier to determine whether a patient's condition is normal or abnormal at an early stage. Following that, we use the retrieved features to forecast a patient's survival rate.

[3]ZakariaSulimanzubi; “Improves treatement programs of lung cancer using data mining techniques; Journal of software engineering and applications; 2014 Although lung cancer is a fatal disease, there is a good chance that the patient will be cured if the disease is detected early enough. At first glance, lung X-ray chest films appear to be the most reliable method for early detection of lung cancers. However, due to serious errors in some diagnosing cases that result in poor outcomes and death, computer aided diagnosis systems are required to assist medical personnel in achieving high capability and effectiveness.

[4] Charles Edeki; “Comparitive study of data mining and statistical learning techniques for prediction of cancer survivability”; Mediterranean journal of Social sciences; 2012; Volume 3These methods are employed in the domains of computational biology and bioinformatics. Computational biology and bioinformatics combine components of biology, computer science, mathematics, and other disciplines to tackle biological problems (Adams, Matheson & Pruim, 2008).

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[5] A Sahar; "Predicting the severity of breast masses with data mining methods"; Data mining is the process of sifting through vast data sets to discover patterns and develop links in order to solve problems through data analysis. Cancer is one of the most common causes of death worldwide. The early detection and prevention of cancer is critical in reducing cancer-related fatalities. The identification of genetic and environmental variables is critical in the development of new cancer detection and prevention approaches.

3. SYSTEM DESIGN

Here we proposed a system to make it visibly hand able and easy to use for even a first time userto predict the result in the manner that will not make it difficult to understand for both our entities the amin and the user. This system is proposed to create awareness as well as the motive to make it accessible to the patient with cheap alternative system which provides a high-level overview of major system components, key process participants, and important working relationships. We need to determine the main features and the framework. When we are constructing the framework, we determine the main purpose of our system.

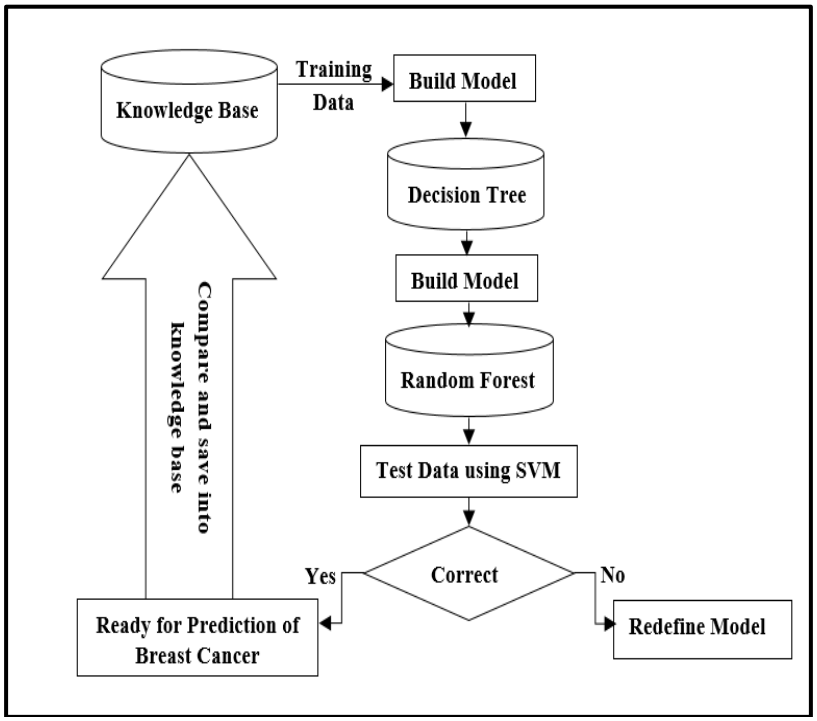

Fig – 1: System Block Diagram

Cancer is named the most unpredicted and dangerous disease existing till date. It's detection andprediction in early stage can help a lot for avoiding death rates. Symptoms can help to clear a view of such disease that may lead to death. Therefore, a technique of naive bayes is used to get a predicted result for cancer. With the help of symptoms like blood clots, breast size, Headache, Vomiting, Stomach pain Memory loss, Through rashes, Body aches (the symptoms are analyzed by the registered doctor). Further the cancer cluster of symptoms are bifurcated into various frames of cancer by the technique of data mining. The data fed in the form will be analyzed laterby an expert doctor or specialized we trained our model, we will evaluate our model or find the accuracy of our model by testing it with test data. Once we split the data we will feed our training data to our random forest model

A. Navie Bayes Algorithm

The Naive Bayes classification algorithm is a probabilistic classifier. It is based on probability models that incorporate strong independence assumptions. The independence assumptions often do not have an impact on reality. Therefore, they are considered as naive. You can derive probability models by using Bayes' theorem (credited to Thomas Bayes). Depending on the nature of the probability model, you can train the Naive Bayes algorithm in a supervised learning setting. Data mining in Info the Naive Bayes classification algorithm is a probabilistic classifier. It is based on probability models that incorporate strong independence assumptions. The independence assumptions often do not have an impact on reality. Therefore, they are considered as naive. You can derive probability models by using Bayes' theorem (credited to Thomas Bayes). Depending on the nature of the probability model, you can train the Naive Bayes algorithm in a supervised learning setting.

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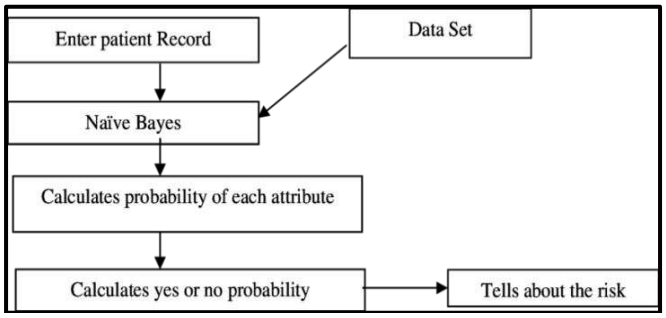

Fig-2: Navie Bayes Algorithm

The basic algorithm that will be implemented forworking of this proposed system is as follows:

1. User has to enter necessary data into the applications fields like symptoms and personal information.
2. Then combine user input and Data set to get the accurate results.
3. Then Navie bayes Algorithm will be applied on to the user data and dataset.
4. Then with the help of the algorithm it will calculate the probability of having cancer to the user.
5. Then finally the result will show to the user.

4. SOFTWARE IMPLEMENTATION

SMSS: Microsoft SQL Server is a relational database management system developed by Microsoft. As a database server, we have used it as a software product with the primary function of storing and retrieving data as requested by other. Here we have used it our priority to make datafetching easy.

Visual Studio2019: Microsoft Visual Studio is an integrated development environment (IDE)from Microsoft. It is used to develop computer programs, as well as websites, web apps, web services and mobile apps. Visual Studio supports 36 different programming languages and allowsthe code editor and debugger to support nearly any programming language.

First of all, we upload our dataset from the local repository in the CSV format.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	Name of Cancer	Age	Gender	Breast Size	Irritation	BloodClot	Urination	Chest Pain	CoughBlood	Mouth Pain	Red-White Patch	Chewing	Headache	Vomit	Memory Problem	Skin Patch	Patch Size	Heart Burn	Stomach Bloating	Shoulder Pain	Weight Loss
2	Bladder Cancer	45	1	0	0	1	15	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	Skin Cancer	60	1	0	0	0	6	0	0	0	0	0	0	0	0	15	2	0	0	0	
4	Bladder Cancer	48	1	0	0	1	12	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	Bladder Cancer	50	1	0	0	1	10	0	0	0	0	0	0	0	0	0	0	0	0	0	
6	Bladder Cancer	53	1	0	0	1	15	0	0	0	0	0	0	0	0	0	0	0	0	0	
7	Bladder Cancer	55	1	0	0	1	13	0	0	0	0	0	0	0	0	0	0	0	0	0	
8	Skin Cancer	35	1	0	0	0	5	0	0	0	0	0	0	0	0	15	2	0	0	0	
9	Skin Cancer	35	1	0	0	0	5	0	0	0	0	0	0	0	0	12	3	0	0	0	
10	Skin Cancer	40	1	0	0	0	5	0	0	0	0	0	0	0	0	20	1	0	0	0	
11	Skin Cancer	45	1	0	0	0	5	0	0	0	0	0	0	0	0	10	2	0	0	0	
12	Bladder Cancer	35	1	0	0	1	10	0	1	0	2	1	0	2	1	54	0	1	1	3	
13	Skin Cancer	48	1	0	0	0	5	0	0	0	0	0	0	0	0	12	3	0	0	0	
14	Oral and Oropharyngeal Cancer	40	1	0	0	0	5	0	0	1	10	1	0	0	0	0	0	0	0	0	
15	Oral and Oropharyngeal Cancer	45	1	0	0	0	5	0	0	1	15	1	0	0	0	0	0	0	0	0	
16	Oral and Oropharyngeal Cancer	45	1	0	0	0	5	0	0	1	15	1	0	0	0	0	0	0	0	0	
17	Oral and Oropharyngeal Cancer	45	1	0	0	0	5	0	0	1	10	1	0	0	0	0	0	0	0	0	
18	Oral and Oropharyngeal Cancer	50	1	0	0	0	5	0	0	1	15	1	0	0	0	0	0	0	0	0	
19	Brain Tumor	30	1	0	0	0	5	0	0	0	0	0	2	3	1	0	0	0	0	0	
20	Brain Tumor	50	2	0	0	0	5	0	0	0	0	0	3	4	1	0	0	0	0	0	
21	Brain Tumor	55	1	0	0	0	5	0	0	0	0	0	2	3	1	0	0	0	0	0	
22	Oral and Oropharyngeal Cancer	30	1	0	0	0	5	0	0	1	6	1	0	0	0	0	0	0	0	0	
23	Oral and Oropharyngeal Cancer	50	2	0	0	0	5	0	0	1	5	1	0	0	0	0	0	0	0	0	
24	Bladder Cancer	50	1	0	0	1	15	0	0	0	0	0	0	0	0	0	0	0	0	0	
25	Bladder Cancer	45	2	0	0	1	12	0	0	0	0	0	0	0	0	0	0	0	0	0	
26	Lung Cancer	35	1	0	0	0	5	3	1	0	0	0	0	0	0	0	0	0	0	0	
27	Lung Cancer	50	2	0	0	0	5	2	1	0	0	0	0	0	0	0	0	0	0	0	
28	Lung Cancer	40	1	0	0	0	5	2	1	0	0	1	0	0	0	0	0	0	0	0	
29	Bladder Cancer	35	1	0	0	1	10	0	1	0	2	1	0	2	1	54	0	1	1	3	
30	Liver Cancer	40	1	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	2	

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5. RESULTS

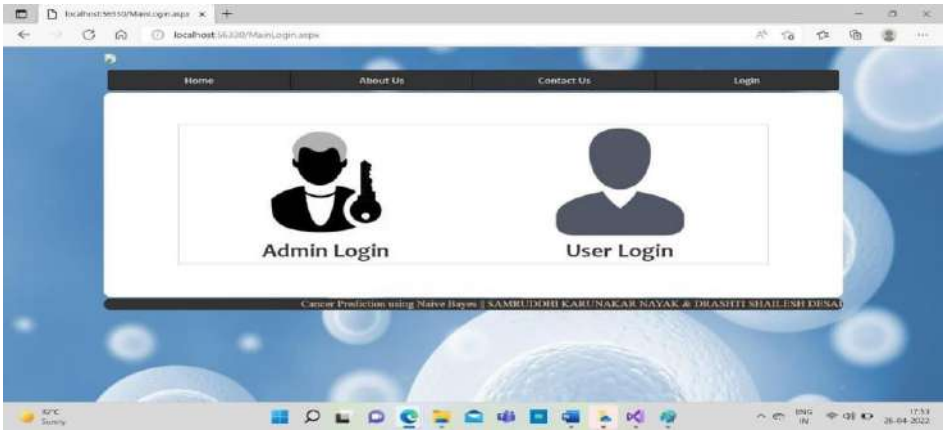

Fig- 3: Login Page

Login page: There are two logins on our website one is admin and another is user. This grants access to the doctor as well as the patient to add their details and make a clear perspective towards this login.

The most convenient way to use it is for the doctor to check the patients detail report for prediction.

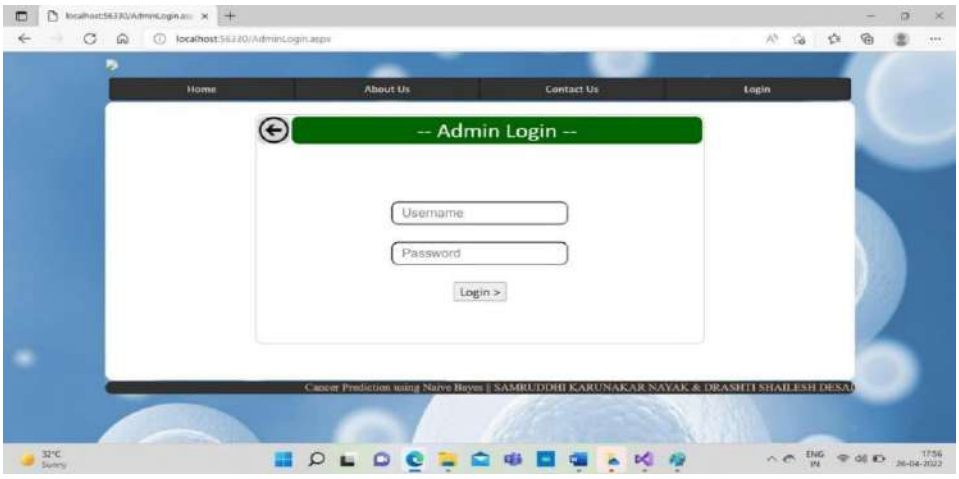

Fig-4 Admin login.

Admin Login: Here it is the outlook and login for the doctor that will further give access to admin to make a prediction looking at the entered data from the user.

Following is the examples of what is inside admin login page.

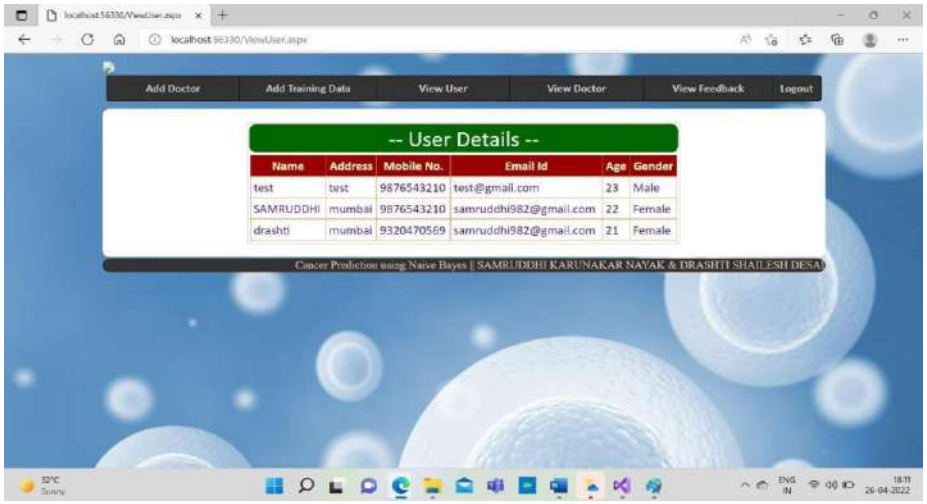

Fig 5: Users details

In user detail user can fill the data like name, address, contact number etc. and then user can login for the further process.

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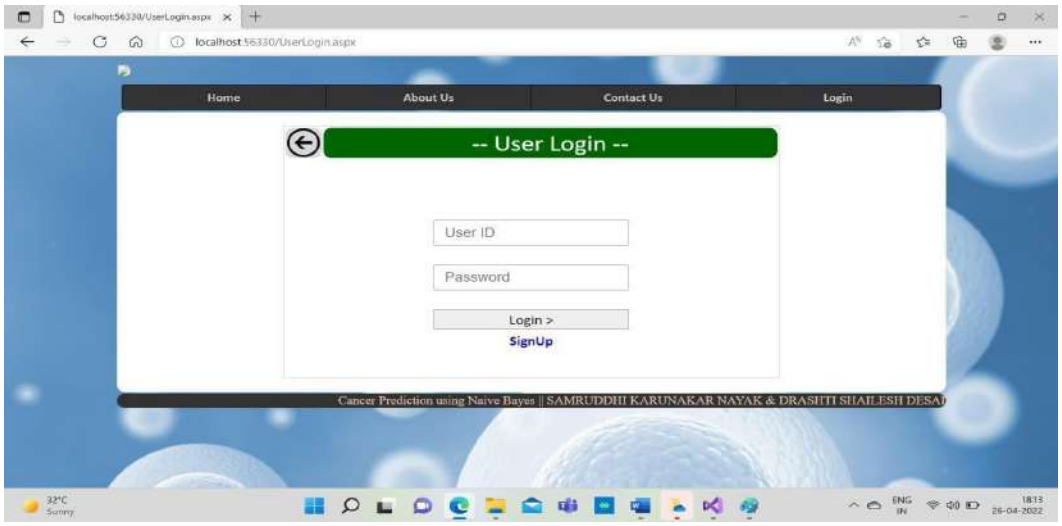

Fig 6: User login.

Here we have the details to be filled by the user to track the details of his /her inputted data that will be verified by the doctor/ amins present in our webpage for the prediction of the cancerous disease.

There are details to be filled for the data that will be in common with the symptoms the user will be facing.

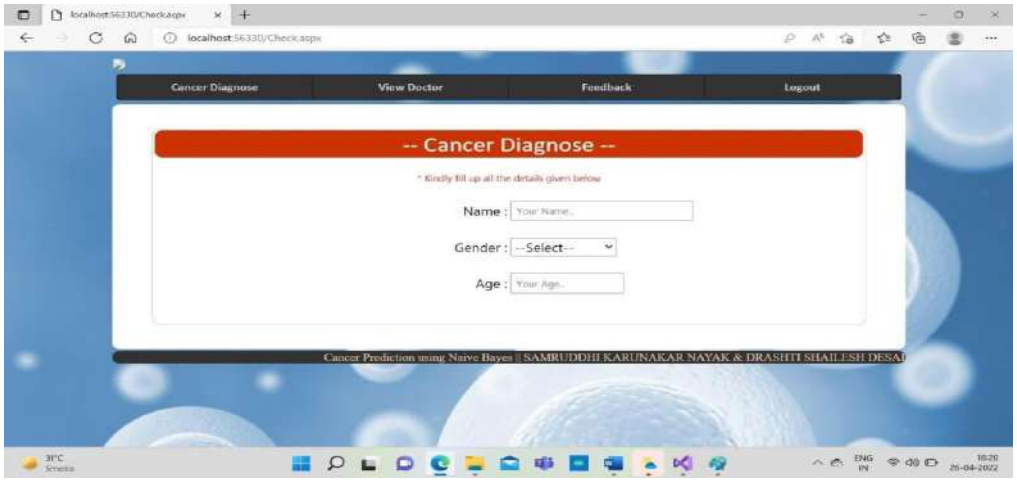

Fig 7: diagnosis form

In diagnosis form user can feel their data like name, age, gender. after submitting these detail symptoms detail page is open where user can feel their diagnosis details.

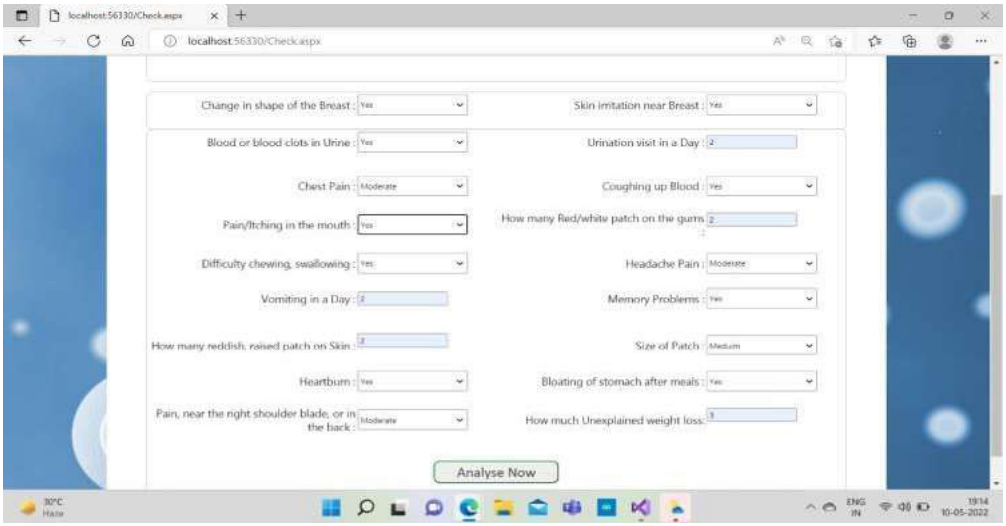

Fig 8: Symptoms Details

In Symptoms Details user put their diagnose Symptoms details like Chest pain, itching in mouth, Stomach pain, headache, etc. after submitting these details then result will show

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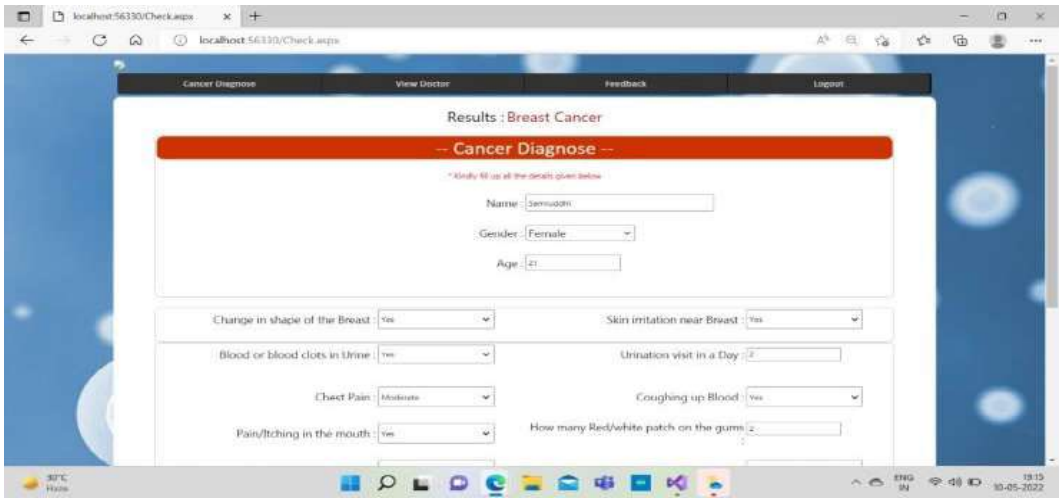

Fig 9: Result of Symptoms

If the user entered details are matched with predefined dataset it gives the positive result otherwise it will give negative result

6. CONCLUSION

Our investigation focuses on the current cancer situation in hospitals and its flaws. It exhibits how the meaning of the word "prediction" and the sense of assisting in the conception of the medical outcome of this prediction. The research underlines the shortcomings of existing cancer prediction and the need to understand them in depth in order to avoid unfavorable cancer outcomes. We encourage researchers to think about a cancer prediction system as a whole and develop behaviour prediction and improved sensing characteristics that can help to identify and avoid skilled and critical malignant disorders in the future. Security is critical for the proper installation and development of cancer prediction systems. Furthermore, it provides a sense of security to hospital patients.

7. FUTURE SCOPE

This project is created with the motive to make it easy and cheap delivery of medicalservices and it has to be the all over motive for this project.

We are planning to add the feature where the user might be able to schedule the appointment and personal or virtual meeting with the designated doctor as per thepatient's preference or as the web page suggest the patient as per the doctor's specification.

Might add the feature where the precaution of doctor can be added in detail prognosis and also make it available for the user as prescribed data for medication.

REFERENCES

[1] Rajshree Dash; "A hybridized K-means clustering approach for high dimensional dataset"; International Journal of Engineering, science, and technology; 2010.

[2] AdaandRajneet Kaur; "Using some data mining techniques to predict the survival year of lung cancer patient"; International Journal of computer science and mobile computing; 2013.

[3] ZakariaSulimanzubi; "Improves treatement programs of lung cancer using data mining techniques; Journal of software engineering and applications; 2016.

[4] Charles Edeki; "Comparitive study of data mining and statistical learning techniques for prediction of cancer survivability"; Mediterranean journal of Social sciences; 2012.

[5] A Sahar; "Predicting the severity of breast masses with data mining methods".

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MENTAL HEALTH AWARENESS & POSITIVE LIFESTYLE APPLICATION

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[1,3,4]Students and [2]Assistant Professor, Department of Information Technology, TCOE, Maharashtra, India

ABSTRACT
Today technology has made medical health very accessible to people. Mental health applications are a convenient method to improve your mental well-being. These applications are not intended to diagnose a disorder or to replace professional mental health care. They, however, can help with your general mental wellness. Apps are a convenient way to obtain extra help in between therapy sessions or office visits, and they can also provide ongoing support once you've completed therapy. Apps for mental health can give daily tasks, encouragement, and other strategies. Many types are evidence-based interventions based on research and therapy practices. According to Statista, one of the most popular categories in smartphone applications is "health and lifestyle". According to a credible study published in 2018, mental health apps may aid in the monitoring and management of mental health conditions. As a result, our software would be useful in advising and assisting users with their overall health management as well as offering access to appropriate expert assistance. Our software has the potential to improve self-management, cognition, skills training, social support, and symptom tracking by offering mental health interventions. The user can self-assess their own mental wellbeing as well as access professional help through our software.

Keywords: Coping Skills, Emotions, Healthcare, Journaling, Mental Health, Mood Tracker, Productivity, Self-care.

1. INTRODUCTION

"Having a mental disorder isn't easy, and it's even tougher when others assume you can just get over it," according to a mental health care portal.

That is correct. It is the persistent stigma that prevents sufferers from seeking appropriate therapy for their mental health problems. However, by offering many mental health apps, today's technology is helping to de-stigmatize psychological illnesses.

These apps are simple to use for anyone dealing with mental health issues, and they are even thought to be beneficial in tracking the therapy process of people with various mental health diseases. According to the National Institute of Mental Health, technology-based mental health solutions can help with a number of psychological issues.

This is where these applications come in handy, whether it's for information, self-improvement, or access to mental health treatment. Many users also use apps to educate themselves with the terminology of mental health wellbeing, which helps them gain confidence in seeking out established therapy and counselling providers.

1.1 PROBLEM STATEMENT

With people's lives becoming increasingly stressful and hectic, a system that can alert them to their physical and mental health for their well-being is needed.

One of the most effective and favored methods of coping with mental health has been self-assessing and tracking emotional well-being. Our application would make it simple to attain this goal.

To be able to assist and guide users in managing their overall health and to provide them with appropriate expert assistance.

1.2 LITERATURE SURVEY

- Rozita Yati Masri, Hajar Mat Jani, Alicia Tang Yee Chong [1] presented a proposal regarding an Expert System Approach in Diagnosing Mental Health.

Because the intended Expert System (ES) will be utilized to serve the Malaysian public, a survey of the general public was conducted to gauge public perceptions of mental health and mental disorders in the country. Interviews and a survey for psychotherapists are now being used to look at the prevalence, severity, and treatments of stress-related, psychotic, and neurological disorders among Malaysian mental patients. The proposed ES will be utilized by psychotherapists to assist them in the same way that a true expert would.

- Ariel Teles; Ivan Rodrigues; Davi Viana; Francisco Silva; Luciano Coutinho; Markus Endler; Ricardo Rabêlo published a paper for the topic Mobile Mental Health: A Review of Applications for Depression

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Assistance. The author's goal in this research is to discover, analyze, and characterize the current state of mobile applications dealing with depression. They did this by conducting a comprehensive review of depression support apps. Following the application of the inclusion and exclusion criteria and a quality review of the results, 216 apps were chosen for the data extraction phase, where they highlighted their merits and limits while also identifying gaps and trends. The findings of this study revealed an increase in the variety of app uses, including chatbots, online therapy, educational tools, mood trackers, testing, and self-help.

- Jamie M Marshall, Debra A Dunstan, and Warren Bartik published an article on the topic "Effectiveness of Using Mental Health Mobile Apps as Digital Antidepressants for Reducing Anxiety and Depression: Protocol for a Multiple Baseline Across-Individuals Design" in the year 2020 amidst the COVID- 19 pandemic, a time when mental health was getting downhill day by day as time passed. The purpose of this study was to determine the efficacy of five apps (Destressify, MoodMission, Smiling Mind, MindShift, and SuperBetter) in reducing symptoms of anxiety and/or depression. These apps were chosen because they are freely downloadable, have published proof of efficacy, and are publicly available. Their study concluded that the evidence base for mental health apps that offer treatments for anxiety and depression is currently lacking.

2.1 OBJECTIVE

The Aim of this application is to bring forward the awareness and importance regarding issues related to mental health. To be able to help and guide user with their overall health management as well as providing access to adequate professional help to them. The impact it could bring into the lives of people, change their lifestyle into a healthy one and help organize their daily life, is what we aim through our project.

2.2 REQUIREMENTS

i) Software Requirements

A. Operating system: Any windows will be optimal enough for running this project.

B. Programming languages: JAVA

C. Front-end: XML

D. IDE: Android Studio

E. Backend Database: Firebase

ii) Hardware Requirements

A. System:

A pc with minimum 4 GB RAM

Intel Pentium and above processor.

B. Disk Space: A minimum of 750MB free disk space.

2.3 Design & Implementation

This project is based on maintaining the user's mental health and guiding the user with accurate knowledge. The application keeps track of the user's mental well-being by tracking their moods, providing positive affirmations, maintaining the gratitude journal and providing professional help. The application uses Firebase as its backend database to maintain the applications' functioning and requirements.

1. The User downloads and opens the application.
2. The User then would be prompted towards the Login Page. First time users must register on the Registration Page or can login themselves through their Google account.
3. The User would then land up on the Dashboard which consists of the Main/ Home Page first. The Home page consists of the Informational Guides (consisting of various types of authentic data and media) the 4 main categories in Mental Health — Healthy Diet, Physical Wellbeing, Emotional Wellbeing and Activities.
4. The Home Page also consists of a Gratitude Journal / Diary. The user can write their thoughts and emotions and it gets saved in the database.
5. The User then can also can feel better by going through the Positive Affirmations page. There they can see many positive thoughts and uplifting emotional sayings.
6. The User can also track their emotions using the Mood Tracker which will keep their emotional wellbeing in check.

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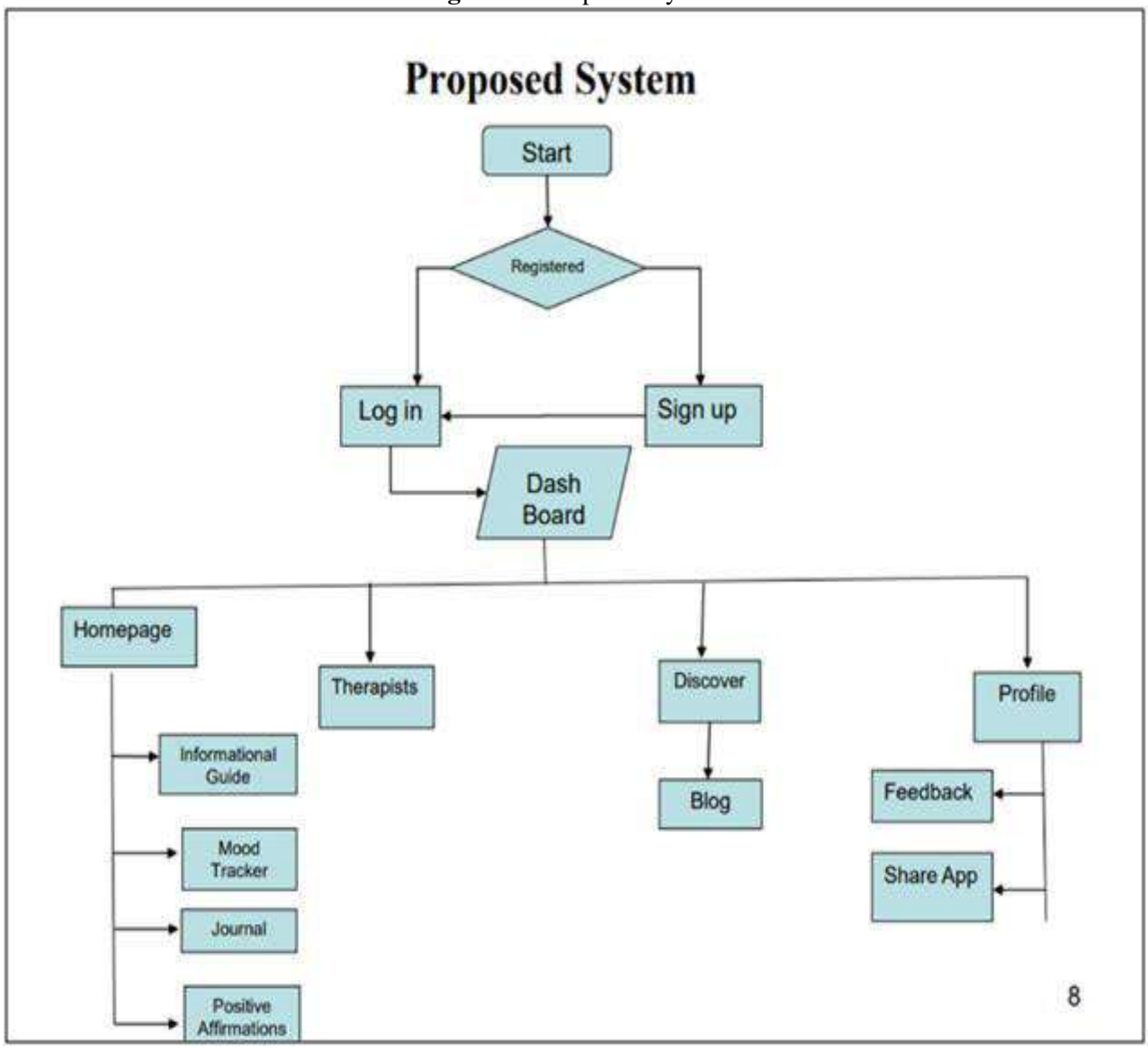
7. Then navigating through the dashboard the user will land up in the second page i.e. the Therapists page which will be providing the user with professional help to the user.
8. The third page consists of inspirational stories and blogs the user can go through.
9. The final page consists of User's Settings where they can share the application and can send feedbacks for the application.

Fig 1.0 the Proposed System



The above mentioned Fig.1.0 describes the

Proposed System for the application

3. CONCLUSION

The application tracks human behaviors and emotions, allowing users to gain insight into what they may be experiencing. This will aid in the maintenance of their emotional well-being.

These applications are easily accessible to anyone struggling with mental health issues, and they are even thought to be effective in tracking the therapy process of people suffering from various types of mental health disorders. According to the National Institute of Mental Health, technology-based mental health solutions are beneficial for a wide range of psychological issues due to anonymity, 24-hour services, and lower costs. To fully grasp the potential of smartphones for the treatment of mental health illnesses, creative use of their new capabilities is required. The goal of this research is to look at the link between mental health and human behavior. It will also be designed with the goal of contributing to society.

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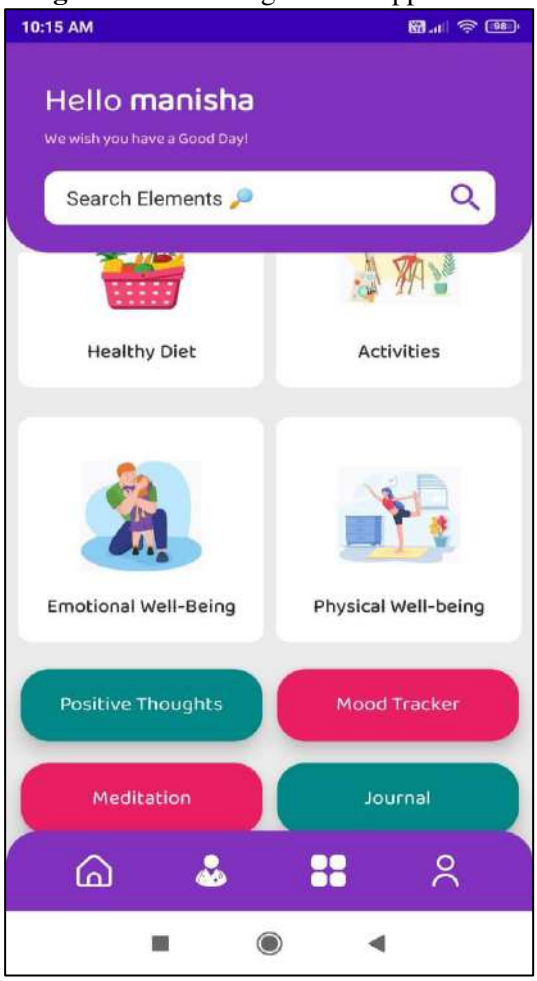
4. RESULTS

Fig 2.0 the Main Page of the Application



The above mentioned Fig. 2.0 describes the main page of the application which consists of the navigation bar through which the user can access various other modules of the

Application

Fig 3.0 the Blog Page of the Application

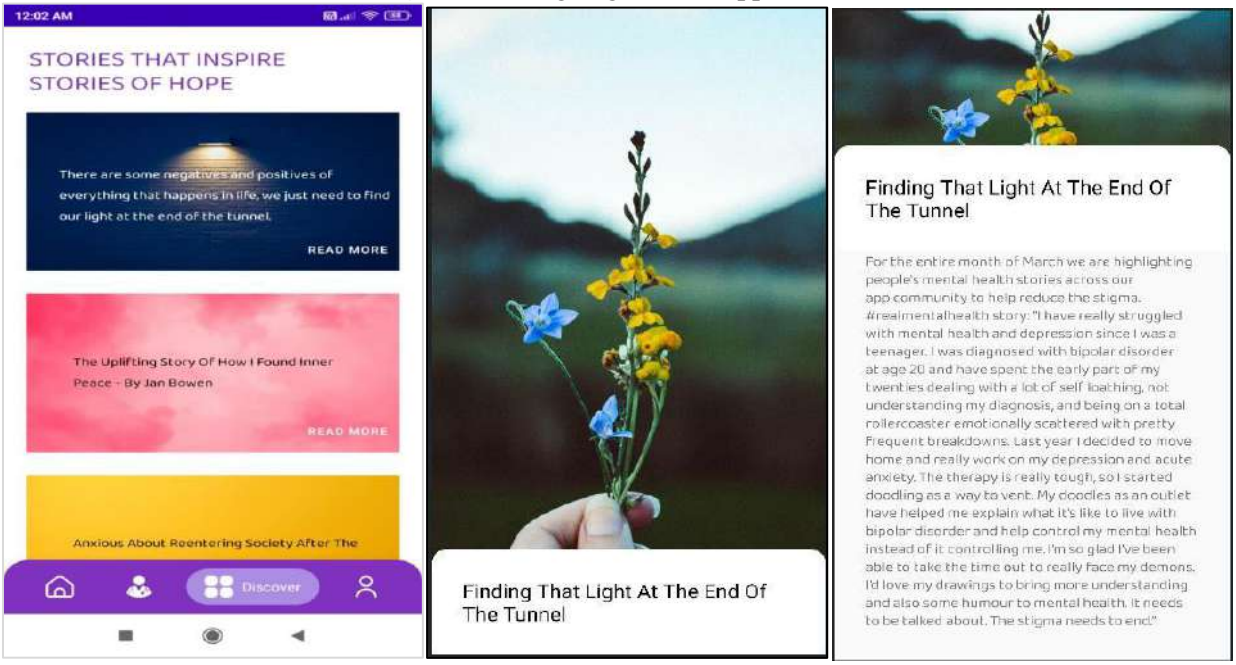


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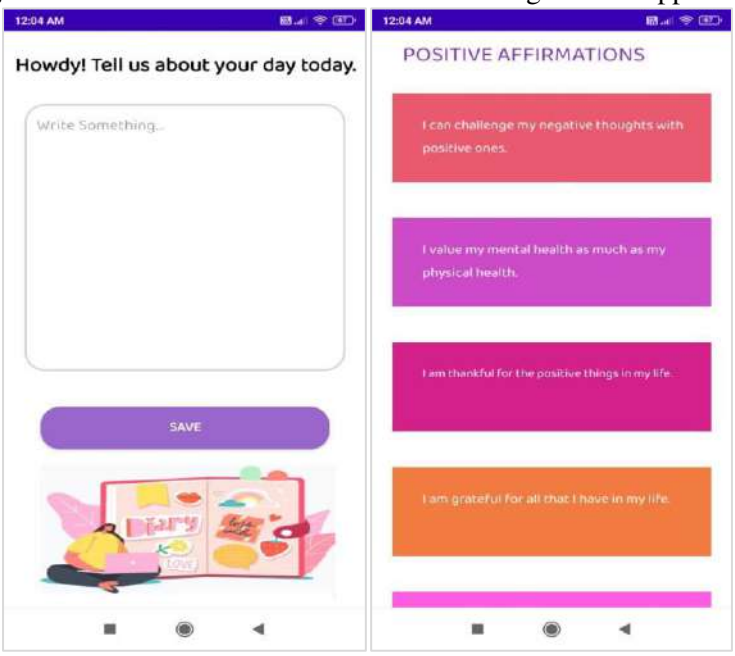
Fig 3.0 the Gratitude Journal & Affirmations Page of the Application



5. REFERENCES

[1] Jamie M Marshall, Debra A Dunstan, Warren Bartik (2020). Effectiveness of Using Mental Health Mobile Apps as Digital Antidepressants for Reducing Anxiety and Depression: Protocol for a Multiple Baseline Across-Individuals Design. JMIR Research Protocols, retrieved from, https:// www. researchgate.net/publication/342705680_Effectiveness_of_Using_Mental_Health_Mobile_Apps_as_Digital_Antidepressants_for_Reducing_Anxiety_and_Depression_Protocol_for_a_Multiple_Baseline_Across-Individuals_Design.

[2] Ariel Teles; Ivan Rodrigues; Davi Viana; Francisco Silva; Luciano Coutinho; Markus Endler; Ricardo Rabêlo, (2019). Mobile Mental Health: A Review of Applications for Depression Assistance. 2019 IEEE 32nd International Symposium on Computer-Based Medical Systems (CBMS), retrieved from, https://ieeexplore.ieee.org/document/8787406.

[3] Erly Krisnanik; Ika Nurlaili Isnainiyah; Az Zahra Aininda Resdiansyah, (2020). The Development of Mobile-based Application for Mental Health Counseling during the COVID-19 Pandemic. 2020 International Conference on Informatics, Multimedia, Cyber and Information System (ICIMCIS), retrieved from, https://ieeexplore.ieee.org/document/9354299

[4] Kong Saoane Thach (2019). A Qualitative Analysis of User Reviews on Mental Health Apps: Who Used it? for What? and Why? 2019 IEEE-RIVF International Conference on Computing and Communication Technologies (RIVF), retrieved from, https://ieeexplore.ieee.org/document/8713726

[5] Kiran Wali (2020, Jul 14). Rezaid - Mental Health Apps and their Importance, retrieved from, https://rezaid.co.uk/mental-health-apps/

[6] Sierra Williams (2018, Dec 21) Serenity - 6 Keys to the Good Life: #5 Coping Skills, retrieved from, https://serenitymentalhealthcenters.com/6-keys-to-the-good-life-5-coping-skills/

[7] Modern Therapy (2019). 5 Real Mental Health Stories from Inspirational Women, retrieved from, https://moderntherapy.online/blog-2/2019/3/9/5-real-mental-health-stories-from-inspirational-women

[8] Modern Therapy (2022). Recognizing the Signs: Being Aware of Mental Health Relapses, retrieved from https://moderntherapy.online/blog-2/2022/4/16/recognizing-the-signs-being-aware-of-mental-health-relapses

[9] Society of Clinical Psychology (2018). Mental Health Apps: The Importance of Evidence for Publicly Available Apps, retrieved from, https://div12.org/mental-health-apps-the-importance-of-evidence-for-publicly-available-apps/.

[10] Shamim Kalantaran, (2021, March 12). Case Study: Designing A Mental Health Application, retrieved from, https://bootcamp.uxdesign.cc/case-study-mental-health-application-5f4207378e00

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ANIMAL DETECTION USING DEEP LEARNING

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ABSTRACT
Efficient and reliable monitoring of wild animals in their natural habitat is essential. This project develops an algorithm to detect the animals in wildlife. Since there are large number of different animals manually identifying them can be a difficult task. This algorithm classifies animals based on their images so we can monitor them more efficiently. Animal detection and classification can help to prevent animal-vehicle accidents, trace animals and prevent theft. This can be achieved by applying effective deep learning algorithms.

Keywords: Animal Detection and Classification, Camera-trap images, Deep learning Algorithm, DSNN features, SVM, etc. weather, rains, etc. Also, the natural camouflage of animals poses

1. INTRODUCTION
Nowadays, huge data on wildlife activity and behavior can be obtained over larger space and time domain.Camera-trap methods and many other digital technologies can be used in wildlife monitoring and analysis due to relatively low cost and easy to-use. With the growth in data on wildlife, the study related to wildlife has become more convenient such as studying the effects of climate change on wildlife, alterations in habitat, impact of human intervention on animals and biodiversity over different seasons, areas and species. For monitoring wildlife, sensor cameras are placed on trees in a region creating a stationary camera-trap network. The camera traps are activated; each time motion is sensed, and a short video of animals activities are recorded with details about the surroundings (illumination levels, humidity, temperature, and location). Camera-trap networks are vital for acquisition of wildlife data without any disturbance. Moreover, camera trap networks are economically feasible, easy to deploy at larger space and have low maintenance cost; as a result, they are widely used for wildlife monitoring. We can easily obtain data about the visual aspects of animal from the camera-trap images ,that help to know the behavior and biometric features of species along with the relevant features related to wildlife habitat and surroundings. Recently, a huge set of camera-trap images have been acquired which challenges the capability of manual annotation and image processing. There is a dire need to design multiple tools for automated processing of these huge camera-trap images such as animal identification, segmentation, extraction, and tracking. In this work, we propose a method to detect wildlife animal using CNN based on camera-trap images. Object segmentation and detection from the background based on the motion of object are a necessary step for automated analysis from image sequences. Several studies are based on background and foreground modeling for object detection, however, challenges are involved with complex dynamic scene modeling. The image sequences captured by camera traps consist of natural and dynamic scenes that are challenging to analyze using existing techniques. The natural scenes are usually highly cluttered with swinging trees, waving water, shifting shadows, changing another difficulty for analyzing natural scenes. The prime challenge for wildlife detection is to design models that can handle complex backgrounds and efficiently detect animals from dynamic scenes. Conventional approaches based on motion are inefficient with dynamic scenes. Lately, techniques based on deep neural networks are employed for object detection such as Region-based Convolutional Neural Networks (RCNN), Fast- RCNN, and Faster-RCNN. Generally, the object detection can be divided into two steps: first; the detection of image regions using region proposal methods that may contain desired object and second; classification step that detects whether the regions contain the desired object or not. Object detection in terms of animal detection deals with problem of accuracy and speed due to the highly dynamic and highly cluttered image sequences obtained from camera traps. The available region proposal approaches create a huge amount of candidate regions. We observe that DCNN is computationally comprehensive and also requires performing region classification multiple times for all candidate regions. Hence, it is important to study the distinct characteristics of camera-trap image sequences in spatiotemporal domain to model an efficient region proposal approach that creates a small number of candidate regions. Hence, we used the camera-trap image sequences that are analyzed using Iterative Embedded Graph Cut (IEGC) technique to create a small group of Wild Animal Detection Using Deep Convolutional Neural Network.

1.1 Algorithm Overview
Reliable and robust wildlife detection from highly dynamic and cluttered image sequences of camera-trap network is a challenging task. Hence to gain high performance, images need to be analyzed at pixel or small region level. However, due to low contrast and cluttered images, it becomes difficult to identify whether a particular region or pixel based on local information represents animal or background. Hence, we need to

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analyze global image features also. For example, the region of an animal body may be counted as background region. In such case, local information processing will not be sufficient, leading to requirement of global processing (to extract global image features) to detect animal. For example, recognize whether an animal is present or not, one should also identify body parts like head, legs etc. rather than body only.

1.2 Dataset

We have used the standard camera-trap dataset [3] for experimentation and assessing the system performance. Camera-trap images allow assessing the system for wildlife detection even in highly dynamic and highly cluttered natural images. The dataset contains 20 species of animals with around 100 image sequence for each species. The available images are present in both daytime format and nighttime format, resulting in wildlife monitoring system for both daytime and nighttime. Camera-trap networks provide complex images with highly cluttered natural videos and also high-resolution images. The images obtained vary in resolution from 1920 × 1080 to 2048 × 1536. The number of images in each sequence varies from 10 to 300 and more. The number of images in an image sequence depends on the period of action by animal. A total of 1110 patches are extracted from the dataset using the given bounding boxes and their locations.

1.3 Experimental Setup

Tenfold cross-validation, whole feature dataset is divided into ten uniform folds. The primary reason for using tenfold cross validation is to ensure that results remain unbiased to given partitioned data. Out of ten folds, nine are considered as training data and remaining one used as test data. Hence, 90% data is used for training and 10% data is used for test purpose. The process is then repeated ten times so that each sample is used as test data. The final outcome is the average of all the ten results. We use 1110 images as positive samples from the camera-trap images and randomly choose background images from the Web.The camera-trap database used here has bounding boxes around animal regions in the natural scenes. We have used multiple state-of-the-art machine learning algorithms such as Support Vector Machine, K-Nearest Neighbor and ensemble classifiers and its variants. SVMs are

3. CONCLUSIONS

In this paper, we have proposed a reliable and robust method for animal detection in highly cluttered images using DCNN. The cluttered images are obtained using camera-trap networks. The images in camera-trap image sequences also provide the candidate animal region proposals done by multilevel graph cut. We have introduce a verification step in which the proposed region is classified into animal or background classes, Thus, determining whether the proposed region is truly animal or not. We applied DCNN features to machine learning algorithm to supervised learning model; they can be used for both linear and nonlinear classification. We have used linear SVM with linear kernel function giving linearly separable planes. Also, we have used quadratic and cubic SVM that uses quadratic and cubic kernel functions and automated kernel scale. The medium Gaussian SVM uses Gaussian kernel function with kernel scale as 32. The training time and prediction speed vary for each SVM. KNN is an instance-based algorithm widely used in various areas such as medical imaging, pattern recognition, information retrieval.

2. RESULT ANALYSIS AND DISCUSSION

The results and performances of our system show that it provides an efficient and robust mechanism for wildlife detection and analysis. The animal detection has shown accuracy up to 91% with F1-measure up to 0.95. We observe that our system is robust to pose as we have taken images of animals from different views for animal–background verification. Moreover, the system works well in both daytime and nighttime as our database contains both categories of images, i.e., daytime images and nighttime images. Since the database used is camera-trap images, the system is also invariant to dynamic nature of natural scenes and invariant to cluttered images of animals. We have obtained accuracy of 91.4% with weighted KNN and DCNN features which outperform the work in the researchers have performed animal detection using deep learning and HOG-based features for patch verification. They claimed F-score 0.839, which is lower than our study i.e. 0.951. Similarly, in the researchers have applied graph cut for object classification and object verification for animal detection with F1-measure 0.8695, which is also lower than this work.

Achieve better performance the experimental results shows that proposed system is efficient and robust wild animal detection system for both daytime and nighttime.

ACKNOWLEDGEMENT

I take this opportunity to express my profound gratitude and deep regards to my teachers and project guide Prof. Najmuddin Amer for their exemplary guidance, monitoring and constant encouragement throughout the course of this project.

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4. REFERENCES

[1]. https://www.itsrm.org/itd-exploring-wildlifedetectionsystem-in-northern-idaho-to-improve-driver- safety/

[2] http://www.team-bhp.com/ forum/ street experiences/ 144 117-cattle-realmenace-indian-highways.html

[3]. http://www.camrix.net/alert.html

[4]. http://www.govtech.com/public-safety/Roadside-Systems- Detect-Wildl

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TWITTER SENTIMENT ANALYSIS USING MACHINE LEARNING

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ABSTRACT
The Sentiment analysis does the identifying and classifying sentiments of source text. Social media is a place with vast amount of sentiment rich data in different form such as tweets, status updates, blog posts etc. Sentiment analysis generated by user's data is very useful in knowing the opinion of the group of people. Twitter is one of the most widely used social media platform used by the people to express their thoughts and opinions. Its sentiment analysis is difficult compared to general sentiment analysis due to the presence of slang words and misspellings. The maximum characters limit that we can use in Twitter is 140. Knowledge base approach and Machine learning approach are the two strategies used to analyze sentiments in text data. In this paper, we try to analyze the twitter posts about a specific topic defined by the user using Machine Learning approach. By doing sentiment analysis in specific field, it is possible to identify the effect of field information in sentiment classification. We present a new feature for classifying the tweets as positive, negative and to get people's opinion about that topic.

Keywords: Sentiment analysis, Social media, Naive Bayes, Real Time Data Streaming, Data Cleaning, Model Evolution, Per-Processing, machine Learning. Abbreviation: GUI (Graphic User Interface)KNN (K-Nearest Neighbors Algorithm), UML (Unified Modeling Language), SVM (Support Vector Machine Language), TXT (Text), NLP (Natural Language Processing).

I. INTRODUCTION
This Sentiment analysis is the automated process which involves identifying and classifying subjective information in text data. This might be judgment, opinion or feeling about a particular topic or product feature. It is extremely useful in social media monitoring as it allows to gain an overview of the wider public opinion behind concerned topic. With increasing capabilities in technology domain, analysis is becoming a more utilize tool for business Like it can be used by an organization if they want to know the review of the product. It can also be used to know the results of the upcoming election. Many researchers have worked on it by using various machine learning and deep learning algorithms. In machine learning algorithms like naive bias, decision tree and SVM have given a great accuracy depending on data. Even random-forest and KNN is used for classification when data is not classified into 0 and 1 i.e. (true and false or positive and negative). Sentiment analysis is that the machine-controlled method of distinctive and extracting the subjective data that written language. This could be an opinion, a judgment, or a sense a few specific topics or subject The leading common variety of sentiment analysis is known as 'polarity detection' and consists in classifying a press release as 'positive', 'negative' or 'neutral'. For example, allow us to take this sentence: "I don't realize the app useful: it's extremely hard and crashing". A sentiment analysis model would mechanically tag this as Negative or an analysis model would may tag this as positive. A sub-field of tongue process, sentiment analysis has been obtaining attention of many in recent years because of its several exciting apps in a various fields, starting from business to political studies.

II. LITERATURE SURVEY
We present a sequential and brief description of the research works carried out on this domain till now. Since Supervised Machine Learning Techniques is used in Sentiment Analysis (Naive Bayes or other algorithms) is an evolving trend over the past two decades or more, and is a vividly rich topic to explore, hence we explained some researches related to this.

Till now, research works have been considered on the aspect of sentiment classification based on categorization study, with the help of positive and negative This research discusses about sentimental analysis of text for political affiliation using machine learning. In this study, the NLTK and the VADER analyzer were applied to conduct a sentiment analysis of Twitter data and to categorize tweets according to a multi-classification system .it is written by Shihab Elbagir and Jing Yang in 2019[1]**.**

This another research of M. D. Sykora, T. W. Jackson, A. O'Brien, S. Elayan and A. V. Lunen is fined grained emotional reactions to significant events are discussed brevity of messages textual content commonly encountered on social media is often not grammatically proper not even constructed properly and contains large scale use of slang, short-hand syntax, incorrect spelling, repeated letters, repeated words, inconsistent punctuation, odd Unicode glyphs, emoticons and overall a high proportion of terms. Hence it has been

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suggested that a retrained NLP pipeline for sparse, informal text is necessary to effectively process such language Essentially the approach has two parts and is based on a custom Natural Language Processing (NLP) pipeline, which parses tweets and classifies parts-of-speech tags, and an ontology, in which emotions, related phrases and terms and linguistic analysis rules are represented and matched against [2].

The next model of K Sreelakshmi, P C Rafeeque is for sarcasm detection is created which tackles various features that characterized sarcasm in text data like incongruity, topic, context, pragmatic, lexical and sentiments. Decision Tree and SVM are used for modeling the proposed system and both obtained good results. For dataset tweets are extracted from twitter. Tweets with #Sarcasm are added to sarcastic dataset and tweets without #Sarcasm are added to non-sarcastic dataset. 701 sarcastic and 299 non sarcastic tweets are there in dataset. The types of features that are given weightage are Lexical Features, Pragmatic Features, Incongruity features, sentiment Features, topic features. Support vector machine with Radial Basis Function kernel and decision tree both classifiers are compared on performance. The paper somehow shows that SVM with RBF is more efficient than Decision Tree algorithm [3].

This last research of Tony Mullen discusses about sentimental analysis of text for political affiliation using machine learning. It uses the traditional right/left and other distinction and the naive Bayes text classifier Rainbow (McCallum 1996) classification scheme. Using a combination of verbatim self-descriptions and hand-made general classes, it arrived at a classification including: centrist, liberal, conservative, democrat, republican, green, libertarian, independent, l-fringe [4].

III. PROPOSED SYSTEM

The starting task performed by the system is data collection. For data collection, data is collected from Twitter and Twitter API is used. To access to Twitter API we need a Twitter application to be generated All requests made by the application to API are authenticated by the access tokens issued while app generation. Tokens contain Consumer Key, Consumer Secret, Access Key and Access Secret of the user. The tweets are filtered and collected on the basis of the keyword given by the user. The collected dataset of tweets consists of much other information also. Therefore, it requires being pre-process with a dataset which includes all the pre-processing techniques discussed in next section. After this process and sorting, data becomes completely fitting for sentiment analysis. After this, it is used for the sentiment model built in previous phases to have real-time discernment of data. The model classifies each tweet as positive or negative and accordingly the results are displayed to user. At the same time, the data is stored in TXT file separated by two columns i.e., Tweet and its polarity. After collecting all the labeled data, it is used to present the prediction graph**.**

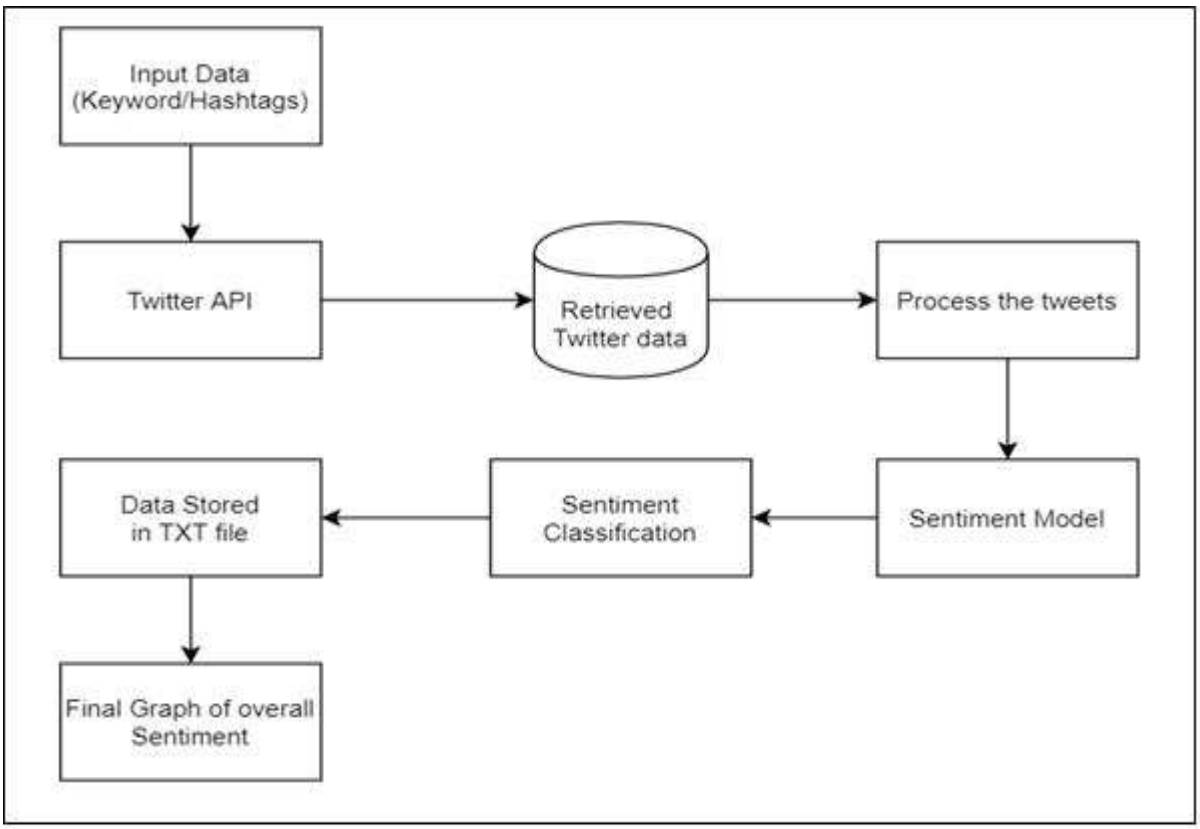

Chart –III.1: Proposed System

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IV. SYSTEM IMPLIMENTATION

1. Data Cleaning and Pre-processing

In this process there are different stages and at every stage here the data is prepared to become data that is ready to be analyzed. There are several stages in this pre-processing, including cleaning, convert emoticons, case folding, tokenization, filtering stopword and lemmatization.

i. Cleaning: Cleaning is a stage was characters and punctuation that are not needed are removed from the text.

ii. Convert Emoticon: Emotion is a facial expression represented by a combination of letters, punctuation, and numbers.

iii. Case Folding: In the tweet it might contain both uppercase and lowercase letters. This stage is used to make the letters uniform by converting all the letters to lowercase.

iv. Tokenization: A process carried out to cut or break sentences into parts or words. The result which is obtained by deduction is called a token. In some cases, the tokenization process is also carried out by removing punctuation that is not needed.

v. Filtering: Filtering is the stage of eliminating words that appear in large numbers but is considered to have no meaning (stopwords). Basically, the stopwords is a list that contains a set of words which are widely used in various languages.

vi. Lemmatization: In this stage, we remove the endings of the words in order to detect their lemmas, i.e., their root forms in a dictionary.

vii. Weighting Word: Weighting Word is a mechanism to give a score on the frequency of occurrence of a word in a text document. Among the methods of weighting words TF IDF (Term Frequency-Inverse Document Frequency) is one of the most famous methods.

2. Machine Learning Algorithm Used

The sentiment analysis in the proposed model is done by applying a mass of algorithms which algorithm shows the best result and is more suitable and accurate.

i. Logistic Regression: Logistic regression is an algorithm which provides great result when it comes to binary classification i.e., the output variable can be 0 or 1(binary from). The reason for this is it uses sigmoid function. It's a mathematical function with the property of being able to map any real value to a number between 0 and 1, formed like the letter "S".

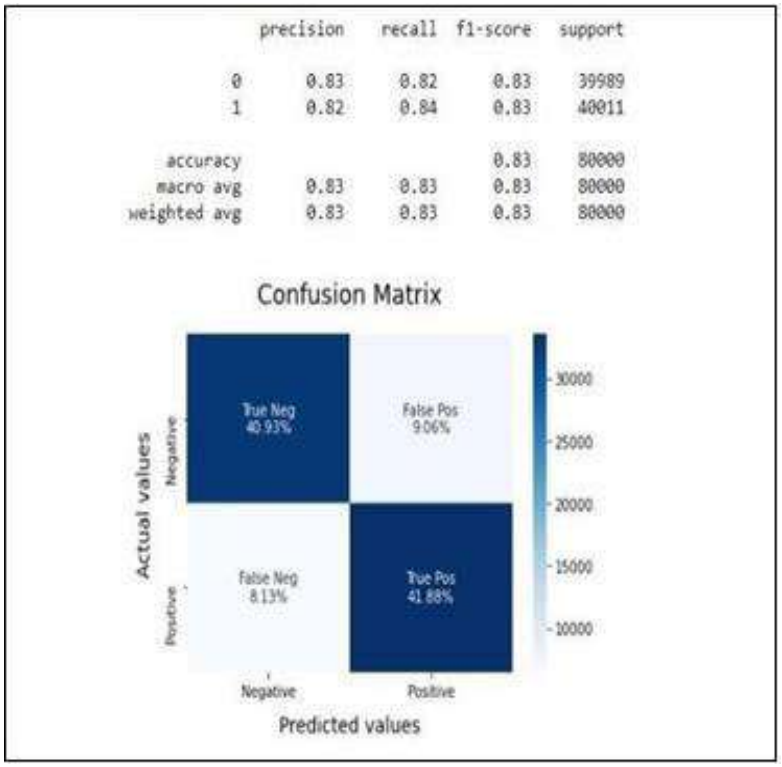

Fig IV.2.i Confusion Matrix for Logistic Regressions

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ii. Bernoulli Naive Bayes: It functions on the Bernoulli distribution and is used for discrete data. Bernoulli Naive Bayes' key characteristic is that it only supports binary values for features such as true or false, yes or no, performance or failure, 0 or 1, and so on. The Bernoulli model and the multinomial model have the same time complexity.

$$P(A|B) = \frac{P(B|A)P(A)}{P(B)}$$

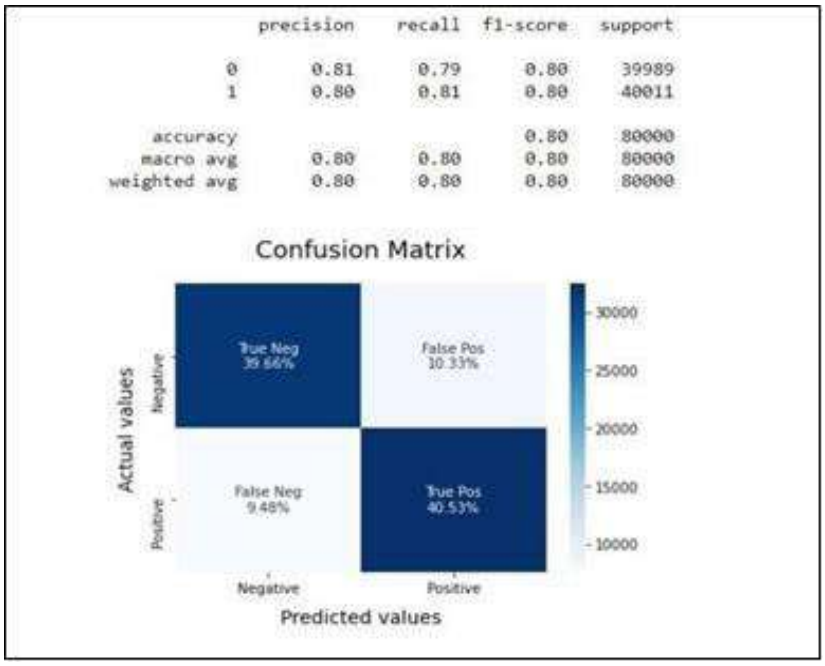

Fig IV.2.ii: Confusion Matrix for Bernoulli Naïve Bayes

iii. Multinomial Naive Bayes: The Bayes theorem is the foundation of Naive Bayes, which states that features in a dataset are mutually independent. The occurrence of one feature has no bearing on the likelihood of the occurrence of the other.

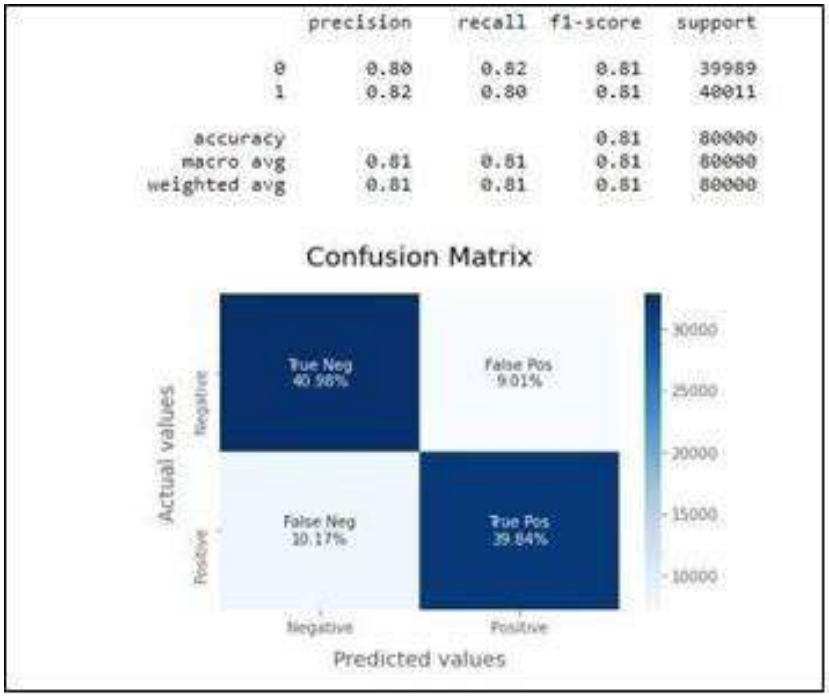

Fig IV.2.iiii: Confusion Matrix for Bernoulli Naïve Bayes

V. RESULT AND DISCUSSION

Our results in two topic model evolution first present our results for the objective/subjective and positive/negative classifications and next will be real time. These results will be the first step of our classification approach. We will only show the short-listed features for both of these results.

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1. Model Evaluation

Given below is the comparison table of the Accuracies of the implemented models:

From this table we could clearly see the accuracy of different algorithms that we have implemented. From this we get to know that logistic regression outperformed every other algorithm. And this is the reason we pickled this model.

Table V.1: Model Comparison

Sr. No.	Model Accuracy ComparisonTable	
	Model	Accuracy
1.	Random Forest	75%
2.	Linear SVC	82%
3.	Multinomial NB	81%
4.	Bernoulli NB	80%
5.	Logistic Regression	83%

2. Real Time Data Streaming

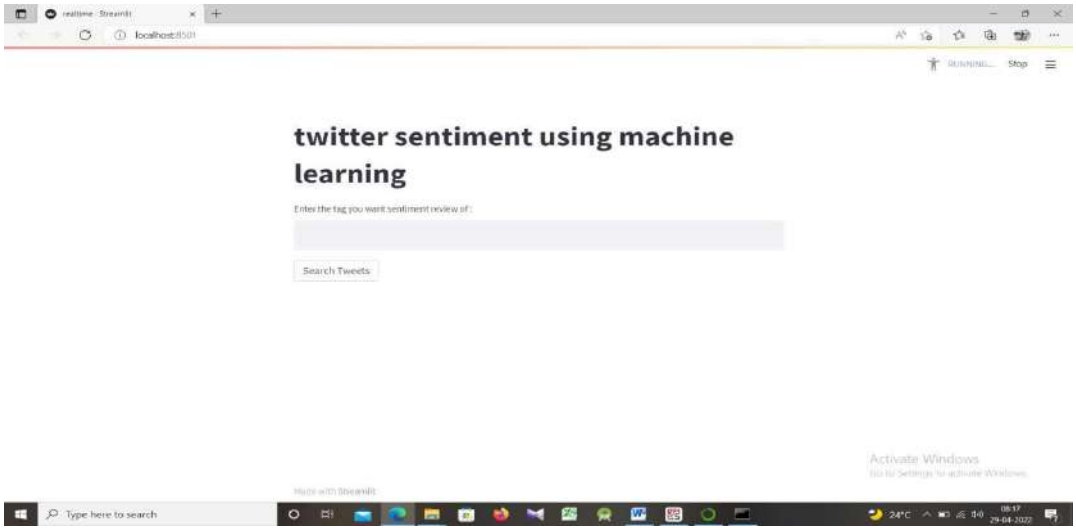

Fig V.2.1: GUI of the Project

This is the main GUI which we have created for the Twitter Sentiment Analysis. We created this GUI to get popular tweets as an output with their analysis. We put tags which we want to analysis and by clicking on the start button it will give popular tweets with their sentiments as output.

1. Here are Popular Tweets Related to Samsung with their Sentiment:

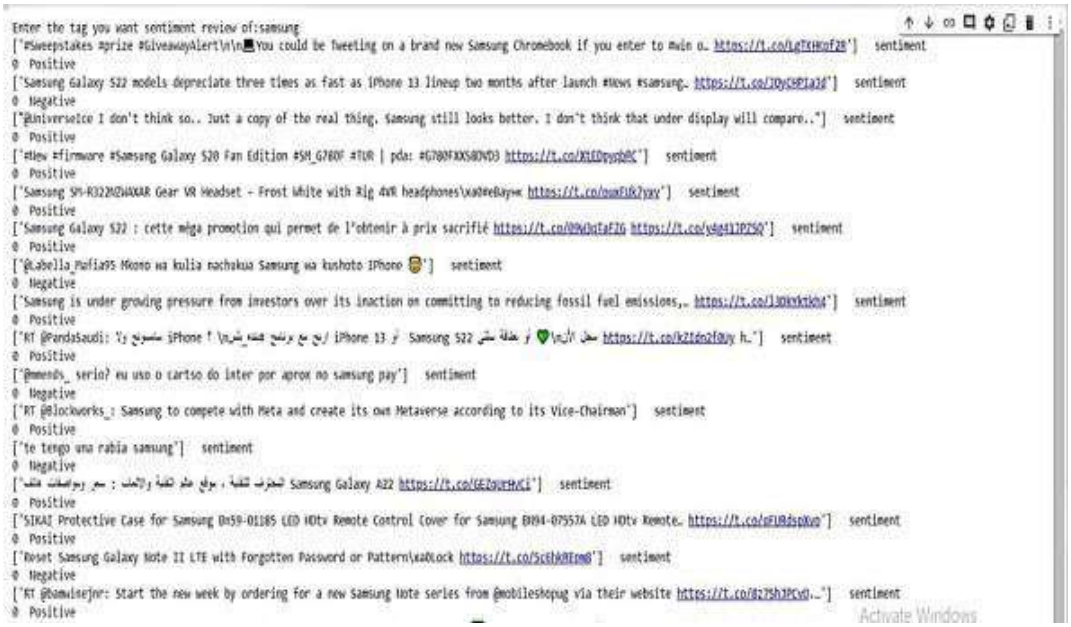

Fig V.2.2: Output for Samsung

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2. Here are Popular Tweets Related to India with their Sentiment:

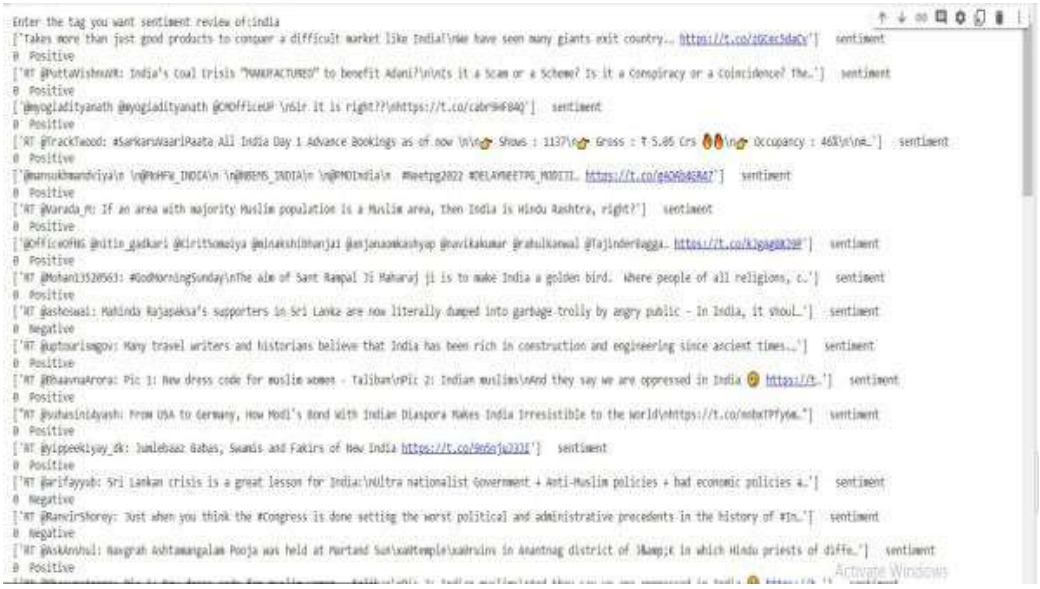

Fig V.2.3: Output for India

3. Here are Popular Tweets Related to Ukraine with their Sentiment:

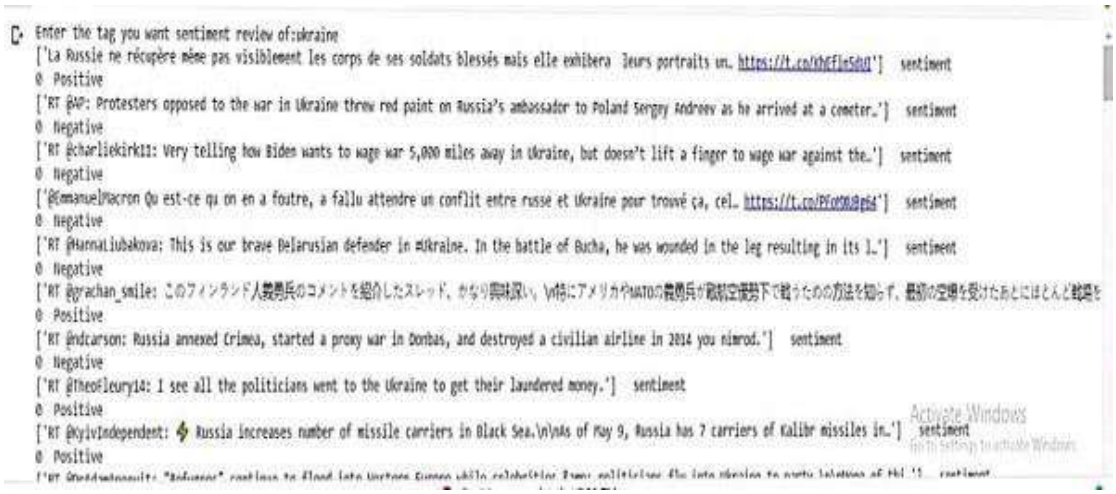

Fig V.2.3: Output for Ukraine

VI. CONCLUSION

In this paper, an attempt was made to classify the analysis sentiments from tweets on Twitter based on the keyword input given by the user. To summarize the sentiment analysis the six machine learning algorithms used are Logistic Regression, Decision Tree, Random Forest, Linear SVC, Multinomial Naïve Bayes and Bernoulli Naïve Bayes. The result shows the Accuracy of the Logistic Regression, Random Forest, Linear SVC, Multinomial Naïve Bayes and Bernoulli Naïve Bayes of 83%, 75%, 82%, 81%, and 80% respectively. So, it can be concluded that among the six algorithms used on this dataset logistic regression is the best which provides the highest accuracy of 83%. The model has been tested in real-time and can capture live streaming tweets by filtering through keywords and then perform immediate classification.

VII. REFERENCES

[1] fthymios Kouloumpis and Johanna Moore,IJCSI International Journal of Computer Science Issues, Vol. 9, Issue 4, No 3, July 2012.

[2] Manju Venugopalan and Deepa Gupta, Exploring Sentiment Analysis on Twitter Data, IEEE 2015.

[3] Tun Thura Thet, Jin-Cheon Na, Christopher S.G. Khoo, "Aspect-based sentiment analysis of movie reviews on discussion boards", Journal of Information Science, 2010, pp. 823–848.

[4] ShravanVishwanathan, "Sentiment Analysis for Movie Reviews", Proceedings of 3rd IRF International Conference, 10th May-2014.

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ATTENDANCE SYSTEM USING ANDROID

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ABSTRACT
Student pursuit is a crucial issue for observation student performance within the room and in their studies. It becomes a matter of concern as a result of the university official adheres to the rule that one student will solely visit the communicating if his or her group action is higher or adequate many p.c (60%, seventieth or eightieth etc.) otherwise. the normal group action arrange needs the scholar to sign a group action sheet on every occasion for every category. This takes uncalled-for time to spot and tag the student's name on the group action sheet. It conjointly happens that some students might accidentally or voluntarily mark a student's name as a representative. A backup copy of the travel document could also be lost. By employing a smartphone as associate automaton technology the topic teacher are ready to simply access our mobile app designed and save the quantity of attendees on the phone and server and may read percentages and may print as a tough copy. victimization the info, the system is ready to tag attendees, mark attendees, proportion attendees statistics, send emails, and send SMS to caregivers to stay them hip concerning their child's presence at the middle. The designed system has net access from anyplace and anytime which will dramatically facilitate a topic teacher keep track of his or her students' presence.

Keywords: Mobile Application, Student's Attendance, Smartphone, SQLite Database, MySQL Database

I. INTRODUCTION
Mobile attending system is that the system of tacking the attending of the coed on basis of presence at school. Winning industries, schools, universities begin by partaking students and ensuring that they're going to come back frequently that the attending rate become important. The attending is very important as a result of students ar a lot of doubtless to achieve teachers once they attend category systematically. It's troublesome for the lecturer to make students' skills and progress if an outsized variety of scholars ar ofttimes absent. owing to the advancement of technology nowadays has immersed itself towards education.

The presence of technology has reached its most of providing property technology towards quality education through delivery and effective learning and sensible devices became how of life particularly in education educational fields be ready to develop their system into sensible attending. The mobile computing and mobile primarily based application process ar being well-liked all told environments and it's not exceptional to educational establishment too. the {traditional|the standard} and traditional mode of attending management system (AMS) leads heap of paper work and it's arduous to take care of for an extended amount of your time.

Due to the character of manual work, it's arduous to perform the activities associated with the management of attending, once there's a necessity in taking reports of specific interest and there's an opportunity of committing error in recording the information and data on the records. The computerised automation of educational attending management system obtainable|is out there|is on the market|is obtainable|is accessible|is offered} within the kind of pc primarily based application and available in varied computing platforms. the varied topologies equipped, computer {based|based mostly|primarily {based|based mostly|primarily primarily based}} management applications ar running economical and effective manner in several establishments and ar being within the class of either net based applications or computer network based applications.

The first class of net primarily based management applications; the system at backend is in would like of live server readying of its info server. The second class of computer network primarily based management applications; the system at backend is enforced among the native network as native info server. This automation of management systems provides the organization or establishment to manage their academic/administrative activities in effective manner and is accessed by their all types of system users in conjunction with the support of 24/7. The system with quality within the kind of movableness provides abundant accessibility. The mobile application primarily based educational management system provides paper less activities, comparison with ancient and private laptop primarily based computations. during this projected, "design and development of mechanical man primarily based educational Management System" (AAMS), the properties supported computer code engineering like simple use, effective user interface, versatile in accessibility, and using MIS principles ar thought-about.

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II. EXISTING SYSTEM

Now each day the faculty takes attending in paper. completely different school conjointly takes attending in paper therefore it's the wastage of paper wastage of cash. currently each day the faculty ought to use associate degree mechanical man attending system. the faculty attending is store during a server. it's simple to oldsters they got notifications although they transportable kid ar gift or absent. within the gift system all work is completed on paper. the full session attending is keep in register and at the top of the session the reports ar generated. we tend to don't seem to be inquisitive about generating report within the middle of the session or as per the necessity as a result of it takes longer in calculation. At the top of session the scholars UN agency don't have seventy fifth attending get a notice.

In the detail position usually perform is completed on paper. the entire course of study assistance is targeted to see and at the time of study the reports ar generated. we tend to don't seem to be caught in generating reveal within the heart of the study or as victimization the stipulation currently it takes a lot of anticipate in calculation. At this moment system isn't addict friendly as a result of the retrieval of announcement is virtually slow and story isn't maintained with efficiency. Existing system needs portion of freed from value work. Loss of at some future time a bingle register/record interested in problem as a result of all the papers ar incomplete to originate the reports.

Every perform is completed manually therefore we tend to cannot bring round one data tell within the heart of the session or as by the agency of the article as a result of it's so time overwhelming. we tend to demand a lot of calculations to inspire the report therefore it's generated at accomplishment of the session. and therefore the students not shooting iron what's coming back to 1 one expose to recover their attending

.PROPOSED SYSTEM

Se is to get the report mechanically at the top of the session or within the between of the session mistreatment mechanical man Studio. Mechanical man software system mechanical man could be a code platform and software system for mobile devices, supported the UNIX operating system kernel, and developed by Google and later the Open telephone set Alliance. It permits developers to jot down managed code within the Java language, dominating the device via Google-developed Java libraries. There are over three hundred million Androids in use and over 850,000 devices activated a day. Mechanical man is one of the foremost used mobile software systems with a market share of forty-eighth and Over four hundred,000 applications obtainable in Google play.

User Friendly: - This code is user-friendly because it is easy to use, and therefore the user doesn't want any special coaching to use this code. Knowledge analysis, knowledge storing, and retrieval is straightforward and doesn't want any serious calculation or methodology. The UI is easy and straightforward to know.

Easy and Quick Report Generation: Reports are generated mechanically quickly in a simple method once every month for the teacher to stay a track of the scholars attending records and give notice to the scholars with minimum attending to attend categories.

Minimal paper work there's no paperwork needed. Knowledge is kept mechanically within the system. the Analysis is finished mechanically. Thence it's value-effective too.

Time Saving: knowledge storing, knowledge retrieval, and knowledge analysis is finished at a minimum time thence it's time-saving manufacturing knowledge with borderline errors.

III. FEASIBILITY STUDY

Economically Feasibility: The program developed is economical in relation to the idea of a School or College. It is expensive in the sense that you have completely removed the paperwork. The system also works on time because the calculations are automatically done at the end of the month or at the user's request. The resulting result contains less error and is more accurate as data is required.

Technical Feasibility: The technical requirement for the system is economic and it does not use any other additional Hardware and software.

Behavioural Feasibility: The system working is quite easy to use and learn due to its simple but attractive interface. User requires no special training for operating system

IV. FEATURES OF THE APPLICATION

Taking attending Statistics and proportion All student attending against every subject is classified on the premise of sophistication attending. If the length of the category is in line with the desired time, then attending

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is indicated 'Current'. The presence of scholars WHO had left the schoolroom throughout category is marked as 'Absence'. There's no chance to duplicate the record within the system. proportion calculations ar mechanically generated at the request {of every of every} student's mobile enrolment in each listed study to be enclosed within the take a look at. If the calculated proportion is a smaller amount than the desired proportion then the scholar can suffer. B. Emailing System and electronic messaging System within the case of an occasional proportion, associate email is shipped to the scholar caregiver together with proportion data and a warning. With this, the student's folks are going to be mechanically updated regarding their child's progress. By causing the Short Message Service (SMS), the mobile application is employed. Whenever a student gets an occasional proportion, associate SMS is shipped to his or her caregiver to update him or her on the Progress of his or her kid just in case he or she is unable to envision his or her email.

V. IMPLEMENTATION

Modular Design our proposed system is divided into four distinct modules described as follows:

A. User Authentication

Initially, once a coach uses the app for the primary time, associate degree login screen can seem which will tell the teacher to enter the username and positive identification required for authentication. The teacher are given a novel username which will be a mix of alphamerical characters. as long as the teacher enters the proper username and positive identification, a "success" message are displayed and therefore the teacher are approved and redirected to consequent screen.

B. Calling of Web Service

In this module, the teacher can have to be compelled to choose details like the name of the topic that the lecture is being taken, time of lecture and therefore the specific semester that the lecture is conducted. When doing therefore, the teacher has to decision the online service by clicking a button provided on the screen. the online service so invoked would come the list of names of all the scholars happiness to a specific semester and branch as per the input provided.

C. Marking Attendance

After the list of students has been displayed the teacher needs to begin the process of marking the attendance of students. For this purpose our application would be providing checkboxes against each student's name that will allow the teacher to mark the student either present or absent. Accordingly, the details of the student will be sent to the remote database and the attendance will be marked for that particular day.

D. Display Information of Student

Once the number of attendees has been successfully marked, the teacher can at any time view the student's attendance record by entering a unique number assigned to each student. The information displayed in that way includes the percentage of student attendance, the number of talks the student attended in a particular subject, the number of missed talks, and the total attendance.

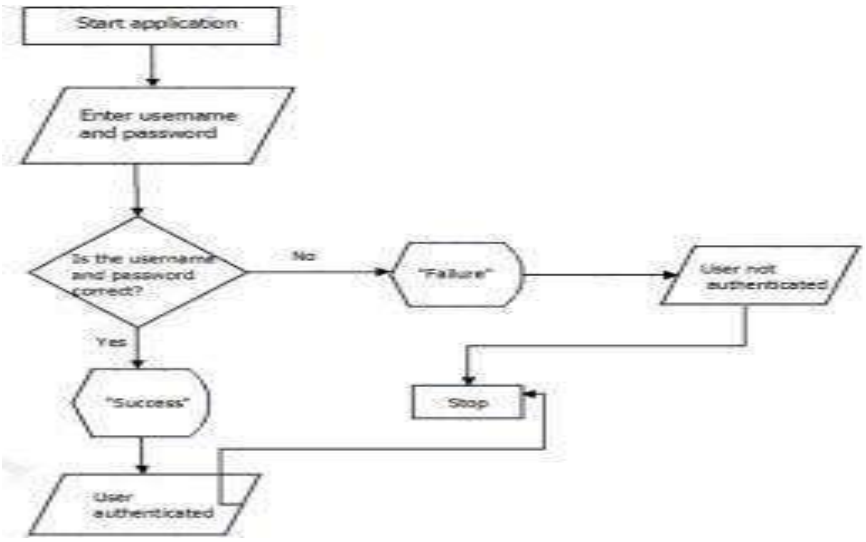

Fig 1: System Flow Chart

E. User Authentication Process

This is the initial method of the system. The teacher must enter the username and positive identification. Consequently, counting on whether the teacher is genuine, a "success" or "failure" message can.

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VI. CONCLUSIONS

With this program marking group action and coverage are created easier. There's very little likelihood that skilfulness exists. The system has reached a solid-state wherever all distractions are removed. The system works with a high level of potency and every lecturer and user related to the system perceives its advantages. It absolutely was meant to resolve as a process demand. In the future, this technique might be wont to build multiple instructional systems and will be engineered across a platform. This project aims to switch the digital register with the recent system of associating existing registers which will demonstrate its quality for its options and easy use. In time, we tend to aim to determine a reference to the faculty server to succeed in out and update the faculty group action.

VII. FUTURE SCOPE

The scope of the project is that the system on which the package is put in, i.e. the project is developed as a desktop application, and it'll work for a selected institute. However, afterward, the project may be changed to work it online.

In the future, our system plans on together with an SMS notification feature whereby each student is going to be sporadically notified concerning his/her group action record for a particular period. The main advantage of SMS notification is that the scholars will apprehend their group action by causing SMS from any place. Students send an SMS to the server with their register range. If it's an incorrect format, the server can replay the group action of the corresponding student through SMS. Otherwise, sends a mistake message.

VIII. REFERENCES

1. Student Attendance through Mobile Devices. Available from: http:// ethesis. Nitrkl. ac. in/ 5195/ 1/ 109CS0146. Pdf. Date Accessed: 11/05/2013.
2. Mobile Phone Based Attendance System", by Shraddha S.Chawhan1, Mangesh P. Girhale2, Gunjan Mankar3, IOSR Journal of Computer Engineering (IOSRJCE) eISSN:2278-0661, p- ISSN: 2278-8727Volume 10, Issue 3 (Mar. -Apr. 2013), PP 48-50 www.iosrjournals.org
3. Online Student Attendance Management System Project. Available from: http://1000projects.org/online-studentattendance-management-system-project.html. Date Accessed: 5/08/2012.
4. B. Sódor, G. Förds, T. Doktor, B. Benyó, "Building a contactless university examination system using NFC", NFC INES 2011 • 15th International Conference on Intelligent Engineering Systems • June 23–25, 2011, Slovakia.
5. Android 4.0 Ice Cream Sandwich, "http://developer.android.com/sdk/android-4.0- highlights.html B. K. P. Mohamed and C. V. Raghu, "Fingerprint attendance system for classroom needs," 2012 Annual IEEE India Conference (INDICON), Kochi, pp. 433-438, 2012.
6. M. Strommer et al., "Smart NFC Interface Platform and its Applications," in T. Tuikka and M.Isomursu, (Eds.), Touch the Future with a Smart Touch, 2009.
7. [RFID Sens Net Lab, "A white paper on Automatic Attendance System," Texas A & M University, Texas, USA, 2005.
8. B. Soewito, F. L. Gaol, E. Simanjuntak and F. E. Gunawan, "Attendance system on Android smartphone," 2015 International Conference on Control, Electronics, Renewable Energy and Communications (ICCEREC), Bandung, pp. 208-211, 2015.
9. S. A. M. Noor, N. Zaini, M. F. A. Latip and N. Hamzah, "Android-based attendance management system," 2015 IEEE Conference on Systems, Process and Control (ICSPC), Bandar Sunway, pp. 118-122, 2015.
10. M. Kassim, H. Mazlan, N. Zaini and M. K. Salleh, "Web-based student attendance system using RFID technology," 2012 IEEE Control and System Graduate Research Colloquium, Shah Alam, Selangor, pp. 213-218, 2012

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EMAIL SPAM PREDICTOR

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ABSTRACT
Spam emails are known as unrequested capitalized emails or deceptive emails transferred to a specific person or a company. Spams can be detected through natural language processing and machine knowledge methodologies. Machine knowledge styles are generally used in spam filtering. These styles are used to render spam classifying emails to either ham (valid dispatches) or spam (unwanted dispatches) with the use of Machine Learning classifiers. The proposed work showcases secerning features of the content of documents. There has been a lot of work that has been performed in the area of spam filtering which is limited to some disciplines. Exploration on spam dispatch discovery either focuses on natural language processing methodologies on single machine learning algorithms or one natural language processing fashion on multiple machine learning algorithms. In this Design, a modeling channel is developed to review the machine learning methodologies.

Keywords: Machine Learning, Spam, NPL, Web application.

I. INTRODUCTION
Of all the different medium communication, dispatch is extremely important medium now a days. It has been used extensively for formal online communication. It can be penetrated from any part of the world just with the help of internet connectivity. According to D Tschabitscher, number of active dispatch accounts was 5 billion in 2017 and is adding exponentially. He also stated that, everyday further than 270 billion Emails are changed, but the worst part of that is, out of that roughly 57 emails are of no use as they're spam emails. Spam emails are creating a serious problem to the stoner as spammers submerge the stoner's system with spam emails which results in storehouse problem, consumption of bandwidth and leads to drop in performance of system.

Spam emails are called as junk emails or unasked communication which is set by spammer through dispatch. To make the dispatch more secure and effective, applicable dispatch filtering is essential. Several types of inquiries have been done on dispatch filtering, some acquired good delicacy but the progress is demanded in this field. In order to avoid discovery, spammers came with a new approach for transferring spams to other druggies. It's included in the announcements as the part of an embedded image train attachment in the form of gif, jpg, png, etc. rather than body of the emails, hence by passing textbook- grounded spam filtering ways. As we know that there are numerous ways formerly there for dispatch spam discovery, our design aims for questing and assaying the effectiveness of the vital fashion used for spam dispatch discovery from images and PDFs using Multinomial Naive Bayes' algorithm.

II. LITERATURE SURVEY
- G. Mujtaba),L. Shuib,R.G. Raj,N. Majeed,M.A. Al-Garadi Proposed the introductory three way which are common in every bracket process. The first step is pre-processing in which the given textbook is converted into commemoratives and this step is also used for junking of stop words. The alternate step is learning process and, in this point, set is erected which is veritably important necessary for the bracket of emails. The last step is bracket of dispatch as ham or spam by using effective algorithm. Algorithms like support vector machine, logistic retrogression, retrogression trees and arbitrary timber are considered for bracket. They used the Phishing Corpus dataset and with the help of Bag of words as point birth approach classified the dispatch as ham or spam. In his study, they didn't mention the different tools for reduction styles for dispatch bracket.
- S. Ajaz,M.T. Nafis,V.Sharma They collected dispatch dataset from the online available websites and used Naïve Bayes for filtering of emails. He proposed a mongrel approach using secure hash system and Naive Bayes to sludge dispatch data but couldn't give information regarding the abuse of storehouse coffers and network bandwidth. By using Secure Hash Algorithm, the dispatch is considered as a communication M due to a generated function. The communication M is farther classified into S and L where L stands for ham dispatch or genuine dispatch and on the other hand S stands for spam dispatch.
- N.F. Rusland, N.Wahid, S.Kasim, H.Hafit Performed analysis on dispatch bracket on two different dataset by using Naïve Bayes algorithm grounded on the Accuracy, Precision, F- Measure and Recall. It predicts whether the given textbook is ham or spam. By using Spam data Dataset, the author achieved an delicacy of 91.13% and for the other Spam Base dataset, delicacy achieved was 88. By his analysis, the author concluded that the performance of NaïveBayes algorithm is better on Spam data dataset compared to Spam Base.

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- Prachi Gupta, Ratnesh Kumar Dubey, Dr. Sadhna Mishra In this, they have compared the performance of Naive Bayes and Support Vector Machine algorithm for classification of emails. The dataset they have used consists of 5574 rows and 2 columns. One column is used for storing emails and other is used as label (Ham or Spam). Accuracy obtained by using Naive Bayes was 99.49% and it was 86.35% by using Support Vector Machine. So, the author concluded that Naive Bayes algorithm performed exceptionally well as compared to SVM for classification of emails.

SCOPE OF PROJECT

In moment's world, spam filtering is a must to cover your business. Spam isn't going down. It's estimated that 70 percent of all dispatch transferred encyclopedically is spam, and the volume of spam continues to grow because spam remains a economic business. Spammers get ever more sophisticated and creative in their tactics to get their dispatches into your inboxes and inflict their annihilation. Spam filtering results must continually be streamlined to address this evolving trouble.

A spam filtering result cannot be 100 percent effective. Still, a business dispatch system without spam filtering is largely vulnerable, if not unworkable. It's important to stop as important spam as you can, to cover your network from the numerous possible pitfalls contagions, phishing attacks, compromised web links and other vicious content.

Spam filters also protect your servers from being overloaded with non-essential emails, and the worse problem of being infected with spam software that may turn them into spam servers themselves should be rescued safely and quickly.

Naïve Bayes Classifier Algorithm

Naïve Bayes algorithm is a supervised knowledge algorithm, which is predicated on Bayes theorem and used for working type problems. It's mainly used in text type that includes a high-dimensional training dataset.

Naïve Bayes Classifier is one of the simple and utmost effective Bracket algorithms which helps in erecting the fast machine knowledge models that can make quick prognostications. It's a probabilistic classifier, which means it predicts on the base of the probability of an object. Some popular samples of Naïve Bayes Algorithm are spam filtration, Mawkish analysis, and classifying papers.

Why is it Called Naïve Bayes?

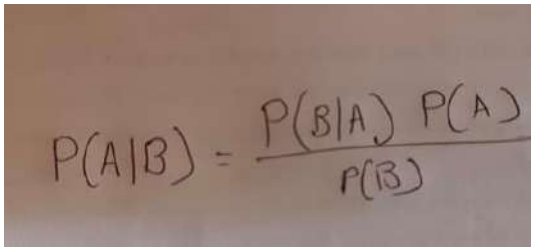
The Naïve Bayes algorithm is comprised of two words Naïve and Bayes, Which can be described as Naïve It's called Naïve because it assumes that the circumstance of a certain point is independent of the circumstance of other features. Similar as if the fruit is linked on the bases of color, shape, and taste, also red, globular, and sweet fruit is honored as an apple. Hence each point collectively contributes to identify that it's an apple without depending on each other.

Bayes: It is called Bayes because it depends on the principle of Bayes' Theorem

Bayes' Theorem:

Bayes' theorem is also known as Bayes' Rule or Bayes' law, which is used to determine the probability of a hypothesis with prior knowledge. It depends on the conditional probability.

The formula for Bayes' theorem is given as



Where,

P (A|B) is Posterior probability: Probability of hypothesis A on the observed event B.

P (B|A) is Likelihood probability: Probability of the evidence given that the probability of a hypothesis is true.

P (A) is Prior Probability: Probability of hypothesis before observing the evidence.

P (B) is Marginal Probability: Probability of Evidence.

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DESIGN AND IMPLEMENTATION

Ultramodern spam filtering software continuously struggles to orders the emails rightly. Unwanted spam & promotional communication is the toughest of them all. Spam communication algorithms must be dinned continuously since there's an ongoing battle between spam filtering software and anonymous spam & promotional correspondence senders. Naive Bayes Algorithm in data analytics forms the base for textbook filtering in Gmail, Yahoo Mail, Hotmail & all other platforms.

Like Naive Bayes, other classifier algorithms like Support Vector Machine, or Neural Network also get the job done! Before we begin, then's the dataset for you to download Dispatch Spam Filtering Using Naive Bayes Algorithm This would be a zipped train, attached in the dispatch. Please allow druggies to download this data

Algorithm

1. Take Subject of Email type it on Web App.
2. Click on process and it will start processing it.
3. Compare the input mail to the database-stored key word.
4. It will classify between Spam and ham mail.
5. It will show result that it is spam or ham mail.
6. User can take action accordingly.

IV. Result

The Web Application

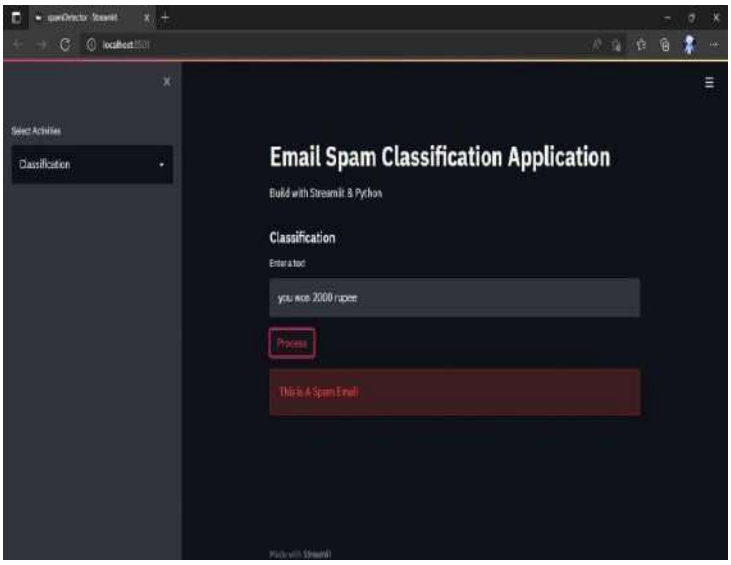

Figure 1: display its spam mail or not

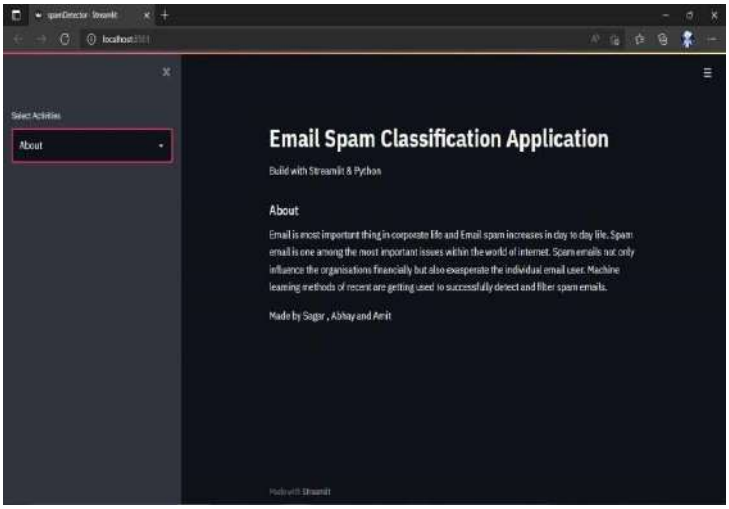

Figure 2: About section

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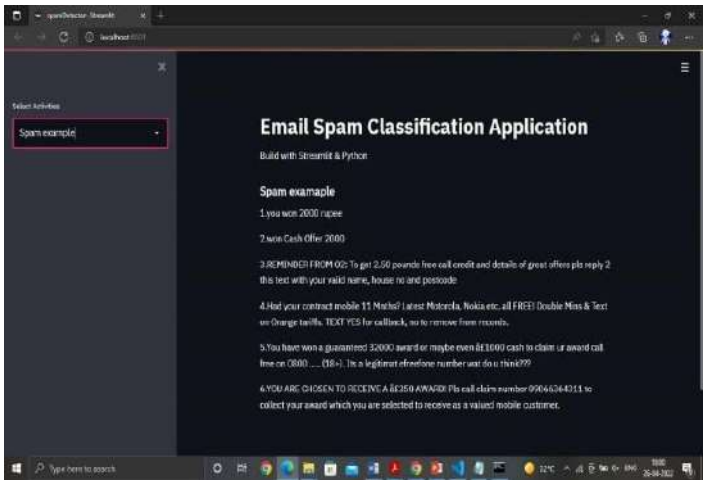

Figure 3: Example Page

V. CONCLUSION

In this study, we reviewed machine learning approaches and their operation to the field of spam filtering. A review of the state of the art algorithms been applied for bracket of dispatches as either spam or ham is handed. The attempts made by different experimenters to working the problem of spam through the use of machine literacy classifiers was bandied. The elaboration of spam dispatches over the times to shirk pollutants was examined. The introductory armature of dispatch spam sludge and the processes involved in filtering spam emails were looked into. The paper surveyed some of the intimately available datasets and performance criteria that can be used to measure the effectiveness of any spam sludge. The challenges of the machine learning algorithms in efficiently handling the imminence of spam was refocused out and relative studies of the machine learning technics available in literature was done. We also revealed some open exploration problems associated with spam pollutants. In general, the figure and volume of literature we reviewed shows that significant progress have been made and will still be made in this field. Having bandied the open problems in spam filtering, farther exploration to enhance the effectiveness of spam pollutants need to be done. This will make the development of spam pollutants to continue to be an active exploration field for preceptor and assiduity interpreters probing machine literacy ways for effective spam filtering. Our stopgap is that exploration scholars will use this paper as a spring board for doing qualitative exploration in spam filtering using machine literacy, deep leaning and deep inimical literacy algorithms.

VI. REFERENCES

[1] S. K. Tuteja, “Classification Algorithms for Email Spam Filtering", 2016.

[2] G. Mujtaba, L. Shuib, R. G. Raj, N. Majeed, and M. A. Al-Garadi, "Email Classification Research Trends: Review and Open Issues", 2017.

[3] S. Ajaz, M. T. Nafis, and V. Sharma, "Spam Mail Detection Using Hybrid Secure Hash Based Naive Classifier, 2017.

[4] Rusland, N. F., Wahid, N., Kasim, S., & Hafit, H.. “Analysis of Naïve Bayes Algorithm for Email Spam Filtering across Multiple Datasets”, 2017.

[5] Prachi Gupta, Ratnesh Kumar Dubey, Dr. Sadhna Mishra,”Detecting Spam Emails/Sms Using Naive Bayes And Support Vector Machine”, 2019.

[6] F. C. Mahima and A. Prof. Gharge. NCRRET, “Design and Build Realtime Monitoring System Centered on Integrated Virtual Server Raspberry PI B+ Board,” pp. (IJAERD).

[7] U. Kumar, R. Manda, S. Sai, and A. Pammi published “Implementation Of Low Priced Wireless Picture Acquisition And Distribution To Client Program Using Raspberry Pi For Remote Monitoring.” Vol. 4, no. 3, 2014, pp. 17–20, International Journal of Computer Networking,Wireless and Mobile Communications (IJCNWMC).

[8] P. Sanjana, J. S. Clement, and S. R. published “Smart Surveillance Tracking System With Raspberry PI and PIR Sensor Module” in 2014*.

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VIRTUAL ASSISTANT FOR THE VISUALLY-IMPAIRED

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ABSTRACT
The field of AI has progressed to colourful virtual sidekicks similar to Google Assistant, Microsoft Cortana, Siri, etc. Indeed, after such a development, veritably little has been done for the operation of this technology for visually disabled people as visually disabled people don't have perfect or indeed near-perfect vision. Relating people or identifying objects can be simple for common people but can be delicate for people who are incompletely or fully eyeless. In this design, we reviewed the current state of assistive technology using voice recognition with the help of AI technology and will be developing an AI- grounded voice-controlled desktop operation model on the Microsoft Windows platform, especially which would be veritably useful for visually bloodied persons to reduce their problems for using a computer and penetrating colourful features handed by the computer. This adjunct can be used for posting task operations, media playback, etc. This is veritably useful as the development in technology is harmonious and desktops or laptops are one of the main platforms for it. We generally make use of the keyboard for every command but using voice-grounded software the command input would be done fluently. This will be helpful not only for normal people but also for visually disabled people. This is why we need a voice adjunct that will take command and execute the instruction by giving affair as voice or any other means. We aim to profit visually disabled people and to help them pierce the computer using a voice adjunct. In addition, indeed normal people can also use the installations handed by the operation and use them as virtual assistants.

Keywords: Python Script, speech recognition, voice assistant. Abbreviation: API (Application program interface), NLP (Natural Language Processing), TTS (Text to speech), STT (Speech to text).

[I] INTRODUCTION
As we all know the use of virtual assistants is increasing day by day. There are various features in the desktops and mobile phones which can be used more conveniently and in a faster way by using a virtual assistant. An AI personal assistant maybe a piece of software that understands verbal or written commands and completes tasks assigned by the client. It is an example of weak AI that's it can only execute and perform quests designed by the user. In this project, we give voice commands as input using a microphone which is converted into electrical energy. The understanding of the audio signal would be done through Google API. The voice assistant acts like a companion which will help the user with their day-to-day tasks. This assistant will work with minimum effort and will give daily updates. This has inspired the project which will perform tasks from playing music, sending emails, etc. We would use python language with the help of pyttsx3 which is a text to speech conversion library in python and speech recognition APIs. The software would repeat the commands that will be useful for visually impaired people to know what command they have inserted. Browsing the command through the internet and displaying the results through audio as well as the output would be printed on the screen. The visually impaired person would be free from remembering complex braille keyboard commands or the hassle of typing, he/she can simply voice out his/her command and the software will execute it. The system also has the functionality of providing a summary of the content on the website and answering questions asked by the user concerning the summary using a BERT model trained on the Stanford Question Answer Dataset. The main purpose of this project is to help the users who are visually impaired to give them a voice assistant which would help them use laptops and desktops.

[II] LITERATURE SURVEY
[1] MallapaD.Gurav, Shruti S. Salimath, Shruti B. Hatti, Vijayalaxmi I.Byakod, ShivaleelaKanade “A Reading aid for the Blind People using OCR and OpenCV”
Optical character recognition (OCR) is used to sight written or typed characters victimization photoelectric devices and laptop software. It converts footage of typed or written communication into machine-encoded text from scanned documents. throughout this analysis, these written communication square measures regenerate into audio output. OCR is employed in machine techniques like psychological feature computing, text to speech, key info and text mining. it's primarily used inside the sector of research in Character recognition, AI and pc vision. For pattern recognition and to perform Document Image Analysis (DIA) we tend to use data in a grid format in virtual digital library’s vogue and construction. They promote Python programming as the main programming language in their system.

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[2] "Natural human-computer interaction for virtual personal assistant systems", WilliamC.DeLeeuw
A data processor designed to require audio input, distort the audio input to produce a variety of distorted audio variations, and perform speech recognition on the audio input and also the distorted audio variants is one in all the technologies for natural language interactions with virtual personal assistant systems. Based on contextual info, the data processor chooses a result from a huge number of doable voice recognition results. The data processor could use an eye pursuit detector to assess whether or not the user is visually centered on the Associate in Nursing avatar rendered by the virtual personal assistant to assess the user's level of engagement.

[3] "Next- generation of virtual personal assistants Microsoft Cortana, Apple Siri, Amazon Alexa and Google Home", Veton Kepuska
The development of natural interaction between humans and 17 machines is one of the aims of computing (AI). In recent years, the quickest developing topic in AI has been dialogue systems, generally referred to as interactive colloquial systems. several companies have used dialogue systems technology to form several varieties of Virtual Personal Assistants (VPAs) supported their applications and areas, like Microsoft's Cortana, Apple's Siri, Amazon's Alexa, Google Assistant, and Facebook's

[III] METHODOLOGY

The system consists of a client-server distributed architecture. The system communicates with the system using the speech-to-text interface. The Google API library is used for speech-to-text in python. There will also be a beep so that the user will know when to give the command. The input given from the user has been repeated for the user to confirm the intended input. The understanding of the audio signal would be done using API. The voice assistant acts like a companion which will help the user with their day-to-day tasks. This assistant will work with minimum effort and will give daily updates. This has inspired the project which will perform tasks from playing music to sending emails. Pyttsx3 is a text to speech conversion library in python and speech recognition APIs**.**

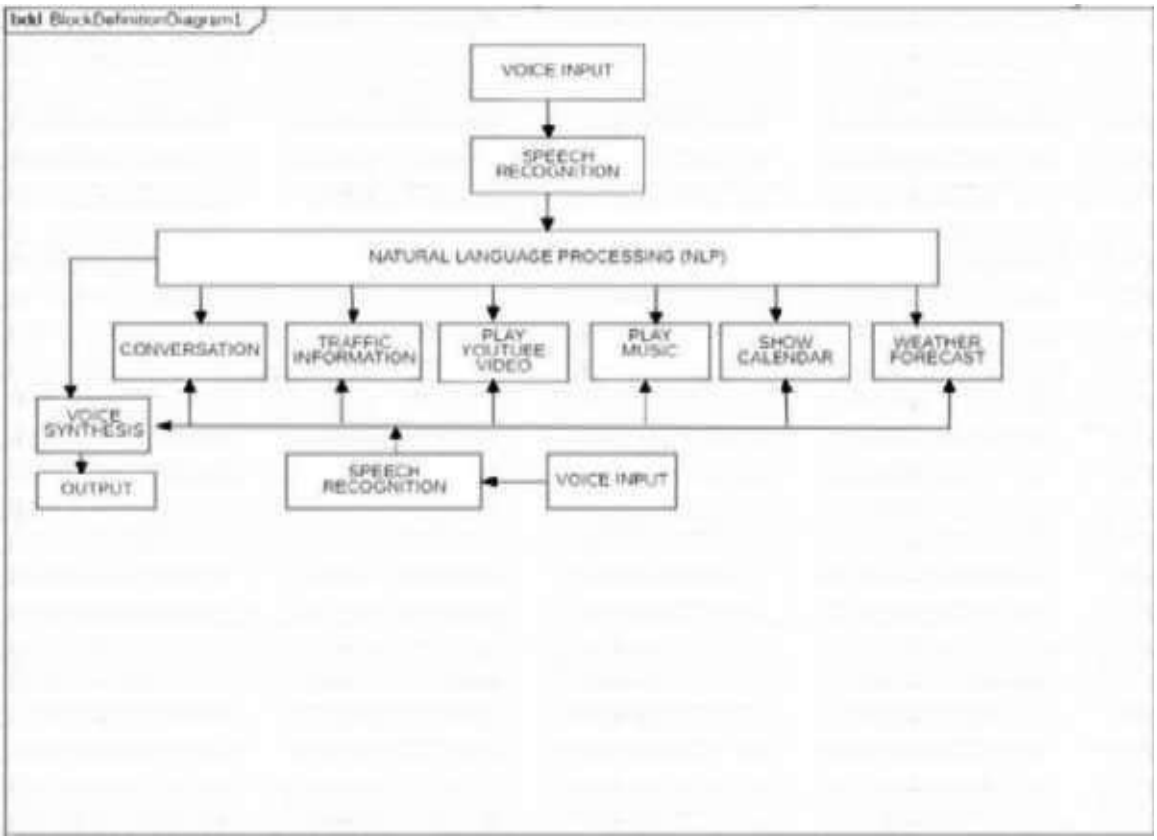

Chart -1: Block diagram

[IV] PROPOSED SYSTEM

[1] The software will take input as speech through the microphone.

[2] The audio is interpreted and converted into text.

[3] The software compares the input with predefined commands.

[4] Gives output in the form of voice or other means.

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The above steps include input taken in the form of speech through the microphone. The collected data is transformed into texted data using NLP. The resulting data is processed through a python script where it is compared with the predefined command. The last step is generating the output which is in the form of the next or converted from text to speech using TTS.

[V] RESULT

Fig: GUI of the Project

This is the main GUI which we have created for the virtual assistant. By clicking on the start button the assistant will start listening and will respond to the given command. The GUI is made to make our project user friendly and for better interaction.

1) When the user says the input as YouTube our assistant processes and gives the output by opening the YouTube video.

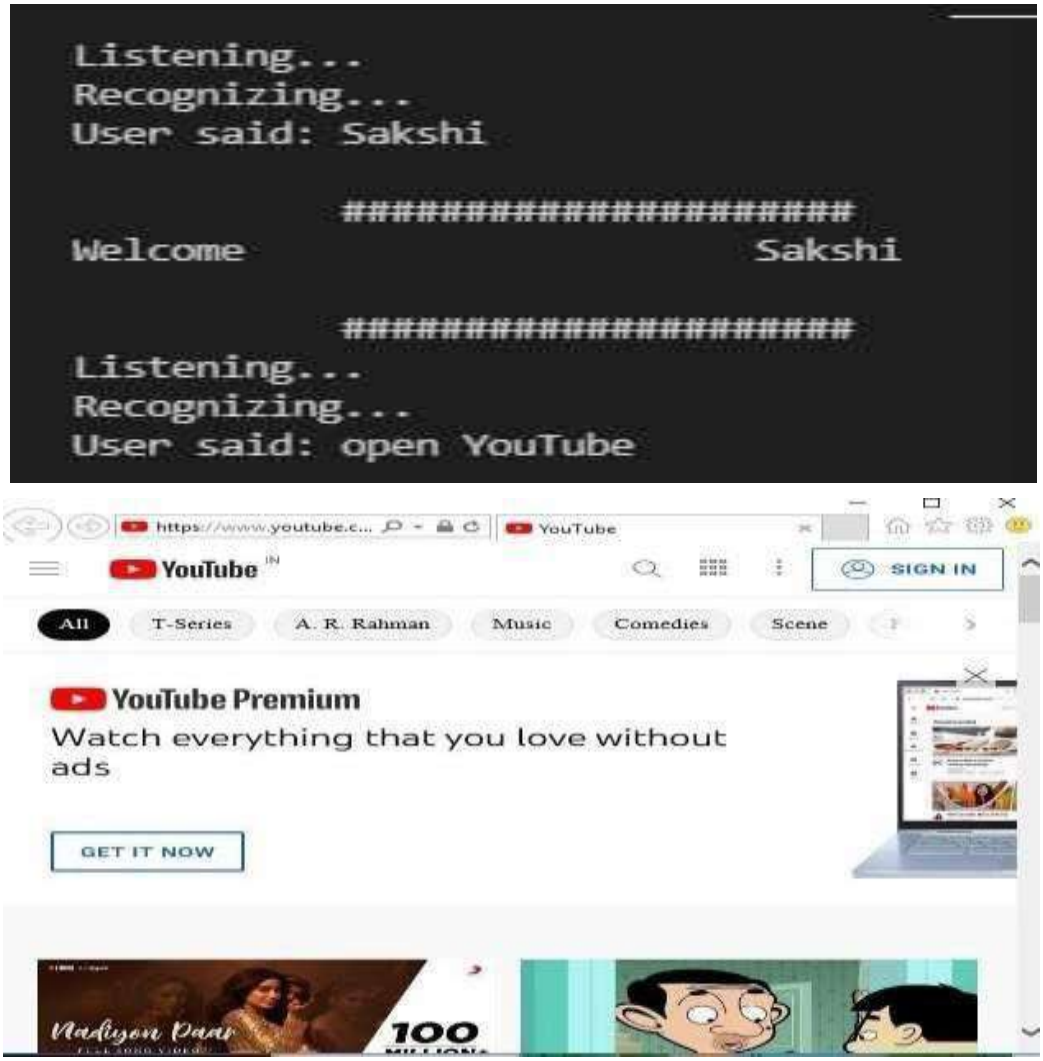

Fig: Output of the command YouTube

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2) **When the User Says Open Google the Google Window is Opened.**

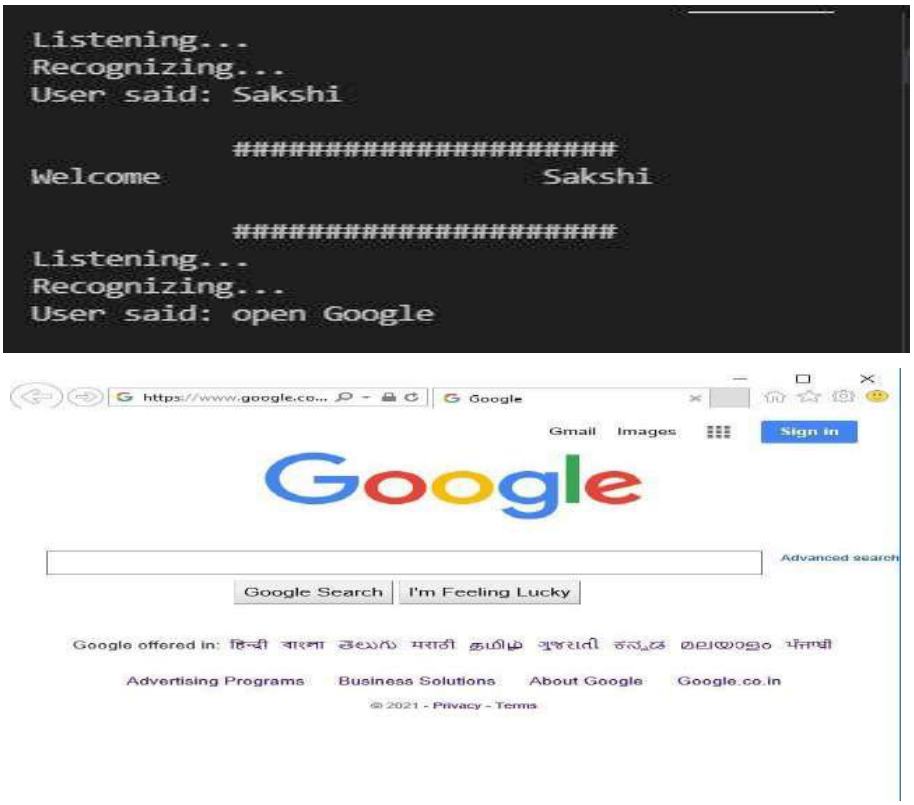

Fig: Output of command Google search

3) **When the User Says Play Song it redirects to the Song Folder and Plays Songs.**

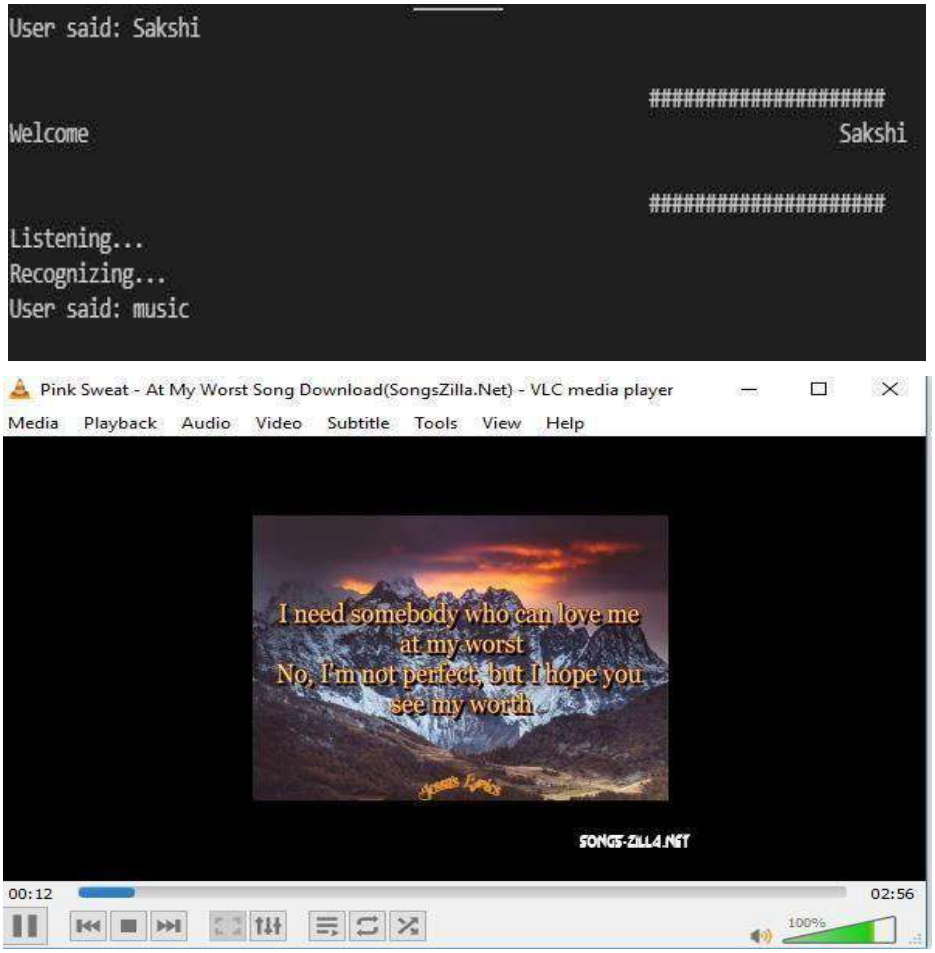

Fig: Output for command music play

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[VI]CONCLUSION

The project is a voice assistant for visually impaired people for them to use the computers effectively. It does not require keyboard input for them to run some commands. With the help of speech to text and text speech, the user can interact with the customized system. The features like news, music, video player, read/write an email, etc. It eliminates the need for remembering complex keyboard commands. It is not only useful for the visually impaired but also for other people too. It will get the work done easily and with certain perfection.

[VII] REFERENCES

[1] "Accurate and compact large vocabulary speech recognition", INTERSPEECH 2013, pp.662-665, ISCA

[2] “A Reading aid for the Blind People using OCR and OpenCV”, MallapaD. Gaurav, Shruti S. Salimath, Shruti B. Hatti, Vijayalaxmi I. Byakod, ShivaleelaKanade IJSRET Journal 2017.

[3] “Disabled people and the Internet: experiences, barriers and opportunities.” York, UK: Pilling, D., Barrett, P. and Floyd, M., Cesspools and lords et al.

[4] "Natural human-computer interaction for virtual personal assistant systems", Williams.DeLeeuw

[5] "Next- generation of virtual personal assistants Microsoft Cortana, Apple Siri, Amazon Alexa and Google Home", Veton Kepuska

[6] "Voice-based e-mail system for blinds", International Journal of Research Studies in Computer Science and Engineering (IJRSCSE), ISSN 2349-4859

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THREE LEVEL AUTHENTICATION SYSTEMS

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ABSTRACT
Despite many efforts taken nowadays still security threats can be seen everywhere. And from the start, we are using just single-level password authentication factors, which is not sufficient to give more security. To be more secure we can think of a Three-Level Password Authentication System. So this is an idea to implement three levels of password authentication for true users. In short, we can say, this is to implement three levels of security. The First level password constitutes of simple text-based password and double encrypted with a custom caesar cipher and AES algorithm this effort is taken to resist shoulder surfing attacks through the text password. In the Color Combination password, where users can set different combinations of colors using hex color codes according to their choice just by clicking on those colors forms the second level of authentication. The third level uses a Random File as a Password there at first user has to select a file to use as a password. These three levels are used as a key for custom substitution cipher algorithms.

Keywords: Authentication, Text Based Password, MySQL, JavaFx, Hex Color Code, JDBC, Eclipse, AES algorithm, Caesar cipher.

I. INTRODUCTION
As the ever-changing digital world provides us with a lot of perks and ease in everyday work, there are also security issues and challenges that arise daily, and one of these issues is authentication. Authentication is a very important part of any digital or software application, for a basic level of authentication we use text-based passwords but with time even they became vulnerable, so to increase the security two-factor authentication was introduced. In two-level authentication the second level of security is used as a biometric, captcha, etc which increases the complexity for hackers and makes the system more secure, thus to further increase the security we have used Three Level Authentication. This project gives more security to the user and validates users for accessing the system only when they have input the correct password. The project involves three levels of user authentication. This project contains three logins which include three different kinds of password systems. The password difficulty increases as the authentication level increases. Users have to enter or input the correct password for a successful login. Users will have the right to set passwords according to their wishes. This project comprises text passwords i.e.passphrase, color combination, and graphical password for the three levels respectively. Along these lines there would be immaterial odds of a bot or anybody splitting passwords regardless of whether they have broken the principal level or second level, it is difficult to break the third one. While making the innovation the accentuation was put on the utilization of inventive and untraditional techniques. Numerous clients locate the broadest text-based secret key frameworks hostile, so on account of the three-level secret key, we had a go at making a straightforward UI and giving clients the best possible comfort in solving passwords**.**

II. LITERATURE SURVEY
User Authentication: A Three-Level Password Authentication Mechanism by Gouri Sankar Mishra, Pradeep Kumar Mishra, Parma Nand, Rani Astya, Amrita. published by: International Journal of Engineering Research and Technology IJERT in 2020: In this paper, they have used three levels of authentication and in that the first level is a textual password where the user will have to set up a password at the time of registration and at login the same password needs to be entered to clear the level. The second level of authentication is a color pattern in which the user needs to select the same color pattern that he chose at the time of registration. The last level of authentication is OTP, where the user needs to enter an OTP that is sent at the time of login to the registered mail. [1]

3 Level Security System: A 3 Level Security System by Anaswara Davis, published by IJERT inn 2015 . Here the first level of this is the text-based password that the user needs to enter while login same as registration, then the second level comes as an image-based password where the user needs to select the same three images from three grids that they chose at the time of registration and lastly, they need to verify the third level of authentication which is an OTP sent to their registered email.[2]

Three Level Security System Using Image-Based Authentication: A Three-Level Security System Using Image-Based Authentication by S Gopalkrishna, M Aparna, C.M. Anjushree. Published by IJARCCE in 2018. In this,

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the first level of authentication is the text-based password that is set at the time of registration and while the login user needs to enter the same, the second level of authentication is image-based authentication where the user needs to select images at the time of registration from a grid and later at the time of login user needs to select the same images from the grid in the same sequence. the third level here is OTP validation where the one-time password is sent to the user during login and the user needs to enter that correctly to clear the authentication process.[3]

3LAS (Three Level Authentication Scheme): A 3LAS (Three Level Authentication Scheme) by Kunal mulwani, Saurabh Naik, Navinkumar Gurani, Dr. Nupur GirI, Prof Sharmila Sengupta. published by IJETAE in 2013 . In this a graphical method is used for authentication, as textual passwords are used commonly nowadays and day by day new methods are invented to crack the textual password. Whereas a graphical password is more secure and can also overcome drawbacks of textual passwords like shoulder surfing, key logging etc.[4]

III. PROPOSED SYSTEM

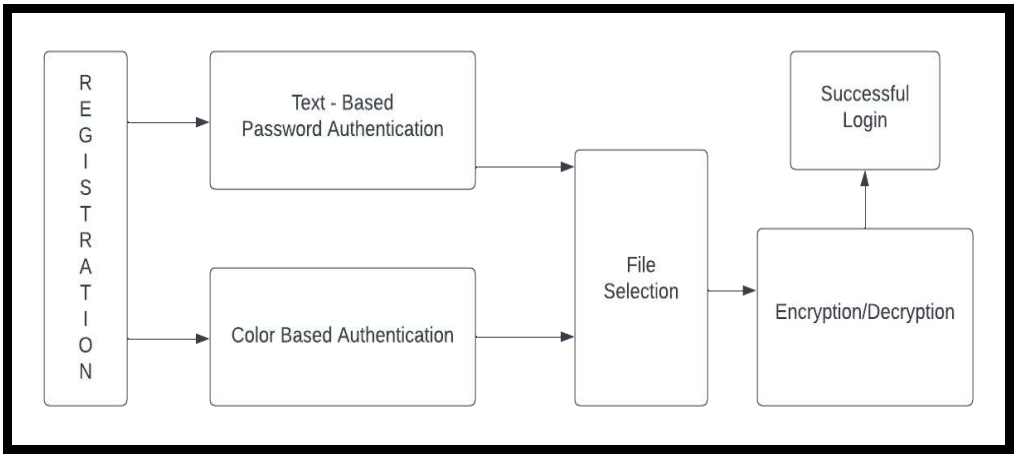

Fig 1: System Block Diagram

The implementation phase of the Three Level Authentication System includes three phases the first phase will be the text-based password, the user will have to enter a textual password at the time of registration and the password should be greater than eight characters and must include numbers and special symbols with at least one caps letter. This password is saved in the database with encryption, later at the time of logging in the user needs to enter the exact password to clear through the first phase of authentication. The second phase consists of a color pattern that means the user will be presented with a color grid from which the user has to choose colors and those colors are saved in the database, and at the time of login to the second phase, the user will have to select the same color codes as during the time of registration to clear that phase. The last level of authentication has a file selection method, here at the time of registration the user can choose any file from the system and there's no restriction to the number of files that can be chosen, the name of the file is saved to a database along with the extension to increase security, later at the time of authentication the user needs to choose the same files with same chronology to successfully access the system. After this, the user can encrypt any of his files using the encrypt button and decrypt using the decrypt button.

IV. TECHNOLOGY USED

Java: Java is used for our frontend. Java is rarely used in frontend development. Java is perfect for writing whole apps with complicated logic, large or complex data sets, and desktop-style interfaces. Custom algorithms, Javafx, and AES algorithm packages are used.

MySql: SQL is a language programmers use to create, modify and extract data from the relational database, as well as control user access to the database.

Advanced Encryption Standard (AES): Advanced Encryption Standard (AES) is a specification for the encryption of electronic data established by the U.S National Institute of Standards and Technology (NIST) in 2001. AES is widely used today as it is a much stronger than DES and triple-DES despite being harder to implement.

- AES is a block cipher.
- The key size can be 128/192/256 bits.
- Encrypts data in blocks of 128 bits each.

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That means it takes 128 bits as input and outputs 128 bits of encrypted cipher text as output. AES relies on substitution-permutation network principle which means it is performed using a series of linked operations which involves replacing and shuffling of the input data.

Working of the Cipher
AES performs operations on bytes of data rather than in bits. Since the block size is 128 bits, the cipher processes 128 bits (or 16 bytes) of the input data at a time.

The number of rounds depends on the key length as follows:

128 bit key – 10 rounds

192 bit key – 12 rounds

256 bit key – 14 rounds

Creation of Round keys:

A Key Schedule algorithm is used to calculate all the round keys from the key. So, the initial key is used to create many different round keys which will be used in the corresponding round of the encryption.

Encryption:
AES considers each block as a 16-byte (4-byte x 4 bytes = 128) grid in a column major arrangement.

[b0 | b4 | b8 | b12 |

| b1 | b5 | b9 | b13 |

| b2 | b6 | b10| b14 |

| b3 | b7 | b11| b15]

Each round comprises 4 steps:

Sub Bytes

Shift Rows

Mix Columns

Add Round Key

Decryption:
The stages in the rounds can be easily undone as these stages have an opposite to it which when performed reverts the changes. Each 128 blocks goes through the 10,12 or 14 rounds depending on the key size.

The stages of each round in decryption are as follows:

Add round key

Inverse Mix Columns

Shift Rows

Inverse Sub Byte

With AES algorithm, a custom algorithm is also used as a two-level security.

V. RESULT AND DISCUSSION

Fig 2: Registration Level 1

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In the first level of registration, the user will be prompted to enter some details and a textual password that can be used at the time of login

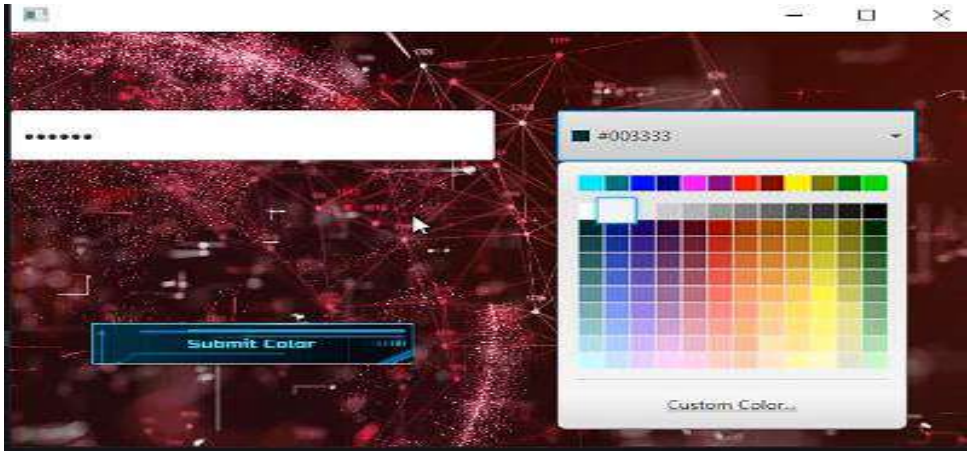

Fig 3: Registration Level 2

In the second phase of registration, the user can select colors from a color grid that will be on the screen, and later at the time of login same color codes needs to be selected to clear the phase.

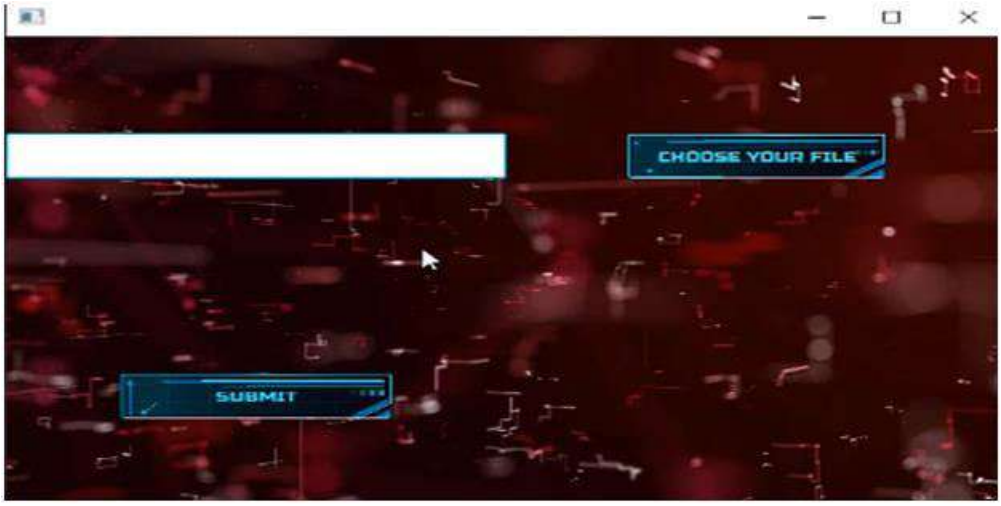

Fig 4: Registration Level 3

In the last phase of registration, the user can choose a file of a number of files and the name of a file with its extension is saved to the database, later at the time of logging in the same file needs to be selected in the correct order to clear the authentication.

Fig 5: Encryption/Decryption

Here the user can use encrypt/decrypt button to perform the encryption or decryption of the selected file.

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VI. CONCLUSIONS

Three levels are efficient because users need to go through three different authentication phases with increased difficulty. Firstly, we have a simple basic authentication using a text-based user id and password. With the benefit of having three-level password authentication, we can check a bot and user security code so we cover all three major security fields. However, time complexity can be high but security is also high and there are regions where you can compromise with a little bit of time complexity but not at all with data security.

REFERENCES

[1] M.Aparna, S.Gopalakrishnan, C.M.Anjusree. "Three Level Security System using Image Based Authentication ", International Journal of Advanced Research in Computer and Communication Engineering, IJARCCE Nov 2018.

[2] Gouri Sankar Mishra, Pradeep Kumar Mishra, Parma Nand, Rani Astya, Amrita, " User Authentication: A Three Level Password Authentication Mechanism ", International Conference on Computational Physics in Emerging Technologies, ICCPET 2020.

[3] Kunal Mulwani, Saurabh Naik, Navinkumar Gurnani, Dr. Nupur Giri, Prof. Sharmila Sengupta. “3LAS (Three Level Authentication Scheme) " , International Journal of Emerging Technology and Advanced Engineering , IJETAE 2013 .

[4] Anaswara Davis. “3 Level Security Systems”, International Journal of Engineering Research & Technology, IJERT 2015.

[5] Xinyi Huang, Yang Xiang, Member, IEEE, Ashley Chonka , Jianying Zhou, and Robert H. Deng, Senior Member, IEEE . “A Generic Framework for Three-Factor Authentication: Preserving Security and Privacy in Distributed Systems ", IEEE Transactions on Parallel and Distributed Systems, IEEE 2011.

[6] Bandar Omar ALSaleem, Abdullah I. Alshoshan. "Multi-Factor Authentication to Systems Login " , National Computing Colleges Conference , NCCC 2021 .

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MOVIE RECOMMENDATION SYSTEM USING SENTIMENTANALYSIS

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ABSTRACT
Recommendation system has become an essential part of E-commerce and Digital Marketing. It is difficult to filter out options for an Individual based on personal preference and it is a major challenge for the recommendation system. Many users keep wondering what would bethe next best thing to watch in their limited free time. A good recommendation helps solve the issue. The proposed system is built on the Content-Based Recommendation System. Users will receive user preference-based results, as well as an analytical version of a set of reviews, saving them from having to read through a lengthy paragraph of review. The user will learn the simplestmeaning of it by just two keywords: good and bad. Sentiment Analysis is used to perform this analysis. In the Movie Recommendation System machine learning algorithms are implemented to solve this issue. This system works on the individual's rating and would suggest certain options based on the user's previous watch. As it calculates the similarity between different users' taste and rating given by them for further Recommendations.

Keywords: Bad, Content-Based, Good, Movie Recommendation, Machine Learning Reviews, Sentiment Analysis.

I. INTRODUCTION
In today's world, entertainment is the most important element of one's lifestyle. As OTT grows inpopularity as a result of the digital revolution, more and more people are turning away from traditional concrete block movie theatres and toward monthly subscription-based OTT. Users areenrolled to multiple OTT services, however, because corporates are competing to acquire major titles and publish them under their banner. As more content becomes available to the user, the user's perplexity about what to watch grows. A consumer spends more time perusing the catalogue than actually watching the content. Users should have a good number of recommendations from past material so that they can simply choose what to watch next. The goal of the movie recommendation system is to make the catalogue browsing experience more user friendly and easyto analyze for the user in order to reduce buffer time.

II. PROBLEM STATEMENT
We've all been in the situation when, instead of viewing something significant at lunch, we just keep scrolling through the vast catalogue of movies and shows, and before we know it, our time isgone. Instead of navigating through the sea of options, we may just check the recommendations forthe genres we enjoy watching. As a result, this system is built on the Recommendation System, which provides consumers with a variety of choices from which to choose. Users will berecommended movies by this method. This system is based on the individual's rating and would recommend certain options based on the user's previous viewing history. As it computes the similarity between different users' tastes and ratings for future recommendations.

III. LITERATURE SURVEY
1) Bagher Rahimpour Cami, Hamid Hassanpour, and Hoda Mashayekhi proposed a Content- based Movie Recommender System Based on Temporal User Preferences. It implements theTemporal Preference Model, which is trained with three primary elements in mind: interest extraction, preference inference, and prediction. The dataset of movies is gathered from IMDB and then separated into these three key elements depending on the plot, rating, and genre. The suggested system provides consumers with reliable results based on the content seen, as well asrecommendations for new movies connected to the content.

2) B Venkatesh and Subramanyam Kunisetti introduced Content-Based Movie Recommendation System Using Genre Correlation. The objective of this system is to give consumers with material based on a dataset that has been partitioned into two portions. One partoffers a list of movies as well as the genres into which they have been classified. The other sectionof the dataset comprises a list of movie ratings given by the user on a scale of 1–5, with 5 beingthe highest. The rating has been converted to binary values for ease of use. It compares the similarity of the values.

3) Minjae Kim, SungHwan Jeon and Heeseong Shin proposed Movie Recommendation Based on User Similarity of Consumption Pattern Change. The purposed system is to forecast and propose a movie based on user movie consumption behaviours. Because it calculates user similarity based on movie rating data and

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classifies users with similar movie preferences. The system uses RNN to learn movie consumption patterns of comparable user groups and then forecast or recommend movies based on those patterns. They use a collaborative filtering algorithm to demonstrate the system's usefulness. To demonstrate the prediction, they employ simple RNN and modified RNN on the dataset.

4) Sai Rohit, Vishwas Sathish, Tanya Mehrotra, and Bhaskarjyoti Das introduced Applications of Optimal Stopping Algorithm for Social Graph Based Recommendation. This system has proposed Basic item-based recommendation algorithms were enhanced to take into account the effect of a user's social circle when making recommendations. Depending on a person's social network. The things to be recommended were chosen by the user. Apart from that,as a result of this, his past movie ratings were deemed to be inadequate. Acquire a sense of his tastes, which were then combined with the preferences of this ego-network to get a list of suggestions.

IV. OBJECTIVE

The system's major goal is to give users with a movie recommendation system in order to save theusers' time.

To give movie data to users, such as the release date, genres of the movie discussed, release date, director's details, actor details, and so on.

Users to have insight with reviews of the specifically sought movie, analyze the reviews using sentiment analysis, and provide a positive or negative result to the user.

Help users with suggestions depending on the movie they have looked for, and to strive to deliveras accurate recommendations as possible based on the movie.

V. REQUIREMENTS

i) Software Requirements

A. Operating system: Any windows will be optimal enough for running this project.

B. Programming languages: Python

C. **Front-end:** HTML, CSS

D. **Framework:** Flask

E. **API:** TMDB

ii) Hardware Requirements:

A. **System:** A pc with minimum 4 gb ram, intel Pentium and above processor.

VI. ALGORITHMS

Cosine Similarity

The proposed outcomes were implemented with the help of cosine similarity. The output is based on the similarity scores. It is a numerical value that runs from 0 to 1 and is used to determine howsimilar two items are on a scale of 0 to 1. By analysing the text details of both items, the similarity score is calculated. This is accomplished through the use of cosine similarity. The advantage of cosine similarity is that even though the items are plotted far apart by Euclidean distance, there is achance they will be plotted closer together in cosine similarity. As a result, the output is better streamlined.

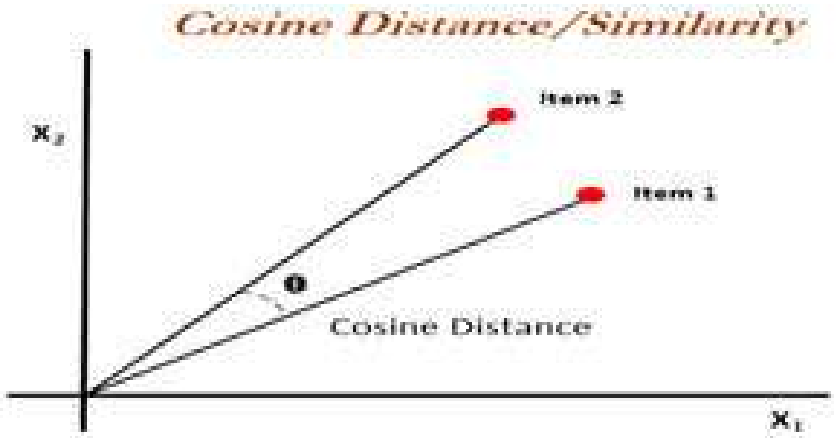

Chart -1: Cosine Distance/Similarity

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Naive Bayes Algorithm:
It's a classification method based on the Bayes theorem and the assumption of predictor independence. The presence of a given feature in a class is assumed by a Naive Bayes classifier. The Naive Bayes theorem allows us to calculate probability. The data is transformed into a frequency table, and a likelihood table is constructed, giving us a yes/no probability. It is the result of the input given. Naive Bayes outperforms other algorithms like logistic regression, and it requires less training, which is a plus.

VII. METHODOLOGY

The movie recommendation system uses cosine similarity and the naive bayes algorithm, as well as the TMDB API and beautifulsoup4 to scrape data from the IMDB site for reviews. For the years 2018, 2019, and 2020, the data sets used were the IMDB 5000 Movie Dataset, The Movies Dataset, and a list of movies from Wikipedia. When a user conducts a movie search, the results are sent to the database for filtering. Following the filtering, the user is supplied with movie data, which includes the title, overview, rating, genre, release date, runtime, and status of the film. The user is also given information about the movie's cast. The user can click on a certain cast member to learn more about that person's personality.

For sentiment analysis, the reviews from IMDB are fed through a trained model using the Naive Bayes algorithm. The output is generated as a consequence of a good/bad review analysis, which allows the user to save time that would otherwise be spent reading the review. We also present recommended movies based on the searched movie, which we collected using cosine similarity, which helps compare and provide similar results.

1. The User will visit the System.
2. It will Search for the movie.
3. The Search result will be then given to the database for filtering.
4. After the Filtering the Recommended list is given to the user.
5. The list will also show the reviews which have been also segmented with sentiment analysis (as a “Good” or “Bad” Review).

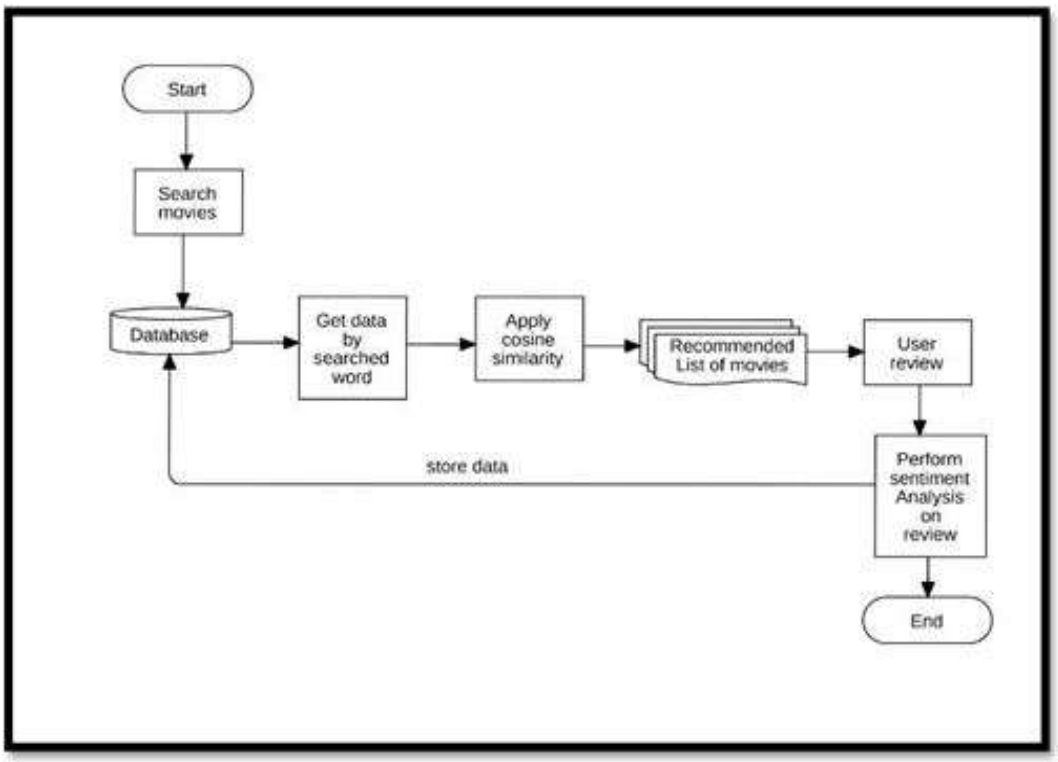

Chart -2: Methodology Used

VIII. RESULTS

When a user searches for a movie title, cosine similarity determines the distance closest to the result. As a result, when the user searches for a movie title, 10 recommendations linked to the same genre appear. The title that was searched will also display an overview, run time, and release date. The cast members' bios were included with the cast details.

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Fig 1: Home page

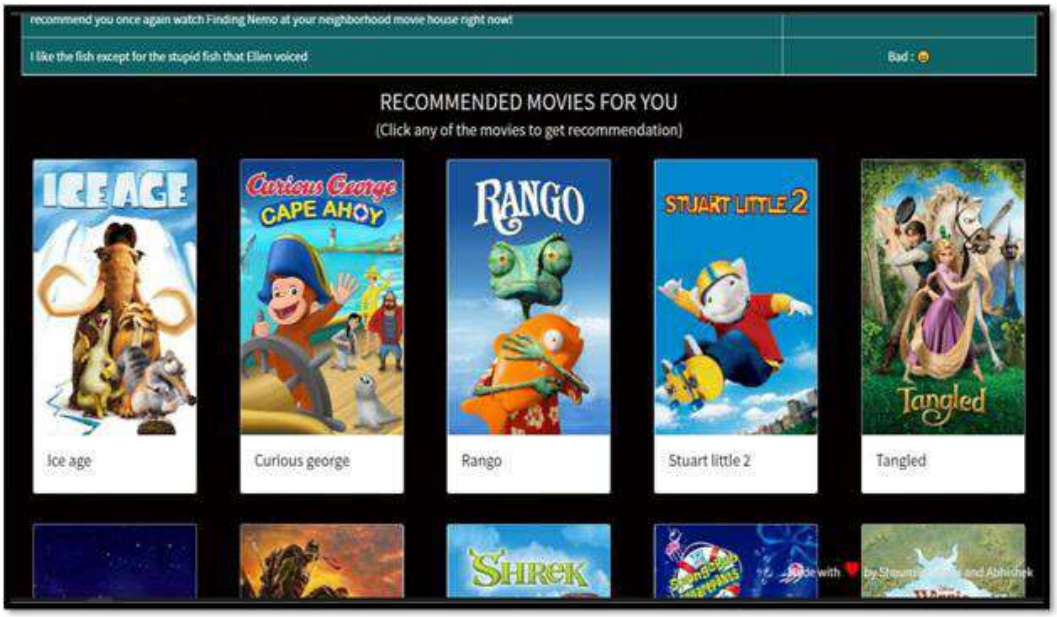

Fig 2: Recommendations

After the recommendation part, the user is provided a table where a long monologue of a review is delivered by a watcher, and this monologue is translated to a simple response of “Good” or “Bad” via sentiment analysis with naïve bayes. We have made it easier for users to choose a movieby doing so.

Fig 3: Review Analysis

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IX. CONCLUSIONS

Our system mainly focuses on making a unique experience for the user as it gives user content related to the searches and also gives more recommendations to explore around. The paper pointsout certain outcomes for the recommendation systems as the system only tends to provide user content based on the rating the user has provided to a certain genre of movies as basis on which the recommendation list is provided to the user. As in this project we try to overcome some aspects. As our system gives insight regarding the movies as users also explore the review section. At timesreading or analyzing the review can get tricky for users. We have also taken care of that aspect. As we have applied sentiment analysis on given reviews so the system can distinguish whether the content was pleasing or not for the user. Though users can analyze how many users have liked the movie and disliked it through the review section.

REFERENCES

[1] Bagher Rahimpour Cami, Hamid Hassanpour, Hoda Mashayekhi, A Content-based Movie Recommender System Based on Temporal User Preferences, 2017 3rd Iranian Conference on Signal Processing and Intelligent Systems (ICSPIS), 2017 IEEE, pp. 122-124.

[2] Rupali Hande, Ajinkya Gutti, Kevin Shah, Jeet Gandhi, Vrushal Kamtikar, MovieMender- A Movie Recommender System, International Journal of Engineering Studies and Research Technology, Nov.2017, pp. 470-472.

[3] SRS Reddy, Sravani Nalluri, Subramanyam Kunisetti, S. Ashok, B. Venkatesh, Content-Based Movie Recommendation System Using Genre Correlation, ResearchGate Publication ConferencePaper, nov.2018, pp. 393-397.

[4] Minjae Kim, Wonseok Choi, SungHwan Jeon, Haejin Chung, Heeseong Shin, Yunmook Nah - Movie Recommendation Based on User Similarity of Consumption Pattern Change, 2019 IEEE Second International Conference on Artificial Intelligence and Knowledge Engineering (AIKE).

[5] Sai Rohit, Vishwas Sathish, Tanya Mehrotra, Bhaskarjyoti Das, Applications of Optimal Stopping Algorithm for Social Graph Based Recommendation, 2019 IEEE Students Conference on Engineering and Systems (SCES).

[6] Bagher Rahimpour Cami, Hamid Hassanpour, and Hoda Mashayekhi. User trends modeling for a content-based recommender system. Expert Systems with Applications, 87(30):209–219, 2017.

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FORGE: A VOICE MIMICKING TECHNOLOGY

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ABSTRACT
Technological advancement has continued to develop over the once two decades impacting how we engage with each other. Text-to- speech has been a crucial area of focus for software inventors in recent times, especially those working in fields similar as developing AI for smart machines, deep- literacy, and NLP. We present a neural network- grounded system for textbook-to- speech (TTS) conflation that's suitable to induce speech audio in the voice of different speakers, including those unseen during training. Our system consists of three singly trained factors a speaker encoder network, a sequence-to- sequence conflation network grounded on Tacotron 2, an bus-accumulative WaveNet- grounded vocoder network. We demonstrate that the system is suitable to transfer the knowledge of speaker variability learned by the discriminatively trained speaker encoder to the multi-speaker TTS task and is suitable to synthesize natural speech from speakers'unseen during training. We quantify the significance of training the speaker encoder on a large and different speaker set in order to gain the stylish conception performance. Eventually, we show that aimlessly tried speaker embeddings can be used to synthesize speech in the voice of new speakers different from those used in training, indicating that the model has learned a high- quality speaker representation. As similar, the thing of this design was to produce a tool for generating natural speech from textbook for a variety of speakers. The result of this design demonstrates the capability of neural network to be useful in this task.

Keywords: Voice cloning, voice recognition, Deep learning, Speaker Encoder, Synthesizer, Wavenet , vocoder, Text-to-speech.

I. INTRODUCTION
Forge is an implementation of Transfer Learning from Speaker Verification to Multi-Speaker Text-to-Speech synthesis with a vocoder that works in real- time. It's a deep literacy frame in three stages. In the first stage, one creates a digital representation of a voice from a many seconds of audio. In the alternate and third stages, this representation is used as reference to induce speech given any arbitrary textbook.

It consists of three independent factors which is introduced to give an effective result to the multi-speaker adaption during speech conflation. These factors videlicet Speaker Encoder, Synthesizer and Vocoder are deep literacy models that are trained singly of each other. It allows creating a numerical representation of a voice from a many seconds of audio and to use it to condition the model to induce new voices.

The thing of this work is to make a TTS system which can induce natural speech for a variety of speakers in a data effective manner. We specifically address a zero- shot literacy setting, where a many seconds of un transcribed reference audio from a target speaker is used to synthesize new speech in that speaker's voice, without streamlining any model parameters. Similar systems have availability operations, similar as restoring the capability to communicate naturally to druggies who have lost their voice and are thus unfit to give numerous new training exemplifications. They could also enable new operations, similar as transferring a voice across languages for further natural speech-to- speech restatement or generating realistic speech from textbook in low resource settings.

Synthesizing natural speech requires training on a large number of high- quality speech- paraphrase dyads, and supporting numerous speakers generally uses knockouts of twinkles of training data per speaker. Recording a large quantum of high- quality data for numerous speakers is impracticable. Our approach is to uncouple speaker modeling from speech conflation by singly training a speaker-discriminational embedding network that captures the space of speaker characteristics and training a high- quality TTS model on a lower dataset conditioned on the representation learned by the first network. Divorcing the networks enables them to be trained on independent data, which reduces the need to gain high quality multi-speaker training data. We have trained the speaker embedding network on a speaker verification task to determine if two different utterances were spoken by the same speaker. In discrepancy to the posterior TTS model, this network is trained on un transcribed speech containing reverberation and background noise from a large number of speakers. We demonstrate that the speaker encoder and conflation networks can be trained on unstable and disjoint sets of speakers and still generalize well.

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II. LITERATURE REVIEW

There has been significant interest in end-to- end training of TTS models, which are trained directly from text-audio duos, without depending on hand framed intermediate representations. Tacotron 2 (6) used WaveNet (11) as a vocoder to invert spectrograms generated by an encoder-decoder framing with attention, attaining naturalness approaching that of natural speech by combining Tacotron's prosody with WaveNet's audio quality. It only supported a single speaker.

Gibiansky etal. (5) introduced a multispeaker variation of Tacotron which learned low-dimensional speaker embedding for each training speaker. Deep Voice 3 proposed a completely convolutional encoder-decoder architecture which gauged up to support over speakers from LibriSpeech.

These systems learn a fixed set of speaker embeddings and thus only support conflation of voices seen during training. In discrepancy, VoiceLoop (10) proposed a new armature grounded on a fixed size memory buffer which can produce speech from voices unseen during training. Attaining good results needed knockouts of twinkles of registration speech and reiterations for a new speaker.

Recent extensions have enabled many- shot speaker adaption where only a many seconds of speech per speaker (without reiterations) can be used to induce new speech in that speaker's voice. Neural voice cloning by Sercan O Arik etal. (2) Extends Deep Voice 3, comparing a speaker adaption system analogous to VoiceLoop, where the model parameters (including speaker embedding) are fine-tuned on a small quantum of adaption data to a speaker garbling system which uses a neural network to prognosticate speaker embedding directly from a spectrogram. The ultimate approach is significantly further data effective, carrying advanced lightheartedness using small quantities of adaption data, in as many as one or two utterances. It's also significantly further computationally effective since it doesn't bear hundreds of backpropagation duplications.

Nachmani etal. (7) also extended VoiceLoop (10) to use a target speaker garbling network to prognosticate a speaker embedding. This network is trained concertedly with the conflation network using a contrastive trinity loss to insure that embeddings prognosticated from utterances by the same speaker are near than embeddings reckoned from different speakers. In addition, a cycle- thickness loss is used to insure that the synthesized speech encodes to a analogous embedding as the adaption utterance.

An analogous spectrogram encoder network, trained without a triplet loss, was shown to work for transferring target prosody to synthesized speech. In this paper we demonstrate that training a analogous encoder to distinguish between speakers leads to dependable transfer of speaker characteristics. Our work is most analogous to the speaker garbling models in Neural Voice cloning by Sercan O Arik etal. (2) and befitting new speakers grounded on untanscribed sample by Eliya Nachmani etal. (7), except that we use a network singly- trained for a speaker verification task on a large dataset of untranscribed audio from knockouts of thousands of speakers, using a state-of-the- art generalized end-to- end loss by Li Wan et al (4).

Eliya Nachmani etal. (7) incorporated a analogous speaker-discriminational representation into their model, still all factors were trained concertedly. In discrepancy, we explore transfer literacy from apre-trained speaker verification model.

Doddipatla etal. (8) in DNN grounded speech conflation used a analogous transfer learning configuration where a speaker embedding reckoned from apre-trained speaker classifier was used to condition a TTS system. In this paper we use an end-to- end conflation network which doesn't calculate on intermediate verbal features, and a mainly different speaker embedding network which isn't limited to a unrestricted set of speakers. Likewise, we dissect how quality varies with the number of speakers in the training set, and find that zero- shot transfer requires training on thousands of speakers, numerous further than were used in Speaker adaption in DNN grounded speech conflation using d-vectors.

III. PROJECT DESIGN AND IMPLEMENTATION

3.6 Overview

This system aims to resolve real time voice replicating challenges by offering a technology which will synthesize voice from text while retaining its naturalness. With technologies developing every day in such a fast pace, the need for better system that can give best possible result is high. Text to Speech Synthesis is a problem that has operations in a wide range of scripts. They can be used to read out pdfs loud, help the visually crippled to interact with text, make chatbots more interactive etc. Historically, numerous systems were erected to attack this task using signal processing and deep literacy approaches. As numerous positive, instigative use cases for voice cloning are arising, Forge has marked a huge scope for voice mimicking and can be used in promoting the development of this technology.

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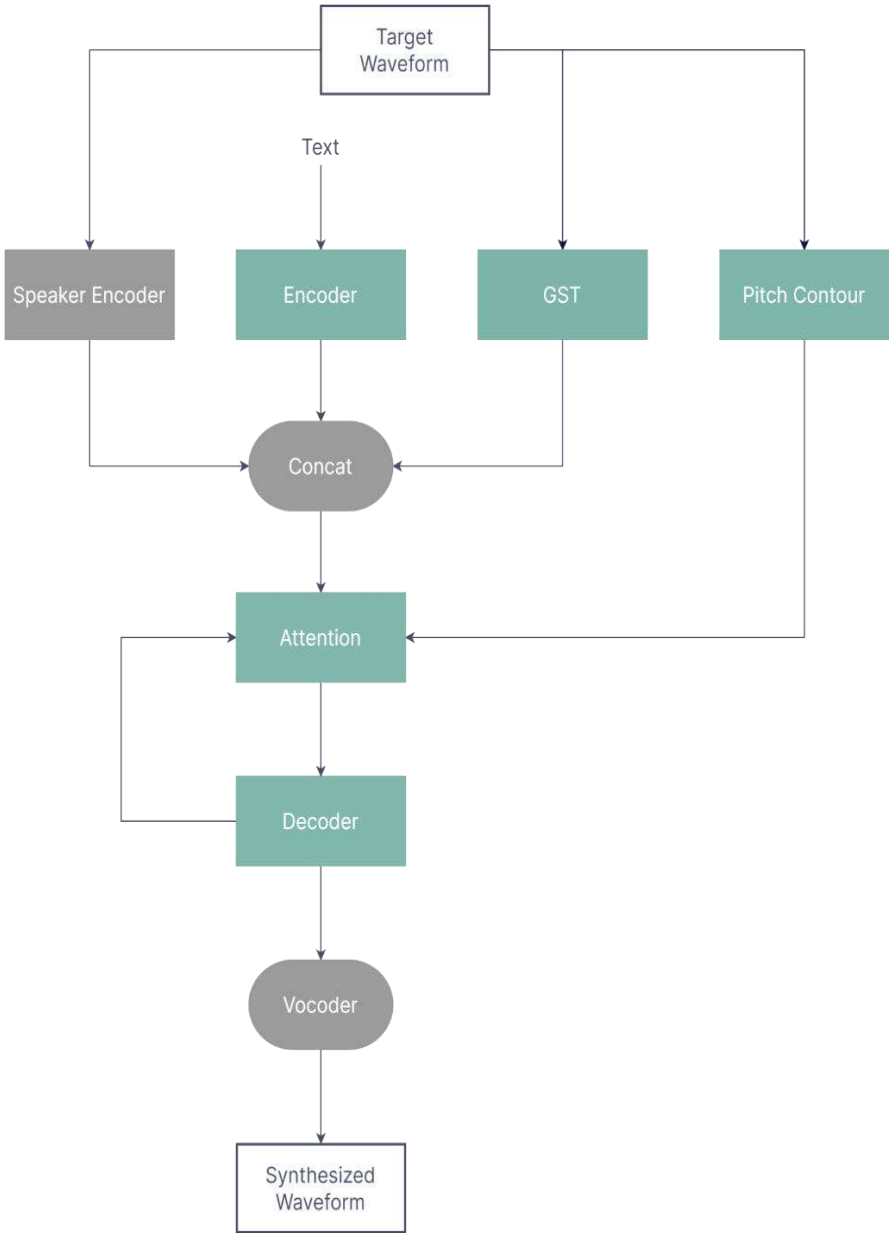

Fig 3.1 Flow Chart of Forge

3.7 Existing System:

There has been some advance development in the field of voice cloning in the past several times. One correspondent is WaveNet by google where ae.g. Genuinely large database of short speech fractions is recorded from a single speaker. Also these fractions are recombined to form the complete utterances. The strike of this approach is that you'll need a completely new database of audio samples if you want to make minor tweaks to the voice, like altering the emphasis or emotion. Also, the audio samples generated by this approach are really unnatural, glitchy and robotic. A debit of autoregressive models like WaveNet is that they tend to learn original structure much better than global structure. It's further conspicuous when modeling high-dimensional distributions.

Another similar development would be Deep Voice. Deep Voice is a TTS system developed by the experimenters at Baidu. Its first interpretation, Deep Voice 1 was inspired by the traditional textbook-to-speech channels. It adopts the same structure, but replaces all factors with neural networks and uses simpler features. First, it converts the textbook to phonemes and also uses an audio synthesis model to convert verbal features into speech. The rearmost interpretation of this design is Deep Voice 3, which uses a completely-convolutional character-to-spectrogram armature. Two approaches were took up by Baidu's experimenters Speaker adaptation and Speaker encoding. Both approaches can deliver good performance with minimum audio input data and both of them can be integrated into the deep voice system without demeaning the quality of the system.

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3.8 Proposed System

Our system describes a neural network-based system for text-to-speech (TTS) synthesis that is able to generate speech audio in the voice of different speakers. It is composed of three independently trained neural networks, illustrated in Figure:

(1) A recurrent speaker encoder, which computes a fixed dimensional vector from a speech signal,

(2) A sequence-to-sequence synthesizer, which predicts a Mel spectrogram from a sequence of grapheme or phoneme inputs, conditioned on the speaker embedding vector, and

(3) An autoregressive WaveNet vocoder, which converts the spectrogram into time domain waveforms.

It takes a clean audio sample and text from the user as input and produces speech in the exact voice which was given as input saying the exact text as output.

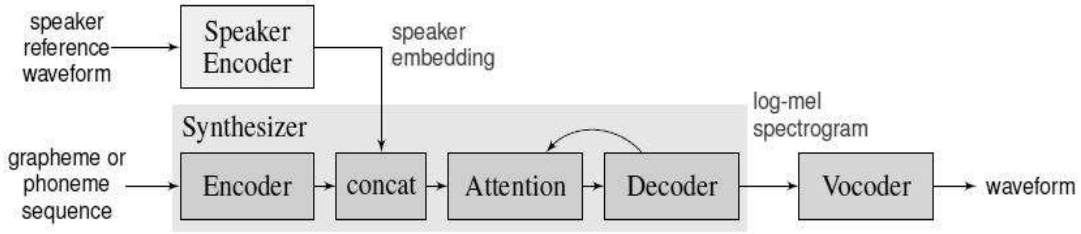

Figure 1: Proposed System

Algorithm

1. Input a small audio sample of the voice we wish to use .
2. Encode the voice waveform into a fixed dimensional vector representation.
3. Input a piece of text
4. Encode the text into a vector representation too.
5. Combine the two vectors of speech and text and decode them into a Spectrogram
6. Use a Vocoder to transform the spectrogram into an audio waveform that we can listen to.

IV. TECHNOLOGY STACK

We describe a neural network- based system for text-to- speech (TTS) synthesis that's suitable to produce speech audio in the voice of numerous different speakers, including those unseen during training. Our system consists of three singly trained factors (1) a speaker encoder network, trained on a speaker verification task using an independent dataset of noisy speech from thousands of speakers without transcriptions, to produce a fixed-dimensional embedding vector from seconds of reference speech from a target speaker; (2) a sequence-to- sequence conflation network based on Tacotron 2, which generates a Mel spectrogram from text, conditioned on the speaker embedding; (3) an bus-accumulative WaveNet-based vocoder that converts the Mel spectrogram into a sequence of time sphere waveform samples.

We demonstrate that the proposed model is suitable to transfer the knowledge of speaker variability learned by the discriminatively- trained speaker encoder to the new task, and is suitable to synthesize natural speech from speakers that weren't seen during training. We quantify the significance of training the speaker encoder on a large and different speaker set in order to gain the best generalization performance. Eventually, we show that randomly tested speaker embeddings can be used to synthesize speech in the voice of new speakers different from those used in training, indicating that the model has learned a high-quality speaker representation. Following is the detailed description of each individual factors.

1. **Speaker Encoder:** The voice data from each speaker is encrypted in an embedding generated by a neural network trained using speaker verification loss. The Speaker verification loss is calculated by predicting whether two voice samples are from the same user or not.
2. **Synthesizer**: Synthesizer is the core component of the Text-to-Speech Synthesis. The sequence of phonemes is taken as inputs to produce a spectrogram of the corresponding text input. Phonemes are tiny units of a sound of words. Each word gets broken down into the phonemes and sequence input is created for the model. This model also requires Speaker encodings to support multi-Speaker voices.
3. **Vocoder:** A sample-by-sample autoregressive WaveNet model is used as a vocoder to invert synthesized Mel spectrograms emitted by the synthesis network into time-domain waveforms. In this model, Mel Spectrogram is taken as an input to produce time-domain waveforms.

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Technologies used

1. **PyTorch**: PyTorch is an open- source machine learning framework based on the Torch library, used for operations similar as computer vision and natural language processing, primarily developed by Facebook's AI Exploration lab (FAIR). It's free and open- source software released under the Modified BSD license. Although the Python interface is more polished and the primary focus of development, PyTorch also has a C interface.
2. **Matplotlib:** Matplotlib is a comprehensive library for creating static, animated, and interactive visualizations in Python. Matplotlib makes easy effects easy and hard effects possible. Matplotlib is a putting up library for the Python programming language and its numerical mathematics extension NumPy. It provides an object- acquainted API for rooting plots into operations using general- purpose GUI toolkits like Tkinter, wxPython, Qt, or GTK. There's also a procedural"pylab"interface grounded on a state machine (like OpenGL), designed to nearly act that of MATLAB, though its use is discouraged. SciPy makes use of Matplotlib. Pyplot is a Matplotlib module which provides a MATLAB-suchlike interface. Matplotlib is designed to be as usable as MATLAB, with the capability to use Python, and the advantage of being free and open- source.
3. **Librosa:** Librosa is a python package for music and audio analysis. It provides the structure blocks necessary to produce music information reclamation systems. Librosa is principally used when we work with audio data like in music generation (using LSTM's), Automatic Speech Recognition.
4. **Scikit- Learn:** Scikit- learns (formerly scikits.learn and also known as sklearn) is a free software machine literacy library for the Python programming language. It features colorful bracket, retrogression and clustering algorithms including support-vector machines, arbitrary timbers, grade boosting, k- means and DBSCAN, and is designed to interoperate with the Python numerical and scientific libraries NumPy and SciPy. Scikit- learns is a community trouble and anyone can contribute to it. Colorful associations likeBooking.com, JP Morgan, Evernote, Inria, AWeber, Spotify and numerous further are using Sklearn .
5. **Pillow:** Python Imaging Library is a free and open- source another library for the Python programming language that adds support for opening, manipulating, and saving numerous different image train formats. Development of the original design, known as PIL, was discontinued in 2011. Latterly, a successor design named Pillow branched the PIL repository and added.
6. **NumPy:** NumPy is a library for the Python programming language, adding support for large,multi-dimensional arrays and matrices, along with a large collection of high- ranking accurate functions to operate on these arrays. The ancestor of NumPy, Numeric, was firstly created by Jim Hugunin with benefactions from several other inventors. NumPy addresses the slowness problem incompletely by furnishing multidimensional arrays and functions and drivers that operate efficiently on arrays; using these requires rewriting some law, substantially inner circles, using NumPy.

Dataset

- **LibriSpeech:** The LibriSpeech corpus is a collection of roughly hours of audiobooks that are a part of the LibriVox design. Utmost of the audiobooks come from the Project Gutenberg. The training data is resolve into 3 partitions of 100 hr, 360 hr, and 500 hr sets while the dev and test data are resolve into the' clean'and' other' orders, independently, depending upon how well or challenging Automatic Speech Recognition systems would perform against. Each of the dev and test sets is around 5 hr in audio length. This corpus also provides the n-gram language models and the corresponding textbooks excerpted from the Project Gutenberg books, which contain 803M commemoratives and 977K unique words. LibriSpeech dataset is SLR12 which is the audio recording of reading English speech. The train format of data is in the form of FLAC (Free Lossless Audio Codec) without any loss in quality or loss of any original audio data. It's used in numerous operations similar as speaker recognition and automatic speaker verification.
- **VoxCeleb:** VoxCeleb is an audio-visual dataset conforming of short clips of natural speech, uprooted from interview vids uploaded to YouTube. VoxCeleb contains speech from speakers gauging a wide range of different races, accentuations, professions and periods. All speaking face- tracks are captured"in the wild", with background chatter, horselaugh, lapping speech, pose variation and different lighting conditions. The dataset consists of two performances, VoxCeleb1 and VoxCeleb2. Each interpretation has its own train/ test split. For each we give YouTube URLs, face findings and tracks, audio lines, cropped face vids and speaker meta-data. There's no imbrication between the two performances.

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- **VCTK CSTR's: VCTK** Corpus (Centre for Speech Technology Voice Cloning Toolkit) includes speech data uttered by 109 native speakers of English with colorful accentuations. Each speaker reads out about 400 rulings, utmost of which were named from a review plus the Rainbow Passage and an elicitation paragraph intended to identify the speaker's accentuation. The review texts were taken from The Herald (Glasgow), with authorization from Herald & Times Group. Each speaker reads a different set of the review rulings, where each set was named using a greedy algorithm designed to maximize the contextual and phonetic content. The Rainbow Passage and elicitation paragraph are the same for all speakers. This corpus was recorded for the purpose of structure HMM- grounded textbook-to- speech conflation systems, especially for speaker-adaptive HMM- grounded speech conflation using average voice models trained on multiple speakers and speaker adaption technologies.
- **PyQt:** PyQt is a Python list of the cross-platform GUI toolkit Qt, enforced as a Python draw- heft. PyQt is free software developed by the British establishment Riverbank Computing. It's available under correspondent terms to Qt performances older than4.5; this means a variety of licenses including GNU General Public License (GPL) and marketable license, but not the GNU Lesser General Public License (LGPL). PyQt supports Microsoft Windows as well as colorful flavours of UNIX, including Linux and MacOS (or Darwin).

Testing

Testing is the process of executing a program with the intent of detecting an error. Testing is a critical element of software quality assurance and presents ultimate review of specification, design and coding. System testing is an important phase. Testing represents an fascinating anomaly for the software. Therefore, a series of testing are performed for the proposed system before the system is ready for stoner accepting testing.

A good test case is one that has a high probability of chancing an undiscovered error. A successful test is one that bares an as undiscovered error.

The primary objective for test case design is to derive a set of tests that has the highest livelihood for expose defects in the software. To accomplish the objective two different categories of test case design techniques are used. They are

- White box testing
- Black box testing

System Test Plan

Sr. No.	Test Case Description	Expected Result	Actual Result	Test Case Criteria (P/F)
1	Upload audio sample successfully	Audio uploaded successfully	Audio uploaded successfully	P
2	Synthesis of vector embeddings	Embeddings created successfully	Embeddings created successfully	P
3	Input Text uploaded successfully	Input Text uploaded successfully	Input Text uploaded successfully	P
4	Successful synthesis of Mel spectrograms	Mel Spectrogram synthesized successfully	Mel Spectrogram synthesized successfully	P
5	Successful Vocoding	Vocoded successfully	Vocoded successfully	P
6	Successful Audio synthesis in real-time	Audio synthesized successfully	Audio synthesized successfully	P
7	Lag in audio (Native American English audio sample)	No lag found in audio	No lag found in audio	P
8	Lag in audio (Indian English audio sample)	No lag found in audio	Lag found in audio	F
9	Successful export of synthesized audio	Audio exported successfully	Audio exported successfully	P

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Mean Opinion Score

The quality of text-to- speech systems can be effectively assessed only on the base of reliable and valid listening tests to assess overall system performance. A mean opinion score (MOS) has been the recommended measure of synthesized speech quality.

The most broadly used direct approach of particular quality evaluation is the order judgment methodology in which listeners rate the quality of the test signal using a five- point numerical scale, with 5 indicating " excellent" quality and 1 indicating " wrong" or " bad" quality. This system is one of the styles recommended by the IEEE Subcommittee on particular styles as well as by ITU. The measured quality of the test signal is attained by comprising the scores attained from all listeners. This average score is generally appertained to as the Mean Opinion Score (MOS).

The MOS test is administered in two phases training and evaluation. In the training phase, listeners hear a set of reference signals that illustrate the high (excellent), the low (bad) and the middle judgment orders. This phase, also known as "anchoring phase", is veritably important as it's demanded to equate the private range of quality conditions of all listeners. That is, the training phase should in principle equate the "virtuousness" scales of all listeners to insure, to the extent possible, that what's perceived "good" by one listener is perceived "good" by the other listeners. A standard set of reference signals need to be used and described when reporting the MOS scores. In the evaluation phase, subjects hear to the test signal and rate the quality of the signal in terms of the five quality orders (1-5).

Detailed guidelines and recommendations for administering the MOS test include:

1. **Selection of Listening Crew**: Different number of listeners is recommended depending on whether the listeners had extensive experience in assessing sound quality. Minimum number of non-expert listeners should be 20 and minimum number of expert listeners should be 10. The listeners need to be native speakers of the language of the speech materials tested, and should not have any hearing impairments.
2. **Test Procedure and Duration**: Speech material (original and degraded) should be presented in random order to subjects, and the test session should not last more than 20 minutes without interruption. This step is necessary to reduce listening fatigue.
3. **Choice of Reproduction Device:** Headphones are recommended over loudspeakers, since headphone reproduction is independent of the geometric and acoustic properties of the test room. If loudspeakers are used, the dimensions and reverberation time of the room need to be reported.

For the above reasons – and due to several other contextual factors influencing the perceived quality in a subjective test – a MOS value should only be reported if the context in which the values have been collected in is known and reported as well. MOS values gathered from different contexts and test designs therefore should not be directly compared. It is not meaningful to directly compare MOS values produced from separate experiments, unless those experiments were explicitly designed to be compared, and even then, the data should be statistically analyzed to ensure that such a comparison is valid.

Due to the human tendency to avoid perfect ratings (now reflected in the objective approximations), somewhere around 4.3 - 4.5 is considered an excellent quality target. On the low end, call or audio quality becomes unacceptable below a MOS of roughly 3.5.

Rating	Speech Quality	Level of distortion
5	Excellent	Imperceptible
4	Good	Just perceptible, but not annoying
3	Fair	Perceptible but slightly annoying
2	Poor	Annoying but not objectionable
1	Bad	Very annoying and objectionable

V. CONCLUSION AND FUTURE SCOPE

Forge acts as a perfect resolution to various text-to- speech synthesis and voice cloning challenges and surely has a lot further to offer in incubating this experimental technology.

The scope of Forge tracks down the adaption of different voice replicating results and services used by several end- user verticals similar as IT & telecommunication, BFSI, educational institutions, healthcare,etc.

The use cases for synthetic media are still arising, but we're seeing a lot of areas where people and associations can advantage from this technology, some of which we've mentioned then. Voice replicating tools can be useful

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for various degenerative ails like Motor neuron complaint (MND), Amyotrophic side sclerosis (ALS). These tools can also be helpful for critical operations similar as a laryngectomy, which can lead to the loss of speech. With the help of a speech-generating tool, a case can hear to his voice, which was replicated from their preliminarily recorded voice.

In Education, replicating the voices of literal numbers offers new chances for interactive tutoring and dynamic liar. For illustration, on November 22, 1963 President Kennedy was on his way to give a speech in Dallas when he was assassinated. We can now hear that speech in his own words using this technology.

The epidemic sparked a surge in content consumption. One of the mediums that availed from this boom was podcasting, which has grown exponentially year of year and reaching indeed broader, more different cult. In addition, synthetic voice is formerly being used to help restate content in demand into different languages. Advertisers seeking voices that reverberate with their target followership, synthetic voices help advertisers produce further engaging content without having to coordinate as numerous moving pieces similar as trip and studio time.

REFERENCES

[1] "Efficient Neural Audio Synthesis" by Nal Kalchbrenner *, Erich Elsen *, Karen Simonyan, Seb Noury, Norman Casagrande, Edward Lockhart, Florian Stimberg, Aaron van den Oord, Sander Dieleman, Koray Kavukcuoglu arxiv.org/pdf/1802.08435

[2] Sercan O Arik, Jitong Chen, Kainan Peng, Wei Ping, and Yanqi Zhou. Neural voice cloning with a few samples. arXiv preprint arXiv: 1802.06006, 2018.

[3] "Tacotron: Towards end-to-end speech synthesis" Yuxuan Wang∗, RJ Skerry-Ryan∗, Daisy Stanton, Yonghui Wu, Ron J. Weiss†, Navdeep Jaitly, Zongheng Yang, Ying Xiao∗, Zhifeng Chen, Samy Bengio†, Quoc Le, Yannis Agiomyrgiannakis, Rob Clark, Rif A. Saurous∗ arxiv.org/pdf/1703.10135

[4] "Generalized end-to-end loss for speaker verification" Li Wan Quan Wang Alan Papir Ignacio Lopez Moreno arxiv.org/pdf/1710.10467

[5] Andrew Gibiansky, Sercan Arik, Gregory Diamos, John Miller, Kainan Peng, Wei Ping, Jonathan Raiman, and Yanqi Zhou. Deep Voice 2: Multi-speaker neural text-to-speech. In I. Guyon, U. V. Luxburg, S. Bengio, H. Wallach, R. Fergus, S. Vishwanathan, and R. Garnett, editors, Advances in Neural Information Processing Systems 30, pages 2962–2970. Curran Associates, Inc., 2017

[6] Jonathan Shen, Ruoming Pang, Ron J. Weiss, Mike Schuster, Navdeep Jaitly, Zongheng Yang, Zhifeng Chen, Yu Zhang, Yuxuan Wang, RJ Skerry-Ryan, Rif A. Saurous, Yannis Agiomyrgiannakis, and Yonghui. Wu. Natural TTS synthesis by conditioning WaveNet on mel spectrogram predictions. In Proc. IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2018.

[7] Eliya Nachmani, Adam Polyak, Yaniv Taigman, and Lior Wolf. Fitting new speakers based on a short untranscribed sample. arXiv preprint arXiv:1802.06984, 2018.

[8] Rama Doddipatla, Norbert Braunschweiler, and Ranniery Maia. Speaker adaptation in dnnbased speech synthesis using d-vectors. In Proc. Interspeech, pages 3404–3408, 2017.

[9] Georg Heigold, Ignacio Moreno, Samy Bengio, and Noam Shazeer. End-to-end text-dependent speaker verification. In Acoustics, Speech and Signal Processing (ICASSP), 2016 IEEE International Conference on, pages 5115–5119. IEEE, 2016.

[10] Yaniv Taigman, Lior Wolf, Adam Polyak, and Eliya Nachmani. VoiceLoop: Voice fitting and synthesis via a phonological loop. In Proc. International Conference on Learning Representations (ICLR), 2018.

[11] Aäron van den Oord, Sander Dieleman, Heiga Zen, Karen Simonyan, Oriol Vinyals, Alex Graves, Nal Kalchbrenner, Andrew Senior, and Koray Kavukcuoglu. WaveNet: A generative model for raw audio. CoRR abs/1609.03499, 2016.

[12] Christophe Veaux, Junichi Yamagishi, Kirsten MacDonald, et al. CSTR VCTK Corpus: English multi-speaker corpus for CSTR voice cloning toolkit, 2017.

[13] Dzmitry Bahdanau, Kyunghyun Cho, and Yoshua Bengio. Neural machine translation by jointly learning to align and translate. In Proceedings of ICLR, 2015.

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ALCOHOL DETECTION WITH ENGINE LOCKING SYSTEM

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ABSTRACT
Drink and drive is the reason behind most of the deaths, so the Alcohol Detection with Engine Locking Using Raspberry Pi aims to change that with automated, transparent, noninvasive alcohol safety check in vehicles. System uses alcohol sensor with raspberry pi along with dc motor to demonstrate as vehicle engine. System constantly monitors the sensitivity of alcohol sensor for alcohol detection. If driver is drunk, the processor immediately stops the system ignition by stopping the motor. If alcohol sensor is not giving high alcohol intensity signals or values, system lets engine run. The raspberry pi processor constantly processes the alcohol sensor data to check the presence of alcohol and operates a lock on the vehicle engine accordingly. So, by providing this solution the accidents can be prevent.

Keywords: Alcohol Sensor, DC motor, Ignition, Processor, Raspberry Pi

I. INTRODUCTION

The current scenario shows that the most of the road accidents are occurring due to drink and drive cases. The drivers who drink alcohol are not in a stable condition and so, rash driving occurs on highway which can be risky to the lives of the people on road, the driver inclusive. The laws in India are currently prohibiting drivers to drink and drive so that the fine imposed on them can stop them to drink and drive. Therefore, there is the need for an alcohol detection system that can function without the restriction of space and time. This project comes with the solution that, when an alcohol is detected around the sensor, the sensor will send the command to processor to immediately stop the engine of vehicle. Simultaneously it will also track the location with the help of GPS module and will send it to Raspberry pi and then the raspberry pi will click the picture of drunk person and will send all the information to the telegram bot of the registered person. This method is very effective in not only lifesaving of particular person but the life of others also who are driving nearby the drunk person. It will also save the loss of vehicle done due to accidents. This application is more useful for those people who gives their vehicles on rent for driving.

II. LITERATURE SURVEY

[1] L. A. Navarro, M. A. Diño, E. Joson, R. Anacan and R. D. Cruz, "Design of Alcohol Detection System for Car Users thru Iris Recognition Pattern Using Wavelet Transform," 2016 7thInternational Conference on Intelligent Systems, Modelling and Simulation (ISMS), Bangkok, 2016, pp. 15-19. The author has put forward a technique which utilizes GPS and GSM to ascertain alcohol but this technique is very expensive, but the expenses can be cut off to a great extent. In this project a siren is being used which is most highly economical, and can keep people in close proximity vigilant.

[2] Mugila.G, Muthulakshmi.M, Santhiya.K, Prof. Dhivya.P- Smart Helmet System Using Alcohol Detection For Vehicle Protection [International Journal of Innovative Research in Science Engineering and Technology (IJIRTSE) ISSN: 2395-5619, Volume – 2, Issue – 7. July 2016]. Composite health monitoring and sensors based on infrared is utilized to ascertain alcohol as talked about by writer but the chance of false alarm can't be avoided in this system, because minute changes in some situations can result in false alarm but in our project use of required technology makes it more authentic.

[3] Dhivya M and Kathiravan S, Dept. of ECE, Kalaignar Karunanidhi Institute of Technology- Driver Authentication and Accident-Avoidance System for Vehicles [Smart Computing Review, vol. 5, no.1, February 2015]. To prevent the mishap of drunken driving author have used PIC16F877A microcontroller which is an outdated system and expensive one also which restrains its use to only certain class of society whereas we are using Arduino Uno microcontroller which is advanced as well as economical.

[4] Babor, AUDIT: The alcohol use disorders identification Test: Guidelines for use in primary health care. 1992, Geneva, Switzerland: World Health Organization.

Worrying about the drunken driving the author suggests the system to overcome the issue but using mQ2 alcohol sensor has come flames .MQ2 alcohol sensor is not authentic and raises the chances of false alarm while we have used MQ3 which is highly authentic.

[5] D. S. a. A. Chowdhury, "A Real Time Embedded System Application for Driver Drowsiness and Alcoholic Intoxication," International Journal of Engineering Trends and Technology (IJETT), vol. 10, no. 9, Apr 2014.

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There are many works carried out on the driver's drowsiness detected. A large number of road accidents takes place due to fatigue of drivers due to alcohol consumption. An embedded system with UNO and open CV is developed. Where the Alcoholic drivers are detected in real time using the driver's drowsiness and intoxication, since large number of road accidents takes place due to alcohol drinking. In computer vision concept is used which has an alcohol gas sensors combined with the Raspberry pi micro-controller and embedded systems.

[6] J. Dai, J. Teng, X. Bai, Z. Shen and D. Xuan, "Mobile phone based drunk driving detection," 2010 4th International Conference on Pervasive Computing Technologies for Healthcare, Munich, 2010, pp. 1-8, 2010. Dai et al. proposed a system to detect and alert dangerous driving triggered by drunk-driving in real-time using mobile phone. It requires placing the mobile phone alongside accelerometer and orientation sensor in a vehicle. With the phone, accelerations can be read and compared with the pattern behavior of drunk-driving. Once the pattern is detected, the mobile will automatically alert the driver or even call police before accident occurs.

[7] N. L. J. J. Jain and C. Busso, "Modeling of Driver Behavior in Real World Scenarios Using Multiple Noninvasive Sensors," IEEE Transactions on Multimedia, vol. 15, no. 5, pp. 1213 - 1225, 2013. The intentional accidents have become more in recent years due to the development of new in-vehicle technology. The driver's scenario like eye blink is collected and drivers were dictated on how to drive through their mobile phones. It analyses the behavior of the driver and classifies it and avoids the accidents through the metric obtained.

III. METHODOLOGY

The Alcohol Detection with Engine Locking system helps to reduce the accidents which are occurring due to drunk driving. MQ-3 sensor detects the presence of the alcohol in the surroundings. The sensor provides the output on the basis of the concentration of alcohol, if the alcohol concentration is higher the conductivity of MQ-3 sensor increases which in turn gives the reading to Raspberry pi. If the reading is greater than the threshold level, Raspberry pi will stop the DC motor. Nodemcu will fetch the location with the help of GPS module of vehicle and will send it to Raspberry pi. The camera module will click the picture of driver and then all these details will be sent on the telegram bot of the registered number.

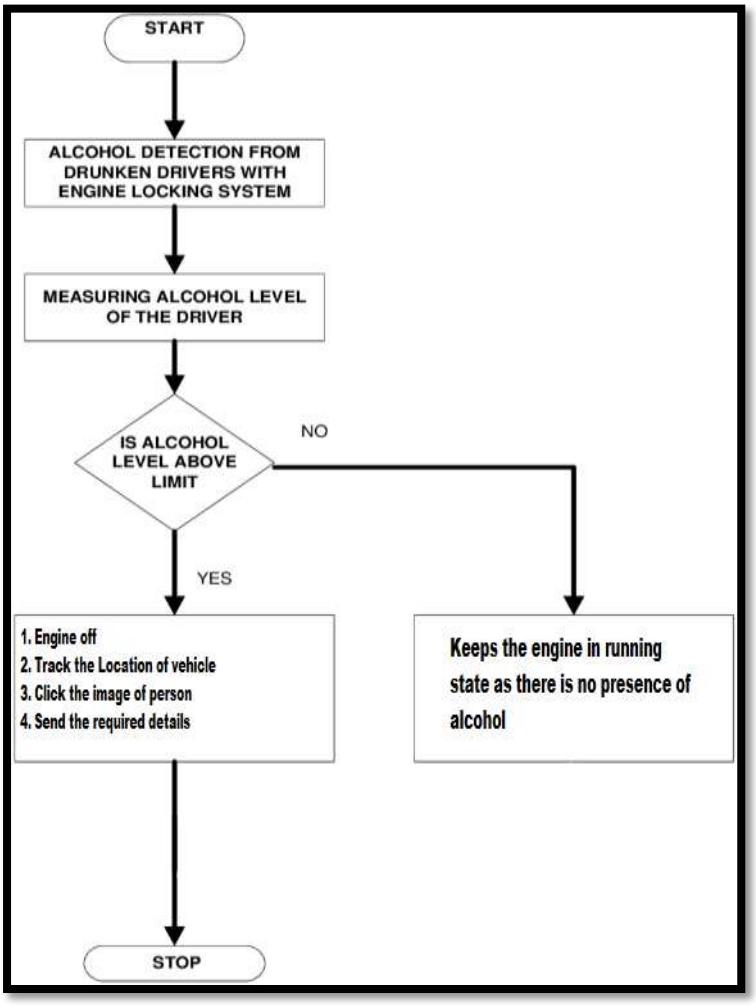

Fig 1: Flowchart of system

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IV. RESULTS

If alcoholic person tries command on vehicle, then the alcoholic sensor determines the existing of alcohol and shut down the vehicle engine and sound alarm by which the nearby people will exchange the seat or can get alert. We can avoid any kind of loss by using this system. All equipment's are totally tested and connected as required thereby giving us the much-needed result as shown in the image below:

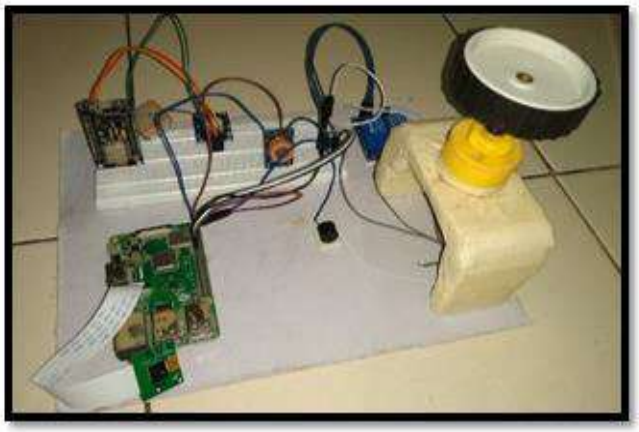

Fig 2: Alcohol Detection with Engine Locking System

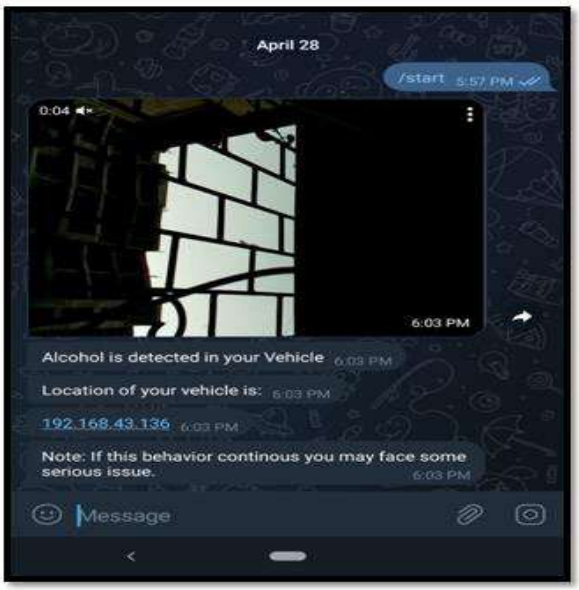

Fig 3: GUI of telegram bot

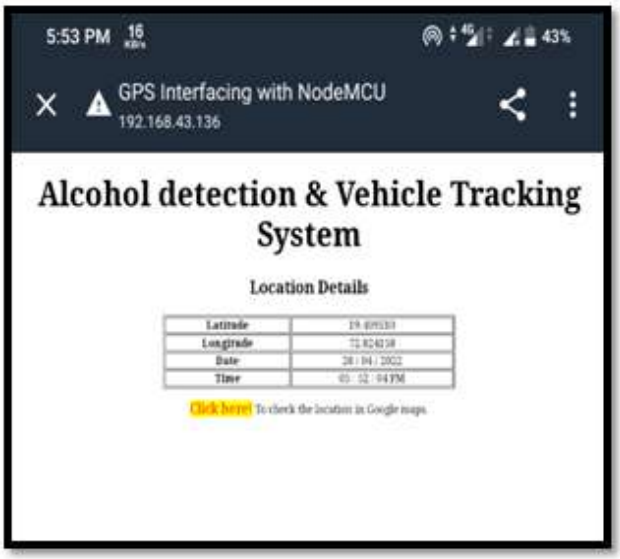

Fig 4: GUI of Vehicle tracking system

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V. APPLICATIONS & ADVANTAGES

Applications

"Alcohol detector project" can be used in various vehicles for detecting whether the driver as consumed alcohol or not.

This can be used in ola & uber as well as other taxis given on rent.

This system can be very helpful for police department also.

Advantages

To prevent accident due to drink and driving.

Easy and efficient to test the presence of alcohol content in the body.

Helpful for police and provides automatic safety system for cars and other vehicles as well.

The alcohol detection with engine locking system proves automatic safety system for cars and other vehicles.

VI. CONCLUSION

We have provided a very effective solution to develop an intelligent system for the vehicles for alcohol detection. Since sensor has fine sensitivity range around 25 to 500 ppm, it can suit to any vehicle and can easily be hidden from the suspects. As growing public perception is that vehicle safety is more important, advances in public safety is gaining acceptance than in the past. The main aim of this system is to control the accidents causes due to alcohol consumption. This system improves safety of human being. With the help of all the technologies used in this system many lives can be saved. And hence providing the effective development in the automobile industry regarding to reduce the accidents cause due to alcohol consumption.

VII. FUTURE SCOPE

We can implement a live fine system so that if driver does the crime, he/she can be fined on the basis of crime.

We can implement heart rate pulse variability to accurately identify the driving behavior of drivers and to assist them.

We can use GSM module along with the system so that if any incidents occur it will get notified to concern person or nearby police station.

REFERENCES

[1] L. A. Navarro, M. A. Diño, E. Joson, R. Anacan and R. D. Cruz, "Design of Alcohol Detection System for Car Users thru Iris Recognition Pattern Using Wavelet Transform," 2016 7th International Conference on Intelligent Systems, Modelling and Simulation (ISMS), Bangkok, 2016, pp. 15-19.

[2] MUGILA.G, Muthulakshmi.M, Santhiya.K, Prof. Dhivya.P- Smart Helmet System Using Alcohol Detection For Vehicle Protection [International Journal of Innovative Research in Science Engineering and Technology (IJIRTSE) ISSN: 2395-5619, Volume – 2, Issue – 7. July 2016].

[3] Dhivya M and Kathiravan S, Dept. of ECE, Kalaignar Karunanidhi Institute of Technology- Driver Authentication and Accident-Avoidance System for Vehicles [Smart Computing Review, vol. 5, no. 1, February 2015].

[4] Babor, AUDIT: The alcohol use disorders identification Test: Guidelines for use in primary health care. 1992, Geneva, Switzerland: World Health Organization.

[5] D. S. a. A. Chowdhury, "A Real Time Embedded System Application for Driver Drowsiness and Alcoholic Intoxication," International Journal of Engineering Trends and Technology (IJETT), vol. 10, no. 9, Apr 2014.

[6] J. Dai, J. Teng, X. Bai, Z. Shen and D. Xuan, "Mobile phone based drunk driving detection," 2010 4th International Conference on Pervasive Computing Technologies for Healthcare, Munich, 2010, pp. 1-8, 2010.

[7] N. L. J. J. Jain and C. Busso, "Modeling of Driver Behavior in Real World Scenarios Using Multiple Noninvasive Sensors," IEEE Transactions on Multimedia, vol. 15, no. 5, pp. 1213 - 1225, 2013.

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CRYPTOGRAPHY BASED MESSENGER APP

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ABSTRACT
With the advancement of technology, communication has taken a big step. A number of messenger applications are designed to exchange data once information online. This data is also very confidential could be in danger of a security attack. Therefore, it must be protected with certain encryption techniques to keep the information confidential and away from unauthorized access. In this paper, we propose an efficient cryptography algorithm based messenger app. Symmetric and asymmetric algorithm is used in this application. This application is more secure and makes use of private communication between sender and receiver.

Keywords: Cryptography, Encryption, Decryption, AES, DES, RSA, MD5, Secure messenger application.

1. INTRODUCTION

Technology is used in all areas of life, and people are more dependent on smartphone technology that contains powerful computer processors to exchange information and data. This is due to the necessity of our multimedia documents to be protected from unauthorized people. Therefore, the daily use of cryptography in our life greatly increased. The Messaging System is a text or instant messaging service component of telephone, web or mobile communication systems worldwide. But is it really safe to use? In public instant messaging systems, messages are sent by from the client to the server and back to the second client. This data could potentially be seen by an eavesdropper anywhere along its Internet path or in the network. So at any time information can be passed on to others. For this reason, this project involves the event of the secure messaging system using cryptographic technology.

Secure messaging is developed to guard sensitive data from unauthorized access. it's confidential and authenticated exchange by any internet user worldwide. Brute force attacks are made to interrupt the encryption and that they are growing so faster. These attacks are the most drawbacks of older algorithm. But with feature this algorithms are going to be replaced by other techniques which will provide better protection. during this paper we are getting to proposed a secure messaging system that's implemented by an encryption technique which is more faster, better resistant to attacks, more complex, easy to encrypt and lots of more advanced security feature included.

2. LITERATURE SURVEYS

- In this paper Rohan Rayarikar [1] introduced a method running on the Android environment that encrypts messages before being sent by the user over the network allowing the encrypt messages before sending them over the network. The AES algorithm has been used to encrypt and decrypt data and this method can run on any mobile running the Android system environment.
- SMS Encryption by using Android Operating System by Asst. Prof. Dr. Jane [2] is based on the RSA algorithm to encrypt a message and the length of 160 characters and after using the algorithm to encrypt the message in the Android environment is sent via the recipient's phone number by the sender and the application is programmed using the language of Java.
- The authors Jayeeta Majumder [3] in this paper used application is based on the AES algorithm to encrypt SMS message and sending a message encrypted in the Android environment over the network the application is programmed using the language of Java.

3. PROBLEM STATEMENT

Malicious users are always interested to hack servers and reveal information about users in a certain system including celebrities and this happens almost every day in the introduction Internet world. Unfortunately, instant messaging applications are not an exception. There are many mobile chat applications available for users. Many of these applications claim that they are providing confidentiality, integrity and availability of user's information. However, daily hacking news prove that many developers do not consider security as the primary goal of their applications. On the other hand, governments are keen on tracking their citizens and forcing more service providers to reveal profiles of their users in the hands of their agents. Furthermore, chat applications providers misuse information of their users. For example, while many chat applications are free to use, they equip the application with built-in processes which track every single movement. There must be careful with what is going to be published on social networks.

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4. PROPOSED METHODLOGY

There are a number of algorithms for performing encryption and decryption. The most successful algorithms use a key. A key is simply a parameter to the algorithm that allows the encryption and decryption process to occur. The modern field of key-based cryptographic algorithms can be divided into two classes, such as symmetric-key cryptography and asymmetric cryptography or publickey cryptography. Symmetric-key cryptography refers to encryption methods in which both the sender and receiver share the same key. This was the only kind of encryption publicly known until June 1976. The public-key cryptography is cryptography in which a pair of keys is used to encrypt and decrypt a message so that it arrives securely. Another cryptographic algorithm is cryptographic hash function that uses a mathematical transformation to irreversibly "encrypt" information.

In our application the user first select the one of the algorithm as per the user's choice. After that it will enter the text which he is want to encrypting or decrypting it and than set the key. Finally he will get his encrypted text or decrypted text.

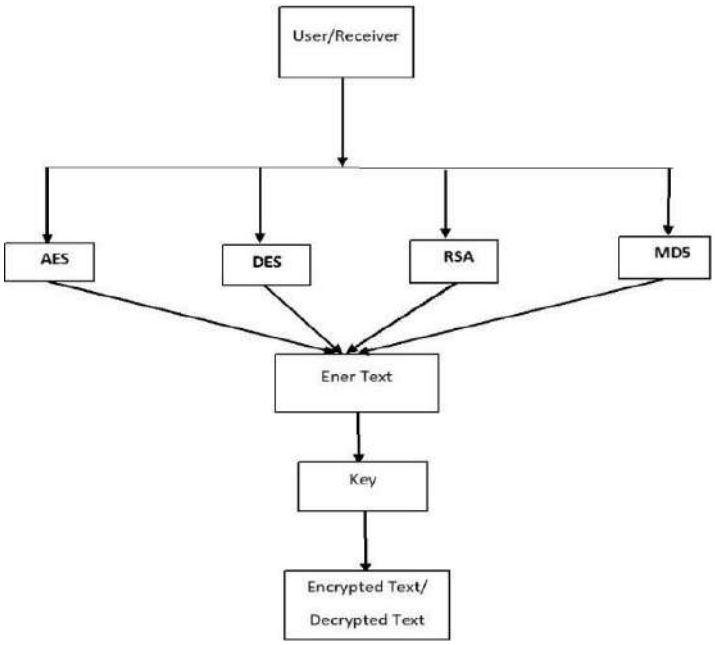

Fig 1: Architectural Diagram

5. ALGORITHM USED

There are a number of algorithms for performing encryption and decryption. The most successful algorithms use a key. A key is simply a parameter to the algorithm that allows the encryption and decryption process to occur. The modern field of key-based cryptographic algorithms can be divided into two classes, such as symmetric-key cryptography and asymmetric cryptography or public key cryptography.

In this project we have used AES, RSA and DES algorithm for encrypting and decrypting the text. We have provide different user interface for different algorithms. The workings of all above algorithm in this project are as follows:

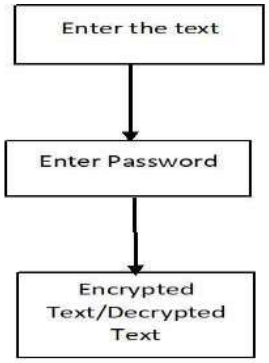

Fig 2. Encryption and Decryption of different algorithm

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To use this algorithm is very simple for user. The only need to user enter the text and set the correct password for encryption and decryption. Then finally he/she will get encrypted text or decrypted text.

We have used MD5 algorithm in this project for making secure password. With this secure password user can use this for encryption and decryption process. Because MD5 algorithm can not decrypt the text, only it will encrypt the text through hashing.

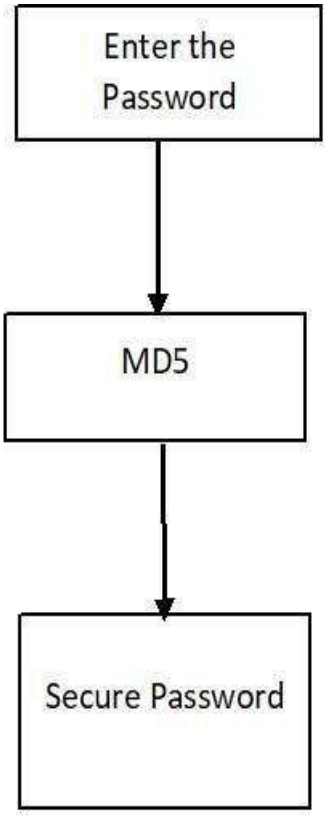

Fig 3: Flow of MD5 Algorithm for messenger app

6. IMPLEMENTATION AND RESULTS

Implementation involves the following steps:

Step 1: Algorithms module

In this interface the application is showing different algorithm for encryption and decryption. User can select any of the algorithms for encrypting and decrypting the text.

Step 2: Key Selection

In this module sender or receiver can set our key and also can change the existing key with the new key.

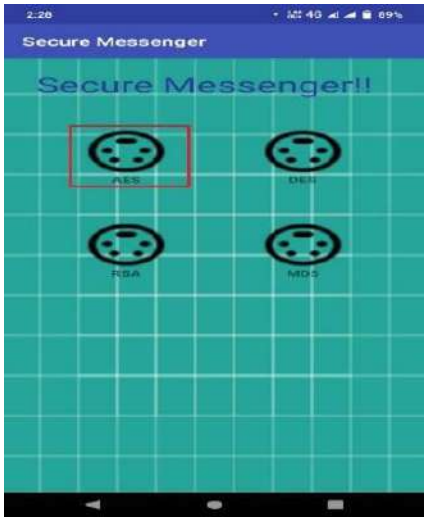

Fig 4: Algorithm Module

Fig 5: Key Selection

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Step 3: Encryption Module
In this phase sender can enter the text for encryption process and simply by clicking the encryption button after setting the required key he will get his encrypted text.

Step 4: Decryption Module
In this module the same process will follow as followed in encryption module. In this receiver can enter the encrypted text or cipher text and by adding required key he can get the original text.

Fig 6: Encryption Module

Fig 7: Decryption Module

Step 5: Voice Recognition Module
In this module, we have added the feature of voice recognition. If users want to enter long text for encryption process he can use this feature for entering the text.

Step 6: Send Module
After encrypting the original text sender can send the encrypted text to receiver with the use of this send button. The user can send encrypted text all the message sending application which are available in sender's phone.

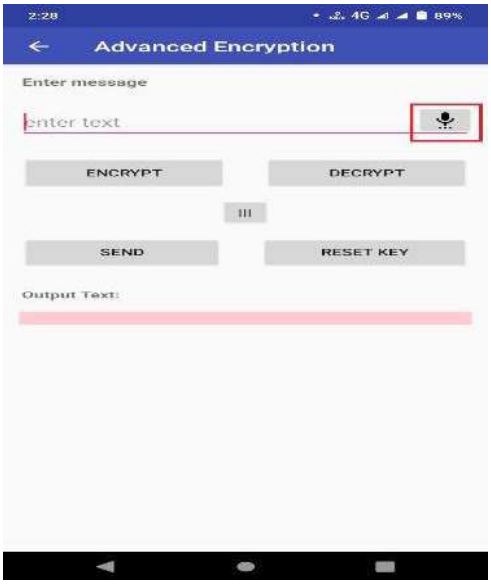

Fig 8: Voice recognition module

Fig 9: Send Module

7. CONCLUSION
The main objective of the proposed system is to transfer message in a communication system securely. Android-based applications for secure messaging have been developed using cryptographic algorithms for the users to send their message between users on any organization securely. Encryption and decryption of message are done by using AES, DES and RSA algorithms. Obviously encryption and decryption is one of the best ways of hiding the meanings of a message from intruders in a network environment.

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The proposed secure messaging can be used in many areas with personal and company-wide sensitive data exchanges. For example, financial institutions, insurance companies, public services, health organizations and service providers rely on the protection by Secure Messaging.

The proposed system has been designed and developed with easy integration and modification to take full advantage of future technologies. There are some limitations in the current system to which solutions will be provided as a future development; such as, sending encrypted text within this application, so the user don't have to send manually through other applications. In future, a public-key encryption scheme will be implanted in this secure messaging system.

8. REFERENCES

[1] Rohan Rayarikar, Sanket Upadhyay and Priyanka Pimpale," SMS Encryption using AES Algorithm on Android", International Journal of Computer Applications, Volume 50– No.19, pp. 0975 – 8887, July 2012.

[2] Asst. Prof. Dr. Jane J. Stephan and Zahra Salah Dhaief," SMS Encryption by Using Android Operating System", Iraqi Commission for Computers & Informatics (ICCI), Iraqi Journal for Computers and Informatics (IJCI) Vol (1) Issue (1), 2014.

[3] Jayeeta Majumder, Sagarjit Das and Sayak Maity "SMS Encryption in Android Platform", International Journal of Computer Engineering and Applications, Volume IX, Issue V, May 2015.

[4] Muhammed Kuliya, Hassan Abubakar "Secured Chatting System Using Cryptography" International journal of creative research thoughts Volume 8, Issue 9 September 2020.

[5] Rahman MM, Akter T and Rahman A "Development of Cryptography-Based Secure Messaging System" Journal of Telecommunications System & Management Volume 5 Issue 3 2016.

[6] Akash Kumar Mandal, Chandra Parakash and Mrs. Archana Tiwari, "Performance Evaluation of Cryptographic Algorithms: DES and AES", IEEE Students' Conference on Electrical, Electronics and Computer Science, pp. 1-5, 2012.

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STOCK MARKET PREDICTION USING MACHINE LEARNING

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ABSTRACT
Algorithmic trades (AT) and their activity in the esteem revelation process on the S&P 500 summary associations are being assessed. Extraction of the association tickers and their individual stock data is being done. Gotten some answers concerning different AI classifiers and their importance in Algorithmic Trading. Algorithmic trading act purposely by checking the market for liquidity and deviations of expense from focal regard. Algorithmic Trading chooses the three fundamental conditions of the securities trade whether to buy, sell, or hold a stock. Different data controls were done and numerous abilities were made which were mapped to different names and using classifiers endeavoured to anticipate the three conditions of the securities trade. Overall, budgetary trade estimate is an extraordinarily confounding system, to control stocks as demonstrated by your necessities, incorporates cumbersome data of stocks and how these stocks can change their advancements and by the sum they will climb or down in light of some financial circumstances. Issue is that, can a Machine foresee these advancements and devise a sort of trading strategy according to the given data using particular AI models.

Keywords: Stock market; Prediction; Machine learning; Artificial neural network

L. INTRODUCTION
The Stock market check is an exceptionally fascinating errand which joins high substances of how the budgetary exchange limits, and what unconventionalities can be prompted in a market in light of different conditions. While a few venders may battle that the market itself is functional, and that if there is new check or any assortment from the standard in a market it charms it by auditing itself, thusly making no space for conjectures, while several vendors may battle that on the off chance that the information is orchestrated well, by then machine can make a sort out of procedure that is persuading can affect high continue exchanging or HFT, which is just conceivable through Algorithmic Trading Systems or Automated Systems of Trade. Money related authorities think about the expression, buy low, move high yet this does not give enough setting to settle on proper Endeavor decisions. Before an investigator places assets into any stock, He should realize how money market continues. Setting assets into a wonderful stock regardless at a horrible time can have awful results, while vitality for a common stock at the fortunate time can hold up under focal points. Cash related monetary pros of today are going toward this issue of trading as they don't for the most part understand concerning which stocks to buy or which stocks to offer with the authentic objective to get impeccable focal points. Envisioning whole game plan estimation of the stock is commonly clear than foreseeing on day-to-day premise as the stocks change rapidly reliably subject toward events.

The answer for this issue requests the utilization of instruments and advances identified with the field of information mining, design acknowledgment, machine learning and information forecast. The application will foresee the stock costs for the following exchanging day. The necessities and the usefulness of this application corresponds it to the class.

II. RELATED WORK
[1] Stock Market Prediction Using Machine Learning Techniques Mehak Usmani, Syed Hasan Adil et al [3] proposed the main objective of this research is to predict the market performance of Karachi Stock Exchange (KSE) on day closing using different machine learning techniques. The prediction model uses different attributes as an input and predicts market as Positive & Negative. The attributes used in the model includes Oil rates, Gold & Silver rates, Interest rate, Foreign Exchange (FEX) rate, NEWS and social media feed. The old statistical techniques including Simple Moving Average (SMA) and Autoregressive Integrated Moving Average (ARIMA) are also used as input. The machine learning techniques including Single Layer Perceptron (SLP), Multi-Layer Perceptron (MLP), Radial Basis Function (RBF) and Support Vector Machine (SVM) are compared. All these attributes are studied separately also. The algorithm MLP performed best as compared to other techniques.

[2] Gursean et al. (2011) describe ANN as one of the best techniques to model the stock market, because it does not contain standard formulas and may be easily adapted to market changes. ANN have the ability to learn by example and make interpolations and extrapolations of what they learned. The use of ANN in the solution of a

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task initially involves a learning phase, which is when the network extracts the patterns, thereby creating a specific representation of the problem (Braga, Carvalho, & Luderman, 2007). The first model for prediction of stock price based on ANN was developed by White (1988). The author used a feed forward network to detect unknown regularities in stock price changes. The goal was to analyse the daily returns of IBM stock in order to test the efficient market theory, proposed by Fama (1970), which states that stock prices follow a random walk. Although he has not obtained good predictive results, the research stressed the potential for such analysis. Since then, a large number of researchers have actively participated in the development of predictive models that may be reliably applied in the stock market.

[3] Stock Market prediction has been one of the more active research areas in the past, given the obvious interest of a lot of major companies. In this research several machine learning techniques have been applied to varying degrees of success. However, stock forecasting is still severely limited due to its non-stationary, seasonal and in general unpredictable nature. Stock Market Prediction Using Hidden Markov Models Aditya Gupta, Non-Student Member, IEEE and Bhuwan Dhingra, Non-Student member, IEEE T Predicting forecasts from just the previous stock data is an even more challenging task since it ignores several outlying factors (such as the state of the company, economic conditions ownership etc.)

III. EXISITING SYSTEM

Money related trade judgment making is a strengthening and difficult errand of fiscal data guess. Figure about securities trade with high exactness improvement return advantage for examiners of the stocks. In perspective on the snare of budgetary trade financial data, expansion of productive models for forecast conclusion is very difficult, and it must be precise. This consider attempted to make models for guess of the securities trade and to pick whether to buy/hold the stock using data mining and AI techniques. The AI framework like Naive Bayes, k-Nearest Neighbors (k-NN), Support Vector Machine (SVM), Artificial Neural Network (ANN) and Random Forest has been used for progressing of gauge model. Particular pointers are resolved from the stock prices set up on timetable data and it is used as commitments of the proposed guess models. Ten years of securities trade data has been used for sign gauge of stock. Based on the instructive accumulation, these models can make buy/hold signal for monetary trade as a yield. The rule target of this errand is to deliver yield signal(buy/hold) as per customers essential like mean be contributed, time term of endeavour, least advantage, most prominent hardship, using data mining and AI frameworks.

Compared to the existing work, this project analyses the stocks trading decisions utilizing the technical conduct of the trading patterns within the context of the changeable economic and business environment.

The objective function is to maximize medium to longer term profits based on S&P500 stock market index. The inputs are the technical pointers data and the economic indicators data. Three models (neural network, soft max logistic regression, decision forest) are then used to predict the buy/sell decisions.

IV. PROPOSED SYSTEM

As debated overhead stock market forecast is a huge subject and has a lot parts on which we can investigation upon, but one object all models have in common is their check on correctness of how well the model's practical can fit to a given dataset and is it identical the results and forecasting correctly or not. Still each model has a few effects in common, they all need a list of companies of any stock exchange to forecast upon the three basic situations of market buy, hold, and sell and to do this the stock market data for each company against their tickers was stored in machine (to avoid larger accessing time) and data manipulations were performed in order to prepare the dataset for additional machine learning classifiers which will ultimately forecast the marks and deliver the output.

V. METHODOLOGY OF BUILDING A PREDICT MODEL

General steps of building and predicting the value by using Long Stort Term Model in the Neural Works Predict.

1. Building a Predict Model: To make predictions from data if target outputs can be any value in a Continuous range of numeric values or a discrete ordered range of numeric values.
2. Selection of model: Long Stort Term Model (LSTM) is selected to predict the stock value.
3. LSTM Input training data
4. LSTM Output training data
5. LSTM Training data characteristics
6. LSTM Network parameters

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7. Reviewing parameters and training the model
8. Saving the model
9. Training statistics
10. Testing a predict model
11. Specifying data sets for testing
12. Interpreting test results
13. Running a LSTM predict model

VI. RESULTS

As it can be grasped in the figure given underneath, one side it demonstrations the forecast counter spread of the company future prices, and additional figure demonstrations the graph of the company at that particular time of year in terms to the forecast and it can be detected that much of the outcomes are precise. As it can be perceived that the data spread is habitually saying buy the stock, it can be incorrect on the hold condition because the teaching data will never be perfectly stable ever, so supposedly if the model forecast buy then this would be 1722 correct out of 4527 which is still good and a better score than it attained, and it still is getting the above accuracy mark of 33% which is decent in a stock market analysis. Many situations will static be there which machines can miss out, supposedly this has circumstances to buy, sell, hold and sometimes the model can be penalised, say the model predictable a 2% rise in the following seven days, but the growth only went up to 1.5% and departed 2% the next day, then the model will forecast (buy, hold) rendering to the 1.5% rise in the seven days and give the predictable spread.

A model can also be penalised if supposedly the growth went 2% up and then suddenly falls 2% short the next day, this sort of outcomes in real trading would be thoughtful and same goes for the classical of it turns out to be highly precise. Now observing at the spread and the graph of the company notice around the era of 2017 the company was growing in the market so therefore there were actually more buys, which rapidly fallen in 2018, but the data we mined was till 31, December 2017 and it displays that at the starting of the year it had lot of buys, hence 1722 out of 4527 which speedily was sold just in a tiny time hence a lot of sells more than the holds, giving 1424 out 4527, the model may not be perfectly accurate but has a very close range of decisions which can be accepted in real trading or using algorithms to trade.

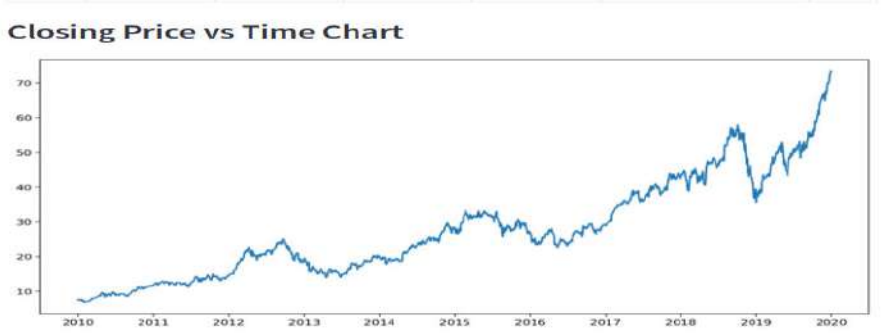

Fig 3 :(A)

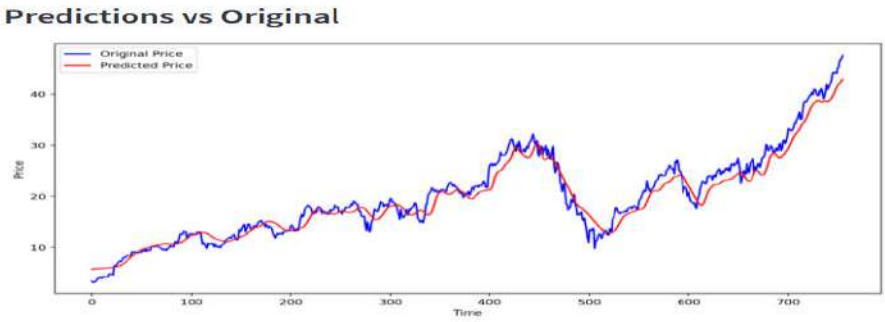

Fig 3 :(B)

In Fig 3(A) &3(B) shows the prediction graph using neural network. The data is of Tata Motors whereas in fig 3(A) shows the opening price from the Jan 2010 till Jan 2020. And the fig 3(B) shows the closing price of Tata Motors.

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VII. CONCLUSION

Hereby, it can be proposed that no trading algorithm can be 100% effective, not only 100%, it will typically never be close to 70% but to attain even an accuracy of 40% or 35% is still good sufficient to get a good forecast spread. Although extreme attained accurateness was 39%, it was still able to closely forecast the predictable outcome and have coordinated against the company graph. To make our expectation more efficient, it can be done by including bulky data sets that have millions of entries and could train the machine more powerfully. Different activities of stocks can lead to diverse raises or lows in the forecast price, use these movements to magistrate whether a company should be traded in or not. No training Data can ever be stable, hence there are always some unevenness which can be seen in the above data spread, but to still forecast close to a consequence will also lead to a good approach if it has greater than 33% accuracy. While developing a strategy trader should always think to always have nominal imbalance while still being above 33% accurate.

It can also be determined that in a stock market, there is probable that some companies might not be associated at all, and mostly can be associated to each other, and can help justice movements of stock accordingly, we can scale affairs and see how much in percentages they are correlated. Including gigantic data sets, to increase more effectiveness, and in data set if had nan values in tables, because of two simple reasons either a specific company was not opened during that time of year, or the data is not readily obtainable, in both the cases replace the null values with 0, which is that trader might want to change while developing a trading tactic.

Furthermore, there can be back testing of the trading strategy, using zip line and Quantarian a python platform for testing trading strategies and can see how well can a model fit into some random data of stock, and can the model from this random data of stock develop relations and correlations, and predict on terms of change.

REFERENCES

1. https://www.researchgate.net/publication/
2. http://cs229.stanford.edu/proj2017/final-reports/5234854.pdf
3. https://pythonprogramming.net
4. https://pypi.org/project/pandas/
5. https://matplotlib.org
6. https://www.google.co.in/amp/s/www.geeksforgeeks.org/numpy-in-python-set-1-
7. introduction/amp/
8. https://pypi.org/project/beautifulsoup4/

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E-COMMERCE APPLICATION USING MERN STACK (GADGETKART.COM)

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[1,2,3,4]Student and [5]Professor, Department of Computer Engineering, Theem College of Engineering, Boisar, Maharastra, India

ABSTRACT
In today's generation, most people are using technology for leading their lives and fulfillingtheir daily needs. In this generation, most of us using E- commerce websites for shopping for clothes, groceries, and electronics. We have developed one E-commerce websites by using MERN stack technology as it contains MongoDB, Express.JS framework, React.JS library, Node.JS platform. This site is fully functional with different views for user and admin and it also has integratedwith payment gateway for checkout. By using this website, we can buy different types of electronic products and we can choose different styles of electronic products based upon customerinterests. In this project, we can add different products and can delete them also. We have developed administrative functions for the website such as create a product, createcategories, Admin dashboard, manage products, Manage categories. For customers, they can quickly add their items to the cart. Based on the items in the cart then the bill gets generate and the customer can pay by using stripe. MERN stack is a collection of technologies that enables faster application development. It is used by developers worldwide. The main purpose of using MERN stack is to develop apps using JavaScript only. This is because the four technologies that make up the technology stack are all JS- based.

1. INTRODUCTION
The goal of this work is to build a simple E-Commerce website using MERN stack(MongoDB, Express, React and Node) where users can add items, pay and order. Ecommerce, also known as electronic commerce or internet commerce, refers to the buying and selling of goods or services using the internet, and the transfer of money and data to execute these transactions. Ecommerce is often used to refer to the sale of physical products online, but it can also describe any kind of commercial transaction that is facilitated through the internet. Whereas e-business refers to all aspects of operating an online business, ecommerce refers specifically to the transaction of goodsand services. In online shopping customers can select a wide range of products based upon their interests and their price also, one can compare prices also from one store to another by using online shopping. By encountering the all problems and weaknesses of the offline shopping system, creating an E-commerce web application is necessary for searching and shopping in each shop. These days we have seen so many e-commerce websites are createdlike Flipkart, Amazon, Myntra one can easily buy their necessary products by using these websites. By using these types of websites one can buytheir products by staying in their home. Eventually, we can see the difference between the prices of products also effective and powerful web applications. We aim to make a working e-commerce website where everything functions correctly. So, the features we would be having in the application that we would be building are:-Authentication using JSON Web Tokens (JWT).Option to add, edit, view and delete all the items in our store. Option to add items or remove items from the cart. Display the total bill of the cart and update it as soon as the cart is updated by the user. Using Local Storage to store the JWT so that we only allow logged-in users to buy items. Option to pay and checkout thus creating order and emptying the cart. So, these are the basic features we would have in our application.

2. MOTIVATION
Study on ecommerce shopping and shoppers, mostly in the American continent, the European continent, Australia, and some parts of Russia have indicated various motivations behind the rising trends of ecommerce among the masses. However, the following are the most common and widely acceptable reasons behind the motivations for online shopping.

Low Price: Investment in online business is low compared to a brick-and-mortar store. Therefore, ecommerce can offer cheaper rates with other additional advantages that ultimately lures the shoppers to go online for various shopping needs.

Wide Selection Options: Ecommerce customers can surf the various stores for a wide range of products to make a better choice.

Convenience: Online shopping eliminates traveling or walking from one shop to another and save time, fuel, and money on visiting a number of brick stores.

Price Comparison and Bargaining: Due to comparatively low investment in ecommerce and stiff competition in online businesses, customers can get the best deal and more opportunities for bargaining.

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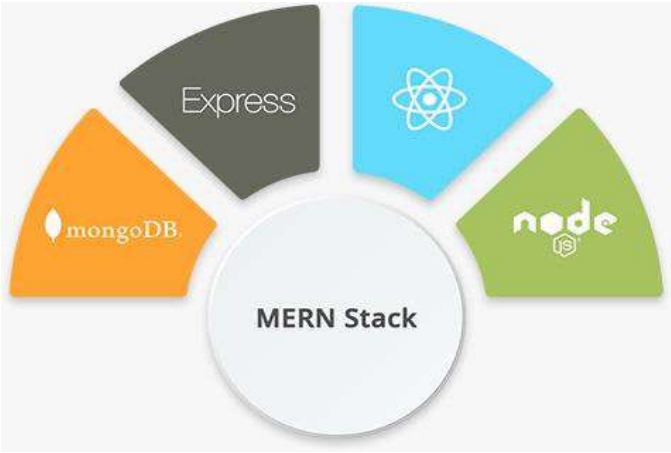
Free shipping and other incentives: The shipping price is the biggest obstacle after the delay due to shipping in the way to ecommerce. Therefore, to lure more online customers, ecommerce stores are offering free shipping on bulk/big volume purchases or big amount of order.

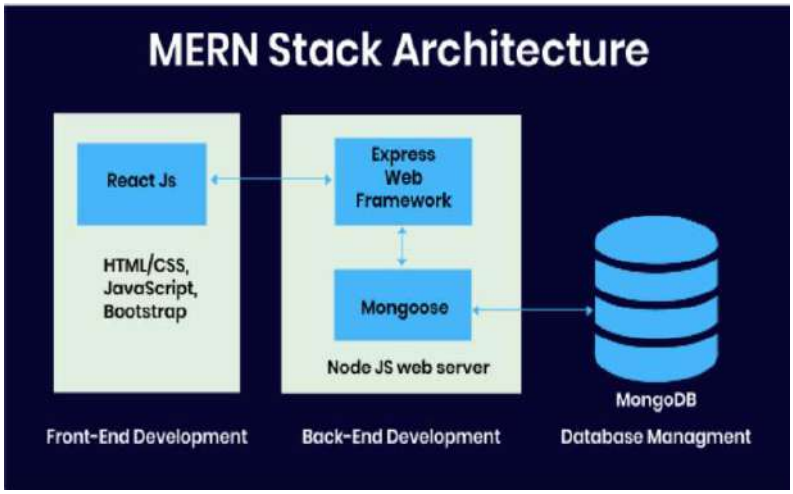
We will be able to introduce new products and services. Also to take advantage of brand name.It will allow us to enter the global market, also to react to pressure from competitors. To meet customer's demand. To meet customer's demand. It also allows us to increase sales. To reduce transaction costs. To reduce customer support costs. E-commerce customer motivation boils down to a few key factors: a streamlined shopping experience, an appropriate number of choices along the way, social proof to boost confidence and the power of a compelling discount.

3. LITERATURE SURVEY

The problem we are trying to solve is the lack of a platform for developers Alternatives that exist, but the difference is Jiphy provides all the features such as social media platform, code editor and compiler, social forum, blog post, and Q&A section on a single platform. Whena user registers to Jiphy, they experience a clean UI, FAQ sections on how the website works, and a few blog posts to where they can get all the services like asking about code error, sharingcode snippets, working on a code editor online with different developers in real-time, creating new connections, and sharing their experience on a social platform everything at one place. There are a few alternatives that exist, but the difference is Jiphy provides all the featuressuch as social media platform, code editor and compiler, social forum, blog post, and Q&A section on a single platform. When a user registers to Jiphy, they experience a clean UI, FAQ sections on how the website works, and a few blog posts to get started on our website. People can use it as a platform to increase connections or can also use it to work on the same code base in real-time with multiple developers. We have used MERN stack in web development and firebase for authentication. We havealso integrated a machine learning model in our code compiler which helps in auto compilation.Everything is hosted as a separate microservice. The web part is containerized and hosted on Heroku and the machine learning model is hosted on AWS Saga Maker. The future scope of our project would be making it open source and asking other developers for their contribution and new ideas a few of them will be a section for tech news updates and a section for learning chatbots to answer your tech questions.



4. System Architecture



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Modules Imported

• **Mongo DB:** This is a free open-source, cross-platform document-oriented database program. Itis classified as a No SQL database program, which means that data is stored in flexible documents with JSON-based query language. MongoDB is a source-available cross-platform document-oriented database program. Classified as a NoSQL database program, MongoDB uses JSON-like documents with optional schemas. MongoDB is developed by MongoDB Inc. and licensed under the Server Side Public License (SSPL).

• **Express JS:** This is also a free, open-source software, it can be classified as a web application framework for Node.js. To be more precise, Express JS is made for developing webapps and APIs. Express is a fast, assertive, essential and moderate web framework of Node.js. You can assume express as a layer built on the top of the Node.js that helps manage a server androutes. It provides a robust set of features to develop web and mobile applications. Let's see some of the core features of Express framework:

It can be used to design single-page, multi-page and hybrid web applications. It allows to setupmiddleware to respond to HTTP Requests. It defines a routing table which is used to perform different actions based on HTTP methodand URL. It allows to dynamically render HTML Pages based on passing arguments to templates.

• **React JS/Redux:** Redux is an open-source JavaScript library for managing and centralizing application state. React is a JavaScript library for building user interfaces. React is used to buildsingle- page applications. React allows us to create reusable UI components. The main objectiveof ReactJS is to develop User Interfaces (UI) that improves the speed of the apps. It uses virtualDOM (JavaScript object), which improves the performance of the app. The JavaScript virtual DOM is faster than the regular DOM. We can use ReactJS on the client and server-side as wellas with other frameworks. It uses component and data patterns that improve readability and helps to maintain larger apps.

• **Node JS:** Originally built for Google Chrome and later on open-sourced, Node JS is a cross- platform run-time JavaScript environment used for executing JavaScript code outside of a browser. Node.js is an open-source and cross-platform JavaScript runtime environment. It is a popular tool for almost any kind of project! Node.js runs the V8 JavaScript engine, the core of Google Chrome, outside of the browser. This allows Node.js to be very performant.

• **React Native:** React Native is an open-source JavaScript framework, designed for building apps on multiple platforms like iOS, Android, and also web applications, utilizing the very same codebase. It is based on React, and it brings all its glory to mobile app development. React Native is a JavaScript framework used for developing a real, native mobile application for iOS and Android. It uses only JavaScript to build a mobile application. It is like React, which uses nativecomponent rather than using web components as building blocks.

• **Expo Go:** Expo is an open-source platform for making universal native apps for Android, iOS, and the web with JavaScript and React. Expo is an open-source platform for making universal native apps that run on Android, iOS, and the web. It includes a universal runtime and libraries that let you buildnative apps by writing React and JavaScript. This repository is where the Expo client software is developed, and includes the client apps, modules, apps, and more. The Expo CLI repository contains the Expo development tools.

5. PROPOSED SYSTEM ARCHITECTURE

The E-commerce Management System has many advantages, compare to traditional store as one can compare the cost of a product with other e-commerce websites, and if a user dislikes any product he/she can return it. While we can make use of the current technology to overcome the problem with the existing system. The E-commerce Management System companies can use a flying robot, so when a user places an order, the company will send theproduct through the robot. The robot will find the user by using the GPS, and in this way, wecan reduce the time to deliver a product. While before sending a product the e-commerce company will check the product that it is same or not with the requested order.

6. METHODOLOGY

This system works using various modules listed below. Refer fig. 1.0 given below shows various modules in the system and the relationship that exists between them.

1. User - This module of the system describes the different views the system will provide. As shown in there will be two views. They are:

a) Registered User - This view will be provided by the system to the authenticated user who has successfully registered into the system. Only the registered user will be allowed to experience further functionality (i.e to access the products buy them place order and other stuffs.) of the system. Moreover registered user can also use different services provided by our Web App and Mobile Application.

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b) Guest User - This view will be provided by the system to the guest user. Guest user can view add to cart functionality, but cannot use other important functionality of the system.

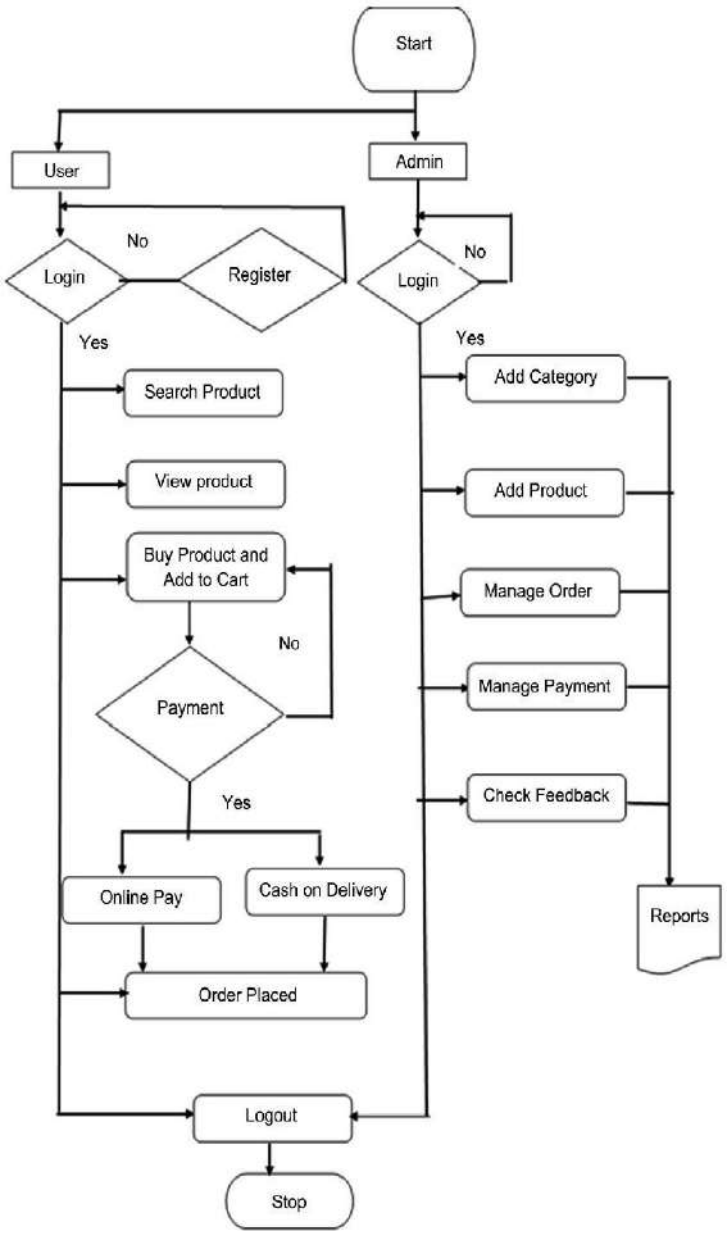
2. Authentication – This module deals with authenticating and verifying whether the user is registered user or not. The user gets to user other privileges once successfully authenticated.

3. Logged in User– This module of the system deals with taking inputs from the user. The users have to enter their credentials type they want along with some basic user information like delivery address PayPal credentials etc.

4. Payment Types: Can select the payment types COD or PayPal account or Card Payment.

5. Placed Order: Order has been placed and the user will get updated when the admin will update from its side after confirmation from the PayPal account of the company.

6. Admin Privileges: Admin will add, update and delete products. Admin has the access to view user profile and update order to deliver if amount is successfully paid.



7. FUTURE SCOPE

Working in the MERN stack delivers powerful results simply and efficiently. Knowingyour way around the stack is an important skill set since building and deploying solid MERNapps is likely to gain importance in the future. These days, MERN Stack is used extensively since everything is done in JavaScript. Asyou know, JavaScript is everywhere. It is used both on the front- end and back-end side. Because of this, there's no need for context

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switching. Tech stack that utilize multiple coding languages, force developers to figure out how to mix them together. Since MRN is JavaScript-based, developers only need to master a single coding an gauge, which makes things a million times easier. Node.js was built on Chrome's JavaScript runtime to make it more conducive to building fast-operating network applications with easy scalability. The platform operates using a no blocking, event-driven I/O model that is incredibly efficient. Node.js's efficiency and simplicity make it an ideal platform for real-time sites running across distributed devices, especially those with intense data requirements. But Node.js hasfar more potential in conjunction with the MERN stack.

8. CONCLUSION

The main theme is to build an e-commerce electronic gadget selling websites with allthree i.e., Front end, Back end, and Database. This website is a fully pledged working websites right from the login authentication, admin authorization, add items to cart, using payment gateway. It can be used by any textile industry on either a small scale or a larger scale. The websites is easy for them to access and without any effort categories can be created and products can be added by them. It will be very attractive for the customer to see the products by sitting at home or office. It will be very helpful for the small-scale industries without selling to wholesales, large retails mediators they can directly sell to thecustomer by saving money for both.

REFERENCES

1. JavaScript [Internet]. Mozilla.org. Available from: https://developer.mozilla.org/en- US/ docs/ Web/ JavaScript
2. NodeJS Introduction [Internet]. Tutorialspoint.com. Available from: https:// www. Tutorials point.com/ nodejs/ nodejs_introduction.htm
3. Express.js Introduction [Internet]. Mozilla.org. Available from: https://devel- oper.mozilla.org/en-US/docs/Learn/Server- side/Express_Nodejs/Introduction
4. MongoDB [Internet]. Mongodb.com. Availablefrom: https://docs.mon-godb.com/manual/introduction/
5. Component [Internet]. Reactjs.org. Available from:https://reactjs.org/docs/com ponents-and-props.html
6. World Applied Programming, WAP journal. www.waprogramming.com
7. Types of E-Commerce Source: Nemat, R.(2011) https://www.researchgate.net/figure/Different-Types-f-E-Commerce-Source-Nemat-R-2011- Taking-a-look-at-different-types_fig3_335665677
8. Blackwell, Roger, D`Souza, Clare, Taghian, Mehdi, Miniard, Paul and Engel, James 2006, Consumer behaviour : an Asia Pacific approach, Thomson, South Melbourne, Vic..
9. Broekhuizen, T., & Huizingh, E. K. (2009). Online purchase determinants: Is their effect moderated by direct experience. Management Research News.
10. Hansen, T., & Jensen, J. M. (2009). Shopping orientation and online clothing purchases: the roleof gender and purchase situation. European Journal of Marketing.
11. Park, J., & Stoel, L. (2005). Effect of brand familiarity, experience and information on online apparel purchase. International Journal of Retail & Distribution Management.
12. Monsuwé, T.P., Dellaert, B.G., & Ruyter, K.D. (2004). What drives consumers to shop online? Aliterature review. International Journal of Service Industry Management, 15, 102-121.

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ONLINE NOTES PORTAL AND OCR

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ABSTRACT
One of the foremost involved issues of these days is to precisely translate the text gift in a picture to somebody's clear text. This has been gaining attention of late due to the huge work done by the pc Vision Community.

The most vital idea behind this technology are a few things known as OCR – Optical Character Recognition. With the assistance of the OCR, we are able to search and acknowledge the text in electronic documents and might simply convert them into human clear text. It converts electronic documents' text into connected grapheme.

Document segmentation and Translation square measure one among the key areas in pattern recognition and tongue process. This paper presents details concerning translation in terms of an online application that accepts image associated pdf document as an input, wherever input document could be a user outline image file containing text in any language offered within the Python-tesseract library and will its actual translation in any supported languages victimisation Google Translator. Python script and numerous libraries square measure accustomed approach numerous challenges in segmentation and translation of a document.

And on-line Notes Portal permits student to share their Notes and Documents while not sharing their non-public info.

It will conjointly permit student to invite the notes that they're needed of on-line Notes Portal has its own info for storing the information files and knowledge recording the notes and student.

Keywords: Online Notes Upload, Download, OCR, Admin panel.

1. INTRODUCTION

Online Notes Portal and OCR may be a web-based application that permits student and school to share notes and documents concerning the topics and lectures.

In several schools their square measure therefore me students square measure introvert they merely can't raise anyone for notes and facilitate so we tend to making a poral which will have all reasonably notes for as long as college desires. It conjointly takes Queries from students if any student desires any reasonably special notes for the study, they merely simply enkindle it mistreatment question page on internet application.

It conjointly has OCR feature if any student desires to grab data the knowledge the data from pictures and pdf and edit that information as doc, they will do this by mistreatment OCR.

OCR signify Optical Character Recognition. it's a mechanism which will convert text in AN electrical document or a scanned writing into human decipherable text. It scans the text of the image character-by-character, analysis the image then converts into the respectable ASCII character Code. Most of the OCR devices have a optical scanner for scanning the text then Analysis it through the OCR and generating an editable document of the scanned image.

1.1 BACKGROUND

In today's world this is problem for many students that they cannot find all notes related to them Study. And also, many school and college doesn't have any website and any app related to library and for the notes. In the Pandemic many colleges and Schools were unable to provide the right kind of books for study for the student. Because they don't have any kind of online portal or app for notes and books study were mainly dependent on google for books and notes.

1.2 PROBLEM DEFINITION

In Current situation several schools don't have any reasonably IT support or any reasonably online management for them. they're in the main reliable on google and online services for give books and notes to their student. For that sort of faculties and college we have a tendency to try to produce an answer for them we have a tendency to create an internet notes portal for them wherever they'll share notes with one another while not revealing any one's identity. There's a quickly increasing demand for versatile and non-traditional learning and teaching. This demand is pushing universities and different instructional establishments to supply new ways in which of achieving best course delivery and scope, like by the increasing giving of on-line and amalgamated courses of study.

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2. OBJECTIVE

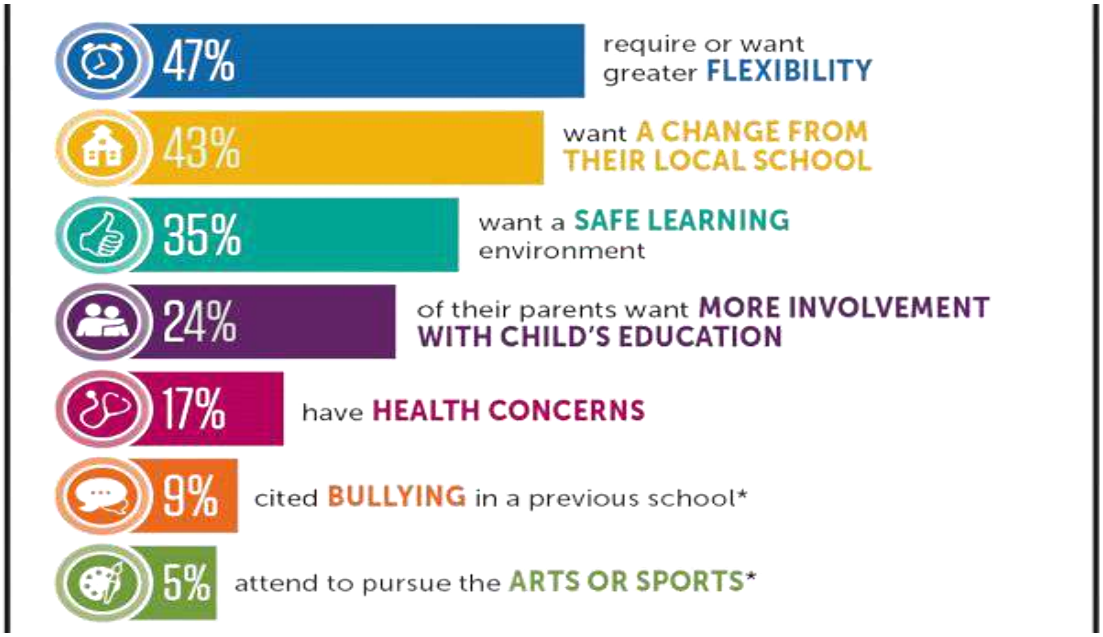
An impediment to the growth and improvement of online university education is that the lack of suitableness of some courses and course options for online implementation. whereas the content of most ancient courses will be delivered on-line and learning outcomes will be achieved by adopting equivalents to face-to-face education approaches, bound courses gift important constraints for delivery on-line. we've got used technology as Django, Py-Tesseract, OpenCV and SQLite for building this project. Django is one in every of best framework for handling great amount of knowledge.

3. LI TERATURE SURVEY

We have undergone certain research papers based on the Experimental Analysis of Colleges and Schools data Using Data Mining and found out certain methodology and key findings. During the process, we have also identified certain research gaps which we can overcome while implementing our project.

Table -1: Literature Review table

S.No	Statements	Responses	N	Marginal Percentage
1.	The usability and expertise in computer ensures the effectiveness in computer mediated learning.	SDA	6	7.2%
		DA	5	6.0%
		N	7	8.4%
		A	38	45.8%
		SA	27	32.5%
2.	Online learning ensures the effectiveness in terms of coping up with missed lectures.	SDA	0	0%
		DA	10	12.0%
		N	14	16.9%
		A	43	51.8%
		SA	16	19.3%
3.	Productivity of students can be enhanced through online learning to strengthen educational concepts.	SDA	1	1.2%
		DA	3	3.6%
		N	15	18.1%
		A	44	53.0%
		SA	20	24.1%
4.	Online learning is economic in terms of time for students and teachers.	SDA	2	2.4%
		DA	10	12.0%
		N	19	22.9%
		A	33	39.8%
		SA	19	22.9%
5.	Students and teachers interaction is weak through online learning.	SDA	4	4.8%
		DA	21	25.3%
		N	17	20.5%
		A	24	28.9%
		SA	17	20.5%
6.	Online learning ensures the effectiveness for presenting the work in class.	SDA	3	3.6%
		DA	13	15.7%
		N	28	33.7%
		A	24	28.9%
		SA	15	18.1%
7.	Quality of teaching and learning can be increased through Online learning because it integrates various types of media.	SDA	3	3.6%
		DA	14	16.9%
		N	14	16.9%
		A	34	41.0%
		SA	18	21.7%
8.	Online learning offer maximum engagement of students.	SDA	4	4.8%
		DA	14	16.9%
		N	18	21.7%
		A	36	43.4%
		SA	11	13.3%



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Method	Description
Optical mark recognition (OMR)	OMR looks for marks in a predefined location. The earliest use of OMR was for paper tape (in 1857) and punchcards (created in 1890). Nowadays OMR uses an optical scanner or mark reader to look for the marks in a predefined location on the questionnaire. OMR can detect the mark but cannot identify what the mark is, as there is no recognition engine. OMR is best used for discrete data, with predefined response categories. Accuracy rates are typically high (~99.8%), and more accurate than manual keying (Smith et al. 2007). OMR employs special paper, special ink, and/or a special input reader.
Optical character recognition (OCR)	Through the recognition engine, OCR translates scanned printed character images into machine-readable characters (ASCII). It looks at individual characters rather than whole words or numerical amounts. Accuracy rates are ~80% (Smith et al. 2007). It therefore reduces the cost of data capture processing by reducing the amount of manual keying. OCR uses a pattern recognition engine, requiring clear contrasts between completed responses and the paper background.
Intelligent character recognition (ICR)	More recently the term ICR has been used to describe the process of interpreting image data, in particular alphanumeric text. ICR recognizes and converts handwritten characters to machine-readable characters. ICR is generally contained as a module of OCR and can provide real-time recognition accuracy reports.

4. Technology Used

OCR (Optical Character Recognition)

Optical character recognition or optical character reader OCR the electronic or mechanical conversion of images of typed, handwritten or printed text into machine-encoded text, whether from a scanned document, a photo of a document, a scene-photo (for example the text on signs and billboards in a landscape photo) or from subtitle text superimposed on an image.

DJANGO

Django is a high-level Python internet framework that allows speedy development of secure and reparable websites. designed by toughened developers, Django takes care of a lot of of the effort of internet development, therefore you'll concentrate on writing your app while not having to reinvent the wheel. it's free and open supply, features a thriving and active community, nice documentation, and plenty of choices for gratis and paid-for support.

Django are often (and has been) want to build virtually any style of web site - from content management systems and wikis, through to social networks and news sites. It will work with any client-side framework, and might deliver content in virtually any format (including HTML, RSS feeds, JSON, XML, etc).

5. METHODOLOGY

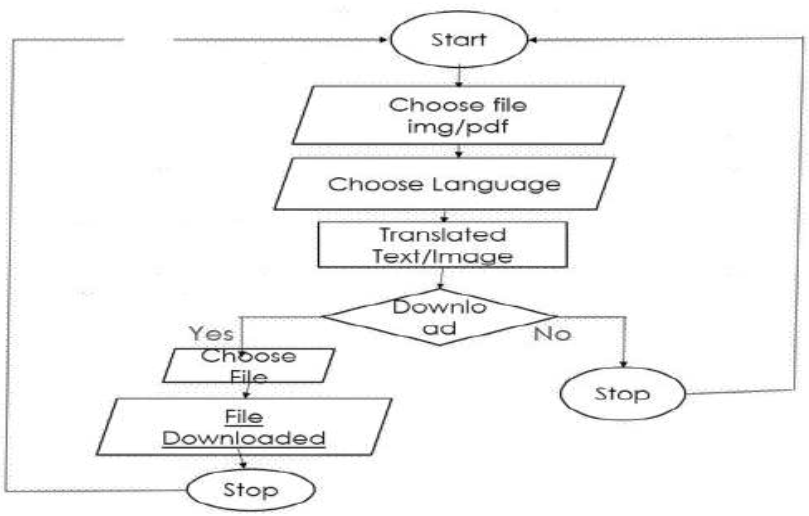

Fig -1: Methodology Diagram for Extracting Text from Images Using OCR

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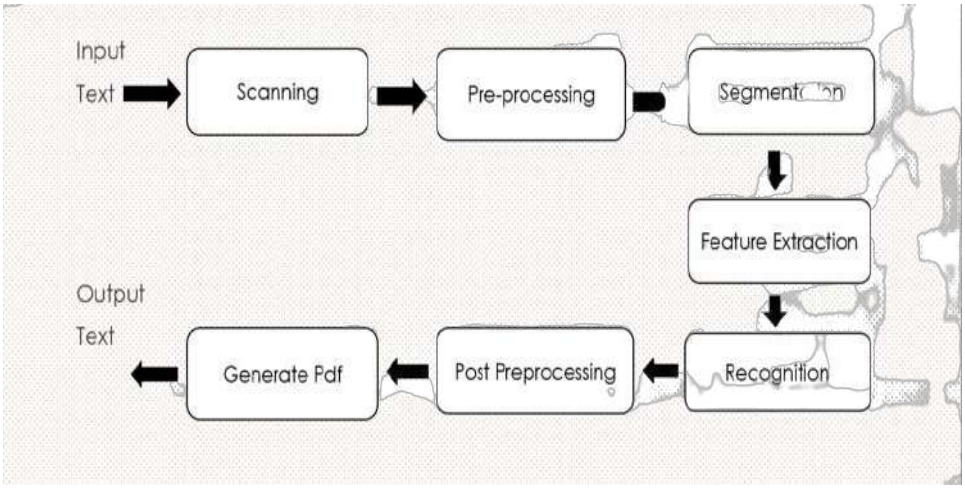

Fig-2: Block Diagram for extracting text from images

6. RESULT AND DISCUSSION

This project is fundamentally related to use of information technology in Education can change the scenario of decision making and learning method can yield in a better way. By using the Online Notes student will able to get study material related to their syllabus and they can also share notes with colleagues. Online Notes Portal also has OCR (Optical Character Recognition) features by using this feature student will be able to extract text from images and use it make documents and pdf files. we can browse any image and ask the application to convert the image text into the required language text.

7. FUTURE SCOPE

The Online Notes Portal will be used as Uploading sharing Notes with student belonging to their colleges and School. It also can be used as library where different kind of books and notes can be uploaded and student can download Share and Upload notes

All the Notes will be managed by some Admin in online notes portal admin could be anyone from teacher faculty all the uploaded Notes will be first verified by the admins than only it will be available for the student.

Student can also use built in OCR feature in Portal for scanning documents and extracting text from them and use that text makes Notes.

8. CONCLUSIONS

Here we have presented a method to use segmentation and translation together in order to separate a document in such a way that it will reduce the complexity to understand a document and make that document easily available in the most understandable form anyone could need. The technology used for Optical Character Recognition will help to get that document readily converted into the characters which can then be translated to any language known to Google Translate API. We have shown that any document whose image is available with us can be read and translated by means of some python scripting and which will ultimately help anyone to understand it in his/her known language. output from the working web-application.

REFERENCES

[1] Ayatullah Faruk Mollah, Nabamita Majumder, Subhadip Basu and Mita NasipuriDesign of an Optical Character Recognition System for Camera-based Handheld Devices,IJCSI International Journal of Computer Science Issues, Vol. 8, Issue 4, No 1, July 2011.t

[2] ranob K Charles, V.Harish,M.Swathi, CH. Deepthi,“A Review on the Various Techniques used for Optical Character Recognition”,International Journal of Engineering Research and Applications (IJERA) ISSN:2248- 9622, Vol. 2, Issue 1, Jan-Feb 2012.

[3] Satyajit S.Saha, Dnyaneshwar S. Hagawane , Pravin .Kulkarni ,Swapnil .Dhamane ,Prof. S.A. Agrawal, Mobile Based Text Detection and Extraction from an Image, International Journal of Emerging Technology and Advanced Engineering (ISSN 2250-2459, ISO 9001:2008 Certified Journal, Volume 3, Issue 11, November 2013).

[4] Shalin A. Chopra, Amit A. Ghadge, Onkar A. Padwal, KaranS. Punjabi, and Prof. Gandhali S. Gurjar , ” Optical Character Recognition” International Journal of Advanced Research in Computer and Communication Engineering Vol. 3, Issue 1, January 2014.

ISSN 2394 - 7780

[5] Smith, R "Hybrid Page Layout Analysis via Tab-Stop Detection, Document Analysis and Recognition" Proc. 10th Int. Conf. on Document Analysis and Recognition, 2009.

[6] Smith, R., "A" simple and efficient skew detection algorithms via text row accumulation" Proc. 3 rd Int. Conf. on Documents Analysis and Recognition, 1995, pp1145-1148.

[7] Yassin M.Y.Hasan and Lina J.Karam, Morphological Text Extraction from Images. IEEE Image Processing and Transaction on Vol.9 No.11, Nov 2000

[8] Nobuyuki Otsu, A threshold method of selection from gray-level histogram. IEEE Trans.Sys.,Man., Cyber 9(1):62-66.

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N-MARKET

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ABSTRACT
As the world is so busy, no one like the complexity with any work dealing with numbers. It might be hectic works. Specially when we have to types numbers for calling, messaging and WhatsApp. The situation creates panic and confusion on the person who do the task of calling, messaging and WhatsApp. Having Records of the called numbers is important the feedback after calling too.

Keyword: Calling, Messaging, Tally, Feedback and WhatsApp

I. INTRODUCTION

So, our aim is to develop an android application for marketing purpose. Marketing application provides you facility to call all the numbers in an excel sheet. Automatically call and hang up after certain duration. It's automatically sends SMS to each number and let them know the scheme. This application gives universal acceptance for offline as well as online commutators.

This application is developed with the objectives of making the system reliable, easier, fast and more informative. This application will help to managing various types of records such as client's details, product/schemes list & easily sell.

One of the main advantages of this Multi-Marketing Caller application is to connect peoples or clients which are far away from the internet world & provides useful content to them through SMS.

Short Message Services (SMS) is one of the most engaging and cost-efficient ways to engage prospects and customers. SMS and Call is a very effective marketing tool.

II. LITERATURE SURVEY

Virtual mentoring to enhance persistence essential for secondary and post-secondary students with disability enrolled in STEM learning (Gregg et al., 2016). Their evidence showed positive results using intentional frameworks and constructs to help enhance persistence and engagement. Their Research uncovered findings from the National Science Foundation that indicated that 1 out of 4 students with a disability enrol in a STEM major (Gregg et al., 2016). In addition, 56% of students with a disability do not report that they have a learning disability (Newman, et al., 2010). As a result, Gregg et al., (2016) their study reveals that with additional Assistance via virtual mentoring, students with a disability can increase their confidence as well as their competencies in areas such as math and science. This virtual program also hoped to reduce some of the barriers often experienced by the students such as traveling, time constraints and costs.

III.TECHNOLOGY USED

1) Android SDK
I) Android Studio as a Developer Environment for our app

II) Its open source

2) Java Language
I) The language that is been used to code N-Market App.

II) It is used in almost devices.

3) Android Device
I) To Install and test the App

II) Android 23+ API

4) XML Language
I) To design the Layout of the N-market app.

II) It is Extensible mark-up language.

5) WhatsApp API
I) TO connect the App with WhatsApp.

II) It check the validity of number

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IV. RESULT

The result is shown below. It shows the main view of our N-Market app. It includes Call, Message, WhatsApp and exit button.

1. Size of our App is 79kb.
2. No extra module used.
3. It is freeware.

V.CONCLUSION

The Multi-Marketing Caller Application concludes that with combination of knowledge and technology one can surely find a new innovative way to produce such algorithm or idea from which our society can be converted to digitally orient. With the point of this application, if this idea can be implemented with full use of technology used by existing supports one can get benefits of this application which is connected to Peoples which are far away from internet world to providing useful information through calling and messaging as well as performing quick way to do selling products.

REFERENCE

1) Bhende, M., Avatade, M. S., Patil, S., Mishra, P., Prasad, P., & Shewalkar, S. (2018). Digital Market : E-Commerce Application For. IEEE. 4, pp. 5386-5257. Pune, India: ICCUBEA.

2) Bujang, A. S., & Selamat, A. (2008). Verification of Mobile SMS Application with Model Checking Agent. International Conference . 8, pp. 217-222. Malaysia (UTM): IEEE COMPUTER SOCIETY.

3) Chapanit, T., & Apinanthana, U. (2020). Big Data Framework for Incoming Calls Forecasting in a Call Center. IEEE Xplore. 2, pp. 7116-7281. Turkey: ICECCE.

4) Chen, J., Watson III, W., & Mao, W. (2010). GMH: A Message Passing Toolkit for GPU Clusters. IEEE International Conference. 16, pp. 35-42. Virginia: IEEE COMPUTER SOCIETY .

5) Dhanawe, S. A., & Doshi, S. V. (2016). Hiding file on Android Mobile and Sending APK file through whats app usin g Steganography and Compression techniques. IEEE. Baramati, Maharashtra, India: SCOPES.

6) Golhar, R. V., Vyawahare2, P. A., Borghare, P. H., & Manusmare, A. (2016). Design And Implementation of Android Base. IEEE (pp. 3660-3663). Wardha, Maharashtra, India: ICEEOT.

7) Hadadi, K., & Almsafir, M. K. (2014). The Relationship between Mobile Marketing and Customer Relationship. Conference Publication Service. 3, p. 6. Malaysia: CPS.

8) Haji Sidek, S. F. (2010). The Development of the Short Messaging Service (SMS) Application for the School Usage. IEEE (pp. 1382-1386). Malaysia: ITSIM.

ISSN 2394 - 7780

9) Kiandokht Hadadi, Mahmoud Khalid Almsafir 2014 3rd International Conference on Advanced Computer Science Applications and Technologies.

10) Ramneek Kalra, Kamal Kumar, Shivani Batra, Namrata, 2017 International Conference on Computing and Communication Technologies for Smart Nation (IC3TSN)

11) Mrs. Manisha Bhende 1, Ms. Mohini S. Avatade2, Mrs. Suvarna Patil3, Mrs. Pooja Mishra4, Ms. Pooja Prasad5, Mr. Shubham Shewalkar6, 2018 Fourth International Conference on Computing Communication Control and Automation (ICCUBEA)

12) Reetesh V. Golhar1, Prasann A. Vyawahare2, Pavan H. Borghare3, Ashwini Manusmare4, International Conference on Electrical, Electronics, and Optimization Techniques (ICEEOT) – 2016

13) ANDROULIDAKIS NIKOS, ANDROULIDAKIS IOSIF Proceedings of the International Conference on Mobile Business (ICMB'05) 0-7695-2367-6/05 $20.00 © 2005 IEEE.

14) Hassan, G. M., Marwat, A. I., Wahid, S., Kareem, F., Yahya, K. M., & Bais, A. (2009). Cell Phone Based Geographical Advertisement System. IEEE (pp. 124-127). Malaysia: SCORED.

15) Janardanan, A., Ajil, P. C., Eldiya, T. V., & Denitta , D. (2018). Android Application for Car Wash Services. International Conference (pp. 1-3). Thrissur, India: ICETIETR.

16) Kalra, R., Kumar, K., Batra, S., & Namrata. (2017). Smart Market: A Step Towards Digital India. International Conference (pp. 352-355). Goenka University: IC3TSN.

17) Liu, L., & Wang, Q. (2011). A SaaS-based Web Call Center System for Network Marketing. IEEE (pp. 122-125). China: IEEE.

18) NIKOS, A., & IOSIF, A. (2005). Perspectives of Mobile Advertising in Greek market. IEEE. 5, pp. 7695-2367. GREECE: COMPUTER SOCIETY.

19) Riadi, I., & Firdonsyah, A. (2018). Forensic Analysis of Android-Base Instant Messaging Application. IEEE (pp. 5386-6940). Yogyakarta, Indonesia: IEEE.

20) See, J., Umi, Y. K., & Kianpisheh, A. (2010). User Acceptance towards a Personalised Hands-free Messaging Appliceation . IEEE International Conference (pp. 1165-1170). Kuala Lumpur, Malaysia: CSSR.

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FAKE NEWS DETECTION USING MACHINE LEARNING

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ABSTRACT
In these current instances, we heavily rely on social media applications inclusive of facebook, instagram, twitter, whatsapp, and many others. With these apps getting used every day, people are sharing extra statistics than ever before. Now-a-days, the news get unfold just in a couple of seconds, with the usage of social media programs. While absolutely everyone can use it best few can inform the distinction between what they're reading is some thing true or something completely fake. In this fast or rapidly developing world we simply examine the news or watch the information and trust it. The news we study is on some social media utility it does now not mean that the news must be correct, it can be fake or perhaps half proper. As we understand social networks are open for everybody and they do no longer verify their consumer or their posts so spreading faux information and misleading humans is an event which is regularly faced. Fake news may be truly harmful as they could target an character, organization or political parties. One such example may be the recent activities where some social media influencers might be bribed to give statements which includes the covid-19 vaccines are useless and can be dangerous for human beings. So, we're creating a gadget to come across whether or not the news that is provided is real or false, with the help of some Machine Learning Algorithms and some python libraries Our purpose is to offer the consumer actual or authentic information and allow the user come to recognise what they may be reading is absolutely actual or not, and additionally take a look at the authenticity of the web sites.

Keywords: Fake News, Machine Learning, News Detection, Algorithm

1. INTRODUCTION
Fake information is false or deceptive facts provided as information. It often has the purpose of adverse the reputation of a person or entity, or earning money through advertising and marketing revenue. They frequently have grammatical mistakes. They are often emotionally colored. They regularly try to affect readers' opinion on some topics. Their content isn't constantly true. They regularly use attention in search of phrases and news format and click baits. They are too properly to be real. Their assets aren't real maximum of the times. Our life now has turn out to be digital, as we can do most of the things on-line just by means of one click. In this virtual growing world, using net is increasing. It's like maximum of our lives depend on such social media programs. So, the use of those packages we additionally gain maximum quantity of news. The cause defined for this is, traditional information is more time ingesting. Consuming information from social media structures feels easy due to the fact we are able to proportion, speak the news via just one click While the use of social media we trust in what we study, and we even don't know that the news we read is whether or not correct or fake. We accept as true with what we see or what we read, and our maximum amount of decisions and reactions rely what we see and study. So, with the aid of analyzing fake news we may also judge the person or organization.

2. LITERATURE SURVEY
Mykhailo Granik ET. Al. In their paper indicates a simple technique for fake news detection using naive Bayes classifier. This technique changed into carried out as a software system and examined in opposition to a information set of Facebook news posts. They have been accumulated from three large Facebook pages every from the right and from the left, in addition to 3 massive mainstream political news pages (Politico, CNN, ABC News). They completed classification accuracy of about seventy four%. Classification accuracy for fake news is barely worse. This can be resulting from the skewness of the dataset: only 4.9% of it is fake information.

Himank Gupta gave a framework primarily based on different gadget studying approach that deals with numerous issues along with accuracy scarcity, time lag (BotMaker) and excessive processing time to handle heaps of tweets in 1 sec. Firstly, they have got accrued 400,000 tweets from HSpam14 dataset. Then they further symbolize the 150,000 spam tweets and 250,000 non- unsolicited mail tweets. They additionally derived a few light-weight capabilities along side the Top-30 words which can be supplying maximum facts advantage from Bag-ofWords model. They have been able to obtain an accuracy of 91.65% and exceeded the present solution through approximately 18%. Marco.

3. SYSTEM DESIGN
We have created this project for detecting fake news. We chose python programming language as it provides beneficial tools and capabilities that makes developing web applications less difficult. It offers developer

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flexibility and is extra handy. It will assist taking the input from the user. Once the enter is given to the gadget the given input records can be passed on for records extraction manner and for this procedure we've TF-IDF vectorizer. It will rework the textual content to characteristic vectors that may be used as enter to the estimator. It is used for massive amounts of facts e.g: Tweets, posts, and many others. It will differentiate commonplace words and new words. After that the facts will go through pre-processing and data extraction using TF-IDF processor. Then the usage of Logistic Regression, Decision Tree classifier, and Random Forest Classifier the data can be categorized as actual or fake, and if actual then upto how tons percentage or faux then upto how lots percent and ultimately the output may be generated and displayed along with its probability percentage.

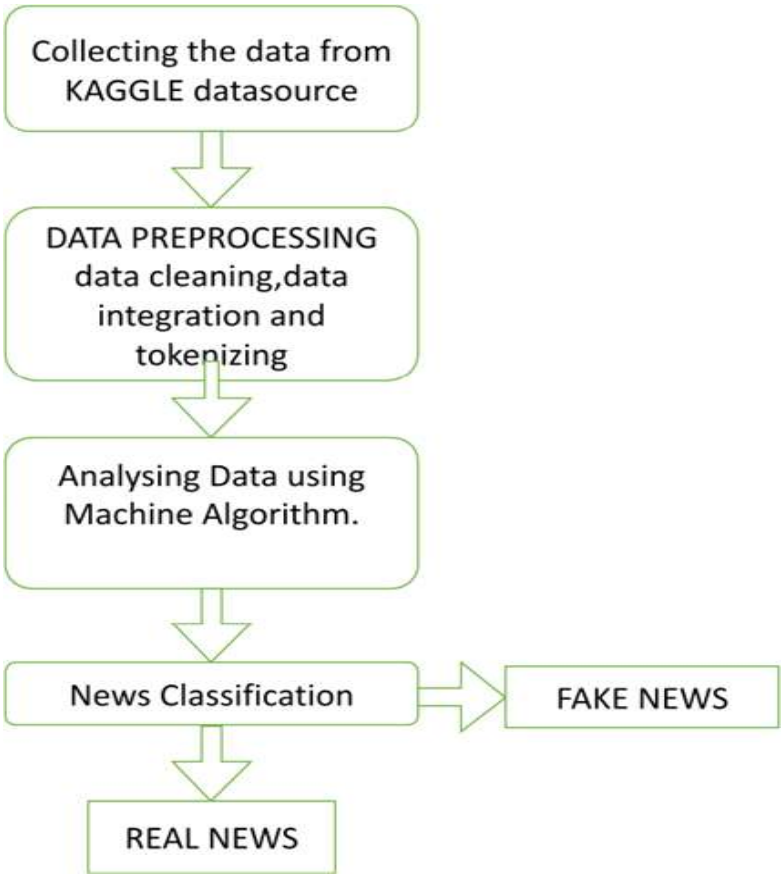

Fig – 1: System Flow diagram

4. IMPLEMENTATION

4.1 Data Collection and Analysis

There are two documents, one for actual news and one for fake news (each in English) with a total of 23481 "fake" tweets and 21417 "actual" articles.

4.2 Management of Data

In this section, a collection of understanding (dataset) is accumulated that could be a set of report articles, memories, information, posts. Once the dataset is gathered, nltk is overseas and corpus is used to perceive a collection of written or spoken material hold on a PC and acquainted with determine however language is used: the statistics is explored to set off a much higher facts of its shape and which means so the stopwords are eliminated.

4.3 Model Training

After the facts is properly explored and managed, the machine learning model is then geared up to be educated. A appropriate algorithm is chosen to teach the version. In our case, we've used three algorithms: Logistic Regression, Decision Tree Classifier and Random Forest Classifier.

4.4 Model Assessment

In assessing the model, the output of the model created is measured severally. Accuracy grading of the version is performed the usage of performance metrics like F1 rating, precision, keep in mind and accuracy charge that is based on confusion matrix record. Some adjustments are often created some of the model until delight is carried out in creating the version yield in clever accuracy of output.

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5. RESULTS AND DISCUSSION

On the basis of 3 system mastering algorithms that we used on this project, each set of rules has its own accuracy percentage while carried out on the dataset. The accuracy in line with the each set of rules implemented are:

Classifier	Accuracy
Logistic Regression	98.8%
Decision Tree Classifier	99.6%
Random Forest Classifier	98.9%

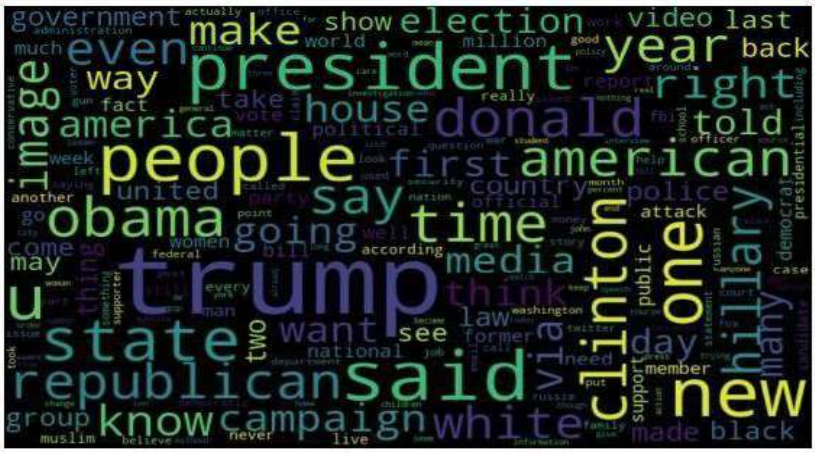

Fig -2: Word Cloud

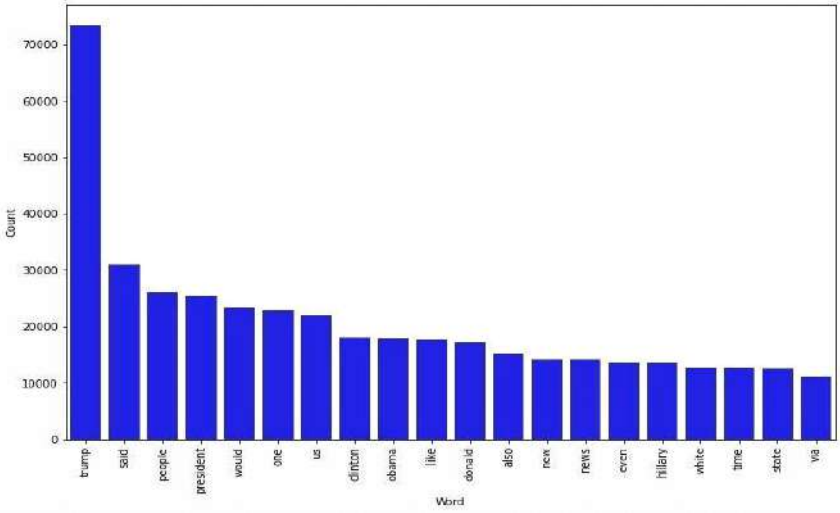

Fig-3: Graph of word count

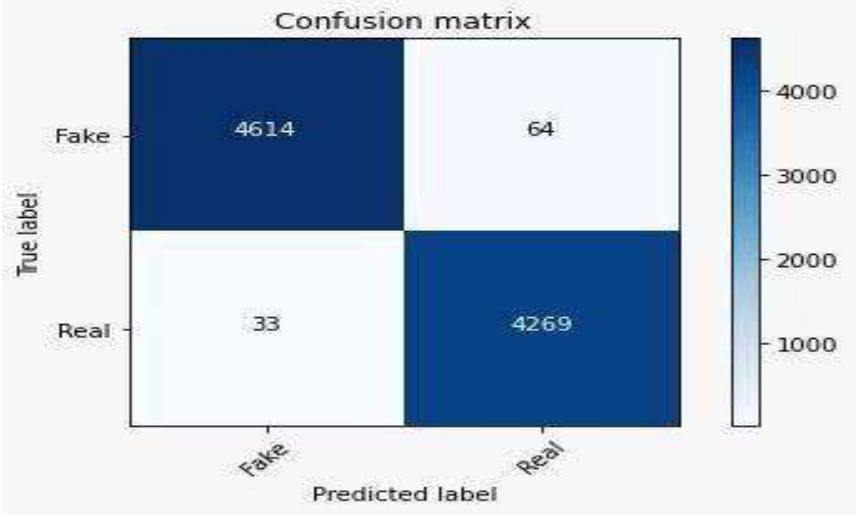

Fig-4: Confusion Matrix for Logistic Regression

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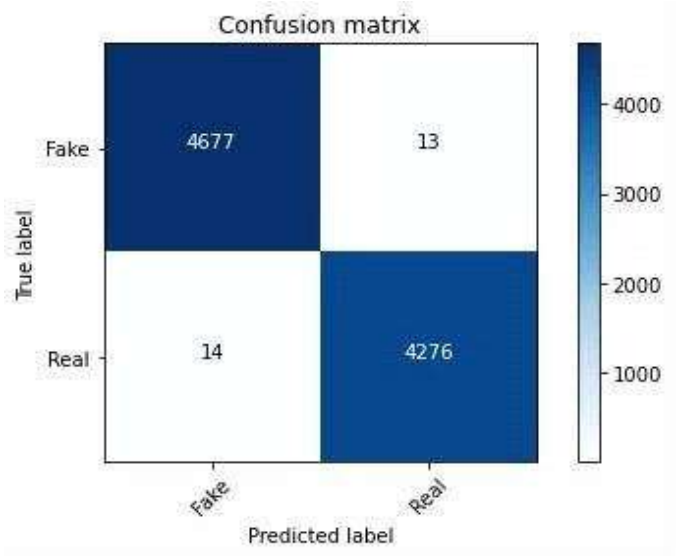

Fig-5: Confusion Matrix for Decision Tree Classifier

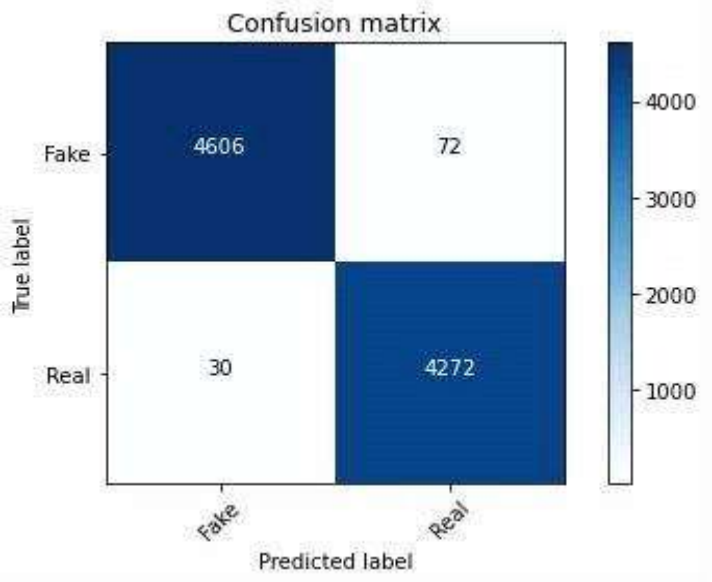

Fig-6: Confusion Matrix for Random Forest

6. CONCLUSION AND FUTURE WORK

"Fake news" is a time period that has come to mean different things to one-of-a-kind humans. At its core, we are defining "fake information" as those information stories which are fake; the tale itself is fabricated, with out a verifiable statistics, sources or fees. Sometimes these memories can be propaganda this is deliberately designed to deceive the reader. In latest years, fake news memories have proliferated through social media, in element due to the fact they may be so effortlessly and fast shared on-line. The assignment of classifying news manually requires in-depth expertise of the domain and understanding to perceive anomalies inside the text. In this mission, we discussed the trouble of classifying fake information articles using machine mastering models and ensemble method. The number one purpose of the undertaking is to identify styles in textual content that differentiate fake articles from authentic information. Fake news detection has many open problems that require attention of researchers, so that you can lessen the unfold of fake information, identifying key elements concerned inside the spread of news is an vital step. Graph idea and system studying techniques may be employed to discover the key resources involved in spread of fake information. Likewise, actual time fake information identity in videos may be any other possible destiny course. In the destiny, I wish to test out the proposed method of Naïve Bayes classifier, SVM, and semantic analysis, but due to constrained knowledge and time, this can be a task for thefuture. It is important that we've a few mechanism for detecting fake information, or a minimum of, an consciousness that no longer everything we examine on social media may be authentic, so we constantly need to be questioning severely. This manner we will help human beings make more knowledgeable selections and they may now not be fooled into questioning what others need to manipulate them into believing.

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7. REFERENCES

[1] M. Granik and V. Mesyura, "Fake information detection the usage of naïve Bayes classifier," 2017 IEEE First Ukraine Conference on Electrical and Computer Engineering (UKRCON), Kiev, 2017, pp. 900-903.

[2] H. Gupta, M. S. Jamal, S. Madisetty and M. S. Desarkar, "A framework for real-time unsolicited mail detection in Twitter," 2018 10th International Conference on Communication Systems &Networks (COMSNETS), Bengaluru, 2018, pp. 380-383.

[3] M. L. Della Vedova, E. Tacchini, S. Moret, G. Ballarin, M. DiPierro and L. De Alfaro, "Automatic Online Fake News Detection Combining Content and Social Signals," 2018 22nd Conference of Open Innovations Association (FRUCT), Jyvaskyla, 2018, pp. 272-279.

[4] C. Buntain and J. Golbeck, "Automatically Identifying Fake News in Popular Twitter Threads," 2017 IEEE International Conference on Smart Cloud (SmartCloud), New York, NY, 2017, pp. 208-215.

[5] S. B. Parikh and P. K. Atrey, "Media-Rich Fake News Detection: A Survey," 2018 IEEE Conference on Multimedia Information Processing and Retrieval (MIPR), Miami, FL, 2018, pp. 436-441.

[6] T. M. Mitchell, The Discipline of Machine Learning, Carnegie Mellon University, Pittsburgh, PA, USA, 2006.

[7] Understanding the logistic regression by way of Anirudh Palaparthi, Jan 28, at analytics vidhya.

[8] Understanding the random woodland by using Anirudh Palaparthi, Jan 28, at analytics vidhya.

[9] Aayush Ranjan, "Fake News Detection Using Machine Learning", Department Of Computer Science & Engineering Delhi Technological University, July 2018.

[10] Parikh, S. B., & Atrey, P. K. (2018, April). Media-Rich Fake News Detection: A Survey. In 2018 IEEE Conference on Multimedia Information

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MENTOR APPLICATION SYSTEM

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ABSTRACT
Mentor is as individual with expertise who can develop the career of a mentee. This career-related function establishes the mentor as a coach who provides advice to enhance the mentee's professional performance and development. Mentors have right to advise students on academic guidance, career advice, and professional development. Different mentors play various roles which are able to address different developmental needs of mentees in order to facilitate career progress. Mentoring is one of the most dynamic and traditional pedagogical tools, holding a great promise in the way of learning in educational technology. The emphasis should be on motivation and improvement of the students. As a replacement for face-to-face interactions, Electronic-Mentoring System (E-Mentoring System) uses an asynchronous, electronic medium to establish and sustain the liaison among the mentors and the proteges in an organization. Mentoring system is a client - server based model which acts as an interface between mentors and mentees-Mentoring uses a computerized medium to transfer knowledge and skills from teacher to student. It basically focuses on student and faculty relationships. E-Mentoring is fundamentally developed to improve the performance of students by assisting mentors to understand the problems of students more effectively and easily.

Keywords: Web Development, Admin Module, Student Module, Teacher Module, Database, Login.

I. INTRODUCTION
We have created a Mentoring software application which is accessible by both the Mentor(faculty) and the Mentee(student). The program is effectively designed to be used in the educational sector. The purpose of this program is mentoring students. This system is built under a runtime environment. While making this program complete object-oriented programming techniques are used to handle the real-world challenges in the system. This system contains three users who are admin, mentors and students. This system can be used as an application for Mentor Information Database to manage the college information and student's information. The system is an online application that can be accessed throughout the organization and outside customers as well with proper login provided. A mentor is an individual with expertise who can help develop the career of a mentee. A mentor often has two primary functions for the mentee.

The career-related function establishes the mentor as a coach who provides advice to enhance the mentee's professional performance and development. The psychosocial function establishes the mentor as a role model and support system for the mentee. Both functions provide explicit and implicit lessons related to professional development as well as general work–life balance. The mentoring relationship is inherently flexible and can vary tremendously in its form and function. The mentoring relationship exists between one individual in need of developmental guidance and another individual who is both capable and willing to provide that guidance.

The program allows for current students to impart their knowledge and experiences attending the college, and enhance their communication and goal setting skills. Mentors have the opportunity to advise students on academic guidance, career advice, and professional development. Mentors and students will be paired based on a variety of factors. There will be an expectation for both individuals to engage each other on a regular basis to ensure the relationship grows and benefits both the student and the professional. Pairs are asked to meet at least once a month for a formal commitment of 4 months, and we hope to allow each mentoring relationship to develop in a way that best suits the individuals involved. Mentees often have more than one mentor throughout their careers. With multiple mentors, a mentee can benefit from different mentors who have a variety of experiences and skill strengths to share. A developmental network perspective is used to expand our understanding of mentoring. Different mentors may be able to address different developmental needs of mentees in order to facilitate career progress

II. LITERATURE SURVEY
We have undergone certain research papers based on the Experimental Analysis of Colleges and Schools data Using Data Mining and found out certain methodology and key findings. During the process, we have also identified certain research gaps which we can overcome while implementing our project.

1. E-Mentoring System Application (DOI: 10.1109/I-SMAC.2018.8653663):
Teaching is most dynamic and traditional pedagogical tool, which holds the great promise in the way of learning in educational technology thus the aim should be on motivation and improvement of the students. Replacing the

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face- to-face interactions, Electronic-Mentoring System (E-Mentoring System) uses asynchronous, electronic medium to establish and sustain the liaison among the mentors and proteges in an organization. E- mentoring system is a client-server-based model which acts as an interface between mentors and mentees. The focus in mentoring program is on fostering and developing a positive relationship between mentors and student.

2. A Research and Mentoring Program for UG Women in Computer Science (DOI: 10.1109/ FIE.2004.1408747): It includes multi-faceted mentoring, community building activities, and a research program with significant educational components. The research component gives women an opportunity to work in research teams under the direction of a female faculty member who serves as role model. While there are other programs that allow students to work with female faculty on their research, this research program was designed to develop female students. The research team presents its research at an appropriate conference each year. The team members also reach out to other students by participating in recruiting activities and presenting their research to high school students at local career days.
3. Implementation of Mentoring System in College for Smooth Transition to work (DOI:10.1109/ ICL.2015.7318202): Developing and securing excellent human resources under both of the internal and external environmental changes today are a key deciding factor of the national competitiveness. However, due to the poor vocational training or career guidance services in college, the colleges have not been playing the role in the transition to the professional world for their students, who consequently cannot meet the industrial demand. In this study, the active support to help college students transferring to the professional world through mentoring was considered, and the needs analysis and system implementation were performed to find an effective way to support such service by implementing this as an online system.
4. Implementation of Mentoring System Using J2EE Architecture: E-Mentoring (DOI: 978-1-5090-5240-0/16): Mentoring is a traditional method of transferring knowledge and skills from an established professional in an organization to an inexperienced member in the field. Education sector has found mentoring as quite effective tool since long back and with the advent of new technologies, comes an idea of online mentoring, which is also referred to as e-mentoring. Instead of face-to-face meetings, Online Mentoring System (OMS) uses asynchronous, electronic communications to establish and support the relationship between mentor and the student using virtual mode. E-Mentoring uses electronic medium to transfer knowledge and skills from mentor to student. It primarily focuses on student and faculty relationship. Online Mentoring System is a Client-Server model, which acts as an Interface between Mentor and student. OMS strives to reduce the work load of students in entering their details and at the same time enable the Mentors to assess their students more efficiently.
5. MENTORing Affectively the Student to Enhance his Learning (DOI: 10.1109/ICALT.2009.205): In this paper a Web-based adaptive educational system to support personalized distance learning, which is named MENTOR is presented. The main purpose of MENTOR is to support learner Silas actions during the learning process in an effective way. To achieve this MENTOR incorporates an affective module which enhances the traditional learning practices with an affective dimension. The affective module makes use of an ontological approach in combination with the Bayesian network model in order to provide learner with the properly affective guidance. In this way the foremost goal of MENTOR, which is to supply the learner with a personalized and emotional awareness learning environment, is achieved.
6. Implementation of Mentoring System in College for Smooth Transition to Work (DOI:10.1109/ ICL.2015.7318202): Developing and securing excellent human resources under both of the internal and external environmental changes today are a key deciding factor of the national competitiveness. However, due to the poor vocational training or career guidance services in college, the colleges have not been playing the role in the transition to the professional world for their students, who consequently cannot meet the industrial demand. In this study, the active support to help college students transferring to the professional world through mentoring was considered, and the needs analysis and system implementation were performed to find an effective way to support such service by implementing this as an online system

III. DESIGN AND IMPLEMENTATION

The users would be highly authenticated as well as can be verified through their google account. Any kind of Data should not be leaked from within the application. Any user without sufficient privileges should not be able to access important data. Firebase Security Rules stand between your data and malicious users. We can write Simple or complex rules that'll protect our app's data to the level of granularity that the application requires.

In this section, we will discuss how the Mentor Application System is developed. This system is built under a runtime environment using complete object-oriented programming techniques to handle the real-world challenges in the system. This system contains three users who are admin, mentors and students

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Figure 01:- Architecture Overview

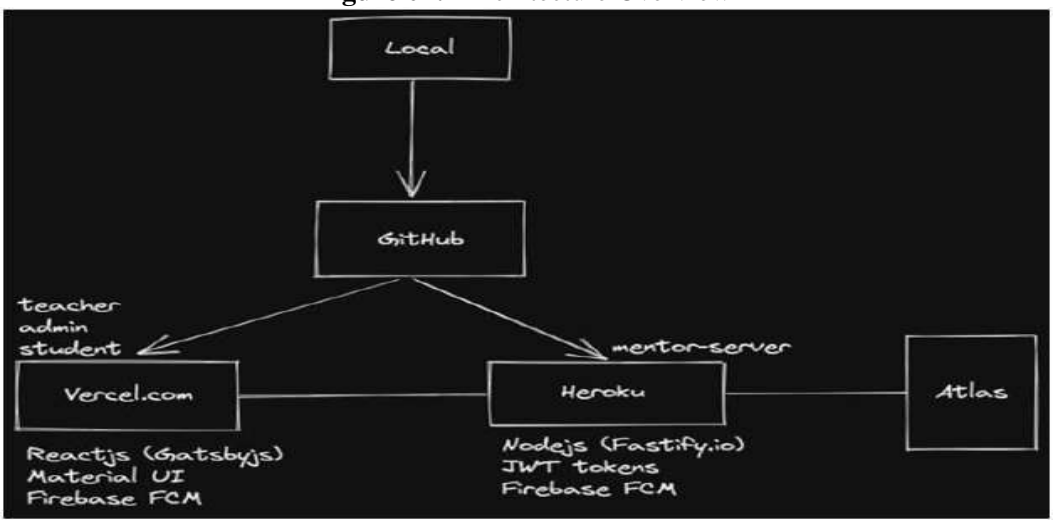
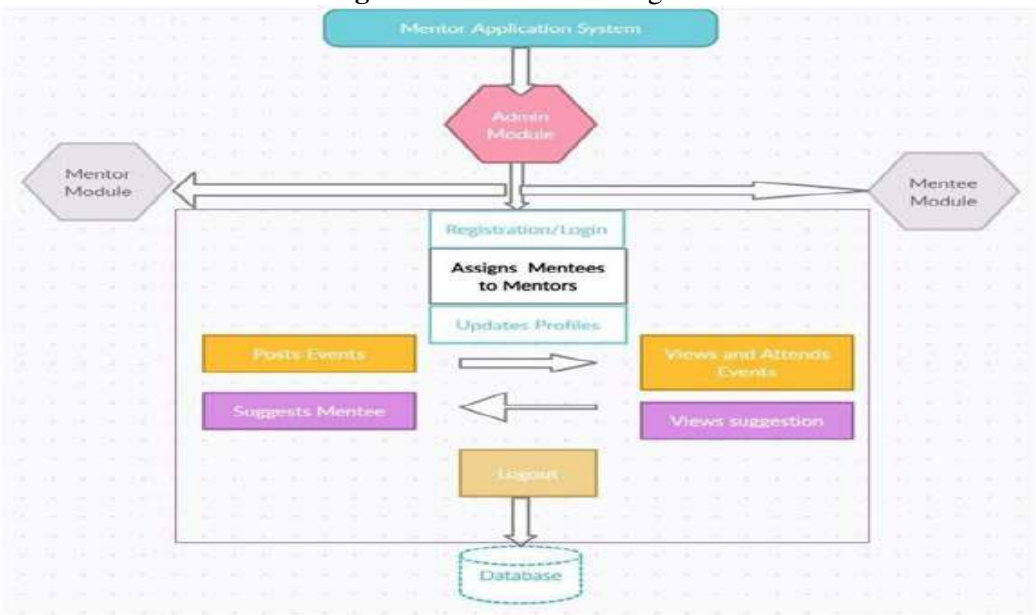


Figure 02:- Data Flow Diagram



ALGORITHM:-

1. The application starts with a home page
2. Home page contain Login button.
3. The application starts with Admin/Student/Mentee Login.
4. If the user is new, then admin will register the Student or Mentor using registration page.
5. Once Admin has entered the valid credential and details, he will share the credentials with the mentor or mentee.
6. After review page, the mentor or mentee login using that credentials and will be directed to Dashboard
7. Dash board is where user can choose to update information if gets wrong or review the Data review page.
8. If the user is existing user, then they will be directed to the dash board.
9. Step 6 again for all the users i.e., Mentor and Students.
10. This loop can only be close if user decide to click on log out button in the dashboard.

IV. RESULTS

- Admin module: The administrator has the only power to add a student or a student's group, the addition of the faculty can only be done by the admin. The messaging system for the admin can support only the faculties, no students can message to the admin, and the message is secure.

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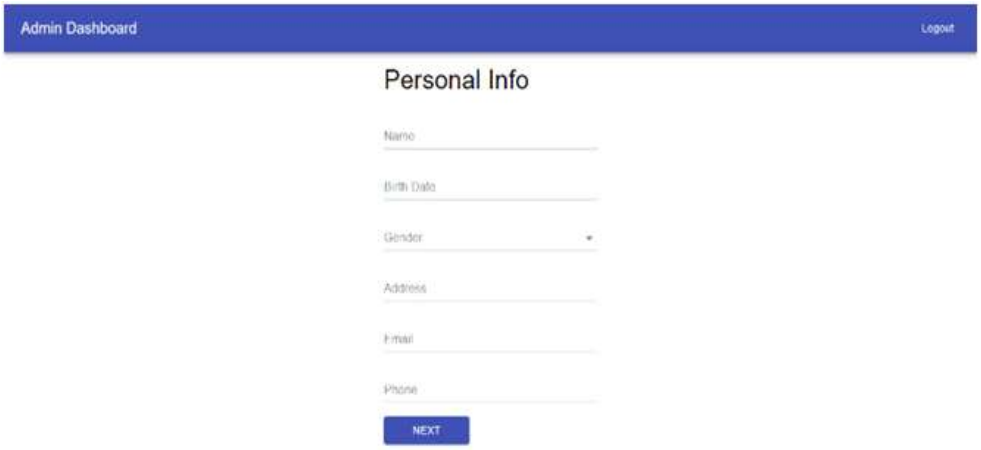

Figure .03:- Admin dashboard

- **Mentor Module**

The mentor module has the capabilities that they can track the student's attendance, marks, progress reports, UT marks, IA marks, etc. Apart from the admin, the mentors can also post the circulars for all the students and the notifications for their allotted mentees.

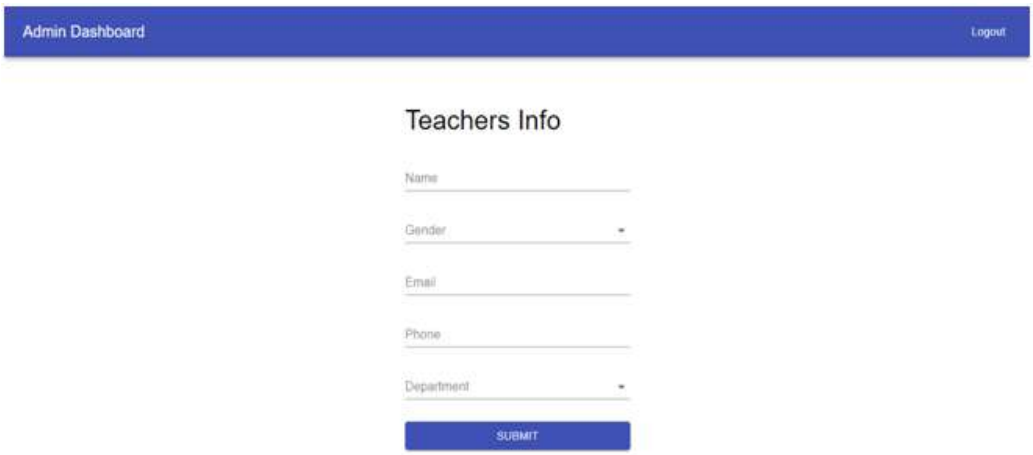

Figure 4:- Teacher Registration

- Student Module: The message/chatting facility for the students that is only with their mentors. The student module has the capabilities only for viewing the details about their marks, attendance, notices / circulars and their progress reports. Another feature that is enabled for the students to add or update their profile. There is also a one-time edit feature of the personal details of the students.

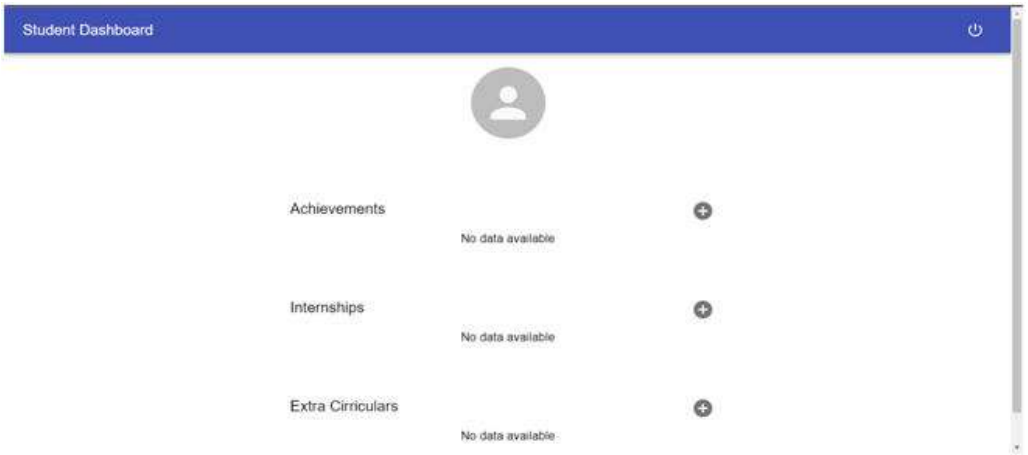

Figure 5:- Student Dashboard

V. CONCLUSION

In our application mentees are given more priority and freedom to select the mentor based on their area or interest and knowledge. This application can help the mentee and mentors to automate their normal workflows.

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This system will be feasible for institutional/College use through the web interface and is secure to use. A mentor can conduct meetings by informing the students through this application and post their results. This module could also be used for collecting data of the mentee, mentor and interaction between them. This Application encourages real time knowledge sharing. We have designed and implemented the Mentor Application System. This system will be available for institutional/College use through the web interface. A database about mentee and mentor is stored. A mentor can conduct meetings by informing the students through this application. Each and every detail about the progress, weakness, strength of the mentee is observed by the mentor. We have successfully delivered the Mentor Application system with the features mentioned and deployed it to the cloud. We ran several tests around it to make sure it works well after being deployed to the cloud. This application thus helps the mentee and mentors to automate their normal workflows. This system will be feasible for institutional/College use through the web interface and is secure to use. A mentor can conduct meetings by informing the students through this application and post their results. This module could also be used for collecting data of the mentee, mentor and interaction between them. Mentors can also look at student's profiles and guide them based on their results.

VI. REFERENCES

1. Javeriya Farheen and Sunanda Dixit of E-Mentoring System Application on 2018 2nd International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud) (I-SMAC)I-SMAC (IoT in Social, Mobile, Analytics and Cloud) (I-SMAC), 2018 2nd International Conference on.
2. P. Doerschuck of A research and mentoring program for undergraduate women in computer science on 34th Annual Frontiers in Education, 2004.
3. Juhyn Jeon, Jaeeung Lee of Implementation of Mentoring System in College For Smooth Transition to Work on 2015 International Conference on Interactive Collaborative Learning (ICL).
4. Makis Leontidis, Constantin Halatsis, Maria Grigoriadou, Mentoring Effectively the Student to Enhance his Learning, IEEE and 2009.
5. Indu Anoop, Rutuja Patil, Pradnya Godambe, Anwish Vast, Implementation of E-Mentoring System, IJREAM and 2019.

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ONLINE SECOND HAND VEHICLE BUYING & SELLING

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ABSTRACT
This Project is a web based application developedfor users who can Buy and Sell Second Hand Vehicle from the comfort of home through the Internet. It is a virtual store on the Internet where customers can browse the catalog and select Vehicles they are interested in, and Further read full details about the Vehicle. This system overcomes the problem of searching for a second hand vehicle. People usually go to garages and showrooms in search for their desired second-hand vehicle that they wish to buy that becomes tedious at a point and even consumes lot of time. Hence the project helps users to get their desired vehicle details online at a single place. User also get an Options where they can see the Health Condition of the Vehicle (Good, Average, Bad) and also the Live Status of the Vehicle whether it is For Sale/Sold. The Main Aim of the Project is to provide best used vehicles at low ratesfor the people without any Commissions. The Vehicles will be listed in the Ads Format, A user can view the details, status and condition. If the user wants to buy the vehicle he can contact the seller using Contact Details.

Keywords: Second Hand Vehicle buy & sell online system, Vehicle resell system

I. INTRODUCTION

SHVBS (Second Hand Vehicle Buy and Sell) isa Project meant to give people a better and trustworthy platform where they can List their vehicle to sell, and buy Vehicles of their own choice and obviously on their own terms and condition. With the help of internet and computer systems anyone can buy/sell his vehicle from anywhere the anytime.

People usually go to garages in search for their desired second-hand vehicle that they wish to buy, it becomes tedious at a point and even consumes lot oftime. Hence the project helps users to get their desired vehicle details online at a single place.

User also get an Options where they can see the Health Condition of the Vehicle (Good, Average, Bad) and also the Live Status ofthe Vehicle whether it is For Sale/Sold.

The Main Aim of the Project is to provide best used vehicles at low rates for the people without any Commissions.

II. SCOPE OF THE PROJECT

This is Project is based on buying and Selling of Wide Variety of categorized used Vehicles, easily and more comfortably.

The Burden of visiting, seeing, condition and human mood gets cleared by this simple website.

This system overcomes the problem of searching for a second hand vehicle. People usually go to garages and showrooms in search for their desired second hand vehicle that they wish to buy that becomes tedious at a point and even consumes lot of time.

Hence the project helps users to get their desired vehicle details online at a single place.

III. EXISTING SYSTEM

- The existing system is paid and in some system commission is taken for buying/selling used cars.
- Whereas our system is Free to use for both Buyers and Sellers, no commission are taken, there is no middle-men.
- Buyers contact the Sellers using details provided in the Ad/Listing, and proceeds further.

IV. PROPOSED SYSTEM

- Second Hand Vehicle buy and sell website is not only for cars, but bikes, scooters, EVs as well.
- The scope of the system allows developer to know about the limitations of the proposed system.
- The system is designed for the people who is having much more interest in sell and purchase vehicles.
- The proposed system is a website developed for people who wants to sell their vehicles and purchase vehicles.

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- This system provides all library portal functionalities in one where user can upload their vehicles, can search,
- Can customize web pages according to their choice.

They have to have their laptops/desktop to enjoy the services provided by the system. The version of the system is Limited to only Maharashtra Territory. Therefore no foreign people can register in the System and avail facilities which is otherwise not present in the past system. The system is developed in English. Therefore the user can not convert the system in his Native language. The website content is limited in terms of user.

Some of the information about the user is provided when then user is registered.

V. ADVANTAGES

- It saves user time that is wasted in search of required second hand vehicles.
- User can find the various vehicles information along with images at a single place.
- This system is effective and saves time, efforts and cost of users.
- Sellers can also easily find a buyer for their vehicle easily by posting ads.
- Easy registration.

VI. DISADVANTAGES

- The user cannot view the vehicle in person.
- The system is developed in English. Therefore
- the user can not convert the system in his Native language
- If there are poor quality photographs then it's of no use.

VII. APPLICATIONS

- The system can be applied to warehouses where the vehicles are put up for resale.
- Any person can use it to put up their vehicle for resale.
- Any person who wants to resell his/her old vehicle.

VIII. FEATURES OF THE PROJECT

- Search for your Desired Vehicles.
- Free of cost registration in the website.
- Free of cost listing of the Vehicle.
- Search through a variety of category.
- Commission is not required in buying/selling used vehicles.
- Price can be negotiated by Contacting with the buyer.
- Report an unwanted or misleading Listing.

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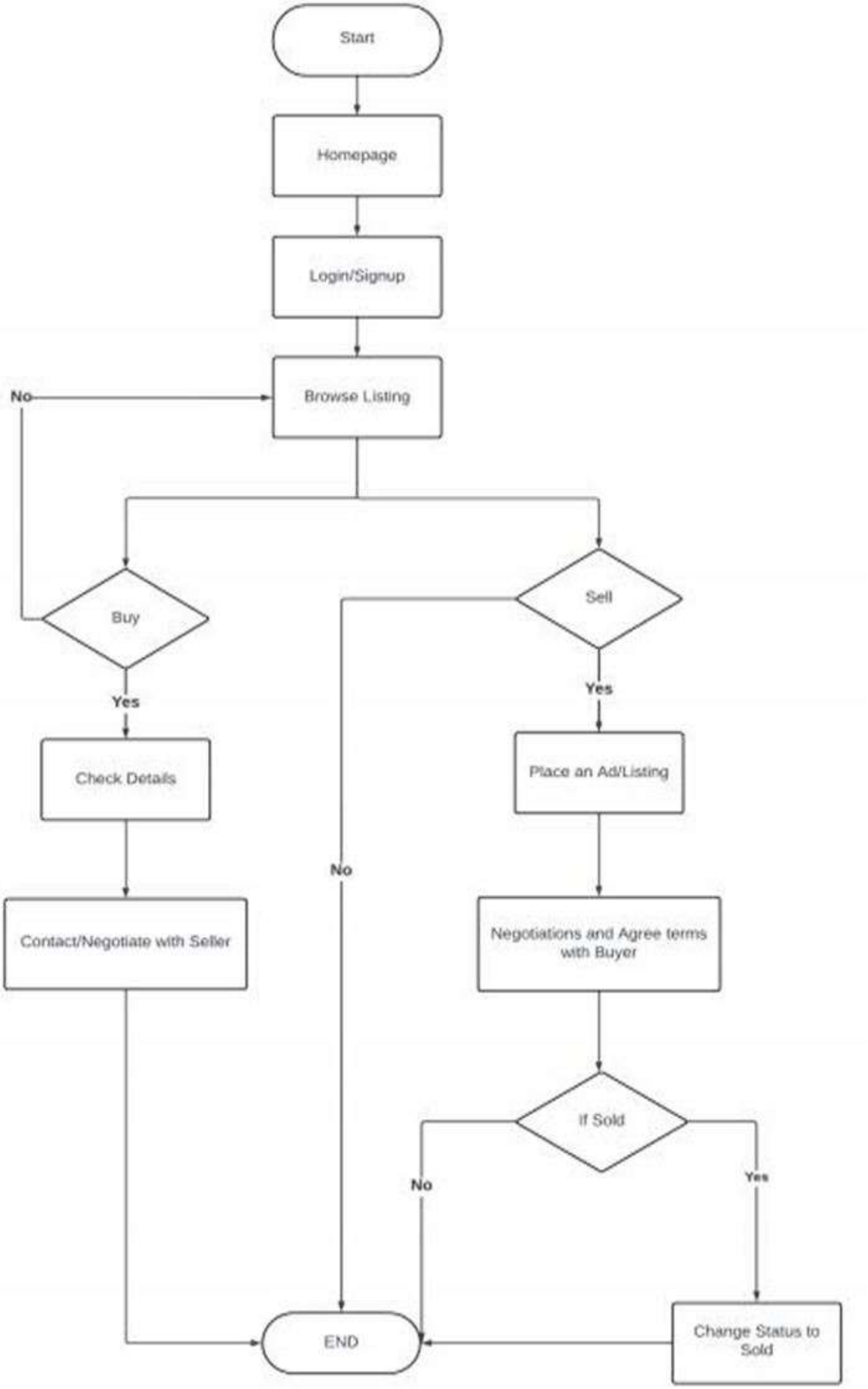
IX. FLOWCHART



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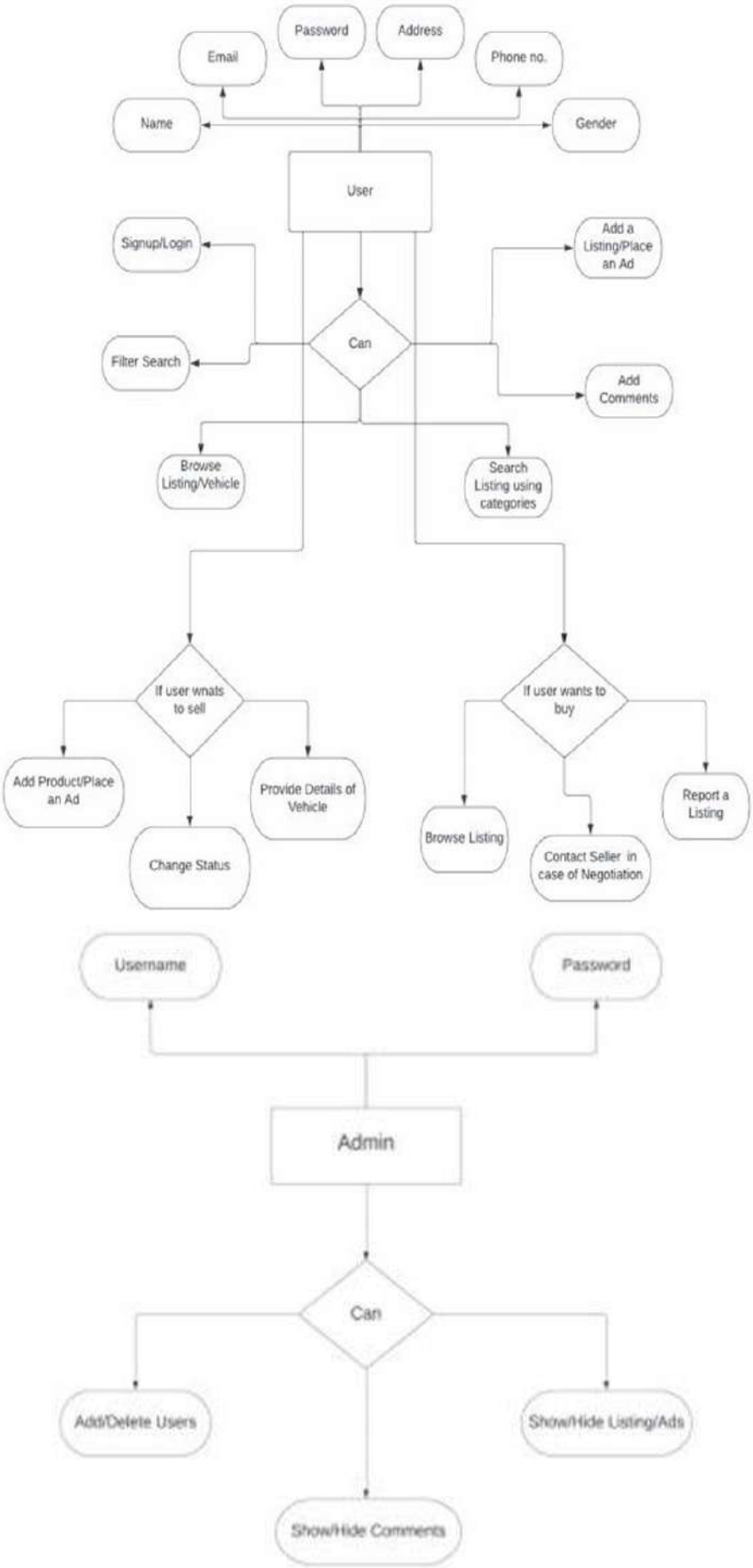
X. E-R DIAGRAM



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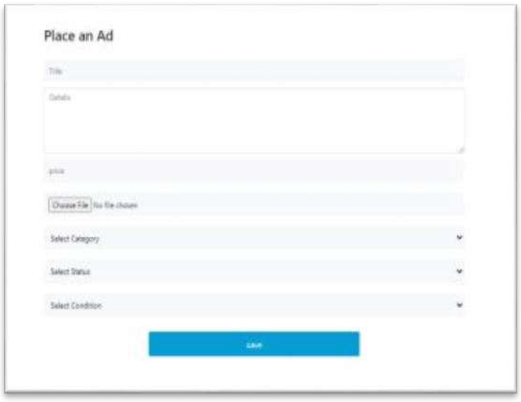
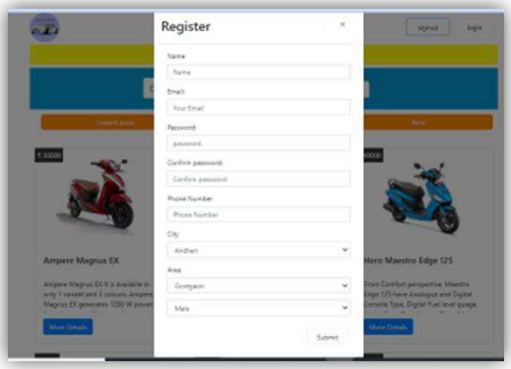
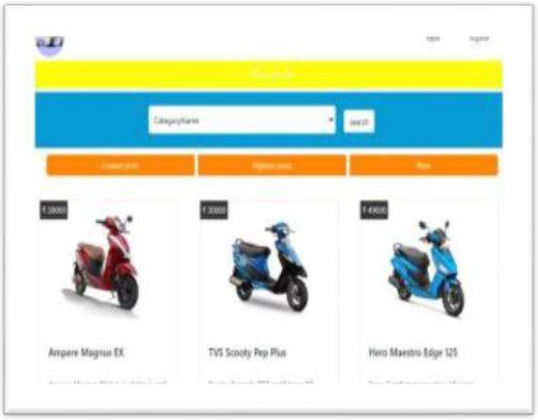
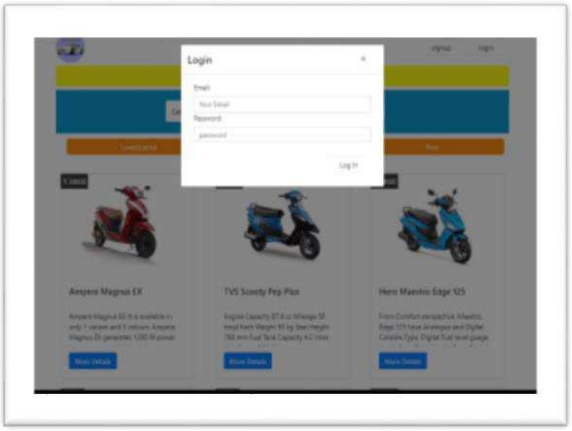
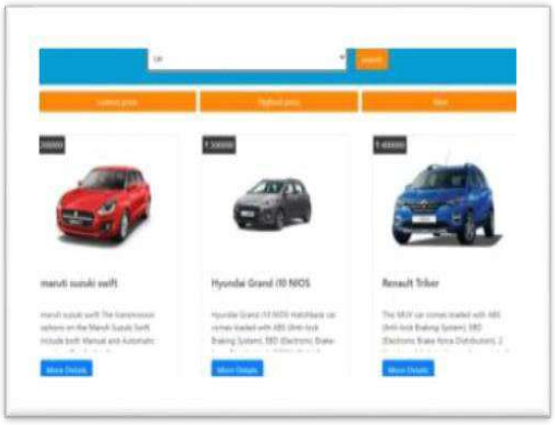
XI. SCREENSHOTS

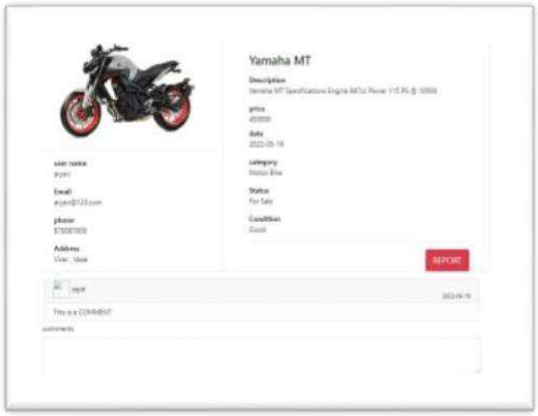












XII. FUTURE SCOPE

- More customization, Customer Support, and Privacy Changes, etc.
- Providing Messaging functionality in user profile, so that buyer and seller can have a conversation inside the web application.
- An option in which a seller has to pay in order to get his listing maximum distribution/get suggested to more users than normal.

XIII. CONCLUSION

Second Hand Vehicle Buy and Sell (SHVBS) provides a better way for faster searching and uploading, it is a portal system which is meant for seller and buyer. There are several things which are important in a Vehicle portal like searching vehicles according to their profiles and Cheaper way. After a complete indent of hard work I conclude that the project was absolutely challenging for implementing features such as searching according to their Categories and Filters. The project comes out to be successful in some way. Quickly summarizing all the efforts put into this assignment, I would like to conclude that this assignment has definitely helped me enhancing my Web Designing skills and improve my existing knowledge in Php, HTML MYSQLITE, etc. in a unique way.

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Like any other web-application, my website had errors; I had also performed proper testing so as to ensure that my website remains robust, usable and manageable. Working as a Php Web application designer and Programmer proved quite of a unique experience. I am sure this project would be beneficial for me in the near future.

XIV. REFERENCES

- Web Based Application using PHP, Mr. Ravindra wolodare, Mr. Amar Salonkhe, Mr. Rahul Thorat
- https://riptutorial.com/yii2/example/2830/validate-unique-value-from-database-in-yii2
- https://iaraedu.com/
- https://www.php.net/manual/en/language.types.resource.php
- https://www.restconf.org/
- https://www.knowledgehut.com/blog/programming/web-development-using-php-mysql

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UP FLOW - ANAEROBIC SLUDGE BLANKET REACTOR (UASB)

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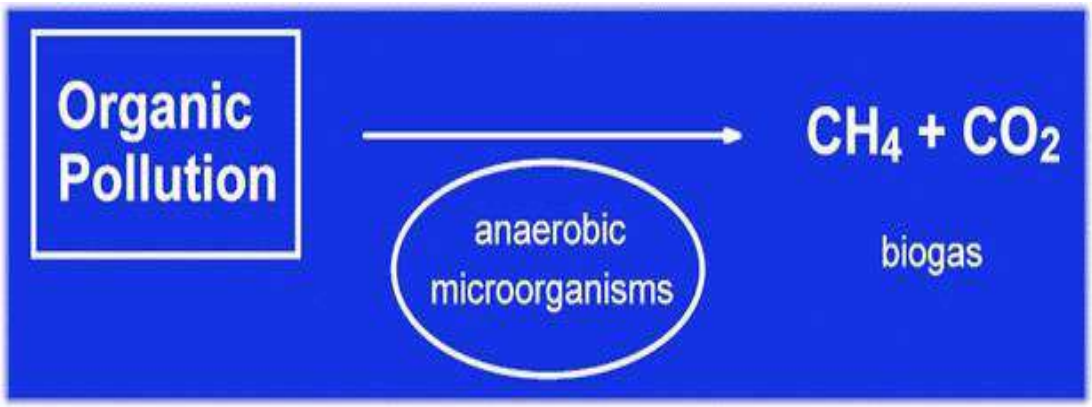
ABSTRACT
Anaerobic Wastewater Treatment is a wastewater treatment system in which waste is decomposed anaerobically in closed tank, anaerobic treatment is used around the world treating biologically for both domestic and industrial wastewater. The two principal advantages of anaerobic over aerobic treatment are the production of biogas, which can be used as fuel, and the lower rate of biomass production, which results in lower maintenance costs for the plant. The up flow anaerobic sludge blanket (UASB) reactor is an attractive alternative for regions in hot climates since it works better under mesophilic conditions and it does not need any other structure for the development of microorganisms, which grow in the form of granules. In this thesis, a model describing the UASB reactor behaviour with respect to substrate degradation, microorganism growth and granule formation is discussed

Keywords: UASB, aerobic, anaerobic

INTRODUCTION
Anaerobic Wastewater Treatment is a wastewater treatment system treated biologically without using of air or oxygen. It aimed to remove organic pollution in wastewater, slurries and sludge. Anaerobic microorganisms convert organic pollutants into a "biogas" which contains methane and carbon dioxide.[1]



Conversion of Organic Pollutants to Biogas by Anaerobic Microorganisms
Up flow anaerobic sludge blanket technology also known as UASB reactor is a form of anaerobic digester which used in wastewater treatment. UASB reactor is a methane-producing digester, which uses an anaerobic process and forming a blanket of granular sludge and is processed by the anaerobic microorganisms.

Concept and Design
UASB reactor is three-phase separator, which enables the reactor to separate gas, water and sludge mixtures under high turbulence conditions. This allows for compact, cheaper designs.[1]

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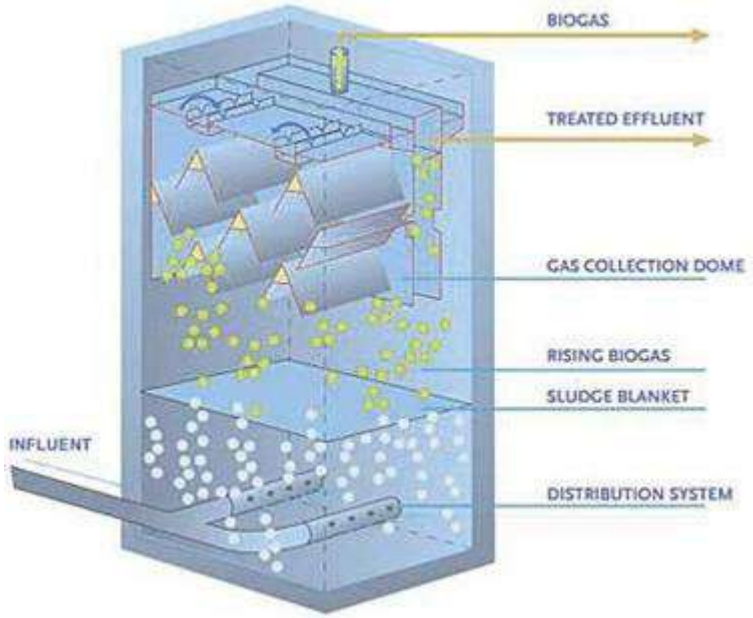

The reactor has multiple gas hoods for the separation of biogas. As a result the extremely large gas/water interfaces greatly reduce turbulence, making relatively high loading rates of 10 – 15 kg/m3.d possible. Separation in the UASB reactor requires only 1.0 meter of height, which prevents flotation effects and, consequently, floating layers.

Generally, during the treatment of UASB reactor, the substrate passes through an expanded sludge bed which containing a high concentration of biomass first. After that, the remaining part of substrate passes through a less dense biomass which named the sludge blanket.

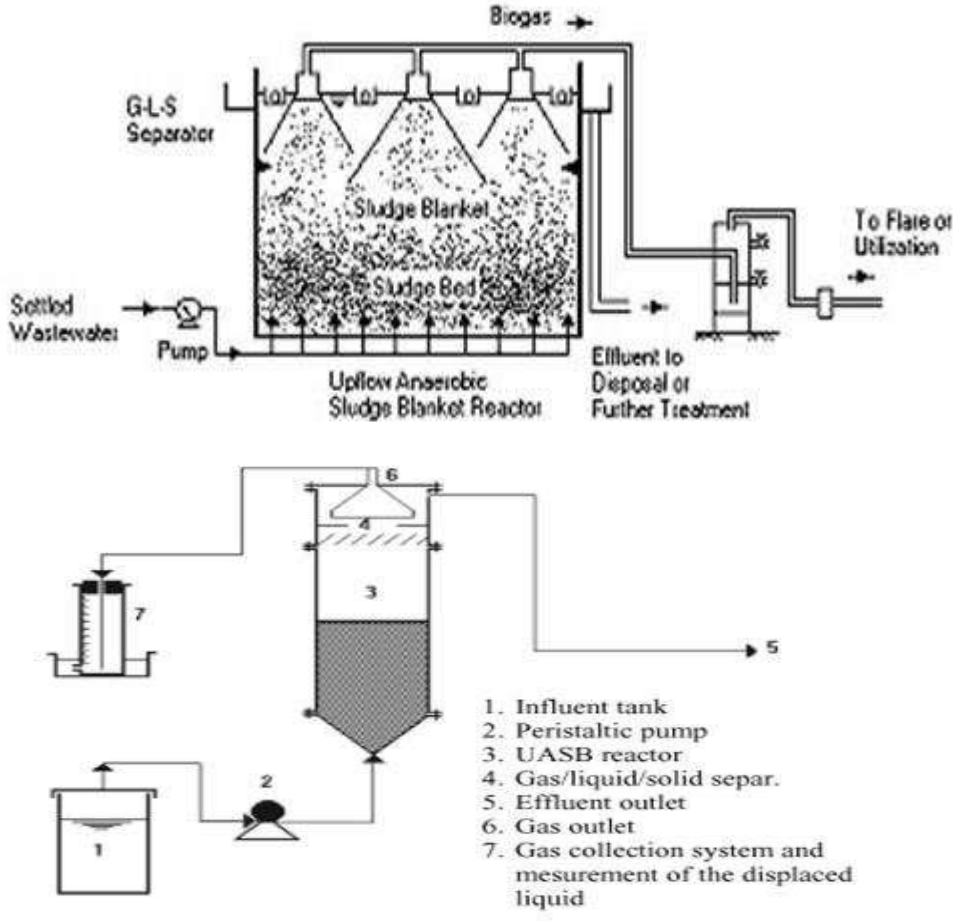

Figure 1: Schematic diagram of the laboratory UASB reaction system.

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The influent is pumped to the UASB reactor from bottom of it by Peristaltic pump. The influent move upwards and get contact with the biomass in sludge bed, then continue to move upwards and the rest substrates act with the biomass again in the sludge blanket which has a less concentration of biomass compared with the sludge bed below.

The volume of sludge blanket must be sufficient to conduct the further treatment to wastewater by-passed from the lower layer of sludge bed by channelling. At the same time, it will help to ensure a stable effluent quality. A 3 phases (Gas-Liquid-Solid or GLS) separator located above the sludge blanket to separate the solid particles from the mixture (gas, liquid, and solid) after treatment and hence allowing liquid and gas to leave the UASB reactor.

After the treated wastewater will be collected by the effluent collection system via number of launders distributed over entire area discharging, to main launder provided at periphery of the reactor. And the bio gases generated will be collected as the valuable fuel or for deposal.

The average full-scale design loading of the UASB of 682 full-scale plants surveyed was 10 kg COD/m3.d.

UASB Reactor Dimension

To reduce size and to reduce the cost of land, GLS separator and influent distribution arrangement etc. the reactor should be as high as possible. And the height of the sludge bed should be sufficient to minimize the channelling and to make sure the liquid up flow velocity within the maximum permissible limits (1.2 – 1.5 m/h). Therefore, the height of the sludge bed should be at least about 1.5 to 2.5 meters and hence the height of the reactor should be restricted to 4 meters to provide convenient accommodation for sludge bed, sludge blanket and 3 phases separator. As the standard mentioned, the maximum height of the reactor is around 8 meters but the applicable height in common usage is between 4.5 and 6 meters.

In addition, the sludge bed occupies 30 to 60% of the total reactor volume, 20 to 30% of the total volume is provided for sludge blanket and GLS separator occupies remaining 15 to 30% of the total volume.

Gas Liquid Solid (GLS) Separator

The main objective of this design is to facilitate the sludge return without help of any external energy and control device. The function of the GLS separator is to provide enough gas-water interfaces inside the gas dome, sufficient settling area out side the dome to control surface overflow rate; and sufficient aperture opening at bottom to avoid turbulence due to high inlet velocity of liquid in the settler, to allow proper return of solid back to the reactor. Due attention has to be paid to the geometry of the unit and its hydraulics, to ensure proper working of the GLS separator.

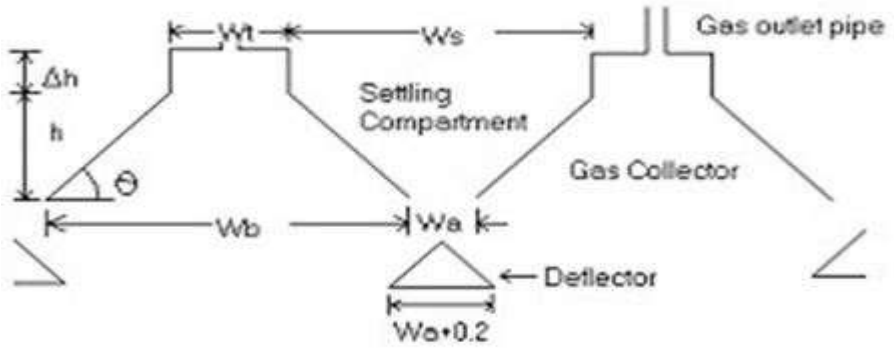

Figure 2: Details of the Gas-Liquid-Solid (GLS) Separator

Aerobic and Anaerobic Treatment

Aerobic wastewater treatment process is governed by aerobic organisms which need oxygen for the breaking process. Aerobic wastewater treatment tanks are constantly supplied with oxygen. It is been done by circulating air through the tanks. For effective functioning of aerobic organisms, sufficient amounts of oxygen should be present in the aerobic tanks at all times. Therefore, aeration is properly maintained throughout aerobic treatment. There are two main types of aerobic wastewater treatments: attached culture systems or fixed film reactors and suspended culture systems. In attached culture system, biomass is grown on solid surfaces or media and wastewater is passed over the microbial surfaces. Trickling filter and rotating biological contactor are two attached culture systems. In suspended culture systems, biomass is mixed with wastewater. Activated sludge system and oxidation ditch are two popular suspended culture system Anaerobic wastewater treatment is a biological treatment process where organisms, especially bacteria, break down organic material in the wastewater in an oxygen absent environment. Anaerobic digestion is a well-known anaerobic wastewater

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treatment process [3]. The degradation of organic material is done anaerobically. For the effective anaerobic digestion of organic materials, the entry of air into anaerobic tanks is prevented. During anaerobic digestion, methane and carbon dioxide are produced. Methane is a biogas. Hence, anaerobic digestion process can be used to produce biogas which can be utilized as electricity. Anaerobic wastewater treatment process occurs via four major steps named hydrolysis, acidogenesis, acetogenesis, and methanogenesis. All these steps are governed by anaerobic microorganisms, especially bacteria and archaea. Anaerobic treatment is preferred to treat municipal wastewater because of its merits over conventional treatment methods [4] . These advantages are (i) its ability to treat high COD loads and withstand fluctuation in the influent, (ii) biogas formation, and (iii) effective treatment of wastewater in a short period of time [5]. Anaerobic reactors reduce pollution load and provide good stabilization of solids. Furthermore, depending on the design of a UASB reactor, a high sludge hold-up time can be obtained so that the excess sludge needs to be discharged only once every three to four years [6]

Table 1: Anaerobic vs Aerobic Treatment for 1000 kg CODB/d

Parameter	Anaerobic	Aerobic
Power consumption (kW)	1.5	65
Net biosolids prod. (kg TS/d)	15-100	200-600
Energy produced (kW)	140	Nil

(For a given biodegradable chemical oxygen demand (CODB) waste load)

FUNCTION AND APPLICATION

- Breweries and beverage industry
- Distilleries and fermentation industry
- Food Industry
- Pulp and paper.

ADVANTAGES

- During the treatment process a amount of valuable biogas energy will be produced which can be collected for other usage;
- Much less bio-solids waste generated compared with aerobic process because much of the energy in the wastewater is converted to a gaseous form and resulting in very little energy left for new cell growth;
- A low energy requirement for the treatment process;
- Less nutrients required;
- System can be shut down for extended periods without serious deterioration; and
- Can handle organic shock loads effectively.

DISADVANTAGES

- Anaerobic treatment cannot achieve surface water discharge quality without post-treatment;
- Reduced sulphur compounds are produced, which need to be properly addressed in terms of corrosion, odour and safety; and
- Longer start-up period.
- A proper temperature range is required for the anaerobic process (15oC to 35oC), therefore it is not applicable during cold season in certain countries. (i.e. Canada)
- Some equipment (i.e. pH meter, thermometer etc.) and professional staff is necessary for monitoring the internal condition of the reactor. It is costly.

CASE STUDY

Kanpur UASB

The present paper describes a performance of 1200 m^3 UASB reactor at Kanpur India. The reactor was constructed in three parallel compartment 600,300 and 300 m^3 respectively, data collected over a period of twelve month and showed that there was reduction in BOD, COD and TSS concentration of respectively 74%,75% and 75% at hydraulic retention time of 6 hours .the Excess sludge was 0.2kg TSS / m^3 waste water ,the gas was 0.05-0.10 m3/kg COD removed.

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CONCLUSION

In conclusion, up flow Anaerobic Sludge Blanket (UASB) reactor is a form of anaerobic digester that is used in the treatment of wastewater. It's typically suited to dilute waste water streams (3% TSS with particle size >0.75mm).

As we had mentioned earlier, these are the 4 top applications of the reactors:

- Breweries and beverage industry
- Distilleries and fermentation industry
- Food Industry
- Pulp and paper

Further more in warm climates, the UASB concept is also suitable for treatment of domestic wastewater.

REFERENCES

1. Mainardis M., Buttazzoni M., Goi D. Up-flow anaerobic sludge blanket (UASB) technology for energy recovery: A review on state-of-the-art and recent technological advances. Bioengineering. 2020;7:43
2. "Anaerobic Digestion | Anaerobic Wastewater Treatment Systems." RWL Water. N.p., n.d. Web. Available here. 08 Aug. 2017
3. A. C. Haandel and G. Lettinga, Anaerobic Sewage Treatment: A Practical Guide for Regions with A Hot Climate, John Wiley and Sons, Chichester, UK, 3rd edition, 1994.
4. P. S. James and S. Kamaraj, "Immobilized cell anaerobic bioreactors for energy production from agro-industrial waste waters-An introduction," Bioenergy News, vol. 6, no. 3, article 10, 2002.
5. G. Lettinga, S. Rebac, and G. Zeeman, "Challenge of psychrophilic anaerobic wastewater treatment," Trends in Biotechnology, vol. 19, no. 9, pp. 363–370, 2001.

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ACOUSTIC OF SOUND TREATMENT

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[1,3,4,5]Students and [2]Assistant Professor, Department of Civil Engineering, TCOE, Maharashtra, India

ABSTRACT
Noise pollution 'is usually defined as Unwanted sound or noise that is not required. This disturbance noise is also known as noise pollution, which often haunts local communities especially for residents around cities, as well as industrial and commercialization areas. According to the world health organization (WHO), noise pollution is ranked third as the most dangerous environmental pollution after air and water pollution. So new field science is developed with planning building and auditorium and schools and colleges with to provide best audible to audience and students is called acoustic of sound treatment. Use of sound absorbing material to give desire degree of from echo and to absorb or diffuse sound in the room to avoid ringing and flutter echoes and improve stereo imaging. It helps to keep sound from leaking into or out of the room. Study how acoustic treatment is done by using such type of project improves the quality in auditorium or classrooms or conference hall or theatre, stadium etc. Audience in there can hear better sound. We have a idea about how we used waste material to different things after treatment of wastage of raw materials used are polyester cloth, polythene rope, nails. The polyester cloth or polyester acoustic panel is a high performance and durable sound absorptivity product installation of polysorb acoustic. Polythene rope is to resist polyester cloth on wall surface. Concrete nails we use for fixing the rope in the wall. It is found how acoustic treatment is done by using above type of waste material. It is expected results to improve the sound quality in auditorium or classrooms etc. Audience can hear better sound. Full construction of acoustic treatment of sound is durable. Economical and very strong for long suitable. Thus this paper is an attempt to define sound treatment, its classification and types, procedure adopted, advantages and its application in the field of construction by literature view are discussed.

Keywords: Noise, Sound Absorber, Echo Time, Frequency.

1-INTERODUCTION

Noise pollution 'is usually defined as unwanted sound or noise that is not required. This disturbance noise is also known as noise pollution, which often haunts local communities especially for residents around cities, as well as industrial and commercialization areas. According to the world health organization (WHO), noise pollution is ranked third as the most dangerous environmental pollution after air and water pollution. So new field science is developed with planning building and auditorium and schools and colleges with to provide best audible to audience and students is called acoustic of sound treatment.Noise pollution does not only impact human psychology but also flora and fauna following noise pollution that often affects people and the environment sound absorbing panels have been introduced for use in all types of space. Different types of sound absorption materials have been produced from a variety of sound absorption materials in the market. Every sound absorbs produce different sound absorption rates. Nowadays, a lot of sound absorber panels are made using less environmentally friendly materials which are synthetic.Among synthetic materials used are glass fabrics and minerals studies have shown that glass fiber can absorb sound better than their synthetic materials, however other studies on health issues mentioned that glass fiber is not suitable to be used as a materials for sound absorbing purposes. It is stated that if humans breathe in the air filled with glass fiber for too long they will experience skin inflammation redness, sore throat, cough, bronchitis, breathlessness, and lungs related illness.

2- STATEMENT OF THE PROBLEMS

Acoustic Problems and Solutions, we address some of the most common acoustic problems music education face in their rehearsal and practice areas. We help define the problems and explain the steps you can take to fix or at least minimize them. A few solutions are simple, most will require some investment, and in some cases, very little can be done short of renovating your space. But in every instance, we believe this guide will help you better understand and evaluate your own areas—help you avoid spending time or money on remedies that don't actually work and equip you with a starting point and some facts to advocate effective improvements to your spaces. In this guide, Acoustic Problems and Solutions, we address some of the most common acoustic problems music educators face in their rehearsal and practice areas. We help define the problems and explain the steps you can take to fix or at least minimize them. A few solutions are simple, most will Require some investment, and in some cases, very little can be done short of renovating your space. But in every instance, we believe this guide will help you betterunderstand and evaluate your own areas help you avoid spending time or

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money on remedies that don't actually work---and equip you with a starting point and some facts to advocate effective improvements to your spaces.

3-OBJECTIVES OF THE PROJECT

- This is done in theatre to improve sound quality and audience can hear clear sound.
- It also in music studio to hear good quality of sound through the instrument which they have used.
- It also used in conference hall to clear sound of speaker.
- It also done in auditorium.
- The main goal of acoustic of sound treatment auditorium is to maintain sound quality and hearing better or objectives of the project are as follows.
- Cheap and economical.
- Acoustic treatment helps in keeping the noise inside the room.
- It also helps in keeping the noise from the exterior environment out.
- Sound treatment also results in improving the sound quality in the auditorium of theem collage of engineering.
- Save time.
- It also used in seminar hall or conference hall to clear sound of speakers.
- It also done in buildings, flats, bungalows.

4-PURPOSE OF THE PROJECT

- Use of sound absorbing material to give desired degree of from echo and reverberation.
- To prevent standing waves and affecting the frequency response in auditorium.
- To reduce model ringing in small room and lower the reverb time in auditorium.
- To absorb or diffuse sound in the room to avoid ringing and flutter achose and improve stereo imaging.
- To keep sound from leaking into or out room.

5-METHODOLOGY

Stage 1: Taking dimensions of the wall between column to column distances 3.10m center to center distance. By using tape.

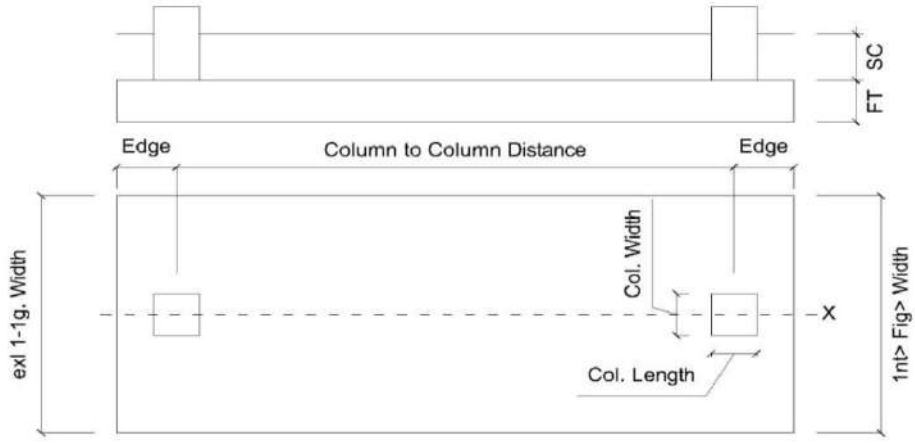

Fig.5.1

Stage 2: Drilling is done as per dimensions which we have taking in previous stage in such a way that the nails are fixed in the holes.

- Determine exactly where you want your picture frame or mirror to hang. If your picture frame or mirror has a wire-hanger in the back, be sure to take into account the amount of slack when figuring-out where you want the picture or mirror to hang.

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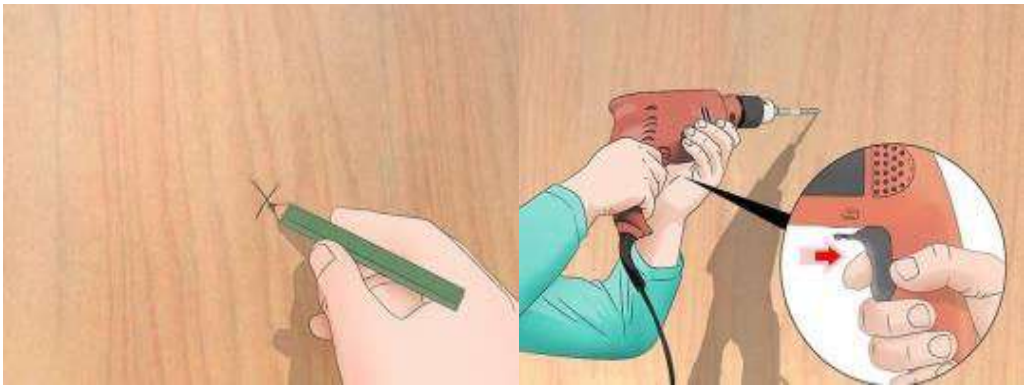
- **Make a small pencil mark where the center of the screw will go:** If the picture frame or mirror has multiple hooks on the back, be sure to measure the distance between them. Use a level to measure the spot for your second anchor. Make another small pencil mark where the second anchor will be installed. You can also apply a bit of grease or lipstick on the hooks of the item you will hang. Place the item where you want it on the wall and gently press it against the wall. The grease or lipstick will leave a mark to show you where to install your anchors.



- **Drill a Hole in the Spot(S) You Marked:** Be sure that you hold the drill perpendicular to the wall so that the anchor will sit parallel to the ground: an anchor that is not installed straight will not be able to support as much weight. You should drill a hole that is approximately the same size as the anchor itself (the screw will force it to expand outward). Make sure the hole you drill is deeper than the anchor is long.
- **Slide the Expansion Anchor into the Hole:** If the hole is too small, the anchor will collapse onto itself and may not install properly. Push it in until the anchor sits flush against the wall. Do not bang on the screw because it could bend or break. If needed, tap the anchor with a rubber mallet lightly to get it to sit flush against the surface of the wall.

Screw the support screw into the anchor: Line up the screw and the anchor and, using either a Philips or flat head screwdriver, turn the screw clockwise just until the base of the screw comes to rest against the base of the anchor.

- If the object you are hanging has a mounting bracket, you may need to slide the screw through the bracket before screwing it into the anchor.
- Back the screw out slightly by turning it counter-clockwise: Be sure to leave just-enough of the screw exposed to "catch" the hanger on the back of picture frame or mirror. A good rule of thumb is to leave about a 1/4" of screw exposed for hanging.

Stage 3: Fasten the polythene rope on the concrete nails in such away that it bears the weight of the cloth.

Stage 4: Fasten the cloth on the polythene rope with using string. Tighten the cloth in this way that it does not form any unavoidable waves.

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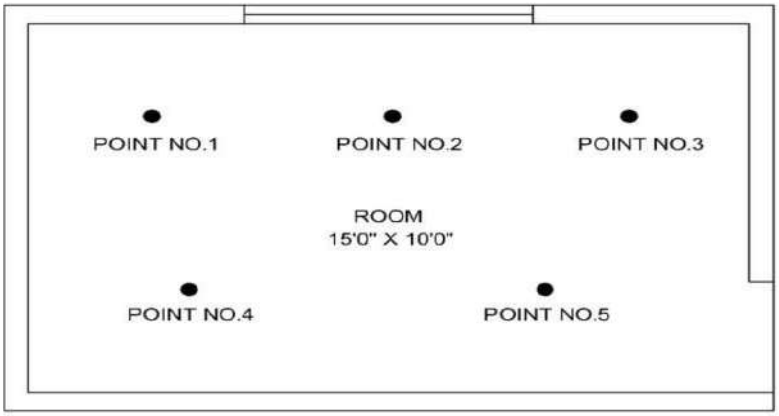
6-RESULTS & DISCUSSION

Take a reading at five station points before installation project with the help of decibel meter.

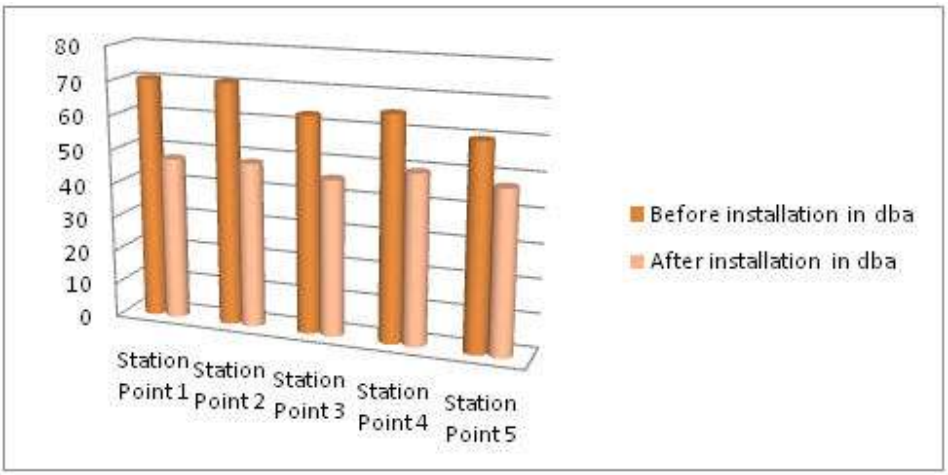
Take a reading at five station points after installation of project with the help of decibel meter.

- The sound level or noise inside the room by using decibel meter.
- The decibel (dB) is a logarithmic unit used to measure sound level.



Calculation of Noise Reduction Coefficient

Sr.No.	Before installation in dBA	After installation in dBA
Point 1	70.5	47.6
Point 2	70.7	48.2
Point 3	63.1	45.6
Point 4	65.2	49.5
Point 5	59.7	47.5



- Total NRC in particular area of room before installation of project.

NRC = 70.5 dBA + 70.7 dBA + 63.1 dBA + 65.2 dBA + 59.7 dBA

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5

∑NRC= 65.84 dBA

- Total NRC in particular area of room after installation of project.

NRC = 47.6 dBA + 48.2 dBA + 45.6 dBA + 49.5 dBA + 47.5 dBA

5

∑NRC= 47.68 dBA

7-CONCLUSIONS

The project course provided us the chance to apply our theoretical knowledge in practical application.In this project we study how acoustic treatment is done. By using such type of project improve the sound quality in auditorium and audience in auditorium can hear better sound. This project has given us chance to test our group working ability, managerial abilities and technical knowledge and has imparted a great confidence for successfully carry out the work with responsibility.This is done in theatre to improve sound quality and audience can hear clear sound.It also in music studio to hear good quality of sound through the instrument which they have used.It also used in conference hall to clear sound of speaker.It also done in auditorium.The main goal of acoustic of sound treatment auditorium is to maintain sound quality and hearingbetter or objectives of the project are as follows.Cheap and economical.Acoustic treatment helps in keeping the noise inside the room.It also helps in keeping the noise from the exterior environment out.Sound treatment also results in improving the sound quality in the auditorium of theem collage of engineering.Save time.It also used in seminar hall or conference hall to clear sound of speakers.It also done in buildings, flats, bungalows.

8-REFERENCES

- The Baux-Book Acoustics.
- The master handbook of Acoustics 4th edition (F.Alton Everest McGraw-Hill 2001).
- Industrial Noise control, catalog (1987 4th edition planning guide and catalog 1987).
- Parkin and Humphreys (1958).
- Wastes not want not (2002).
- ILLBRUCK BROCHURE 1998 book about foam absorbers.
- CHEREMINNOFF (1996) book about some benefits of acoustical polyurethane foam.
- Research paper about sound treatment by Misari Kaamin, Noorul Hudai Abdullah, Nur'ain Idris, Siti Noorain Mohd Razali.
- 11TH and 12th physic books.
- Room acoustic HEINRICH kuttruff.
- Detailing for acoustics Peter lord and Duncan Templenton.
- Auditorium acoustics and architectural design MICHAEL BARRON.
- Acoustic and noise control Dr.B.J.SMITH.

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MINI HYDROELECTRIC POWER PLANT

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ABSTRACT
Hydroelectric power plant are one of the best renewable energy sources in the world. This paper presents the development of a hydroelectric generating system that generates electricity from the potential energy of water strike on the Pelton bucket and converting the kinetic energy of water into electrical energy that can be stored in batteries to be used as power supply for Home appliances, and any other applications. The developed system is hydroelectric generator designed for small sized pipes (1 to 2 inch). Hydroelectric power plant contains a turbine that rotates by the running water in these penstock to generate the electricity and a charging circuit to store the generated electricity into battery cell. It also contains a Pressure detector and DC Voltmeter, ammeter for the whole operation of the system, measure and display the amount of water flow, the amount of electricity generated. By increasing the flowing of water, the rotation of the Pelton turbine will be increased and the amount of generated electricity will be increased. Therefore, the proposed system can also be applied on a wider scale so that this system with big Pelton turbine can be connected with municipal water pipelines, which ensures greater flow of water and generating more energy that can be used for street lighting and etc. The results show that the proposed hydroelectric generator can harness the untapped kinetic energy of water flowing inside the Penstock and produce power around 70 W when the velocity of water flow is 31.8 l/min.

Keywords: Hydroelectric generator; renewable energy; Pelton turbine; Penstock; kinetic hydropower.

I. INTRODUCTION
Renewable Energy is an energy which can be replenished naturally and thus is not going to run out such as solar energy, wind energy, geothermal energy, bio energy, hydropower energy. Hydropower is considered one of the most developed renewable energy technologies and it is used for generation electric power in many countries worldwide. Since generation electricity from the hydropower does not consume or pollute the water used for this generation, it leaves this energetic resource available for the other uses.

The electric power shortage and the continuously electrical power cut-off is big problem that Gaza faces. Using Hydro power plant for electric power generation is one of the Best methods to generate electricity. A power generating system using the hydropower which is the most pure type of energy in the world. The proposed hydroelectric generating system generates electricity from the potential energy of water flowing inside Penstock through converting the kinetic energy of water into electrical energy that can be stored in batteries, which is used as power supply for uninterruptible operation of home appliances and any other uses.

Hydroelectric power technology is generating the electricity from the flowing of water of streams, rivers, and tides. Water is moved through a Penstock to turbine which let its shaft to rotate when the water is striking to the blades of this turbine. The shaft of turbine is connected to a generator which converts the mechanical motion of turbine shaft into the electrical energy. The water flowing is a pollution-free, renewable, safe, and reliable energy source. The water flows in Penstock and turbine contains kinetic energy due to the water pressure fluctuation which can be converted to electrical energy by energy harvesters.

Therefore, this paper proposes a power generating system using the hydropower which is the most pure type of energy in the world. The proposed hydroelectric power plant that generates electricity from the potential energy of water strike on the Pelton bucket and converting the kinetic energy of water into electrical energy that can be stored in batteries to be used as power supply for Home appliances, and any other applications. The developed system is hydroelectric generator designed for small sized pipes (1 to 2 inch). Hydroelectric power plant contains a turbine that rotates by the running water in these penstock to generate the electricity and a charging circuit to store the generated electricity into battery cell. It also contains a Pressure detector and DC Voltmeter, ammeter for the whole operation of the system, measure and display the amount of water flow, the amount of electricity generated.

This paper is organized as follows. Section II discusses previous related works. Section III describes the proposed design of the hydroelectric power plant and its implementation. Section IV presents the results. Finally, Section VI the conclusions of this work.

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II. LITERATURE SURVEY

The new method of micro hydro power plant is [1] by water level control of small - scale Hydroelectric Power plant by Deadbeat control method. In Deadbeat control method. In Deadbeat control method variation of water level is forecasting using two - tanked model for the penstock and the head tank and the water level control algorithm is processed by deadbeat control. It gives stable generation by maintaining the water level in the head tank located in the mid-way in the stream Channel at a constant level. The parameters of the system is that the length of penstock 1800m width of penstock 2.1m maximum - flow from river intake 1.1 m² sec. and Horizontal surface area of head tank 66m². By making preliminary estimation of a system performance and control scheme of deadbeat control high accuracy water level control in the head tank is confirmed.

Speed Optimisation Module of a Hydraulic Francis turbine based on Artificial Neural Networks is proposed [2]. In this paper an Artificial Neural Network is used to generate the reference speed that optimises the turbine efficiency. In order to improve the practicability of the complete system, a modified of the proposed OSM-ANN technique has been implemented, this process gives rise to dynamic changes in operation variables. Where commercial frequency converters and tubular micro turbine (Francis turbine) have been used in this paper. This OSM-ANN technique has been developed to adjust automatically turbine speed to the existing operating conditions. The experimental results confirm the improvements obtained in the turbine efficiency when the turbine speed is continuously adjusted, depending on the hydraulic conditions. So, the variable-speed option would be more advantageous for high specific speed turbines

In [3], a design of an axial flux PM generator (AFPMG) for Pico hydro power plants in remote areas has been discussed. However in the literature, typically have some inherent technique difficulties used in hydro applications. It is hard to balance the Performances stability efficiency and cost. Further to improve the operating performances optimal design -variable speed.

The small Hydro power plant with Integrated Turbine - Generator working at Variable Speed [4] In This paper shows the small hydropower plant based the propeller turbine integrated with the PM generator and the power electronics converter can effectively acquire and transfer available energy from water to electric grid with sufficient efficiency. In this plant new solution of a Variable speed SHP equipped with two hydro set is discussed.

In [5], Hydro power generation using “Archimedes screw generator " is highlighted. They are beginning to be widely adopted at low head hydro sites, due to high efficiency (greater than 80% in some installations), competitive costs and low environmental impact. The main idea was to providing a range of controlled head and flow conditions during operation, Water is supplied by an electric pump that Operates continuously, and reservoir depth is controlled by an adjustable overflow weir. It was designed to operate with a volume flow rate of 70 lit/s. Typical head was 0.85m. The cause of changes in power output caused by varying the water level at the outlet of the screw were attributed primarily to the corresponding variation in head, and dynamic limiting of screw rotation speed causing corresponding limits in volume flow through the screw.

A New structure of turbine base on low head turbine is proposed [6], for getting high efficiency in cross-flow turbine the maximum efficiency was found 88% for different values head and water flow rate. And also that maximum 18 stunner blades are used for smooth running of the turbine. The design was done considering head as 10 m and discharge as 316 lit/sec.

A newly developed hydro power plant Design of Pico-scale Turgo Turbine is proposed [7] they used of Pico Bucket using coconut shell spoon scale Turgo Turbine which is an independent power plant is recommended now a days. Coconut Shell is proposed to the material, thus to ensure the performance of the Turgo turbine under maximum condition. The Curvature angle of coconut shell spoon is -90* taken. Based on the measurement, there is a minimum flow required for the turbine to produce electrical power: For a D/d ratio of 11.6, the minimum flow is 48 ± 0.05 lpm, for a D/d ratio of 13.7, it is 33.52 ± 0.16 lpm, for a D/d ratio of 14.67, it is 31.7 ± 0.14 lpm, for a D/d ratio of 22, it is 19.17 ±0.18 lpm, and for a D/d ratio of 27.5, it is 15.06 ± 0.01 lpm because the used DC generator will generate current. If the minimum rotational speed is 190 rpm.

Table.1 Turbine Classification

Head Classification	**Turbine Type**		
	Impulse	Reaction	Gravity
High (>50m)	1. Pelton 2.Turgo		
Medium (10-50m)	1.Crossflow 2.Turgo	1.Fracis (Spiral Case)	

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	3.Multi-jet Pelton		
Low (<10m)	1.Crossflow 2.Undershot waterwheel	1.Propeller 2.Kaplan 3.Fransic (open flume)	1.Overshot water wheel 2.Archimedes Screw

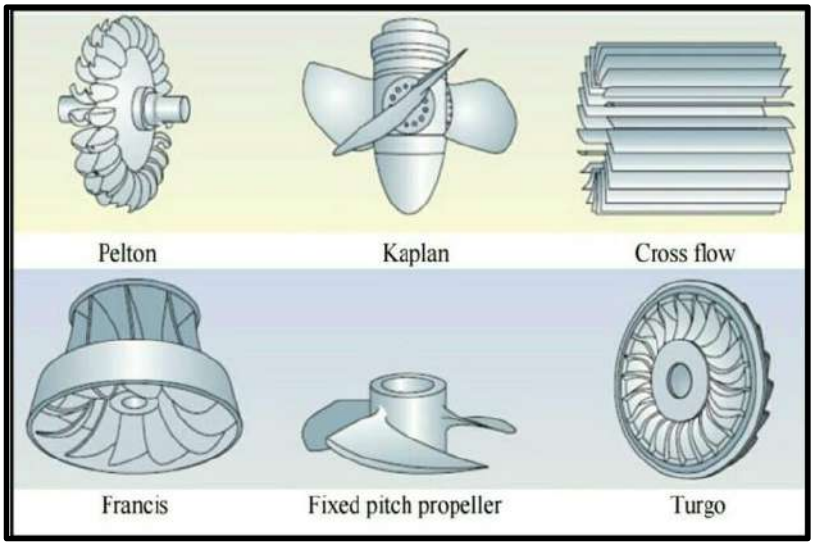

Fig.1: Types of turbine

Thus, a multi jet Pelton wheel turbine based mini hydroelectric power plant has been selected for this project taking its merits in to consideration over other turbine. Using this turbine, the maximum power and constant efficiency was found for different value of head. The suggested turbine reduces the losses compare to other turbines. This turbine can strictly extract energy as of any fast moving fluid, Simple in construction and easy to maintenance.

Iii. Design of the Hydroelectric Power Plant and Its Implementation.

This section describes the design of hydroelectric power plant and implementation of the proposed hydropower generating system that generates the electricity from the water running inside Penstock.

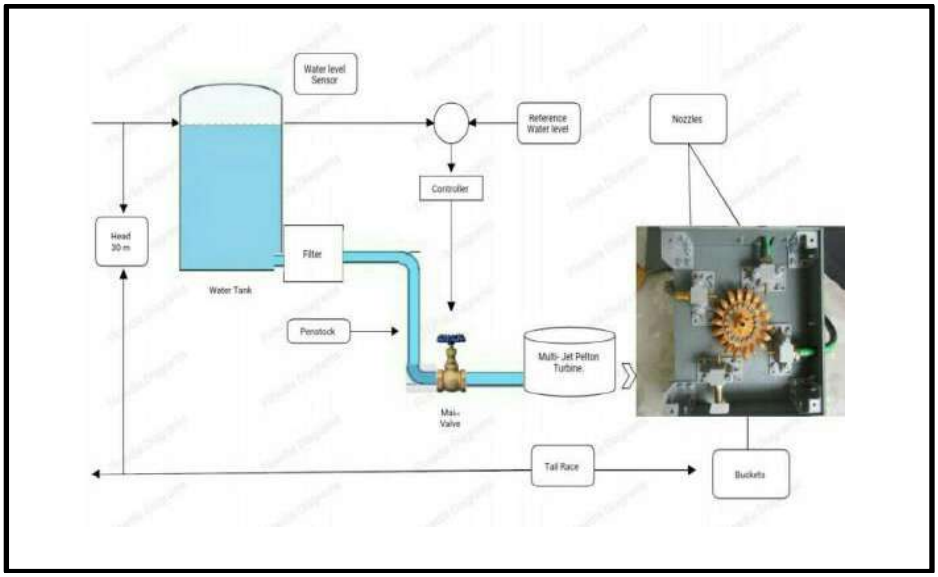

Fig.2: Diagrammatical representation of mini hydroelectric power plant.

As shown in Fig.2, the proposed system consists mainly of a designed Pelton turbine and external electrical generator connect with load, voltmeter and ammeter to display the amount of voltage and current. The hydro turbine is encased and its runner is put it into flowing water and faces the residual pressure of the flowing water. When water runs into the Pelton turbine through the Penstock, its runner will be rotated as the water flows in one side of the runner and comes out it on the bottom side of the casing. Rotation of the runner will run a shaft of permanent magnetic DC motor to produce electricity. In short, the hydraulic power of flowing water pressure is converted by the turbine into mechanical energy which is consequently converted by a DC motor into electrical energy.

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Fig.3: Pelton Turbine

Fig.3 shows the Pelton turbine design and the main components of the proposed hydropower plant which is developed based on the principle of generating power from rotation of an inline Pelton turbine.

Table.2 Table of Parameters

Particular	Details
Head (H)	15 m
Velocity of jet (Vj)	16.81 m/s
Diameter of runner (D)	0.12 m
Diameter of jet (d)	0.00635 m
Flow rate (Q)	5.3 x 10^{-4} m^3/s
Number of Bucket (z)	12
Width of Bucket	38 mm
Depth of Bucket	7.6mm
Speed (N)	1200 rpm

Table shows the parameters that we got from the theoretical calculation done, for manufacturing these custom made bucket and runner and for purchasing the other main components.

Fig.2 shows the Pelton turbine, we have used Pelton type bucket in our project. The length, width and depth of the bucket are 40, 50 and 15mm respectively. The material we used for the bucket is Gun metal and to hold the bucket with runner we used 2 units of nut & bolt with the dimensions of 8 mm. On the basis of the calculation we have used diameter of runner is 120 mm. whereas thickness of runner is 20 mm and bore of diameter is 20 mm to fix the shaft

in it. The weight of the runner is 1.32 kg. Here is an image of runner and bucket fixed with nut & bolt at 30° angle. And there is key slot of 6 mm done on the runner to make it fixed on the shaft. There are 12 buckets used to fixed on runner so if we divided 360° with 12, we get a 30° angle which gives us equal distance of each buckets.

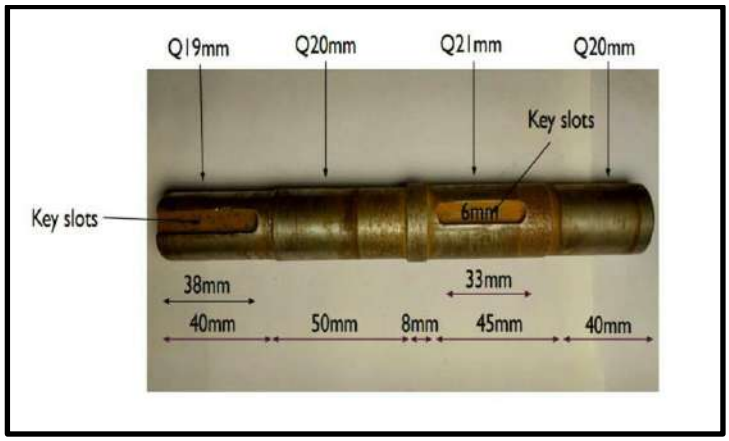

Fig.4: Shaft

Beside from runner and buckets the shaft play an important role. The centre of the shaft has diameter of 21 mm, this is a thickest part of the shaft which is used to connect with runner aligning it with key slot of 6 mm. On the both side of this part thickness decrease to 20 mm to lock shaft with Bearing. The left end part of shaft has thickness of 19 mm with a key slots of 6 mm is used to lock the spocket and pulley.

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Fig.5: Bearing

Fig.5 shows the square flange type pillow block bearing we have used to rotates the shaft very easily and smooth. Which is made up of normal metal with coating of paint. Two number of bearing we have used in our project for no vibration occurs on the body.

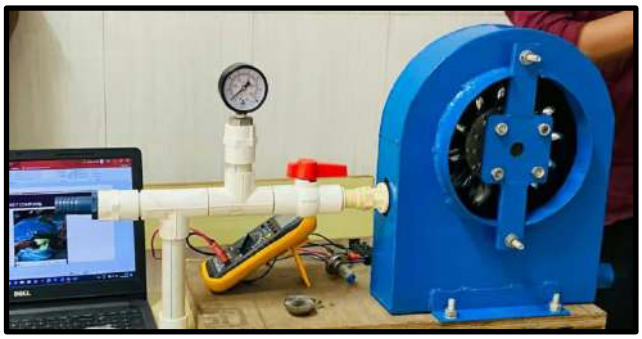

Fig.6: Body Frame

Fig.6 shows the outer design of the proposed hydroelectric power plant. The hydroelectric power plant is designed for the purpose of generating electricity in building's water pipelines ranging from 1 to 2 inch. Body is made up of metal with thickness of 3 mm and height, length, Width of body are 420, 340, and 95 mm respectively.

Fig.7: Nozzle

Fig.7 Shows the image of nozzle, which is made up of brass material. Diameter of nozzle is 6 mm and diameter of inlet is 20 mm and nozzle is fixed on body at 160 mm from the base. Nozzle strike on the bucket at an angle of 90°. On the basis of theoretical calculation we have used DC motor as generator. The specification of the motor is 2750 rpm, 350 W output power, 24V DC, 29.9 A DC current.

We want more output power that's why we experiments on two mechanisms. 1st is spocket chain, on turbine side we attach big spocket of diameter of 5 inch with slots of 60 and pitch is 1/4th and on motor side we connect small size spocket of diameter of 1 inch with slots of 10 and pitch is 1/4th because we want more rpm on motor side that's why we select small size spocket on motor side and big size on turbine side. But while we testing the spocket chain mechanism we get chain slipping problems. That's why we shifted to pulley mechanism. Same

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calculation we did for pulley mechanism we connect 5 inch pulley on motor side and 2 inch pulley on motor, V belt type we have used. Using these pulley mechanisms if we pull the motor we get high resistance problem on motor side because of brushes in DC motor that's we get very low rpm on motor side and got 30 W output power which less than from our requirement. We have used various type of belt but we got the same result.

Finally we shifted on direct coupling method, we connect motor shaft and turbine shaft using coupling of 30 mm diameter, one side bore the coupling of 20 mm to connect the turbine shaft on it and another side we bore the coupling of 10 mm to connect the motor shaft on it. To test the direct coupling we have used water pressure up to 5 psi and we got output power around 70 W.

IV. RESULT

Fig.8: Direct Coupling

Fig.8 shows the proposed hydroelectric Power plant which is expected to harness the untapped kinetic energy of water flowing inside the penstock and produce power around 70 W when the water flow velocity is more than 31.8 l/min required. Which is enough to operate continuously and safely the electrical devices home appliances. If this Pelton turbine was available in Gaza that will assist in a low cost power generation and generate greater amount of electricity thereby solving the continuous power shortage that Gazan people faces.

By increasing the flowing of water, the rotation of the Pelton turbine will be increased and the amount of generated electricity will be increased. Therefore, the idea of this proposed hydroelectric power plant can also be applied on a wider scale so that this hydroelectric power plant with big turbine can be connected with municipal water pipelines, which ensures greater flow of water and generating more energy that can be used for street lighting and other uses.

V. CONCLUSION

In this paper, the concept of development a hydroelectric power plant, in order to generate electricity from the potential energy of water running inside penstock and converting the kinetic energy of water into electrical energy was briefly introduced and described. hydroelectric generating system that generates electricity from the potential energy of water strike on the Pelton bucket and converting the kinetic energy of water into electrical energy that can be stored in batteries to be used as power supply for Home appliances, and any other applications. The developed system is hydroelectric generator designed for small sized pipes (1 to 2 inch).

The proposed system was fully modelled, fabricated and tested. The developed system consists mainly of a Pelton turbine that rotates by the running water inside the penstock to generate the electricity and to store the generated electricity into a battery. It also has a voltmeter and pressure detector to measure and display the amount of water flow, the amount of electricity generated.

The idea of this proposed hydroelectric power plant can also be applied on a wider scale so that this system with big Pelton turbine can be connected with municipal water pipelines, which ensures greater flow of water and generating more energy that can be used for street lighting and other uses. The proposed system is not only support stopping our dependency on the fossil fuel for generation of electricity, but it also can supported our dependence on the green energy and provided an easy generation of electricity in places with a continuous power shortage.

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REFERENCES

[1] S. Endo, M. Konishi and H. Imabayasi, "Water level control of small-scale hydroelectric power plant by deadbeat control method," 2000 26th Annual Conference of the IEEE Industrial Electronics Society. IECON 2000. 2000 IEEE International Conference on Industrial Electronics, Control and Instrumentation. 21st Century Technologies, 2000, pp. 1123-1128 vol.2, doi: 10.1109/IECON.2000.972280.

[2] J. Fraile-Ardanuy, J. I. Perez, I. Sarasua, J. R. Wilhelmi and J. Fraile-Mora, "Speed Optimisation Module of a Hydraulic Francis turbine based on Artificial Neural Networks. Application to the Dynamic Analysis and Control of an Adjustable Speed Hydro Plant," The 2006 IEEE International Joint Conference on Neural Network Proceedings, 2006, pp. 4104-4110, doi: 10.1109/IJCNN.2006.246956.

[3] L. Belhadji, S. Bacha and D. Roye, "Modeling and control of variable-speed micro-hydropower plant based on Axial-flow turbine and permanent magnet synchronous generator (MHPP-PMSG)," IECON 2011 - 37th Annual Conference of the IEEE Industrial Electronics Society, 2011, pp. 896-901, doi: 10.1109/IECON.2011.6119429.

[4] D. Borkowski and T. Węgiel, "Small Hydropower Plant With Integrated Turbine-Generators Working at Variable Speed," in IEEE Transactions on Energy Conversion, vol. 28, no. 2, pp. 452-459, June 2013, doi: 10.1109/TEC.2013.2247605.

[5] Archimedes Screws for Micro Hydro Power Generation Conference Paper · July 2013 DOI: 10.1115/ES2013-18067

[6] International Journal of Engineering and Advanced Technology (IJEAT) "Design and Analysis of High Efficiency Cross-Flow Turbine for Hydro-Power Plant" ISSN: 2249 – 8958, Volume-5, Issue-4, April 2016.

[7] Feasibility Analysis of a Pico-Scale Turgo Turbine Bucket using Coconut Shell Spoons for Electricity Generation in Remote Areas in Indonesia Article · May 2020 DOI: 10.37934/arfmts.69.1.8597

[8] https://youtu.be/nQcWcKAGPf

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FOUR QUADRANT SPEED CONTROL OF DC MOTOR WITH THE HELP OF AT89S52 MICROCONTROLLER

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ABSTRACT

The main goal of this study is to use a microcontroller to create a four quadrant speed control for a DC motor. Control is the most critical aspect of any industrial organisation.the rate at which a machine operates. The key benefit of employing a DC motor is that the Speed-Torque relationship is more accurate.can be transformed into nearly any useful shapePulse Width Modulation, an electronic technology, is used to adjust the speed.which produces both high and low pulses. These pulses change the motor's speed. A microcontroller is employed to generate these pulses. Because a microcontroller is utilised, modifying the duty cycles time period in the software to set the speed ranges as needed is simple. Different buttons control different speed grades and directions.

The microcontroller in this project is from the 8051 family, and the programming was written in assembly language before being converted to hex using the micro vision Kiel software. The programme was burned into the microcontroller using the positron boot loader software. Microcontroller AT89S52, DC Motor, L293D Motor Driver IC, Push Buttons, PWM, Voltage Regulator (LM7805)

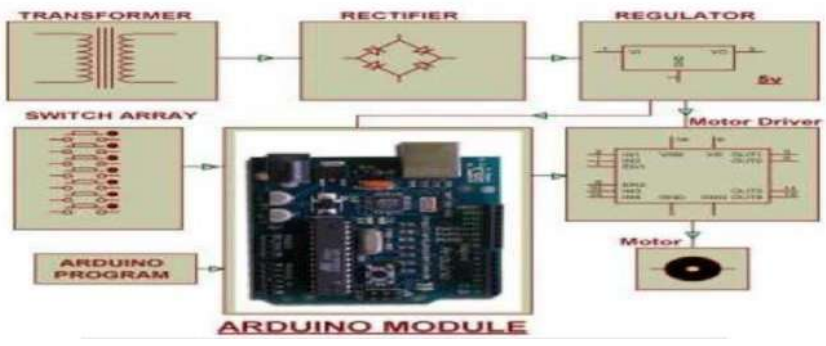
I. INTRODUCTION

DC machines are extremely significant in both industry and everyday life. DC machines have the distinct benefit of having easily adjustable properties. The goal of this paper is to use a microcontroller to create a four quadrant speed control system for a DC motor. The motor has four quadrants of operation: clockwise, counterclockwise, forward brake, and reverse brake. It also features a speed control option.Because electronic technology has advanced rapidly in recent years as a result of scientific and technological progress and social development, a DC motor is now widely used to achieve portability, low cost, energy efficiency, and noise limit, so the study of DC motor speed adjustable has more practical significance. The motor rotates in four directions.

The DC motor's four quadrant action is most suited for industries where motors are utilised and as required, as they may revolve clockwise, counter-clockwise, and apply brakes in both directions. In industrial applications, the motor is used for a specific operation.It must be stopped right away. In this case, the proposed system is an excellent front brake andIts integrated features include reverse brake. As a result of the instantaneous brake in both directions, placing a temporary reverse voltage across a running motor and controlling the motor's speed PWM pulses generated by the microcontroller can be used to do this.

II. LITERATURE SURVEY

The goal of the project is to create a four-quadrant speed control system for a DC motor. It is same as the ourproject but difference only in we are used in our project microcontroller 8051 and those are used in Arduino. but both project work as same The motor has four quadrants of operation: clockwise, counterclockwise, forwardbrake, and reverse brake. It also features a speed control option. The DC motor's four-quadrant functioning is best suited for industries where motors are used according to need. They can revolve in both clockwise and counterclockwise orientations, and brakes can be applied instantly in both directions. When performing a certain activity in an industrial setting, the motor must be stopped promptly. In this situation, the proposed system is ideal because it includes both forward and reverse brakes.When you apply a reverse, you get an instantaneous brake in both directions.



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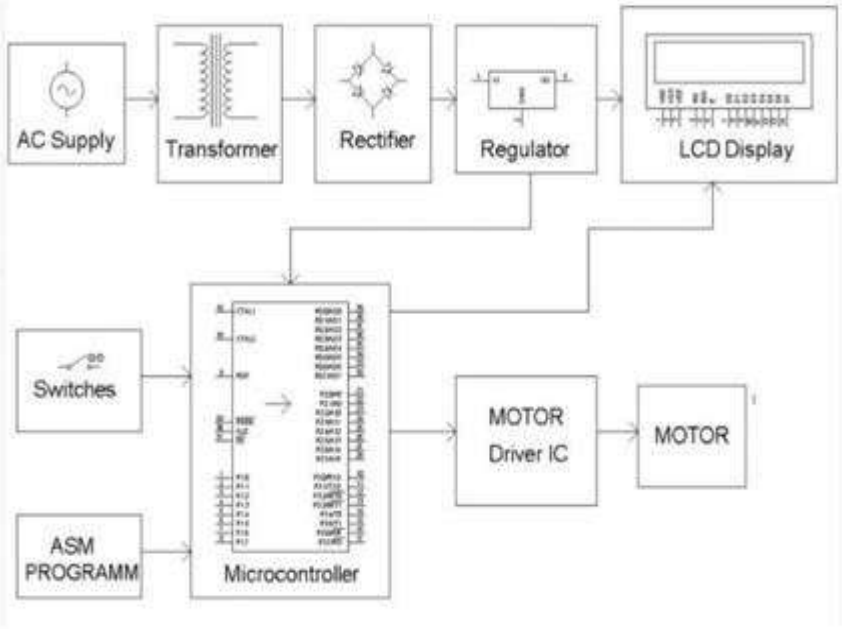
III. METHODOLOGY

A. Block Diagram



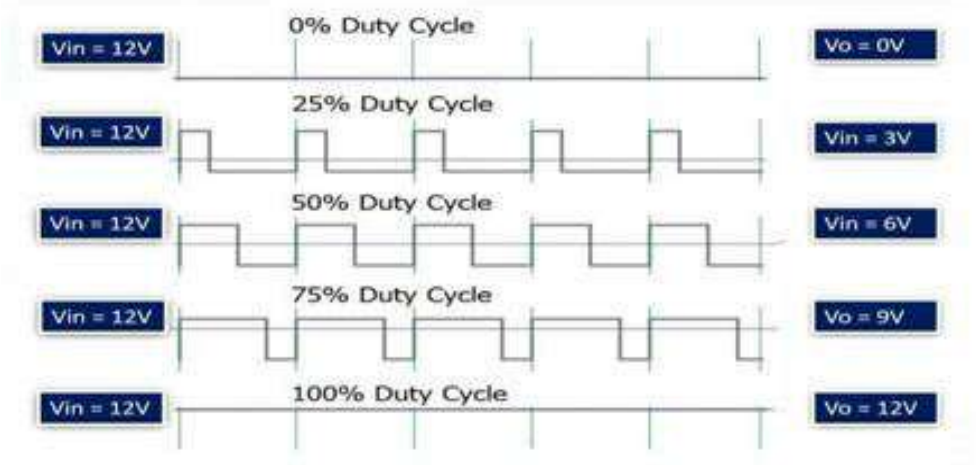
Block Diagram of System

B. Four Quadrant Operation of Dc Motor

depicts the four possible quadrants of operation or modes when using a DC Motor. The supply voltage is greater than the back emf when a DC motor is working in the first and third quadrants, indicating forward and reverse driving modes, respectively.The current flow varies.The value of the back emf created when the motor operates in the second and fourth quadrantsForward braking and reverse braking should be larger than the supplied voltage by the motor.braking types of operation, the direction of current flow is reversed once more.

C. Pulse Width Modulation

Varying the width of these delivered pulses, and thus the average DC voltage applied to the motor terminals, can change the power applied to the motor. The speed of the motor can be regulated by adjusting or modulating the timing of these pulses, i.e., the longer the pulse is "ON," the quicker the motor will rotate, and the shorter the pulse is "ON," the slower the motor will rotate. To put it another way, the wider the pulse width, the higher the average voltage delivered to the motor terminals, the stronger the mangetic flux inside the armature windings, and the faster the motor will spinThe advantage of using pulse width modulation to operate a small motor is that the switching transistor's power loss is minimal because the transistor is either fully "ON" or totally "OFF." As a result, the switching transistor has a substantially lower power dissipation, allowing for more linear control and improved speed stability. Also, because the magnitude of the motor voltage is constant, the motor is always at full power. As a result, the motor can rotate at a considerably slower speed without stalling. So, how can a pulse width modulation signal be generated to operate the motor?



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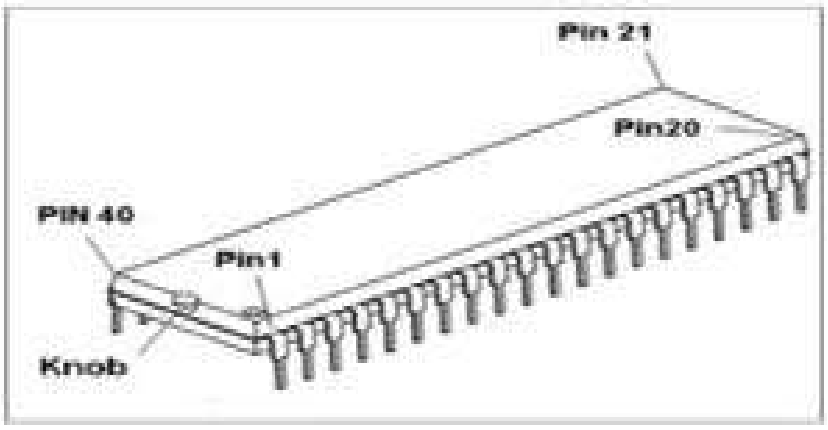
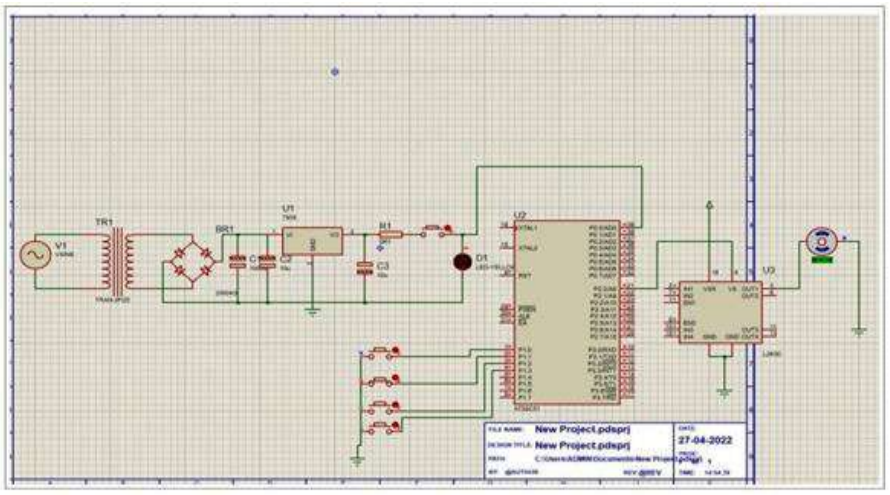
D. Microcontroller

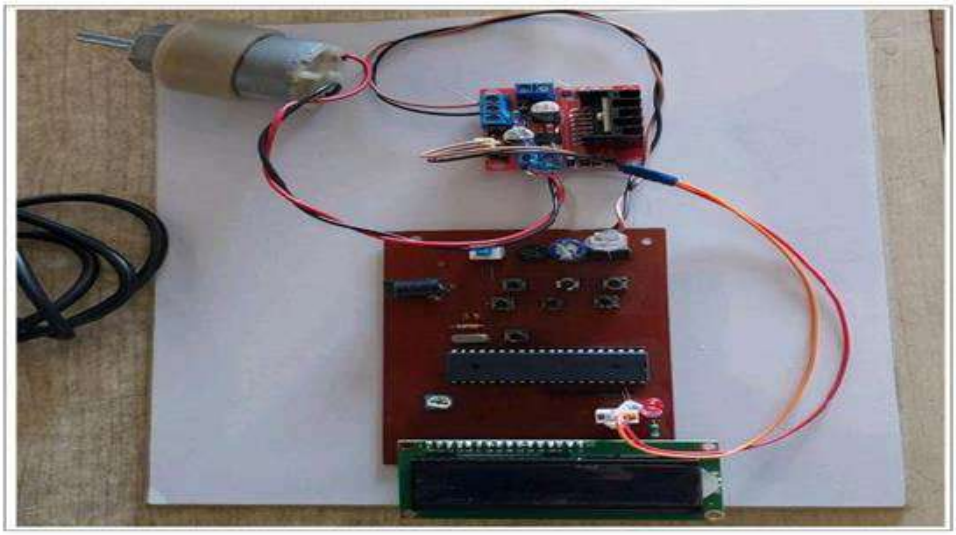
The 8051 architecture, initially launched in 1980 and possibly the most widespread microcontroller architecture available, is the culmination of the microcontroller development effort. The 8051 is a powerful microcontroller with plenty of built-in control memory (ROM and EPROM), increased I/O ports, and the ability to access external memory. An 8051 microcontroller can execute instructions at a maximum clock frequency of 20MHz. A microcontroller is a little computer. The design includes all of the components of a microprocessor, including the CPU, ALU, PC, SP, and registers. It also has the following additional features: ROM, RAM, parallel and serial I/O, counters, and a clock circuit. A non-volatile FLASH programme is included in the 89C51/89C52/89C54/89C58.



IV. Simulation Model



V. Hardware Model



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VI. CONCLUSION

The hardware for controlling the speed of four quadrant DC motors with a microcontroller has been buil. The four quadrant DC motor speed control prototype hardware model is created utilising a microcontroller. Proteus software created a virtual model, which was then checked for accuracy.Using a hardware prototype model The PWM approach has been employed to control the proposed model.the DC motor's rotational speed The speed of DC is affected by the duty cycle, which changes the applied voltage.Controlling the motor is possible. The waveform of the DC motor's input pulse has been captured for various applications.It has been discovered that the speed of a DC motor is directly related to duty cycle values. As the one-time duty cycle grows, the cycle lengthens

VII. ADVANTAGES AND FUTURE WORK

ADVANTAGES

- Due to PWM, the switching time is reduced.
- It is easy to operate
- It requires less maintenance
- Using it is safer.

FUTURE WORK

- It can enable wireless control by using a transmitter and a receiver after the microcontroller.
- A comprehensive automation can be provided by using appropriate sensors.

REFERENCES

[1] B.K. Bose, Recent technological breakthroughs in power electronics and motor drives, IEEE International Symposium on Industrial Electronics, IEEE, 2002, pp 22-25.

[2] "Four Quadrant Speed Control Of Dc Motor Using Chopper" by Devika R. Yengalwar, Samiksha S. Zade, and Dinesh L. Mute.Journal Of International Studies

[3] Engineering Sciences & Research Technology, vol. 4, no. 2, February 2015, ISSN: 2277-9655, pp. 401-406.

[4] dSPACE, Germany, "DS1103 PPC Controller Board," July 2008. "Books on Microcontroller: An Introduction," by Janice Gillispie Mazidi."Embedded systems and the 8051 microcontroller"

[5] Maiocchi, G., "DC Motors: Driving DC Motors," in "Books on DC Motors.""DC Motors and Drives," by BL.Theraja.

[6] "The 8051 Microcontroller and Embedded Systems," by Muhammad Ali Mazidi and Janice Gillispie Mazidi, Pearson Publication by Prentice Hall".

[7] Shruti Shrivastava1, Jageshwar Rawat2, and Amit Agrawal, "Controlling DC Motor with a Microcontroller (PIC16F72) PWM"

[8] S.M.Rangdal1, Prof. G.P.Jain2 "Speed Control Of Dc Motor Using Microcontroller" International Journal of Advanced Technology in Engineering and Science www.ijates.com Volume No.02, Issue No. 12, December 2014 ISSN (online): 2348 – 7550.

[9] Snehlata Sanjay Thakare and Prof. Santosh Kompelli "Design and implementation of dc motor speed control based on pic microcontroller" International Journal of Engineering and Computer Science ISSN: 2319-7242, Volume - 3 Issue -9 September, 2014 Page No. 8075-8079.

[10] Valter Quercioli., "Books on PWM technique: Pulse Width Modulated Power supplies".

[11] Y. S. E. Ali, S. B. M. Noor, S. M. Uashi and M. K Hassan" Microcontroller Performance for DC Motor Speed Control" O-7803-8208, 2003 IEEE.

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FEATURE EXTRACTION OF THERMAL IMAGES FOR FRUIT (BANANA) CONTAMINATION

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ABSTRACT
Entire world is accentuated on inanition health certainty and food safety. Mostly, for fruit ripening the fruit seller uses calcium carbide and for human body the calcium carbide is exceptionally dangerous as it accommodates the phosphorous and arsenic traces. In many countries it is prohibited but in Pakistan, India, Nepal, and Bangladesh and in another country it is directly used. Quality assessment of banana fruit can be concluded by either human inspectors or instrumental tools. This paper presents a method of Thermal Imaging Technology for detection of banana fruit whether it is ripened by calcium carbide or naturally ripened. Thermal imaging is a technology that creates analyzes images by detecting heat radiating from an object. Temperature can be sensed using themaCAM E45 with thermal emissivity and temperature reflectance of 0.5 ℃ with temperature range -20℃ to -100℃. This paper also presents image preprocessing, image segmentation and feature extraction steps for processing of an image. For classifying these images the Neural Network is used.

Keywords: Thermal Image; Banana Fruit; Neural Network; Feature Extraction; Segmentation.

INTRODUCTION
In the world bananas are the forth almost essential crops, India is the superior country for banana manufacturer. For food artifacts of high grade with increased assumptions and welfare standards, the requirement for correct, fast and equitable grade resolution of these attributes in food artifacts ongoing to grow [1]. Presently the fruits bananas are intentionally by chemicals being contaminated effecting health hazards. Randomly Toxic chemicals are used to ripen, grow and make banana fruits which act smooth fresher or last longer, especially during off season. Among the pretreatments, those are mainly resulted for banana fruits deliberated acceptance for best purchaser and ease better marketing, is synthetic banana fruit ripening [2].

The fruit seller of banana uses Calcium carbide for fruits ripening process. For human body the calcium carbide is really dangerous as it includes the arsenic and phosphorus traces. In numerous country of the world the calcium carbide is prohibited, but in India, Pakistan, Nepal, and Bangladesh it is directly used. Thus there is the short-term and long-term possibility of health effects eating banana fruits directly which are persuade to ripen. Calcium carbide has innumerable uses in steel industries, agriculture and chemical. It is colorless when unadulterated, but grayish-white in color otherwise, small like-garlic fragrance. Undiscriminating pesticides on dissimilar variety of fruits conduct to effects of poisonous. Calcium carbide is commonly known as masala, and ripening agent use it, where as the use of calcium carbide is banned in so much countries. When calcium carbide is pure then it is color-less otherwise it is black grayish-white in color. When it reacts with water, cacl2 provides acetylene gas those are analogues of ethylene and ripening process is done in quickness.

In different places the fruits are sent which requires many days either in refrigerated transportation or in ordinary. Before retailing at the destination the fruits are ripened. Use of calcium carbide for ripening process takes less time for fast ripening. The fruit seller uses Calcium carbide for ripening the banana fruit by wrapping the tiny quantity of CaCl2 in packet of paper, and put that packet near the fruit or in fruits box. Whenever the chemical reaction takes place the banana fruit changes its upper surface as well as the test of the banana. The banana fruit which is ripened artificially presents the outer skin as yellow but inside tissue will not be ripe and remains raw and green. As the calcium carbide uses on raw fruit, the chemical amount required for fruit ripening has increased.

Identification of Calcium Carbide Ripened Fruits
The fruits whose outside looks are attractive may not be good for health and also the fruits which has the same color, for example when there is a bunch of bananas and all bananas having same color in those bunch then they are more likely an artificially ripened fruits.

As we discussed in above, the chemical is used for artificially ripening the fruit. The banana fruits which are ripened by naturally has not similar color means not the totally the yellow color either they have some yellow and green bananas. Likewise when papaya and mango are totally orange/ yellow, and also tomatoes are red then CaCl2 have been used. Similarly, for banana if stem of banana is dark green and all remaining body of banana are yellow then bananas can be identified whether it is ripened by natural or by an artificial.

Calcium carbide is indiscriminately used in partially to another advance practice of influencing fruit ripening like the banana fruits dipped in a solution of subjection of fruits to ethylene gas or the solution of

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ethrel/ethephon. The human health infects by using calcium carbide. The effect influences insensibility in the hands and legs, cold and damp skin, weakness and low blood pressure. The chemical remains inside the fruit could conduct miscarriage. Fruits which look delightful from upper coating may not be healthy for health. Fruits which have uniformly color, example, a dozen of bananas having a uniformly color, are further have been ripened artificially [2].

THERMAL IMAGING

The thermal imaging technology detects the heat given off by an object or a person. The use of thermal imaging is to detecting infrared radiation means the heat source and generates the electrical signals from these laser signals, and provides the images in the form of heat. In medical imaging this technology has been widely used, this technique also used in, fault diagnosis, non-destructive testing and structure defect detection. This type of technology can instantly diagnostic target envision, rapid hot spots points, and also thermal profile verification, to regulate the problem condition [4]. Now this technique will be used to detect whether the banana fruit is contaminated or de-contaminated by toxic chemicals (Calcium carbide) or not. Because for ripening a fruit calcium carbide have been extensively used.

It is an exacting problem to detect contamination in fruit that are generally take place underneath the skin of fruit. Detection defects furthermore considerably affected by numerous factors like time, contamination type, contamination extremity, fruit difference, and fruit pre- and postharvest states [3]. The fruits which are ripened naturally are not yellow uniformly; preferably, they are of green and yellow. Whenever mango and papaya are constantly orange/ yellow or tomatoes are red, then fruit sellers may have been used Calcium carbide; banana fruits can be identified if the stem is dark green where the remaining portion of banana fruits are yellow [2]. To determine such kind of problem in fruits Thermal imaging Technique is used. ThermaCAM E45 is used for taking the color images of the contaminated and not contaminated fruit (banana). Thermal camera detects the defected portion in banana fruits as it is affected by the calcium carbide or not. ThermaCAM E45 provides the information in terms of temperature, thermal camera sensed the temperature and displays the color images, and different color shows different temperature.

The colored images of banana fruits can be compared to classify whether the banana fruit is contaminated or not contaminated. Section II gives proposed work. Section III provides the Thermographic Camera system. Section IV provides image preprocessing includes image filtering, and image segmentation. Section V provides different feature extraction. Section VI provides the classification process. Section VII and VIII provides the result and conclusion.

PROPOSED WORK

This paper presents an overview on Thermal Imaging Technique for detection of fruit whether it is contaminated or de-contaminated by toxic chemicals (Calcium carbide) or not. The image is captured by Thermal Imaging Camera FLIR (ThermaCam E45). Thermal camera detects the defects in fruits. If fruit is ripened by calcium carbide means it is contaminated by calcium carbide and when image of that banana fruit is taken by thermal camera then it represents the information of an image in terms of temperature. The different temperature profile for each sample will be generated by thermal camera and classification of an image is done by using artificial neural network.

BLOCK DIAGRAM OF SYSTEM

Fig.1. shows the block diagram of the system. First we take the colored images of the contaminated and non contaminated banana fruits by using ThermaCAM E45 then filtering these images by using different types of filters like, Median filter, Weiner filter, Gaussian filter, Adaptive weiner filter, and Unsharp filter etc. Color based segmentation with PSO is done. After that the feature extraction and classification of those images.

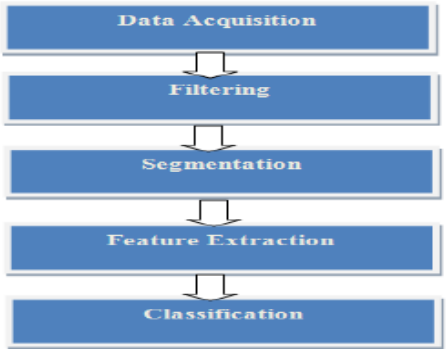

Fig.1: Block Diagram of System

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Thermographic Camera System

Infrared energy coming from an object is focused by the optics onto an infrared detector. The detector sends the information to sensor electronic for image processing. The electronics translate the data coming from the detector into an image that can be viewed in the viewfinder or on a standard video monitor or LCD screen.

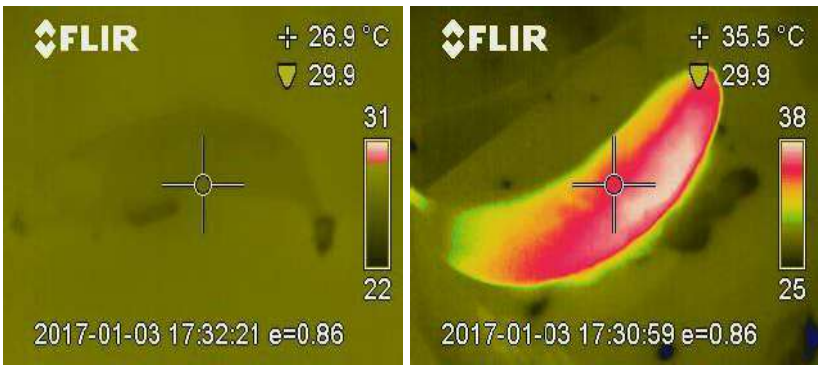

Fig.1: Thermal image of normal Banana and Banana having carbide effect

The ThermaCAM E45 is easy to use. Before capturing an image we have set the thermal camera first then use it so we first go on menu system then navigating the menu system to change the value in dialog box. Point to Meas. mode on the vertical menu bar and press MENU/YES to display the Meas. mode dialog box. In that dialog box we select Meas. mode as spot, Color alarm is set to be below and color alarm temperature is set to be 27.2. For Emissivity the reflectance temperature is set to be 0.5 degree Celsius. For palette the rainbow is selected and alarm is set to be yellow. The range for the images is of -20 to -100. In Fig.3 right figure shows the thermal image of banana for without calcium carbide (which is not contaminated) and left image shows the thermal image of banana with calcium carbide (which is contaminated) obtained from thermaCAM E45.

Image Preprocessing

Pre-processing is the first step for the conversion of thermal image into gray scale image which is followed by filtering process and resizing of image to eliminate unwanted part of the banana fruit.

Image Filtering

In this paper for filtering of images the wiener and median filter is used. Median filter produces good result as compared to wiener filter. So median filter is use for filtering process.

Median Filter

Nonlinear median filtering is used to eliminate noise from an image. It is very productive so it is used to eliminating noise to conserving edges. It is extremely productive to eliminating noise like pepper and salt. The working of median filter is done by affecting across the pixel image through pixel, exchanging each value with neighboring median pixels value.

The design of neighbors is known as “window”, which glides, pixel by pixel overall the whole image. Image median is estimated by firstly categorize all pixel values into numerical sequence from window and after that pixel value which is actually accounted with the median pixel value. The input pixel which is exchanged by middle of the pixel is incorporate around the pixel in the window.

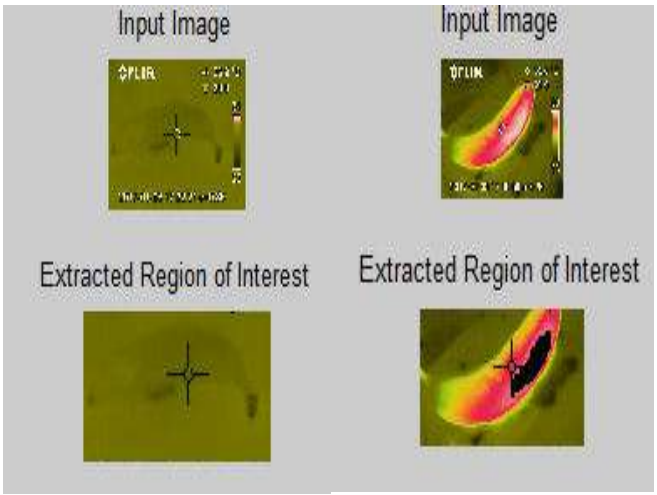

Fig.2: Region of Interest

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The median filtering algorithm instructs in window arrange the pixel values in increasing or decreasing sequence and selecting the median value of the image. Median is calculated by in the middle by two average values. Typical windows are 5x5, 7x7, 3x3, or the 5 point window is reviewed for special type of averaging.

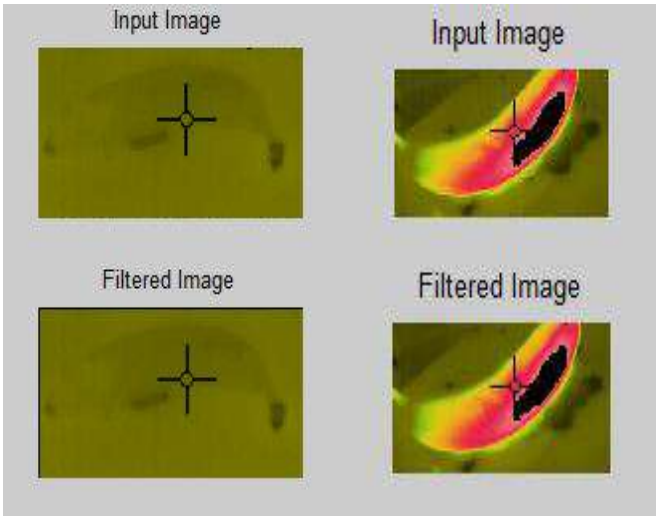

Fig.3: Output of the Median filter

Image Segmentation

In image processing the important step is the image segmentation and it is exacting step position to separate the image constituent regions of interest or area. Segmentation methods are of four types namely classification-based segmentation, edge-based segmentation, threshold-based segmentation and region-based segmentation and clustering based segmentation.

1. Region Based Segmentation

In region based segmentation the image is partitioning into set of connecting regions. The similar regions are found out according to specific criterion like texture and value of intensity. After that the thresholding is independently performed in each region. The main aim of region based segmentation is used to characterize the detected object by certain parameters analysis (size, shape, position). In this type of segmentation the region growing is one of the methodologies.

2. Pixel Based Segmentation

It is the simplest method for segmenting an image and it is known as Thresholding method. In this method the image is classified into an array of sub images overlapping and after that optimum thresholding is applied on that sub images. The thresholding for each and every single pixel is find out by interpolating the results of sub images. The disadvantage of pixel based segmentation is that it is computationally expensive so that this method is not applicable for the application in real time.

3. Clustering Based Segmentation

The clustering based segmentation is mostly used for segmenting the grey level images. This type of segmentation is easily extendable and they are also directly applicable for the data which have large dimensional. The popular clustering methods are fuzzy k-means and the k-means.

4. Edge Based Segmentation

The edge based segmentation works on the discontinuities of data image in sequence to locate boundaries. The edge based segmentation has different profile such as texture and shading can changes due to this the edge based segmentation is not reliable. The object for edge based detection methods are Sobel, canny and the laplacian of Gaussian.

The analysis and processing of an image depends on segmentation of an image. In this paper the color based segmentation is used to segment the contaminated portion in banana fruit. It is attainable to segment image on the basis of color. This can be done by situating of object based on color in an image is attainable. Analysis of image can be accomplished either straightly on the true image or either across individual color of plane. On the basis of intensity value of color to segment the image the threshold is set because intensity values are sustained in homogeneous color region. Specific color range with an object can be detected easily from whole image. The mean value of necessitate color is calculated and it is compared with each RGB pixels values of an image using either Mahalanobis distance measure or the Euclidian distance measure. The particle swam optimization (PSO) algorithm is used for color based segmentation.

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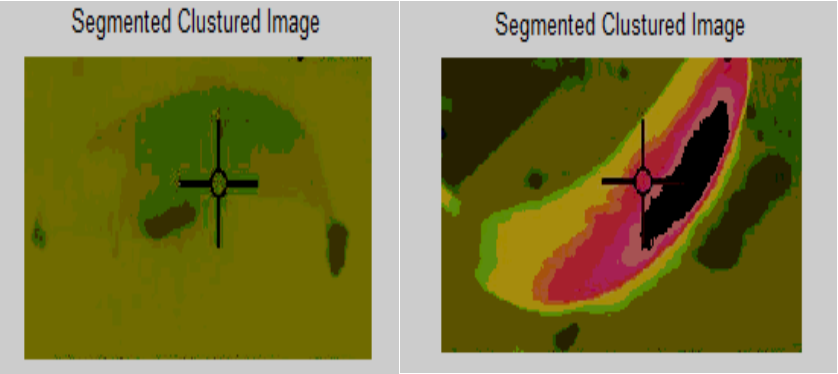

Fig.4: Segmented Clustered image

Particle Swarm Optimization

Particle Swarm Optimization is a kind of Evolutionary computational technique which is developed by Kennedy and Elberhart. Particle swarm optimization is simple and powerful search technique which can be applied in a successful manner to a large variety of optimization problems, which includes the problems of image processing like image segmentation.

Table 1: Particle Swarm Optimization

Parameters	Description
Particle	candidate solution to the problem
Velocity	rate value ob of position change
Fitness	the best solution achieved
Pbest	best value obtained in previous particle
Gbest	best value obtained so far by any particle in the population

In particle swarm optimization, a solution is representing by a particle, and a solution of populations is known as swarm of particles. Each and every particle has mainly two properties: velocity and position. Each particle moved to the new position by use of velocity. Whenever the each particle reached to the new position that time the best position of swarm and the best position of each particle are updated as it is needed. Each particle velocities are adjusted depending on the particle experiences. This process is repeated till the stopping criterion is met.

Particle Swarm Optimization Steps

1. Initialize each particle.
2. For each particle estimate the personal best (pbest) and the fitness value.
3. Estimate global best = best among all particles.
4. Update new positions and velocity.
5. Repeat step from 2 to 4 till the termination criteria is reached.

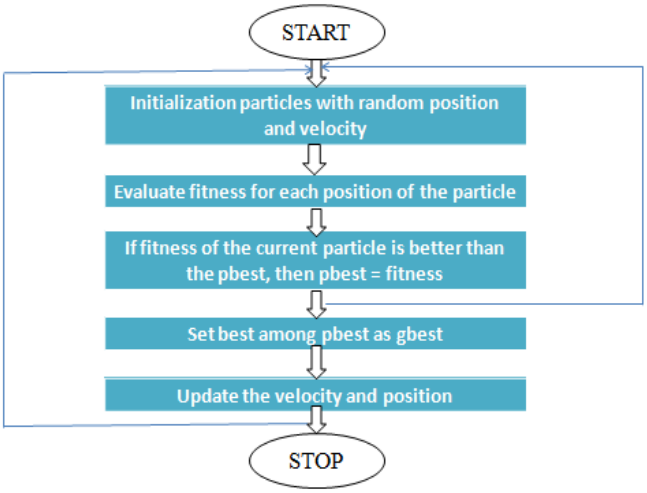

Fig.5: Flowchart for particle swarm optimization algorithm.

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Initialization is the first process of particle swarm optimization where the initial particle of swarm is generated. The concept for solution representation is applied also here as it is applied in genetic algorithm in similar manner. Initializes each particle with a random velocity and position. For fitness value each particle is calculated. Fitness value is calculated each and every time, it is just compared with against previous best fitness value of the particle and global best positions and the personal best positions are updated where it is applicable. Whenever the stopping criterion is not met, then create a new swarm by updating the velocity and position. For updating the velocity the personal best and global best positions and old velocity are also required.

As mentioned above, there are two keys requires for operations of particle swarm optimization to update the positions and velocity. Velocity is updated on the basis of three components such as experience of an individual particle (momentum term or inertia), the old velocity (self learning term or cognitive), and the whole swarm experience (social learning term or group). Each term has the constant weight associated with it. The number of required constants is three for basic particle swarm optimization.

It should be seen that the particle swarm optimization does not require fitness values of solutions for sorting in any process. This is significantly computational advantage over genetic algorithm, especially in that case where the size of population is large. The simple arithmetic operations of real numbers are require in particle swarm optimization for updating the position and velocity of the particle.

First step is to initialize some particles that is known as initial population and the particles those are chosen as the number of particles are considered as size of swarm. Each and every particles are initializes by assuming the initial solutions and after that gradual all particles varies their velocity and position according to their personal best so far and group or global best position in the current time.

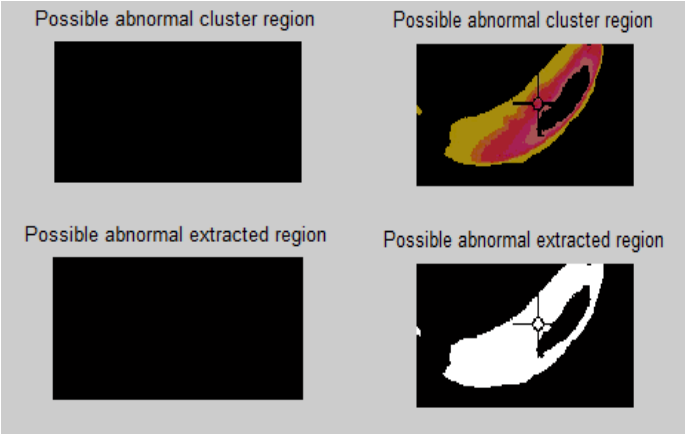

Fig.6: Possible abnormal cluster and extracted region

Feature Extraction

It is the important step in image processing. The most important aim is to extricate the feature from an image. For feature extraction we evaluate the area of an object (i.e. area of banana fruit) in binary image. An input images either a numeric or logical. If an input is numeric then nonzero pixels are appraised like Area, Mean, and Standard Deviation, minimum and maximum of RGB. They are as follows

1. Area: Area is the information of pixel which is present in binary image. Area is defined as:

$$Area = A = \sum i \sum j \ (Ai,j\ Xroi[A], Yroi[A])$$

Where, Xroi [A] = i and Yroi [A] = j vector contains ROI X AND Y position respectively.

1. Mean: The mean, m of the pixel values in the defined window, calculates the value in the image in which central clustering occurs. The mean can be estimated using below formula:

$$\mu = \frac{1}{MN} \sum_{i=1}^{M} \sum_{j=1}^{N} p(i,j)$$

Where, P (i, j) is the pixel value at point (i, j) of an image size MxN.

2. Standard Deviation: The standard deviation, σ is the calculate of the mean square deviation of grey pixel value p (i,j) from its mean value. Standard deviation explains the dispersion within a local region. The std. deviation value of RGB is calculated. It is determined using below formula.

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$$\sigma = \sqrt{\frac{1}{MN}\sum_{i=1}^{M}\sum_{j=1}^{N}(p(i,j)-\mu)^2}$$

Where, P(i,j) is the pixel value at point (i,j), μ and σ are the mean and standard deviation respectively.

3. Minimum and Maximum values of RGB are also calculated.

Classification

After feature extraction the images will be classified by using Artificial Neural Network and the Support Vector machine. Support vector machine basically deals with pattern classification which means that this algorithm is mainly used for classifying the different types of patterns. The main aim of SVM is to maximize the margin hence the SVM can correctly classify the given patterns.

Basically neural networks are those parallel computing devices, which attempt to make computer brain model. The main aim is to design a system. Which perform different computational works or tasks which is faster than the traditional systems. Artificial Neural Network are those types of computer architecture which is supreme by biological neural networks and use to imprecise functions which depends on maximum number of inputs and are usually unknown. During training period, it can be easily estimated whether the outputs of ANN is correct by observing pattern or not.

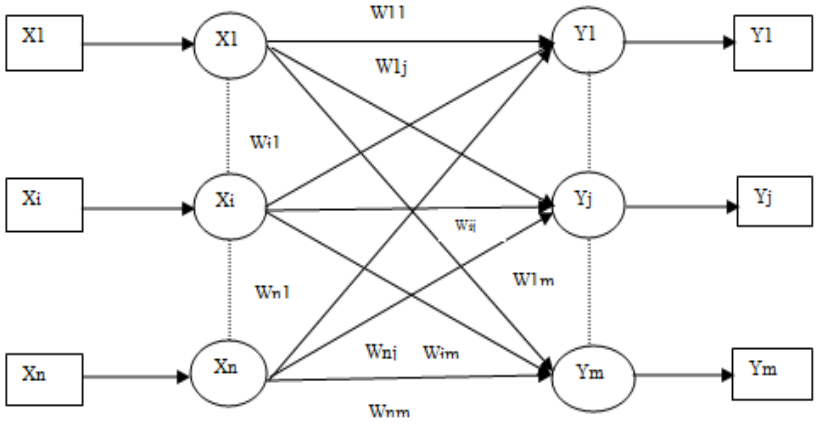

Fig. 7: Architecture for linear vector quantization

In this paper for classification of the banana image we have used the Learning Vector Quantization Neural Network. The learning vector quantization is differ from the Kohonen Self-Organizing Maps (KSOM) and Vector Quantization (VQ), generally uses the supervised learning which is competitive network. Learning vector quantization defines in such a way that it is a process of patterns classification where each output unit representing the class. Supervised learning is uses, so the network will give set of training patterns with known classification along with the class of output with an initial distribution. When the training process is completed the linear vector quantization will classify the vector input by assigned to the same class likely the output unit.

Below figure shows the linear vector quantization architecture which is little but similar to the kahonen-Self-organizing map architecture. In below figure "n" is the number of input units and "m" is the number of output units. These layers are totally interconnected by the weights which they have on them. Parameters used in Linear vector quantization for training process and also for flowchart are as follows:

1. x = training vector (x1,…,xi,…,xn)
2. T = class for training vector x
3. Wj = weight vector for jth output unit
4. Cj = class associated with the jth output unit

Training Algorithm

Step 1 – Initialize the reference vector, it can be done like:

- From the given set of training vectors, take first "m" (number of clustering) training vector and use as weight vector. The remaining vector can be used for training.

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- Randomly assign the initial weight and classification.
- Apply the method of K-means clustering.

Step 2 – Initialize reference vector α

Step 3 – If the condition for stopping this algorithm is not met, then continue with steps from 4-9

Step 4 – For every training input vector x, follows the steps from 5-6.

Step 5 – For j = 1 to m and I = 1 to n then estimate the square of Euclidian Distance.

Step 6 – Obtain the winning unit J where D(j) is minimum.

Step 7 – estimate the new weight of the winning unit by the following relation:

- If T = Cj then Wj(new) = Wj(old)+ α [x-Wj(old)]
- If T ≠ Cj then Wj(new) = Wj(old) - α [x-Wj(old)]

Step 8 – Reduce the learning rate α

Step 9 – Test the stopping condition.

1. Maximum number of epochs reached.
2. Learning rate value reduced to a negligible value.

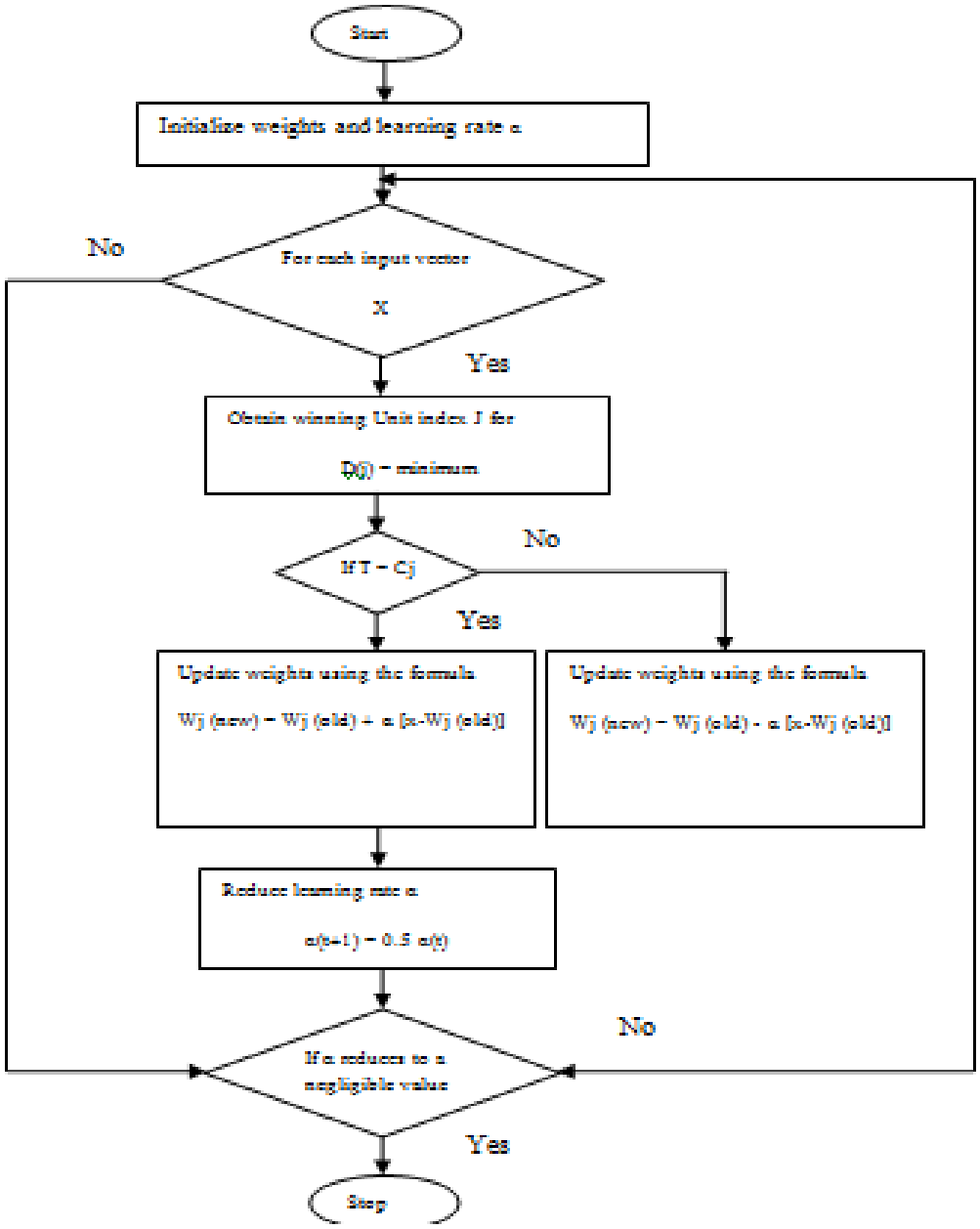

Fig.8: Flow chart for learning vector quantization neural network

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RESULTS

Different parameters for contamination like, area, Mean, Std. deviation of RGB and minimum and maximum values of RGB of normal fruit (not contaminated fruit) and for the contaminated fruit on the basis of different quantity level of calcium carbide has been calculated and also their results based on the thermal camera and system output as shown in below table. For our analysis we take area greater than 100 is normal and value above that is considered that it is contaminated fruit. So we have concluded that these four parameters considered for feature extraction are sufficient for classification of banana to detect either banana is contaminated or not contaminated.

Table 2: Comparative Analysis

Contamination level of CaCl2(gm)	Area	Std r	Stdg	Stdb	Mnr	Mng	Mnb	Mxr	Mxg	Mxb	Mir	Mig	Mib	System analysis on contamination SVM	ANN	Desired O/P Analysis
2	522	0	12.9608	30.5305	165	108.38	43.67	165	115	83	165	40	0	Yes	Yes	Yes
5	1175	0	41.2997	27.8624	168	29.45	49.72	168	117	85	168	0	0	Yes	Yes	Yes
10	0	0	0	0	0	0	0	0	0	0	0	0	0	No	No	Yes
15	2218	0	25.9648	26.7150	177	45.47	48.06	177	115	84	177	0	0	Yes	Yes	Yes
20	617	0	45.4062	15.2944	175	63.69	38.16	175	111	65	175	0	9	Yes	Yes	Yes
24	6128	0	28.315	28.315	208	52.98	42.99	208	85	41	208	0	0	Yes	Yes	Yes
25	11344	0	48.3207	48.3207	166	90.07	36.65	166	140	81	166	0	0	Yes	Yes	Yes
Without CaCl2	0	0	0	0	0	0	0	0	0	0	0	0	0	No	No	No

CONCLUSION

The accurately identification and classification of banana fruit whether it is ripened by calcium carbide or naturally ripened is very important for human body as calcium carbide accommodates traces of arsenic and phosphorous. This paper presents a thermal imaging technique that creates and analyzes images by detecting the heat radiating from an object. Thermal imaging can be used to detect the contamination in fruits as it is non-contact, non-traumatic, non-invasive and simple method for fruit skin temperature.

REFERENCES

[1] Sanjay Chaudhary, Bhavesh Prajapati, "Quality Analysis and Classification of Bananas" International Journal of Advanced Research in Computer Science and Software Engineering Volume 4, Issue 1, January 2014.

[2] Md. Wasim Siddiqui* and R.S Dhana "Eating artificially ripened fruits is harmful" General Article CURRENT SCIENCE.VOL.99, No. 12, 25 December 2010.

[3] Zhou Jianmin, Zhou Qixian, Liu Juanjuan, Xu Dongdong, "Design of on-line detection system for apple early bruise based on thermal properties analysis" International Conference on Intelligent Computation Technology and Automation 2010.

[4] Haoyang Cui, Yongpeng Xu, Jundong Zeng and Zhong Tang, "The Methods in Infrared Thermal Imaging Diagnosis Technology of Power Equipment" 2013 IEEE.

[5] Eduard Llobet, Evor L Hines, Julian W Gardner, and Stefano Franco, "Non-destructive banana ripeness determination using a neural network-based electronic nose" IOP publishing Ltd 26 March 1999.

[6] Jibu Varghese k, Tripty Singh, sreyas Mohan, "PCB Thermal Image Analysis using MATLAB" ISSN (Online): 2347 – 2812, Volume-2, Issue – 3, 2014.

[7] ASHISH, VIJAY, "Review on Thermal Image Processing Techniques for Machine Condition Monitoring" international Journal of Wireless Communications and Networking Technologies Volume 3, No.3, April-May 2014.

ISSN 2394 - 7780

[8] Baohua Zhang, Wenqian Huang….etc. Principles, developments and applications of computer vision for external quality inspection of fruits and vegetables: A review. Food Research International 62(2014) 326-343.

[9] V. Srividhya, K. Sujhata and R.S. Ponmagal, "Ethylene Gas Measurement for Ripening of Fruits Using Image Processing" Indian Journal of Science and Technology, Vol 9(31), August 2016.

[10] Dayanand Savarkar "Identification and Classification of Bulk Fruits Images using Artificial Neural Networks" IJEIT Volume 1, Issue 3, March 2012.

[11] Semwal, Vijay Bhaskar, Kaushik Mondal, and G.C. Nandi. "Robust and accurate feature selection for humanoid push recovery and classification : deep learning approach." Neural Computing and Applications (2015): 1-10.

[12] Semwal, V.B., Singha, J., Sharma, P.et al., "An optimized feature selection techniques based on incremental feature analysis for bio-metric gait data classification" Multimed Tools App (2016).

doi: 10.1007/s 11042-016-4110-y

[13] Semwal, Vijay Bhaskar, Manish Raj, and Gora Chand Nandi. "Biometric gait identification based on a multilayer perceptron ." Robotics and Autonomous Systems 65 (2015): 65-75.

[14] Dr. S. Mary Joans, Poornima.J , " Application of particle Swarm Optimization Algorithm to color Space Image Segmentation and its Analysis" International Journal for research in Emerging Science and Technology, Volume-1, Issue-7, December-2014.

[15] SAGAR S. NIKAM, " A Comparative Study of Classification Techniques in data Mining Algorithms" oriental Journal of Computer Science & Technology.

[16] ThermaCAM E45 Manual.

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ELECTROMAGNETIC SPACE SHUTTLE LAUNCHER

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ABSTRACT
An electromagnetic launcher is a device which use magnetic field to accelerate a projectile. Research of electromagnetic launcher has become wider and discussion on its future has become popular among the scientists and engineers all over the world. Many experiments haveperformed to understand the characteristics of producing high efficiency of electromagnetic launcher. The efficiency of electromagnetic launcher, in terms of velocity, is directly related to design, material selection and construction techniques. This paper is proposed to design and develop an electromagnetic launch system using a coil gun. A coil gun is a type of projectile accelerator comprising of one or more coils used as Electromagnets in the configuration of a linear motor which accelerate a conducting projectile to high velocity. In almost all coil gun configurations, the coils and the gun barrel are placed on a common axis. Coil guns generally comprises of one or more coils arranged along a barrel, so the path of the accelerating projectile lies along the central axis of the coils. The coils are switched off and on in a precisely timed concatenation, resulting the projectile to be accelerated quickly along the barrel via magnetic forces.Coil guns are definite from railguns, as the direction of acceleration in a railgun is at right angle to the central axis of the current loop formed by the conducting rails. Also, railguns usually require the use of sliding contacts to pass a large current through the projectile but coil guns donot necessarily require sliding contacts. Whilst some simple coil gun concepts can use ferromagnetic projectiles or even permanent magnet projectiles, most designs for high velocities actually incorporate a coupled coil as part of the projectile.

Keywords: Coil-Gun, Projectile, Linear Motor, Rail-Gun, Ferromagnetic projectile

INTRODUCTION
Electromagnetic Launch systems have advantages juxtaposed with the existing chemical launch systems. Generally, the electromagnetic launchers are categorized into two kinds of systems; railguns and Coil-Guns. Here we have tried to make a launch system using Coil-Guns. A reluctance Coil-Gun is basically a solenoid which can launch iron or steel projectiles by careful timing of the coil current. The cutaway diagram in figure1 shows the very simplest of Coil-Gun designs.

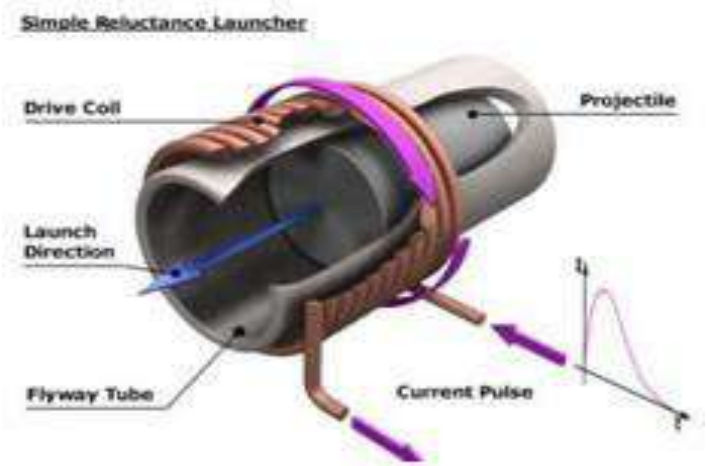

Figure 1: Cut section of Coil-Gun

A coil is wound over a non-conducting 'flyway' tube and the projectile is positioned at the breech end of the tube. If a small pulse of current is passed through the coil the projectile will accelerate into the coil, and if this pulse is terminated just as the projectile gets to the middle of the coil it will leave with a gain in velocity. This is, in a nutshell, how a reluctance Coil-Gun works. The correct timing and shaping of the current pulse is one of the most important facets of Coil-Gun design. There are various refinements that can be implemented to improve the performance. While Coil-Guns don't have any industrial application at present, but these systems could be used to launch payloads into orbit. A more rational application may be launch boosting where a vehicle is given an initial speed from a long Coil-Gun accelerator [1]. Vehicle would fire its rockets to achieve orbit after leaving the Coil-Gun. Launch boosting could result in noteworthy savings in fuel costs. From a military point of view Coil-Gun technology may have aplace in future combat vehicles. Electromagnetic space shuttle launcher can be termed as smokeless launch.

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LITERATURE REVIEW

1. The first Coil-Gun was patented in 1900 by Norwegian researcher Kristian Birkeland. However,his attempts to produce a practical weapon proved disappointing, and the concept was abandoned and languished for many decades. Interest in the concept revived in the wake ofthe Reagan Administration's SDI program, and NASA began looking into the possibility of using Coil-Guns to launch orbital payloads.
2. Sandia National Laboratories investigated electromagnetic launchers to orbit, in addition to researching other EML applications, both railguns and Coil-Guns. In 1990, a kilometer- long Coil-Gun was proposed for launch of small satellites. [2][3] Later investigations at Sandia included a 2005 study of the StarTram concept for an extremely long Coil-Gun, one version conceived as launching passengers to orbit with survivable acceleration. After NASA Ames estimated how to meet aerothermal requirements for heat shields with terrestrial surface launch, Sandia National Laboratories investigated electromagnetic launchers to orbit, in addition to researching other EML applications, both railguns and Coil-Guns. In 1990, a kilometer-long Coil-Gun was proposed for launch of small satellites.
3. The Center for Electromechanics at The University of Texas at Austin (CEM-UT) performed a feasibility study of an EML system for a hypersonic model test Facility for NASA-Langley Research Center. The work resulted in a high-energy EML design to accelerate large, complex18 in. winged aircraft models up to 11 km/s (25,000 mph) at less than 33,000 gees. Two different designs evolved which are based on railgun and Coil-Gun concepts. Both designs make use of low current density, very long, low acceleration electromagnetic motors.
4. Electromagnetic aircraft catapults are planned, including on board future U.S. Gerald R. Ford class aircraft carriers. An experimental induction Coil-Gun version of an Electromagnetic Missile Launcher (EMML) has been tested for launching Tomahawk missiles.
5. A Coil-Gun-based active defense system for tanks is under development at HIT in China.
6. Speculations about Coil-Guns for use as military artillery predate the First World War, and in 1917 a Frenchman named Fauchon-Villeplee actually built a working model of a railgun, with the shells fitted with "wings" that served as an armature. In 1937, an employee of the GermanSiemens company named Otto Muck started looking at railguns again, and in 1943 proposedthe construction of a long-range railgun that could fire twelve 200-kilogram shells every minute, driven by a 100-megawatt power station. The German military was already committedto the development of long-range missiles and other V-weapons, and the project was not funded.
7. An electromagnetic launcher (EML) was designed for NASA-Langley to boost large modelsto hypervelocity for flight evaluation. Two different concepts were developed using railgun and coil gun principles. The aim is to present experimental research information on Coil-Guns and related topics. In this capacity we hope to foster interest in the fields of physics and engineering. Our long-term objective is to design and construct single and multi-stage Coil-Guns capable of firing projectiles at supersonic speeds. [5]
8. "Magnetic Journey of Space Shuttle" published in Advances in Aerospace Science and Applications, By Ravi Kumar Shakya, Priya Garg, Rishabh Bana and Praveen Raj from Aerospace University, SRM University, Chennai, India. In this paper it describes under the principle of magnetic levitation, space shuttle is launched and is directed towards North Pole or South Pole. The contributing factors for magnetic launch discussed are magnetic field strength, the location of the launch and the structural design of the space shuttle. The location for the launch of the space shuttle is the area with least gravitational force, helping in achieving extra velocity, with the minimum usage of propellant. [6]

PROPOSED SYSTEM

This paper represents a space shuttle launching by using electromagnetic principle. Generally, space shuttle launching is done by gave the command to relayed to initiate the space shuttle's three main engines, solid rocket boosters are ignited as the bolts securing the shuttle to the ground are discharged, allowing the rocket launch to propel the spacecraft into the atmosphere. In this process there are required a maximum amount of fuel, space, human efforts and releases gaseous form of pollution. Whereas in electromagnetic principle the power through wounded coils or rail tracks produces magnetic field around it and projectile launches in space by Lorentz force. It has higher reliability and reduced maintenance. This project introduces to an electromagnetic shuttle launcher. Here we are connecting rectifier circuit to an AC supply (240V-440V) with in series resistor and zener diode connected in parallel /across it. The capacitor bank is for stores the energy in it and supplies when the rail needs a desired voltage level for producing magnetic field. As we can also use Microcontroller AT80s51 for control

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circuit to reset or control the clock and I/O of the circuit. A digital oscilloscope is connected across the circuit which shows the ripple free dc waveform. This paper presents developing the shuttle launcher by rail gun method. Where the two-rail track (aluminum strips) which are made up of aluminum are laid on a thin acrylic sheet, by connecting a thick wire to tracks/strips. We made capacitor bank by using connecting 8 capacitors to each other. A 5v charger and for projectile we used tube bearing. And a rectifier circuit uses to charge the capacitor bank. When the AC supply converts to pulsating DC by rectifier the pulsating dc voltage is passes thorough zener diode for pure dc voltage, then capacitors are charge and when closes the switch for launching the projectile the supply passes through the aluminum strips or tracks the magnetic field starts generating through it and at the specific amount of kinetic energy through the strips the projectile starts moving towards the end of tracks with an higher velocity and speed by principle of Lorentz force. At the end of tracks there a projectile at its maximum speed and with higher accelerations projectile launches in atmosphere, starts to locates at the orbit. The gravitational factor also affects at the speed of projectile hence the launching place it should be located at less gravitational force (<9.81 m/s). The same process we can use in coil gun also for launching the space shuttle but due it's having a less reliability and less speed than rail gun. The flowchart for developed rail gun system is shown in Fig. 2 the workflow of developed rail gun system.

Block Diagram

The block diagram for proposed system has been shown in figure 3. The various stages of the system are as follows:

A. **Microcontroller**

An embedded AT80s51 microcontroller is a chip that features a processor with all its support functions (clock & reset), memory (both program and data), and I/O (including bus interface) integral into the device.

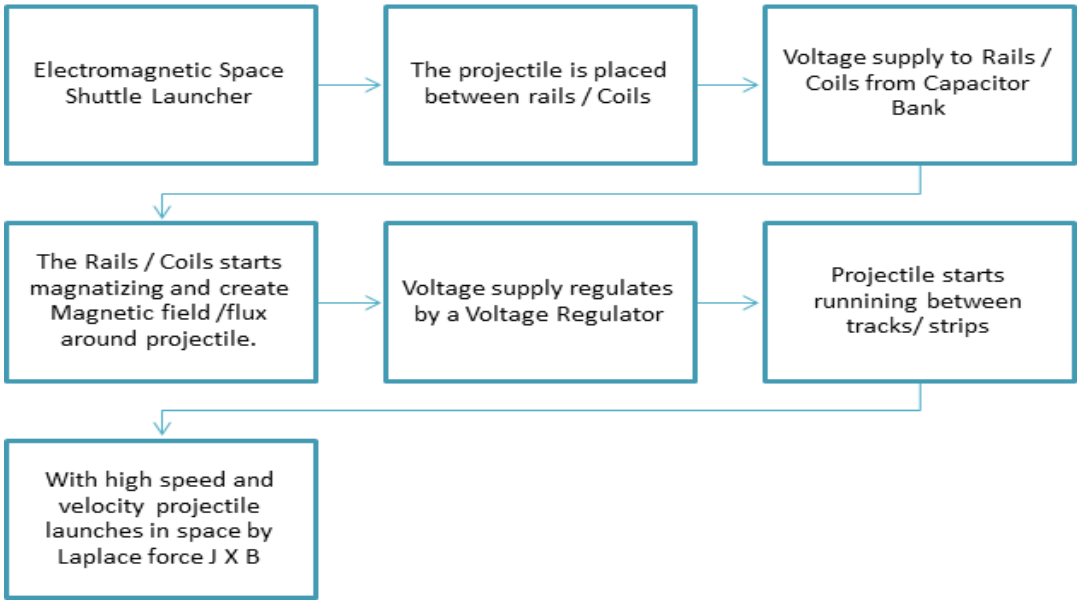

Figure 2: Flow diagram of Rail Gun System

B. RELAY DRIVER CIRCUIT ULN2803 The eight NPN Darlington connected transistors during this family of arrays are ideally suited to interfacing between low logic level digital electronic equipment (such as TTL, CMOS, or PMOS/NMOS) and also the higher current/voltage needs of lamps, relays, printer hammers, or different similar masses for a broad vary of computer, industrial, and client applications. All devices feature open collector outputs and freewheeling clamp diodes for transient suppression.

C. COIL-GUN/RAILGUN The ohmic resistance of the coils and also the equivalent series resistance (ESR) of this supply are among different limits to the efficiency of a coil gun. The magnetic circuit ideally, 100% of the magnetic flux generated by the coil would be delivered to and act on the projectile, but this is often off from the case due to the common air-core coil construction of most coil guns, which are usually comparatively easy and inefficient designs created by hobbyists. To reduce component size, weight, robustness necessities, and most significantly, cost, the magnetic circuit deliver a lot of energy to the projectile for a given energy input.

D. TRANSMITTER and RECEIVER For transmitter section, the different commands signals are transmitted via RF transmitter module of 500 MHz it has 4 pins of antenna, Vcc, ground, & serial data input. Antenna, +5v & ground are connected to respective places and serial data input is generated from encoder IC HT12E.

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This encoder IC's function is to convert parallel data into serial data address lines of encoder are grounded because they are not used.

E. CAPACITOR BANK A capacitor bank consists a numerous capacitor to stores the energy and supplies to a coil gun or rail gun. In this project each capacitor carries 12V-80V and it's connected to a two end to end terminal of the rail gun circuit. F. RECTIFIRE AC supply is connected through rectifier circuit to stores the charge in DC form in capacitor bank with a Zener Diode across it to form pure dc supply. The Transformer is step up the voltage up to 440V and rectifies it through a rectifier circuit.

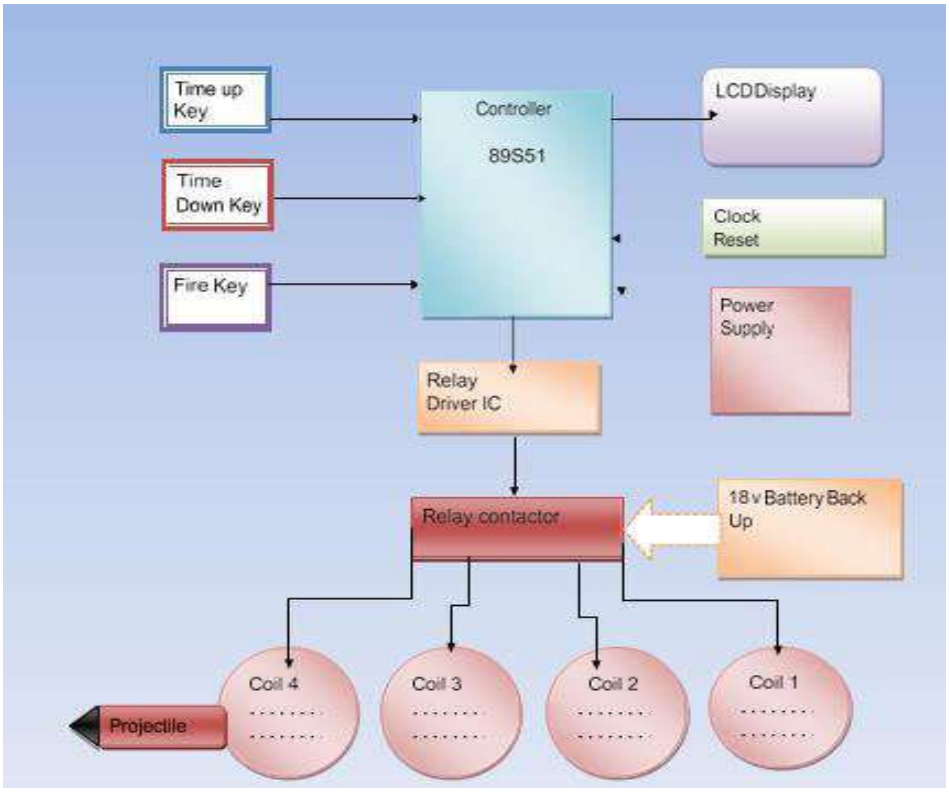

Figure 3: Block Diagram of proposed system

Simulation Results for Railgun Circuit

Controller circuit and capacitor bank switch regulates voltage in the circuit. The simulation results of circuit are as shown in below Fig. 4 when the switch 1 open while Fig 5 shows when the switch 1 is closed. The Digital Oscilloscope is connected across the magnetized tracks and rectifier circuit.

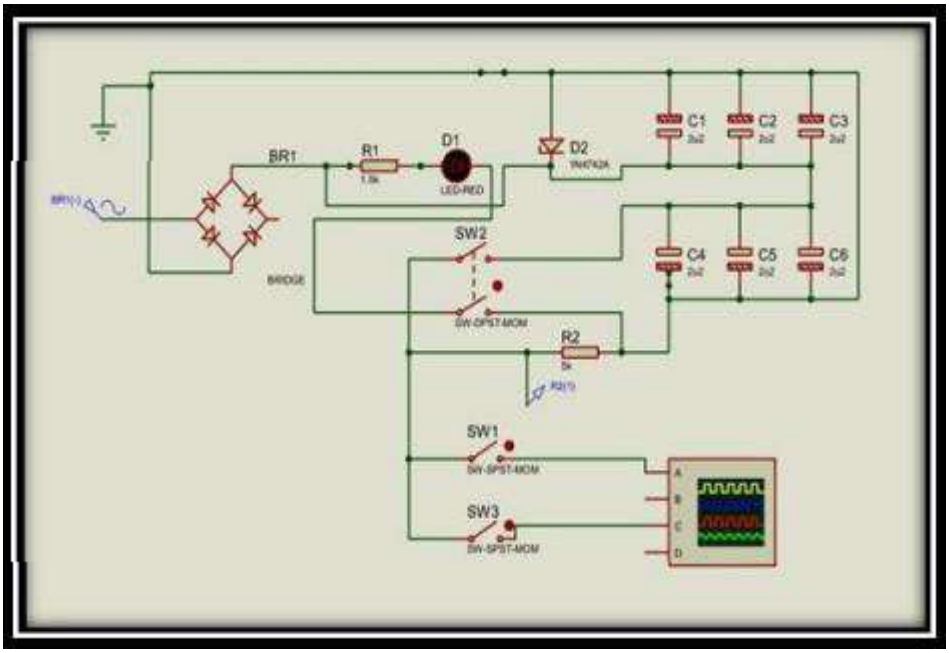

Figure 4: AT switches 1and 2 open in condition

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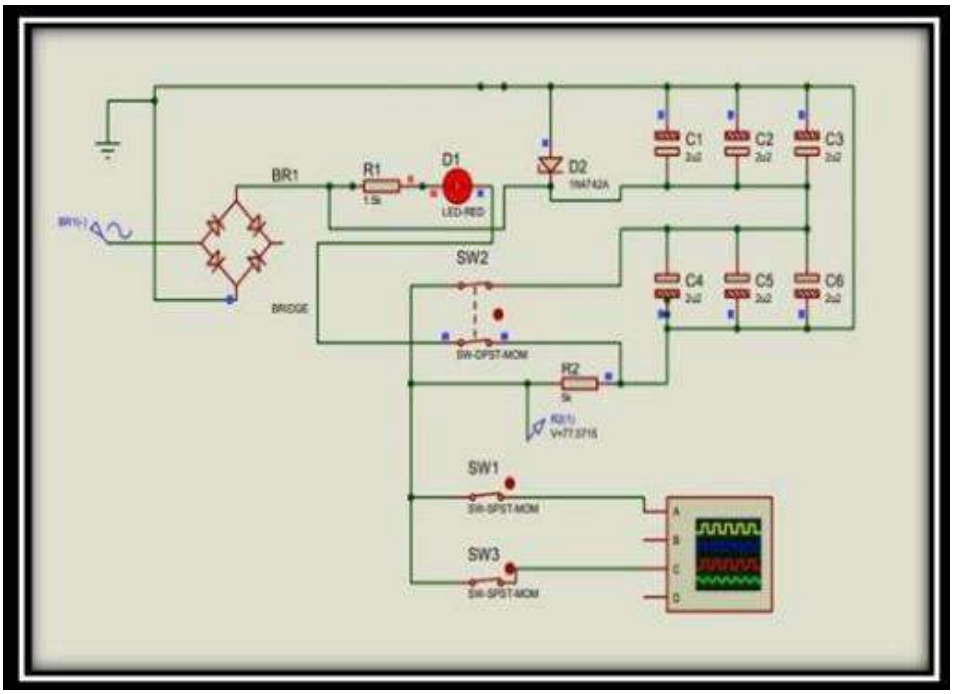

Figure 5: 5. At switches 1 and 2 in close position and projectile starts to run on rail gun and launch in space.

CONCLUSION

The proposed system shall help to make launching system more cost-efficient, reliable and less consumption of propellant. The use of Coil-Gun method can increase speed of projectile and for more reliability aspect the rail gun method implanted for space launcher. The use of magnetic field of the earth for the space transportation would revolutionize the launching mechanism of the space shuttle, which would in turn improve the reliability and the efficiency of the launching process. As the principle of the magnetic levitation is under major application for the railway transportation as well as space transportation, for astronauts to travel in space is in a completely efficient way. The speed of a projectile or rockets are increased effectively by rail gun method.

REFERENCES

[1] B. N. Turman, "Coil gun Launcher for Nano satellites", the Second International Conference on Integrated Micro/Nanotechnology for Space Applications, April 1999.

[2] L5 News, September 1980. Retrieved May 9, 2011

[3] Lab Says Electromagnetism Could Launch Satellites. Retrieved May 9, 2011

[4] Sandia National Laboratories / Lockheed Martin Electromagnetic Missile Launcher. Retrieved May 9, 2011.

[5] IEEE Spectrum, July 2007. Retrieved May 11, 2011

[6] Ravi Kumar Shakya, Priya Garg, Rishabh Bana and Praveen Raj, “Magnetic Journey of Space Shuttle” published in Advances in Aerospace Science and Applications (Volume 3, Number 3,2013) pp.167-176.

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PARALINGUISTICS – A KEY FOR THE AUDIENCE FULLY UNDERSTAND THE ESSENCE OF SPEECH AND CONVERSATION

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ABSTRACT
This article examines Paralinguistics (the voice pitch, voice tone and the rhythm of the speech) which is the most often responsible for "not what you say, but the way you say." It also studies the role of Paralanguage for revealing emotions and the role of language and body language for sharing ideas, conveying information and the people's perceptions and persuasion. The study involves fieldwork of inspecting the speech and conversation of 40 pairs of engineering students. The findings are that people generally use non-verbal communication and apply a combination of paralanguage with language when they need to express their emotions and share pleasure but when they want to express the factual messages in accurate form, only use the words. The research concludes that language, body language and paralinguistics work together in sharing ideas, thoughts and information but paralinguistics is the best one to express a high degree of emotions and to bring people's sentiments out.

Keywords: Paralinguistics, speech, conversations, emotions, perception, persuasion

I. INTRODUCTION

In the process of speech, our voice is our trade mark that assigns extra life while delivering a speech and adds a human touch to the words. It is said that the words are just words, they do not state any meanings but the speaker's voice goes with language and uses Paralinguistics (the non-verbal cues: the voice pitch, voice tone and the rhythm of the speech) to reveal emotion, attitudes, status, personality, etc. Non-verbal communication involves direct communication not exclusively relying on written or spoken words (Berry, 2010; Rimondini, 2012). Paralinguistics reveals feelings of meaning and improves English fluency and accuracy and communication skills more effectively which are the most important requirements in the present era from the learning arena to excel in all professions. Keep on excelling as there is no perfection in the world.

II. AIMS

The objective of the research is as follows:

- Analyse the aspects of communication and how they work together to interpret language
- Study how the paralinguistics helps express the speaker's attitude and reveal emotion, attitudes, status, personality
- Examine how the paralinguistics opens up paths to make the audience fully understand the essence of speech and conversation
- Identify how paralinguistics help to attain good and proper results in communication
- Ignite the learners' interest in enhancing paralinguistics to give a better presentation

III. LITERATURE REVIEW

To complete and achieve the goals of this work, it referred to many research works, books and websites and explored to worldwide things of the following:

- ✓ Language is the use of words to convey information and present meaningful data to different people (Phifer, 2007) but Non-Verbal Communication (NVC) is used to show the way people feel at a given point in time (Littlejohn & Foss, 2010; Wood, 2009).
- ✓ Language, Paralanguage and Body language complement each other in order to provide meaningful communication (Zimmerman & Uecke, 2012).
- ✓ To present or convey various understandable messages and the modification of voices, the components of paralanguage such as non-verbal voice qualities, voice modifiers and independent utterances are used and they are produced by various parts of the body (Poyatos, 2012; Wilson, 2011).
- ✓ Through conventional dialogue and speech of a language, information is carried out from one person to another in mutually intelligible dialect (Perkins, 2010).

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IV. HYPOTHESIS

The study presents here its hypothesis:

- The only aspect of communication is what we say
- The non-verbal communication plays a crucial role in 'how we say the message' and
- Convey as many or more meanings in human interaction with high culture-specific
- It reflects the thought "Action speaks louder than words"

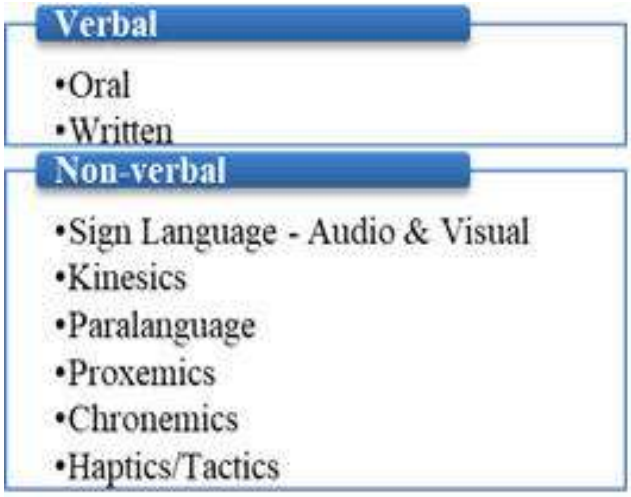

Fig.1: Verbal & Non-verbal Communication

A) Communication Theory: In everyday interaction, Communication is a vital aspect that comprises both verbal and non-verbal elements. Communication theory, seen as a way to map the world and navigable, helps you to study people's behaviours, understand people and their communities, media and associations with families, friends and companies. Communication theory plays a vital role to understand human beings, (Richard West & Lynn H. Turner, 2014).

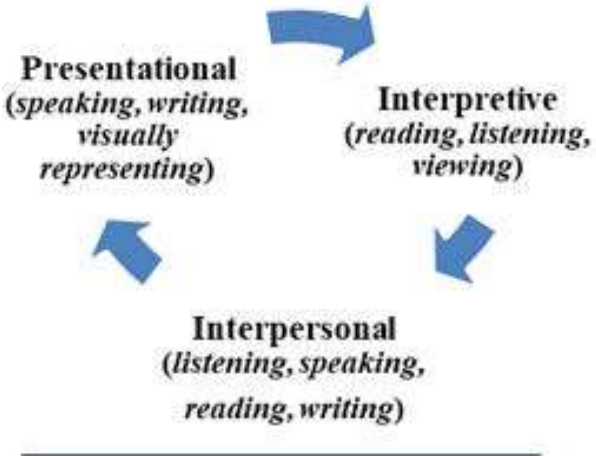

Fig.2: Mode of Communication

B) Modes of Communication: Modes of communication includes Presentational, Interpretive and Interpersonal communications where the communicators follow Listening, Speaking, Reading and Writing (LSRW) processes. The New London Group defines five modes of communication:

Table 1: Five Modes of Communication

5 Modes	Definition
1. Linguistic	Written and spoken words
2. Visual	Images (still or moving)
3. Aural	Sound, music
4. Gestural	Body movements, expression
5. Spatial	Physical arrangement, position, proximity

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C) English Language Skills: The broad and primary plane of communicative competence has discoursed with respect to language development and acquisition of body language and paralanguage. To attain these, you should keep a good habit of reading books that enjoys you. Reading can be an ideal gift by yourself so carry a book where ever you go. As the basic skills are required in all areas, you learn English systematically with fundamentals of study skills, practical grammar for English writing styles such as punctuation, sentence structure, correct word usage, methods to the analysis of English words and sentences for effective writing and speaking. Hence, there is a need for these different approaches to gain the best forms of meaning.

D) Interpretation of Language: Language uses the definition of words, para-language and kinesics which help to understand the meaning within the current and past context.

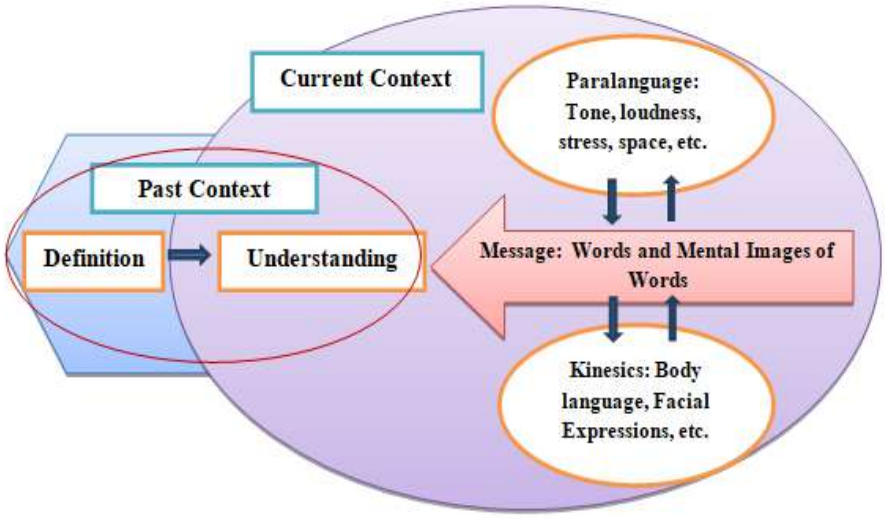

Fig.3: Interpretation of Language in Past and Current Context

Fig.4: Ratio of Communication

E) The Ratio of Communication: People use words to convey messages but they use paralanguage to express a high degree emotions as they can change the meaning of the message completely. Figure 4 shows the research result of Albert H Mehrabian in the 1960s and 1970s: A message being conveyed by body language accounts for 55 per cent, 38 per cent paralanguage and 7 per cent verbal. The study defines that the meaning of what we express is limited or part of the words we say but how we say contains the power to make success in people's perception (awareness) and persuasion (influence).

The details of ratio of communication and its usage are as follows:

Ratio	Categories	Usage
55%	**Body language** - It is conveyed through the whole body which could be understood by vision and sight.	Use of appropriate body language can make face to face communication more meaningful. Kinesics (body language), Haptics (touch), Proxemics (space distancing), Signs and Signals (audio/visual), Chronemics (use of time),

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38%	**Paralanguage** - It is conveyed by the mouth which could be understood by listening.	**1. Components:** Consciousness or unconsciousness, Intonation, Accent, Pitch, Pace/Rate, Pause, Silence, Emphasis, Word Stress and syllable, sound of voice • It reveals more effectively emotion, attitudes, status, personality, etc. in oral communication.
		2. Paralanguage can alter the meaning: In English, a sentence becomes a question when the speaker's voice tone rises at the end of it.
		3. Paralanguage can give emotional context for the content of speech: A loud, high pitched voice tone can express excitement, anger or fear.
		4. Paralanguage can show geographical linguistic subgroup: Accents are partially caused by paralanguage so the rhythm of native speakers easily helps us to know the their geographical region. For example, a southern accent in the U.S. is slow and lazy sounding.
7%	Verbal (Words)	Provides similar or opposite meanings

Table 2: The details of ratio of communication and functions

F) Types of Non-verbal Communication: An interesting fact about non-verbal communication is that it is spontaneous and continuous whereas verbal communication can be planned. The verbal communication can be started and stopped abruptly but the non-verbal can't and it can be considered to be more reliable whenever both types contradict each other. The Non-verbal Communication tools are presented over here:

Sr. No.	Types of Non-verbal Communication	Definitions
1	Kinesics	It is the study of body's physical movements which is considered as an intelligent way of communication.
2	Haptics	It is a Greek word which means able to come into **contact with or touch**. The touch is the most proficient at the core of personal experience or sense for capable of simultaneous input and output.
3	Proxemics	It is the study of how we communicate with the Space/Distance around us that involves how we arrange personal space and what we arrange in it.
4	Paralanguage	It is the vocal but non-verbal dimension of speech deals with the manner in which you say something rather that what you say. It defines the **Rate** (speed at which you speak); **Volume** (loudness or quietness of vocal tone); **People Perception**; and **Persuasion**.
5	Sign Language	It is the Audio/Visual normally used by dump and deaf and it is very important part in their life.
6	Chronemics	It guides us to understand the use of time, punctuality and how people perceive and structure the time and trying to use it more effectively. Rehearsal of formal presentation educates us to be within the time limit and a mark of courtesy and professionalism.

Table 3: Types & Definition of Non-verbal Communication

G) Characteristics of Paralanguage

1) Definition of Paralanguage: Para + language itself means something beyond the language. It has a great impact on people's perception (awareness) and persuasion (influence). This is the non-lexical component of communication that uses the technical term for the voice varieties accompanying spoken words. Paralanguage modifies thoughts and expresses emotions by the way we say something rather than what we say. People normally use it multiple times per day and are sometimes unaware of doing so. As the non-verbal vocal cues are concerned with the sound of the voice, they are known as audio parts of speech. These are very important to identify the way you emphasize certain words in a sentence which can change the meaning. For example, If you ask lovingly, "Did you eat the chocolate?" The answer will be 'Yes' in a polite manner but if you use a harsh or angry voice, you will receive a fearful answer.

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2) Components of Paralanguage: Listeners can interpret various meanings from any sentence depending on the tone, volume, pitch and other non-verbal hints which are classified into two main categories: 1) Vocal Characteristics, and 2) Vocal Interferences. The table presents you with a brief report of these two:

Table 4: Vocal Characteristics

1) Vocal Characteristics
Voice plays a part in the impression others have of you. For example, a) A loud voice is usually associated with aggressiveness. b) People who speak quickly are said to be nervous.
1. Pitch (high or low of your voice)
2. Volume (how loudly or softly you speak)
3. Pace/Rate (the speed at which you speak)
4. Voice Quality (how pleasant or unpleasant your voice sound/voice tone)
5. Rhythm (smooth and regular shows your confident attitude but uneven shows lack of clarity)
6. Articulation (the way you pronounce individual sounds)
7. Pronunciation (the way in which you pronounce or say a word)
8. Enunciation (clearly pronounce or speak the sound of a word)
9. Vocal Segregates (a short non-lexical utterances like 'mm-hmm', 'ok', 'aa', etc. help to regulate and maintain dialogue and sometimes disturb audience)
10. Kinesics (body language like facial expressions, gesture, posture shows different messages) • **Gesture:** (Movements of hands or other body parts to convey a message, for example, moving hands to say 'hallo or bye') • **Posture** (the way a person stands or sits like relaxed or tensed posture which reflect attitude of the person)

Table 5: Vocal Interference

2) Vocal Interferences
1. Vocal interferences are the sounds and words we use when we hesitate or are not sure of the right word.
2. We all use the occasional "uh", "er", "well", "you know", etc. to indicate that we are searching for the right word.
3. Such interferences may become a problem when they pop up too frequently as they can interrupt your listeners' concentration and comprehension.

3) How we can Use Paralanguage to Give a Better Presentation: Paralanguage is considered as a non-verbal in nature that we generally use in communication. It represents a wide range of vocal characteristics like altering the tone and speed of words, changing the facial expressions to underline the remarks and whispering or speaking loudly to emphasize the message which helps us to articulate and imitate the speaker's attitude.

Paralanguage is used to reflect gasp, sigh, clear our throats, change our tone, whisper or shout, emphasize certain words, wave our hands, frown or smile, laugh or cry, string vocal identifiers like uh-huh and ah-hah between our words or speak faster or slower. If you use them intentionally and appropriately in public speech and conversation, you can heighten your speech quality effectively which makes your audience fully understand the essence of your presentation.

H) Tips for Improving Public Speaking Skills

Require Skills	Definition
1. Self-confidence	It is an important aspect of personal development that comes from being well prepared. The following methods will help you to build your confident: ✓ First, do practice in front of mirror ✓ Then, present to family or friends and receive feedback ✓ Use the feedback for further improvement ✓ Never memorize a speech; if you forget, it will cause great confusion
2. Body-language	Body language generally includes Speaker's Appearance and Voice such as grooming, dressing, posture and gestures which are important to impact on the audience because the audience notices the speaker's body language at first before delivering the speech.

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3. Personality	It is greatly influenced by posture, manner of standing, sitting and walking and positions of arms, legs, etc. and how to comfortably handle the thing which you carry in your hands.
4. Comfortable Posture	Deliver your speech by balancing your body weight on both feet and **avoid** the following: constantly shifting the weight from one foot to another that looks uncomfortable, putting your hands into your pockets and leaning on the table or podium. Practice a free and relax standing posture.
5. Eye Contact	Eye contact builds rapport with the audience. Move your eyes to as many people as possible for making brief eye contact but less than 2 seconds.
6. Movements	Avoid too much movement or walking around on the stage because it distracts audience attention.
7. Facial Expressions and Gestures	Naturally, while speaking, we make expressions and gestures; be friendly, pleasantly with cheerful face always to keep up the audience attention.
8. Volume and Pitch of Voice	Your voice tone, volume and pitch should suit the room and reach the audience to make them attentive to you.
9. Pace and Pause	Speak at a comfortable speed right pause or silence for making listeners to perceive important points.
10. Health	Maintain your good health that gives you energy to your body-language, voice and practice to build your confidence.
11. Practicing Delivery of a Speech	Your preparation gives you success in presentation so rehearse your speech naturally and comfortably and maintain the time as per the requirement.

Table 6: Tips for Improving Public Speaking Skills

V. METHODOLOGY

In order to execute the research, practical fieldwork is employed to analyse and review the way students understand the concept of paralinguistics and how they use it with words to share their ideas, thoughts, information and emotions and how they work in relation to:

1. **Sharing ideas, thoughts and information**
2. **Expressing emotions**
3. **Analyzation and Suggesting a better view**

Process Results: In the conduction of fieldwork on 40 pairs of first-year engineering students over a week-day period, they were asked for presenting information by the following activities: dialogue, monologue, story-telling and role-play. The facilitator tested the use of three approaches of language, body language and paralinguistics by monitoring each of the respondents while communicating with another person. After that, they were asked to identify and analyse the benefit of paralinguistics in expressing emotions and grade it as important, quite important or very important in each case. The study analysed the collected data and identified the importance and significance of paralinguistics. The findings draw the conclusion and the tailored data as presented in table 7. It shows how the different respondents presented their views on how emotions can be expressed and make the audience to fully understand the conversation or speech. The grade is presented on the scale of important (A), quite important (B) or very important (C).

Types of Work	Language			Body Language			Paralinguistics		
	A	B	C	A	B	C	A	B	C
1. Sharing ideas, thoughts and information	5	5	30	7	5	28	5	2	37
2. Expressing Emotions	12	13	15	10	10	20	5	2	37
3. Analyzation and Suggesting a better view	10	13	17	5	4	31	3	6	31

Table 7: Grade of Type of Work

Treatment of Results: Results reflect the relative strength and the relative importance of the different approaches to language sharing, information sharing and different methods of sharing ideas which are presented by the various respondents's chosen options. The findings are classified according to the number of respondents chose an option conferring its sum the critical reviews are analysed. These analysation and reviews draw conclusions on whether the hypothesis is valid or not.

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1. **Sharing Ideas:** While sharing ideas, most of the participants acknowledged that the imparting information was almost done with language. Thus, over 75% state that the language is very important to provide knowledge but in conversation and speech for fully understanding and enjoying that knowledge paralinguistics plays a vital role.
2. **Expression of Emotions:** Most of the participants specified that our action and voice tone reveals our emotions although they stated that language is an important tool to concede it. It proves that language, body language and paralanguage are people's natural components and natural attitudes. They work together to convey knowledge, reveal emotions and express joy and happiness. Over 80% recognize that the paralinguistics to be very important and vital in making the audience fully understand and enjoy the speech and conversation. It was accepted unanimously.
3. **Analysation and Suggesting a Better View:** This session was quite complicated as the respondents were split in discussing whether the paralinguistics was important or not. Response of 50% said paralinguistics is important to express feelings and body language supports that. However, over 70% state that paralanguage is very important in suggesting a better or improved view.

DISCUSSION

The facilitator introduced students to the real style of reading the English language which is as follows:

- ✓ Proper stress (individual word, phrase and clause in sentences)
- ✓ Accurate modulation (intonation: voice pitch, voice tone and the rhythm of speech)

Below one is a sample of the reading passage. Students were guided on how to make syllables to read it in original style with proper stress and accurate modulation i.e. understanding the stress of individual words, phrases and clauses in sentences. In addition, the following instructions were given to them to follow: half-second pause for single slash (/); and one-second pause for double slash (//).

To be a good teacher, / you need some of the skills of a good actor / such as / the ability to hold the attention and interest of the audience; / having a clear and strong pleasant voice to control over them well. // Listen carefully, / and you will hear the quality of voice, / pitch, / tone / and the rhythm of the speech changing according to / what the teacher is talking about. // Watch a good teacher / and you will see / that she or he does not sit motionless / before the class. // Teachers stand most of the time, / they walk about, / they use their arms, / hands and fingers to help in explanations, / and face to express feelings. //

Students exclaimed why we have to change our Indian style of reading and follow the American accent. The facilitatory advised them, "You are not asked to follow others' accents but the real style/accent of reading English."

Suggestion and Conclusion: The study suggests that a high degree of emotions can be revealed through bodily actions and intonation that makes listeners feel more emotions and sentiments. Finally, the study concludes that the hypothesis is honoured and justified by proving a better view of "A matter is a matter that is persuasive in nature" here language, paralanguage and body language all work together for making the speaker and the listener attain a reasonable communication. It highlights that in the form of exchange of information language is the main measure in almost all the scenarios and situations but non-verbal communication is used to express everything in concise terms.

BIBLIOGRAPHY

1. Toby Williamson, 26 Nov 2019, The Importance of Language, Paralanguage and Non-Verbal Communication in Various forms of Communication – A Practical Study, Access to Psychology, https://www.ukessays.com/essays/psychology/language-paralanguage-nonverbal-4237.php
2. Littlejohn, S. W., & Foss, K. A. (2010). Theories of Human Communication . Mason, OH: Cengage.
3. Perkins, P. S. (2010). The Art and Science of Communication. London: Wiley.
4. Rimondini, M. (2012). Communication in Cognitive Behavioral Therapy. London: Springer.
5. Davidson, J. (2003). The complete guide to public speaking. New Jersey: John Wiley & Sons, Inc.
6. Wood, J. (2009). Interpersonal Communication: Everyday Encounters. Mason, OH: Cengage.
7. Zimmerman, C., & Uecke, R. A. (2012). Asserting Yourself At Work. New York: AMACOM.

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DESIGN AND FABRICATION OF ELECTRIC FORKLIFT

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ABSTRACT
In today life there is wide of forklifts variety of forklifts from the large heavy loadings trucks to the one that works among narrow aisles forklifts have becomes one of basics transportation tools we use in our lives with all the forklifts in existence we find that there are some improvement that can be to bring forklifts to the better performance. We describe forklift powered by an electric motor instead of the IC engine using rechargeable batteries the main objective of this project is to design electrically powered forklift for material handling in industrial warehouses and workshops. Nowadays in industries, the forklift operates on an IC engine for transportation and hydraulic system for lifting and lowering of materials. Due to this mode of operation, there are many adverse environmental impacts such as emission of carbon dioxide and leakage of hydraulic fluid. Thus, this project aim to making the electric system into a forklift to make it electrically powered which lift to 1 ton kg and elevate up to 8 feet.

Keyword: Forklift, Heavy Loads, Transportation, I.C engine, Industrial Warehouse, Environment, Electrically Powered.

I. INTRODUCTION
In general the forklift can be defined as a tool capable of lifting hundreds of kilograms. A forklift is a vehicle similar to a small truck that has two metal forks on the front used to lift cargo. The forklift operator drives the forklift forward until the forks push under the cargo, and can then lift the cargo several feet in the air by operating the forks. The forks, also known as blades or tines, are usually made out of steel and can lift up to a few tons. Forklifts are either powered by gasoline, propane, or electricity. Electric forklifts relay on batteries to operate. Gasoline or propane forklifts are sometimes stronger or faster than electric forklifts, but they are more difficult to maintain, and fuel can be costly. Electric forklifts are great for warehouse use because they do not give off noxious fumes like gas powered machines do. Forklifts are most often used in warehouses, but some are meant to be used outdoors. The vast majority of rough terrain forklifts operate on gasoline, but some use diesel or natural gas. Rough terrain forklifts have the highest lifting capacity of all forklifts and heavy duty tires (like those found on trucks), making it possible to drive them on uneven surfaces outdoors. Forklifts have revolutionized warehouse work. They made it possible for one person to move thousands of pounds at once. Well-maintained and safely operated forklifts make lifting and transporting cargo infinitely easier. This is the general description of a normal forklift truck. To enhances the technology further, this prototype module is constructed with remote technology, there by the operator can walk along with the forklift for better visibility & the container can be placed accurately (precision position). This increases the safety of the operator.

II. LITERATURE REVIEW

A. Battery Operated Forklift Vehicle.
Dr.V.R.Gandhewar1, Kalyani R. Bhokare2, Chirag D. Pande3,Vaibhav G. Mali4, Ganesh V. Badaki5 Assistant Professor1, BE Student [2, 3, 4, 5] Department of Mechanical Jawaharlal Darda Institute of Engineering and Technology, Yavatmal, Maharashtra, India.

A forklift truck is a powered industrial truck used to lift and transport. This vehicle is self-drive by the used of battery power and the lifting mechanism is also runs on battery power with the help of lead screw mechanism. There are already many types of forklift conveyer available since ancient time. But our aim is to design forklift conveyer pollution free by using battery and more efficient lifting by using lead screw The project work "Battery operated forklift" is aimed to control through lead screw. The main advantage of using this technology is to increase the safety of operator by operating the forklift from certain distance. This increases the efficiency of the productivity, because human errors due to the poor visibility can be minimized.

B. Design and Analysis of Mechanical Forklift
Khebude Karan N*, (B.E, Dept. of Mechanical Engineering, Sanjeevan Engineering & Technology Institute, Panhala, MH,India

The Design Calculations of Fork are compared with Structural Analysis Report. The Lifting of Fork makes the Deformation and bending of fork. Due to selection of forklift material as mild steel it has increased the

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advantages of design due to its high specific stiffness and strength By Using the Mild Steel Material for the Fork the Deformation is minimum. The Results shows Mild steel is Strong wear resistance & Impact strength. The theoretical calculations are safe as it has compared with ANSYS Results.

C. The Travelling of Forklift in Warehouse

Dr.R.N.Mall (2013), Automated Guided Vehicle, ISBN 2091 Journal, MMMEC, Gorakhpur.

In the warehouses forklifts are the most expensive machines. The study pays special attention to the travelling of these machines. Factories, industries and storage go downs need forklifts and cranes for storage and moving large goods. Also there are a numberof goods weighing around 40 – 60 kg that are comparatively lighter but cannot be moved around in market there are severaltypes of forklifts are used in warehouses. These forklifts are either powered by gasoline, propane or electricity but they are more difficult to maintain and fuel can be costly which takes more space. To overcome this entire problem we designed and fabricate the three wheel forklift which drives on electric power and loading & unloading is done by hydraulic jack through forks. In general, there are a lot of activities in traditional warehouses.

D. Construction of Battery Operated Forklift

Krunal R. Dhivar Lecturer Department of Mechanical Engineering L.I.T. Sarigam, Valsad, India

Today all heavy engineering company uses Forklifts. Widespread use of the forklift truck had revolutionized warehousing practices before the middle of the 20th century. A mixture of material handling systems is in the use, exact from that entirely physical to the ones that are semi-automatic but manually controlled. Forklifts have revolutionized warehouse work. They made it possible for one person to move thousands of pounds at once. The project work "Battery operated forklift" is aimed to control through wired communication. The main advantage of using this technology is to increase the safety of operator by operating the forklift from certain distance. This increases the efficiency of the productivity, because human errors due to the poor visibility can be minimized. The system is designed and developed successfully, for the demonstration purpose prototype model (mini model) is constructed. Most of all human safety is a major concern's by using a remote controlled forklift.

E. Design of Electric Forklift used in Small industrial Warehouses and Workshops

Prof. Suryavanshi Amol V Faculty of Department of Mechanical Engineering, PCCOE Savitribai Phule Pune University Nowadays in industries, the forklift operates on an IC engine for transportation and hydraulic system for lifting and lowering of materials. Due to this mode of operation, there are many adverse environmental impacts such as emission of carbon dioxide andleakage of hydraulic fluid. integrate the electric system into a forklift truck to make it electrically powered The main boon of using the technology is to reduce the impact of fuel-based forklift also it lessons human efforts and their misconceptions. It'snot only user friendly but also environment friendly. It is highly affordable at a lower cost.

III. PROBLEM STATEMENT

- Small scale industries having major problem related to cost of material handling system.
- In markets forklift's lifting mechanism is function on hydraulics, chain and screw based which is suitable for smallloads.
- Forklifts are either powered by gasoline, propane or electricity but they are more difficult to maintain and fuel can becostly which takes more space.
- Failure of any technology part.
- Electric forklift are not as affordable as LPG, gas, or diesel equipment.
- Charging electric forklift batteries can be tricky for multi-shift operation.
- Forgetting to charge the battery overnight can result in significant productivity losses the next day.
- Battery chargers have certain voltage requirements and the existing electrical service must meet those.

VI. OBJECTIVE

In this project we investigate a forklift design that is new and different from existing design. The new design offers two features, the forklift's Lifting Mechanism. i.e. Pulley Mechanism which Working of Compound Pulley and 4 ropes Distributes the load and Divide Total Load by Four. So the effective Load on motor will be four time less then actual load of object. The other feature is that the Better Integrated Body design. Which Provide more balance and smooth sliding mechanism and wide Wheels provide more stability.

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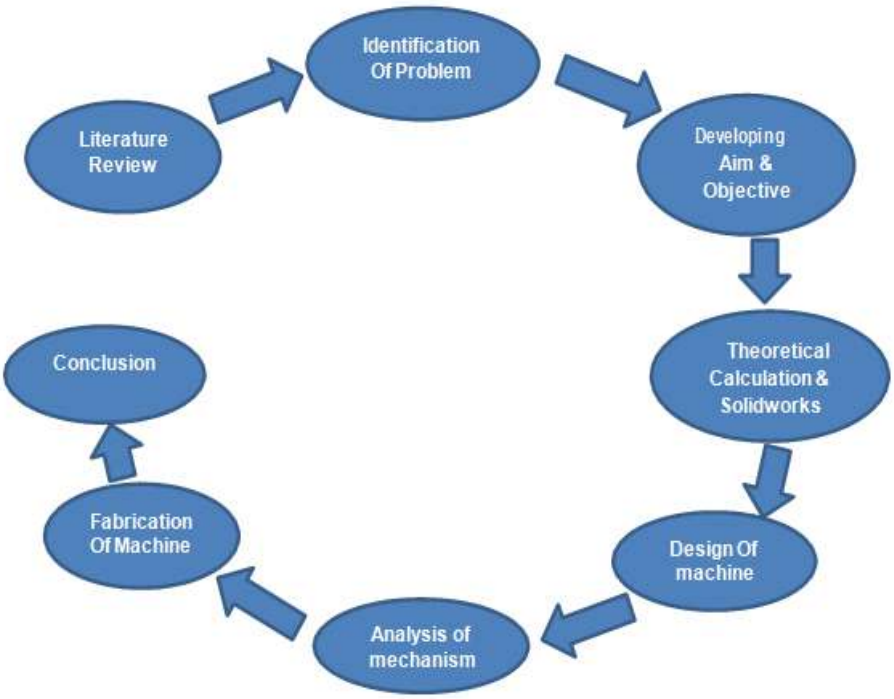
V. RESEARCH AND METHODOLOGY

Although designs vary, the method followed for Project is:



VI. Design of Equipment And Drawing Components

Fabrication of Forklift is consists of the Following components to full fill the requirements of Complete operation of themachine.

1. Ac Motor
2. Lifting Fork
3. Guide Column
4. Inner Column
5. Compound Pulley
6. Wire Rope
7. Bearings
8. Caster wheels
9. Limiter

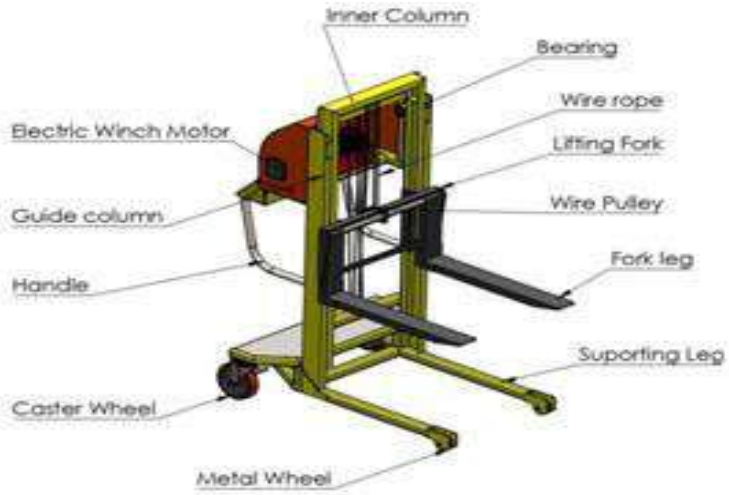


Fig: Electric Forklift

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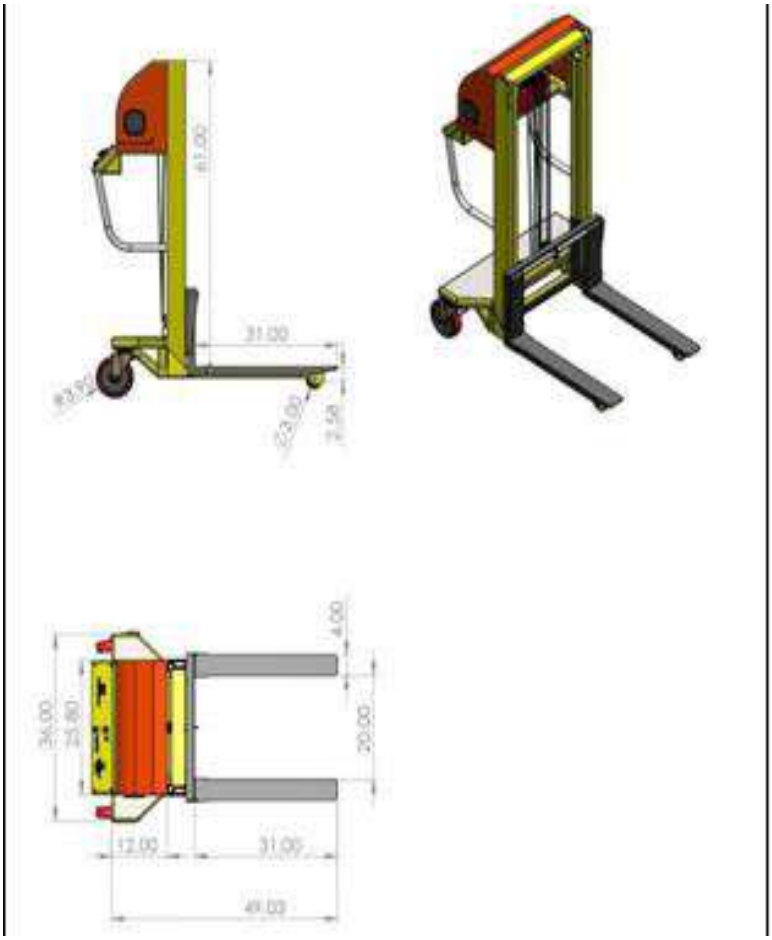

Fig: Solidworks Design

VII. WORKING PRINCIPLE

Forklift works on electrically powered hoist. The lifting mechanism consist of a compound pulley system combines a fixed pulley with a movable pulley (attached to the load). The mechanical advantage can be greater than with only fixed pulleys. Withfour wheels, the mass is supported by four strands of rope. This configuration gives a mechanical advantage of four, and it is possible to lift the load with one-quarter of the force of the load.

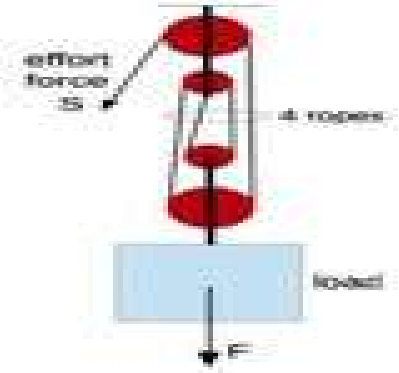

Fig: Compound pulley

Forklift can raise pallets over five ft and can raise them over 8 ft for placement on shelves. Unlike a pallet truck, simply use the control stick to effortlessly raise and lower heavy loads. Capacity of up to 1ton. Forks adjust from 9 to 28 inches, allowing them to accommodate different pallet sizes And a 180° steering arc and 58" turning radius makes them ideal for use in smaller warehouses and loading docks. The back wheels are 6 inch extra wide and provide extra stability to the load and keeps the operator safe and the emergency shut off switch provides additional safety by powering off the machine controls.

VIII. RESULT

Load test upto 600kg for 2.5 feet was done successfully. The tests main objective was to observe time delay for loading and unloading after the Appling of various loads. Below are the test readings for various loads.

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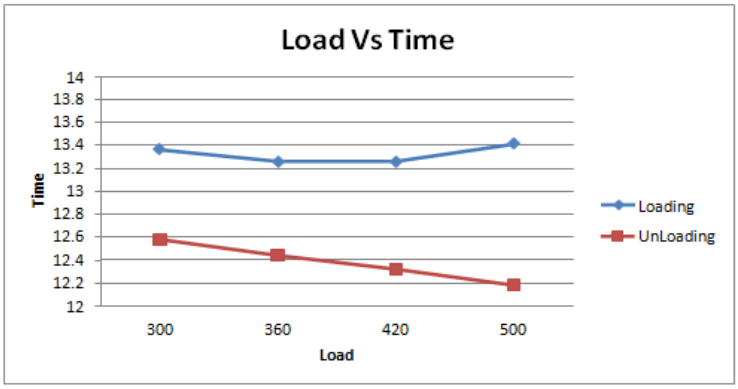
Table 1: Results

Load	Height	Loading Time (Sec)	Unloading Time(sec)
300	2.5	13.36	12.58
360	2.5	13.26	12.43
420	2.5	13.26	12.32
500	2.5	13.41	12.18



Graph 1: Load Vs Time

IX. CONCLUSION

The main boon of using the technology is to reduce the impact of fuel-based forklift also it lessons human efforts and their misconceptions. It's not only user friendly but also environment friendly. It is highly affordable at a lower cost. The project carried out by us made an impressing task in the field of production and manufacturing industries. this project will reduce thecost involved in the concern. Project has been designed to perform the entire requirement task at the shortest time available.

X. FUTURE SCOPE

This project can be further also modified as rechargeable Battery Operated Hoist instead of Ac Supply and automated driver system can be installed instead of manual handling. For the safety precaution we can add lock in mechanism in case electric hoist won't stop or rope breaks then lock in mechanism suddenly stop the forklift.

XI. REFRENCES

Dr.V.R.Gandhewar1, Kalyani R. Bhokare2, Chirag D. Pande3,Vaibhav G. Mali4, Ganesh V. Badaki5 Assistant Professor1, BE Student 2, 3, 4, 5 Department of Mechanical Jawaharlal Darda Institute of Engineering and Technology, Yavatmal, Maharashtra, India "Battery Operated Forklift Vehicle.'' (2018 IJESC Volume 8 Issue No.4)

Khebude Karan N*, (B.E, Dept. of Mechanical Engineering, Sanjeevan Engineering & Technology Institute, Panhala, MH, India'' Design and Analysis of Mechanical Forklift'' International Journal of Scientific Research and Engineering Development-– Volume 3 Issue 2, Mar-Apr 2020

Ugale Sachin,Salvi Tushar, Lanjekar Sachi, SKshirsagar Prashant , Mechanical Engineering Department, Final Year Students RMCET, Ambav, Ratnagiri,India." Design, Development and Modelling of Forklift'' International Journal of Engineering Research & Technology (IJERT ISSN: 2278-0181 Vol. 3 Issue 4, April – 2017)

P. Naveenkumar Asst. Professor, Department of Mechanical Engineering, Hindusthan Institute of Technology, Coimbatore.

N. Ashok, Dinesh Kumar, S. Mohamednizarudeen Ug Scholar , Department of Mechanical Engineering , Hindusthan Institute of Technology , Coimbatore. "Design and Analysis of Two Wheel Drive Forklift for Industrial Warehouses'' (IJERT ISSN: 2278-0181 ETEDM - 2018 Conference Proceedings IJERT)

Krunal R. Dhivar Lecturer Department of Mechanical Engineering L.I.T. Sarigam, Valsad, India "Construction of Battery Operated Forklift" (IJSTE - International Journal of Science Technology & Engineering | Volume 2 | Issue 4 | October 2015 ISSN (online): 2349-784X)

Prof. Suryavanshi Amol V Faculty of Department of Mechanical Engineering, PCCOE Savitribai Phule Pune University**.** "Design of Electric Forklift used in Small industrial Warehouses and Workshops" International Journal of Engineering Research & Technology (IJERT)

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REMOTE CONTROLLED ROVER USING ROCKER BOGIE MECHANISM

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ABSTRACT
The rocker-bogie suspension system has robust capabilities to deal with uneven terrain becauseof it's distributing the payload over its six wheels uniformly. Most of the cover designs have been developed for Mars and Moon surface in order to understand the geological history of thesoil and rocks. Exploration operations need high speed and long distance traversal in a short mission period due to environmental effects, climate and communication restrictions In this research, a new suspension mechanism has been designed and its kinematic analysis results were discussed. One of the major shortcomings of current Rocker-Bogie rovers is that they areslow. In our project, we have focused on six-wheeled rocker bogie suspension system design which has advantage of linear bogie motion in protecting the whole system from getting rollovers during high- speed operations. This has greatly increased the reliability of structure on rough terrains and also enables its higher speed exploration with same obstacle height capacity as twice the diameter of wheel. The project aims to improve some basic working so that it can perform in a better way.

I. INTRODUCTION
The rocker-bogie suspension system was initially used for the Mars Rover and is currently NASA's preferred design for rover wheel suspension. The perfectly designed wheel suspensionallows the vehicle to travel over very uneven or rough terrain and even proceed over obstacles.This rocker suspension is a type of mechanism that allows a six-wheel vehicle to constantly keep all six wheels in contact with a surface when driving on uneven terrain surfaces. The rocker bogie mechanism describes a method of driving a rover so that it can progressively stepover most obstacles rather than impacting and climbing over them. Most of the benefits of thismethod can be achieved without mechanical modification to the same designs – only a changein control structure. Some machine changes are suggested to gather the maximum profit and togreatly increase the effective speed of future rovers. The rocker bogie mechanism is one of themost popular suspension mechanisms, which was initially designed for space travel vehicles having its own deep history embedded in its development.

II. PROBLEM DEFINITION
The Rocker-Bogie Mobility System was designed to be used at slow speeds. It is capable of overcoming obstacles that are on the order of size of a wheel and also use for survilliance. However, when surmounting a sizeable obstacle, the vehicles motion effectively stops whilethe front wheel climbs the obstacle. The rocker-bogie suspension system has robust capabilities to deal with uneven terrain because of its distributing of the payload over its six wheels uniformly, while there is one major shortcoming to high- speed traversal over the planar terrain. Here we aim to overcome the above mentioned issues.

III. LITERATURE SURVEY
1) Para Bimal Saraiya "Design of Rocker Bogie Mechanism" The proposed modification increases in the stability margin and proved with valuable and profitable contrasting the SSFmetric with the 3D model simulations done on AUTOCAD. Study of the existing models of rocker bogie suspension enabled rovers and tried to manufacture a similar kind with the material available.

2) Roshan Sharma, Rajesh Jaiswal, Ankit Yadav, Subash Roy "Design and Fabrication of Rocker Bogie Mechanism Automated Combat Rover" The proposed paper presents a special design in seeking after of developing the rocker-bogie portability framework in customary overwhelming stacking vehicle conduct while high-pace traversal is required and to expand the battery effectiveness and working time of the Rover, which become made achievable theuse of the autonomous directional control machine which utilizes least power modules organized upon the working condition and circumstance.

3j Rajat Murambikar, Vinay Omase, Vivek Nayak, Karan Patil, Prof. Yogesh Mahulkar "Design and Fabrication of Rocker Bogie Mechanism using Solar Energy" Infused solar energy generation, sun tracking and design characteristics to create a modern, more updated and less sophisticated version of Rocker Bogie Rover. Tested its abilities and finally reviewed and updated calculations.

4) Abhisek Verma, Chandrajeet, Yadav, Bandana, Singh, Arpit, Gupta, Jaya, Mishra, Abhishek Saxena "Design of Rocker-Bogie Mechanism". The proposed paper produces a novel design in pursue of increasing the rocker-

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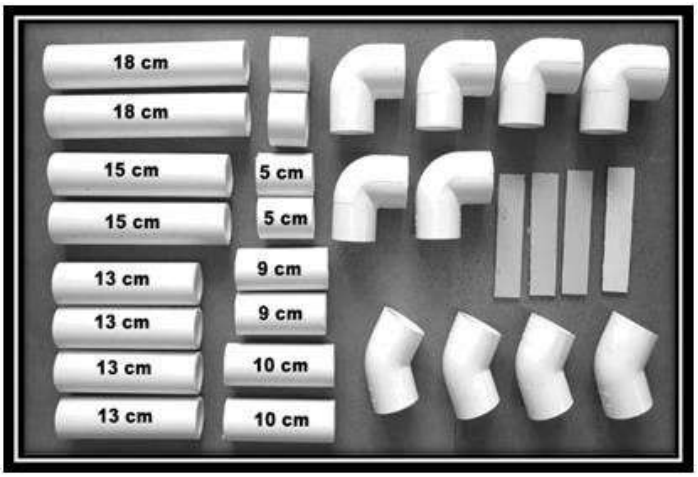
bogie mobility system in conventional heavy loading vehicle behaviour when high-speed traversal is required.The proposed modification increases in the stability margin and proved with valuable and profitable contrasting with the 3D model simulations done in SOLIDWORKS.

IV. COMPONENTS OF ROVER

A. PVC Pipe

PVC Pipe is shown in fig.1 This Pipehave adequate strength, durability, easy installation, and low cost formaking the body of rover.



B. Wheels

Wheels is shown in fig.2 This Wheelhaving Diameter 7 mm.

C. Motor

Motor is shown in fig.3. This is Geared DC Motor Having 100 RPM working on 12V Supply.

Fig.3

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D. ESP 32 Cam Board WithCamera module-.

ESP32 Cam Board Shown in Fig.4, Thisboard contain the ESP32 Cam module with it.

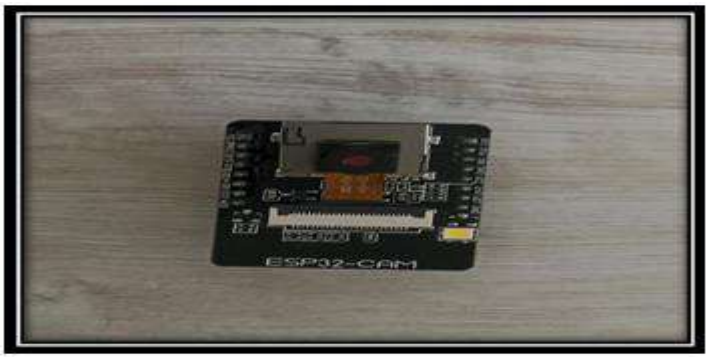

Fig. 2

E. AMS 1117

AMS 1117 shown in fig.5. this moduleuse to convert the 12V voltage into 5Vvoltage for camera.

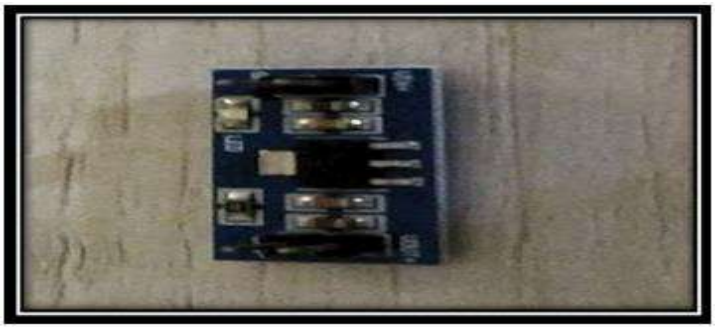

Fig. 3

F. Motor Driver

Motor Driver shown in fig.6, This is L293D Motor driver use to drive the six wheel motors of the rover.

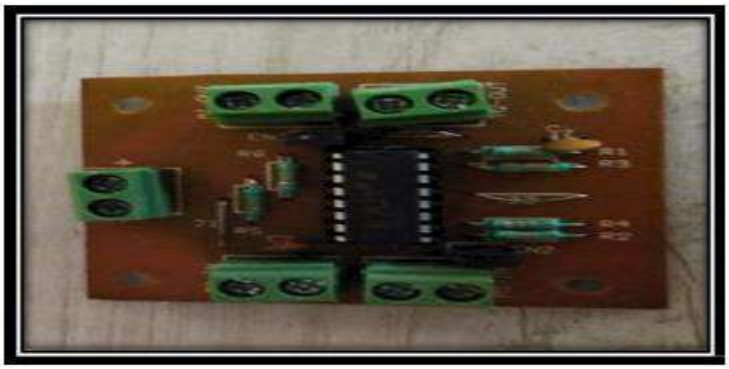

Fig. 4

G. Battery Pack

Battery is shown in Fig.7; This is l2Vvolt Rechargeable Battery Pack use forrover.

Fig. 5

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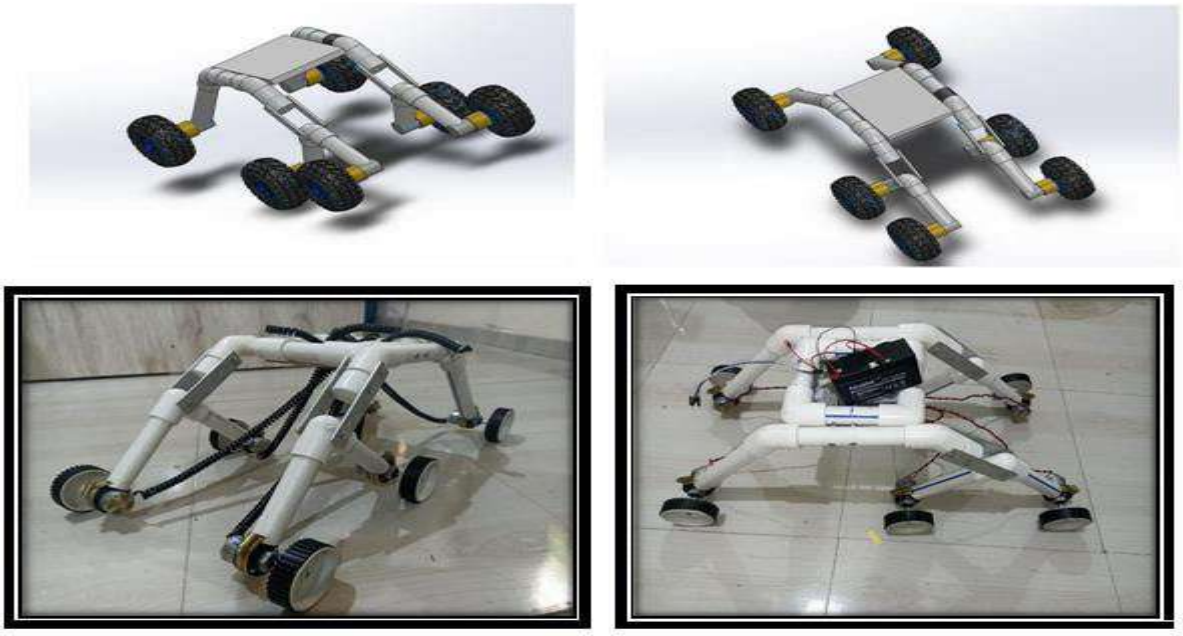
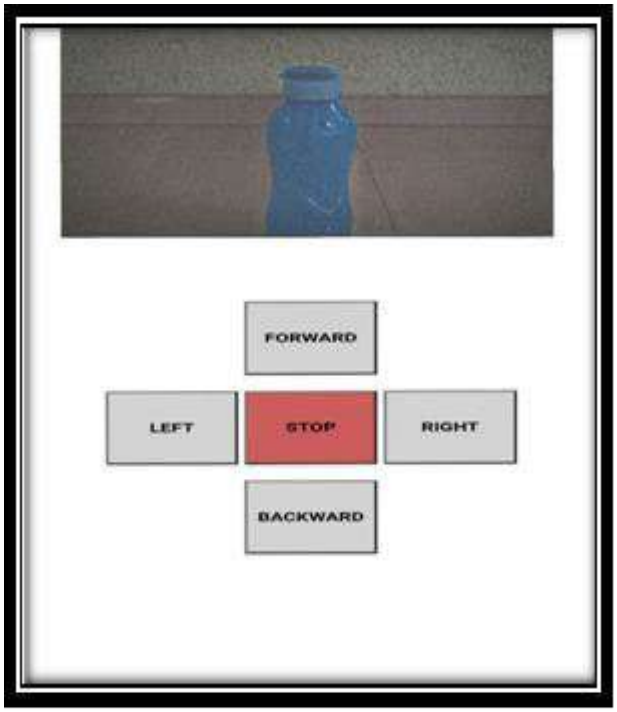
V. METHODOLOGY

1) The system uses ESP32 Cam Board as the microcontroller.
2) The main reason behind selecting this microcontroller is it has inbuilt Wi-Fi which makesit suitable for IoT remote control and monitoring applications.
3) It also has a camera slot and an ESP32 camera can be used on the rover.
4) The rover uses L293D Motor Driver for driving all the motors connected to the rover
5) Rocker Bogie type of suspension is used in the system so that the rover can be operated onoff roads or more specifically it can be operated on any type of land.
6) Blynk app is used for remote controlling of the robot as well as the camera video streaming from the robot can also be seen in the same app
7) Since the Rover are connected to an app hence the rover can be controlled from app easilyin less time and high efficiency.

VI. Design of Rover





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VII. RESULT

Testing the distance of controlling the rover through ESPCAM32 Cam Board is done 6 timesby controlling the rover at a certain distance, whether ESPCAM32 Cam Board can accept thecommand or not. The test results can be seen in Table 1

Testing Rover Connection

No.	Testing	Distance	Status	Visuals
1.	Testing 1	1m – 3m	Connected	Clear
2.	Testing 2	4m – 6m	Connected	Clear
3.	Testing 3	7m – 9m	Connected	Clear
4.	Testing 4	10m – 12m	Connected	Clear
5.	Testing 5	13m – 15m	Connected	Clear
6.	Testing 6	Above 15m	Disconnected	Distort (Disconnect)

The test results in Table 1 can be concluded that the control distance from the surveillance rover can only be controlled with a maximum distance of 15 meters, if the control is carried out at a distance of more than 15 meters, the monitoring robot cannot run because the connection between the android smartphone and ESP32Cam Board has been lost. ESP32CamBoard testing is the basis for controlling rover. If the ESP32Cam Board has been successfullyused, the next step is testing the IP camera on Rover.

Testing ESP32 Cam Connection

No.	Command	Successful	Failed	Percentage of Success
1.	Rover Connection	9	1	90%
2.	Cam Connection	10	0	100%
3.	Move Forward	10	0	100%
4.	Move Backward	10	0	100%
5.	Turn Left	10	0	100%
6.	Turn Right	10	0	100%
7.	Stop	10	0	100%

Overall testing of the system is carried out 10 times per instruction on Rover to ensure that rover can function as it should. The rover is used to perform all of its functions in accordancewith the commands on the web browser that is packed on android app. Table 2 shows the results of overall system testing conducted by rover.

VIII. Technical Detail of Rover

1) Total Length of Rover = 540 mm
2) Total Width of Rover = 330 mm
3) Total height of Rover = 210 mm Weight of Rover = 2.09 kg

IX. FUTURE SCOPE

1) This system can be configured to work on protocol other than Wi-fi.
2) Other Mechanism for application Can be added in the system

a) SPY Operation

b) Rescue Operation

c) Surveillance Operation

3) Sensors can be incorporated in order to monitor an area under observation.

X. CONCLUSION

The proposed paper produces a novel design in pursue of increasing the rocker-bogie mobilitysystem in conventional heavy loading vehicle behavior when high-speed traversal is required.The proposed modification increases in the stability margin and proved with valuable and profitable contrasting with the 3D model simulations done in SOLIDWORKS. In future, if thesystem installed in heavy vehicles and conventional off road vehicles, it will definitelydecreases the complexity as well as power requirements to retain bumping within it Future scopes of Rocker Bogie Mechanism are in military operations as a weapon carrier & for locating coal deposits in coal mines.

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REFERENCES

[1] Para Bimal Saraiya, "Design of Rocker Bogie Mechanism", International ResearchJournal of Engineering and Technology (IRJET) 2020.

[2] Roshan Sharma, Rajesh Jaiswal, Ankit Yadav, Subash Roy, "Design and Fabrication of Rocker Bogie Mechanism Automated Combat Rover", International Journal for Research inApplied Science & Engineering Technology (IJRASET) 2020.

[3] Rajat Murambikar, Vinay Omase, Vivek Nayak, Karan Patil, Prof. Yogesh Mahulkar, "Design and Fabrication of Rocker Bogie Mechanism using Solar Energy", International Research Journal of Engineering and Technology (IRJET) 2019.

[4] Abhisek Verma, Chandrajeet Yadav, Bandana Singh, Arpit Gupta, Jaya Mishra, AbhishekSaxena, "Design of Rocker-Bogie Mechanism", International Journal of Innovative Science and Research Technology 2017.

[5] Chotten. J. E., 1992, “Simulation of a Six-Wheeled Martian Rover Called the Rocker-

[6] Bogie”, M.S. Thesis, The Ohio State University, Columbus, Ohio

[7] D. S. Chinchkar, Letal (January 2017). ”Design of Rocker Bogie Mechanism”, International Advanced Research Journal in Science, Engineering and Technology

[8] Chinchkar DS, Gajghate SS, Panchal RN, Editors. 2017. Design Of Rocker BogieMechanism. IARJSET. AGTI’s.

[9] Dedy Ashardi. 2015. Design and Build Room Monitoring Applications Through IPCameras Using the Android

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DESIGN AND FABRICATION OF DYNAMIC WHEELCHAIR

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ABSTRACT
The research proposes a solution to implement the purpose of this project was to manufacture the multipurpose wheelchair in low cost which promote mobility and enhance the quality of life for the people who have difficulties in walking. This product make the users to lift the patient directly from the bed which help to reduce the pressure injuries. Along with the reducing the cost of product, we also aim to minimizing the pressure injuries and fall. Other specialty of the multipurpose wheelchair is, we can use it on indoor as well outdoor. Then after the completion of project we have successfully achieved what we set out to bring in wheelchair. We made a better multipurpose wheel chair with all safety measures, low cost and high quality. It provide a safe transferring of patients from one place to another place. The procedure that is used for transferring patients is very simple and unique

Keywords: Patient, Wheelchair, Multipurpose wheelchair, Smart Wheel chair

I. INTRODUCTION
A wheelchair is a chair with wheels, used when walking is difficult or impossible due to illness, injury, problems related to old age, or disability. These can include spinal cord injuries (paraplegia, hemiplegia, and quadriplegia), cerebral palsy, brain injury, osteogenesis imperfecta, motor neurone disease, multiple sclerosis, muscular dystrophy, spina bifida, and more.

Wheelchairs come in a wide variety of formats to meet the specific needs of their users. They may include specialized seating adaptions, individualized controls, and may be specific to particular activities, as seen with sports wheelchairs and beach wheelchairs. The most widely recognized distinction is between motorized wheelchairs, where propulsion is provided by batteries and electric motors, and manual wheelchairs, where the propulsive force is provided either by the wheelchair user/occupant pushing the wheelchair by hand ("self-propelled"), by an attendant pushing from the rear using the handle(s), or by an attendant pushing from the side use a handle attachment.A wheelchair assists people to become more mobile and independent. There are many different types of wheelchairs that are used for various reasons. It is important to understand the limitations and safe operation of whatever wheelchair you choose.

A wheelchair is the catalyst to increased independence and social integration, but it is not an end in itself. Studies have shown that assistive technologies including wheelchairs, when appropriate to the user and the user's environment, have a significant impact on the level of participation which people with disabilities are able to achieve and when provided through a supportive service have been reported to reduce the time and physical burden for caregivers. The use of mobility devices, in particular, creates opportunities for education and work, and contributes to improved health and quality of life but may also have an impact on the prevention of falls, injuries, further impairments and premature death. Investment in provision of mobility devices can reduce health-care costs and economic vulnerability, and increase productivity and quality of life.

II. LITERATURE SURVEY
Akhil C, Muhammed Irfan Et.Al. (2021). Even if there is highly advanced equipments, it is highly expensive beyond common patients can't afford. So we have come up electrical and manual wheelchair available in the international market. The wheelchair will make shifting of patients to a far better way. [1]

R.Hari Krishnan Et.Al. (2019) . The study was Based on the conceptual design, a manual and a powered self-transfer device have been developed that can be used as an attachment to a manual and powered wheelchair respectively. [2]

Kedar Sukerkar, Darshitkumar Suratwala, Et.Al. (2018). There are several issues faced by the manufacturers and researchers which needs to be addressed so that, smart wheelchair becomes a commercial success and be widely used. Smart wheelchairs have great scope in future and technological advancement in the field of robotics and sensors will lead to commercial success as well. [3]

Ninad M. Borkar, Saurabh A. Apte, et.al. (2016). The study was intended to develop a concept of wheelchair convertible stretcher with the motivation of saving space and prevent exertion of patient as well as by making sure that the patient does not get hurt. Our study shows that it is possible to save 50% space by using wheelchair convertible stretcher rather than using wheelchair and stretcher separately. [4]

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III. METHODOLOGY

Wheelchair is a device which can empower and enable a person with a disability to live a normal and independent life.Over the years wheelchairs have evolved rapidly from the manual wheelchairs to the powered wheelchairs.But still these wheelchairs have not been able to satisfy the needs of the disabled people.It is therefore critical that the problems of disabled be understood and accordingly wheelchairs are developed fulfilling their needs. Designing of Dynamic wheelchair This design phase included brainstorming, concept sketches and computer models. By categorizing and investigating different mechanisms used for height adjustment and patient transfer, a design matrix was created.Design concepts were selected based on the design matrix.

Height Adjustment Mechanism

The lifting system is comprised of three primary components. The most important part is the "lifting force", which provides the main strength in height adjustment. Two kinds of lifting mechanisms were investigated in this research, the scissor jack and Screw jack. But use of scissor jack couldn't fulfil the requirement so Screw jack was selected.The second primary component is the operation interface. Different control methods were considered for the different lifting methods and the third component is a stability for safety.

Transfer Mechanism

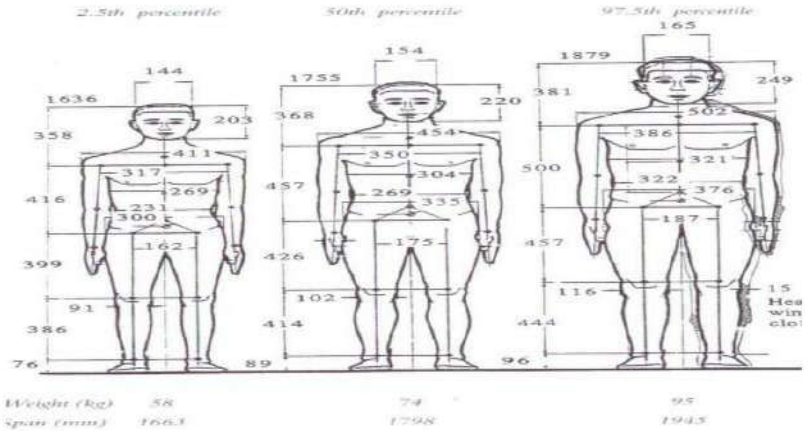
A simple mechanism is used it seems to be a normal wheelchair, but seat and the backrest are divided in two parts from centre as shown in fig. The forearm rest is pivoted at vertical member consisting of height adjustable mechanism, providing 90° of movement by each part.ts unique design helps patient to do their daily routine work like bathing, washroom etc.

Patient Transferring

Patient resting on bed need to mobilise with care without pressure injuries and also with less effort application by care taker. Here comes Dynamic Wheelchair, patient is made to be seated on bed then wheelchair is placed next to bed as its secondary wheels rolls beneath the and seat on the bed with opened in opposite direction creating angle of 180° Then patient is slightly lifted and both seat are pushed under the patient and are locked provided on the back of wheelchair with a safety belt. The patient is successfully transferred from bed to wheelchair without any trouble also with less effort applied by care taker. And patient is ready to mobilise.

Study of Ergonomics

Ergonomics is about ensuring a good fit between people, the things they do, the objects they use and the environments in which they work, travel and play. Human factors (or human factors engineering) are an alternative term for ergonomics. Ergonomics needs to be considered in the design of any product, system or environment. Failure to do so may lead to designs which do not fit the physical, psychological or sociological needs of the users, leading to ineffective, inefficient or unsafe designs, which are unlikely to be commercially successful.The human sciences of psychology, anatomy and physiology provide information about the abilities and limitations of people, and the wide differences that exist between individuals. People vary in many ways: body size and shape, strength, mobility, sensory acuity, cognition, experience, training, culture, emotions, etc. Ergonomics are trained in analytical techniques, which will consider user characteristics and individual differences to the full extent in the design process. Good designers shall consider the people who will use the products, systems and environments they design, but they also have many other factors to consider. Often, it was due to commercial or percentile of population meanthat ergonomics principles are compromised or not given adequate priority. Figures (a) to (d) are the body dimensions to different percentile for men and women. (Dreyfuss, 1967).



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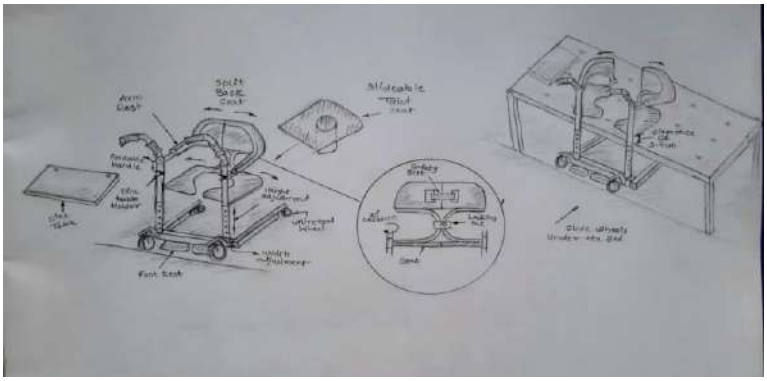
Ergonomic Evaluation Male (A)

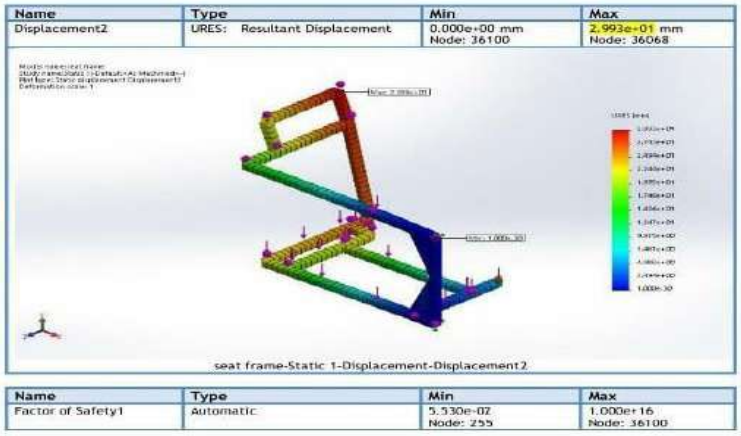


Conceptual Drawing

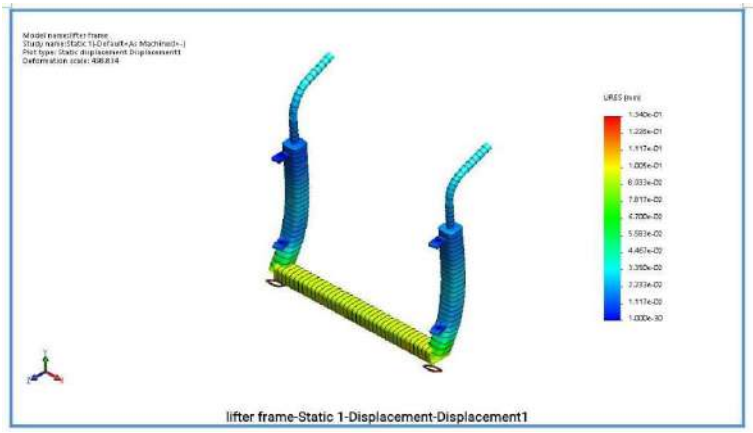
Design Software -Solid Works

Wheelchair with Overhanging Mechanism

Stress Strain Analysis software -Solid Works Simulation



Seat Frame Analysis



Lifter Frame Analysis

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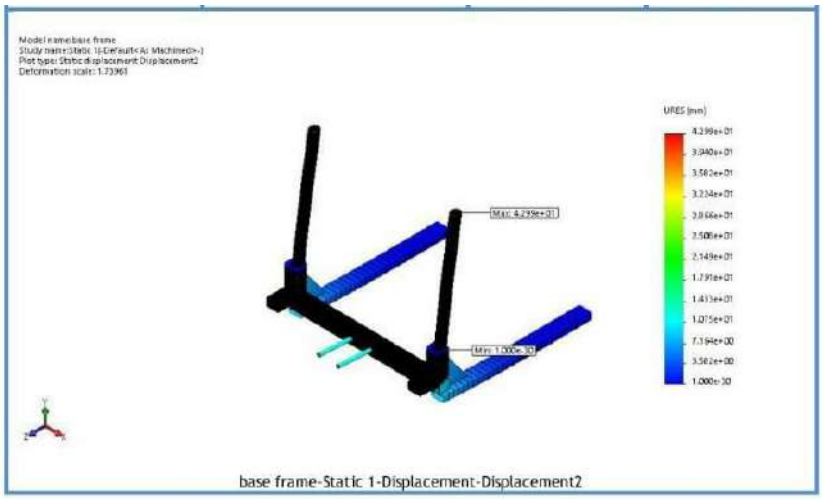
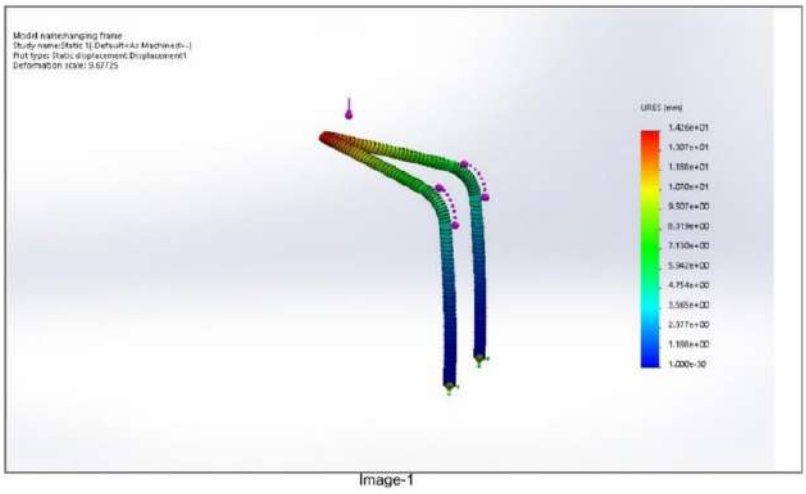


Base frame Analysis



Overhanging Frame Analysis

IV. RESULT & OBSERVATION

From this project, we designed and fabricated a dynamic wheelchair for the shifting of patients from bed with an affordable amount that will be more suitable in the Indian scenario. Analysis were done on wheelchair through both theoretically and practically.The theoretical analysis as done on Solidworks simulation .Maximum principal stress and maximum shear stress were obtained from Analysis report .The maximum stress was found to be 5.022e+08 N/m^2 and minimum of 0.000 N/m^2 .The factor of safety was obtained as 1 .According to maximum strain analysis it was found that a maximum strain of 6.425e-03 and minimum of 0.000.When the deformation was analyzed a distance of 4.299 mm displacement were found. During practical analysis 110 kg weight were loaded and lifted by Dynamic wheelchair. The cost of multipurpose wheelchair is 9000, it is very low camparing to the electrical and manual wheelchair available in the international market

Sr. No.	Parameters	Standard Manual wheelchair	Our Dynamic Wheelchair
1	Weight Capacity (kg)	Up to 100	Up to 130
2	Total Weight of Wheelchair	18	20.5
2	Length (cm)	76	60
3	Width (cm)	80	74
4	Seat Width (cm)	45	48
5	Height (cm)	76	75
6	Height With Overhanging Mechanism (cm)	No	171
7	Transferring Mechanism	No	Yes
8	Lifting Mechanism	No	Yes
9	Height Adjustment mechanism	No	Yes

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10	Commode activity	Yes	Yes
11	Flexibility	Foldable	Detachable & Semi Rigid
12	Costing (Rs)	9990	9000

V. CONCLUSION

Caregiver shall be ensuring that the safety precaution is implement before or during transferring the disabled person from wheelchair to bed or vice versa. It is very dangerous to transfer disabled person without implement the safety precaution, as the accident may be occur. In the worse scenario, disabled people may fall down from the bed or wheelchair. Applied safety lock and canvas, it will be reduce the hazard to minimize level. From time to time, the caregiver shall perform self-inspection.

Our designed wheelchair can reduce handling process if compared to conventional wheelchair. Directly, it can be minimize the pain generate on the under arm due to improper handling by caregiver. At same time, it makes the job much easier for caregiver. He or she might not complaint about their back problem. This will be made the caregiver job more attractive and easy. As the population of elderly increase fast, this will be definitely increasing the caregiver demand.Though our project is less expensive, it does not compromise with the service provided by the conventional equipment. This equipment can be easily portable and can be used in the hospitals, old age homes as well as in houses. With the aid of my designed wheelchair, these shall be no problem of hardly to find people to serve this professional job. In short, the objectives for this research project are meet.

VI. FUTURE SCOPE

The Dynamic wheelchair must be available and affordable and be maintainable and sustainable in the country of use. This is not always easy, because wheelchair users are a diverse group with different requirements and environmental and socioeconomic. Stainless steel or Aluminium Material for making wheelchair can used for overall reductionin weight of chair. Screw nut mechanism or worm and worm wheel mechanism with screw nut mechanism can be used to raised the height of the wheelchair. But maintenance will berequired on the regular basis as there will be more moving parts will be included. Portable

Commode bowls can be provided for rural areas where commode are not preferred. Electric operating overhanging system can be used for lifting the patient, but periodically charging would be required for batteries.

VII. REFERENCES

[1] Akhil C, Muhammed Irfan, Muhammed Shabeeb, Rabeeh Rahman M,Mohammed Sameel.Design and Manufacturing of Multipurpose Wheel chair.(2021)

[2] R.Hari Krishnan and S. Pugazhenthi,Concept Development and Design of Self-Transfer Devices for Wheelchair Users.(2019)

[3] Kedar Sukerkar, Darshitkumar Suratwala, Anil Saravade, Jairaj Patil, Rovina D'britto,Smart Wheelchair.(2018)

[4] Ali Ebrahimil, Alireza Kazemi, Azin Ebrahimi, Wheelchair Design Its Influence on Physical Activity And Quality of Life Among Disabled Individuals. (2016)

[5] Ninad M. Borkar, Saurabh A. Apte, Tejas N. Deshmukh and Sampada M. Apte,Mechanically Operated Wheelchair Convertable Stretcher. (2016)

[6] Yoshikazu Mori, Norikatsu Sakai, Kaoru Katsumura.Development of a Wheelchair with a Lifting Function. (2012)

[7] Yiran Li, Height Adjustable Wheelchair Seat Design. (2011)

[8] Toshiharu Mukai∗, Shinya Hirano∗, Hiromichi Nakashima∗, Yuki Sakaida∗, and Shijie Guo∗ Realization and Safety Measures of Patient Transfer by Nursing-Care Assistant Robot RIBA with Tactile Sensors.(2011)

[9] Hasanat Alamgir, Olivia Wei Li, Shicheng Yu, Erin Gorman, Catherine Fast, Catherine Kidd. Evaluation of ceiling lifts: Transfer time, patient comfort and staff perceptions, June (2009)

[10] TEO CHIN TENG,Lifting Mechanism of Wheelchair . (2005)

[11] Production Engineering------P. C. SHARMA

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DESIGN AND FABRICATION OF COMPOSTMACHINE

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ABSTRACT
Organic waste and Food waste is a worldwide problem, is cost to be disposed and nothing is gained from it on the contrary, it causes the fission of harmful gas such as methane. Vegetable waste with high moisture content and readily biodegradable nature is causing major environmental problems due to improper waste management practices The Design and Fabrication of Compost Machine in India. So, composting could be considered the best alternative for the treatment of these organic fractions. Composting has proven to be a valid solution to this problem. The objectives of this project are to design a composting machine with certain parameters for the design, Process time, and easy, odourless and power saving. The designed food waste decomposition system is designed for rapid composting performance. It can be used for households, restaurants, hotels, schools, apartment buildings, communities, offices and cafeterias depending on the capacity of the machine. The system ploys high temperature, microorganisms to decompose food waste and organic matter. The prototype was able to decompose organic waste in a time frame of 38 to 50 hours with minimum harmful gases emissions and odours.

Keywords: Vegetable waste, decomposition, recycling process, solid waste management.

I. INTRODUCTION
The designed machine is a fully automatic and highly compact composting machine, which uses special microorganisms to break down and decompose all kinds of organic waste into compost within 24 hours with a volume reduction of 85- 90There also lies an issue in transporting the wastes to the recycling plants, wherein a huge amount of effort, time and money needs to be put in fortransporting the wastes which are clustered and are not in uniform shape or size. The waste materials need to be made into a uniform shape for easy and effective transportation. This paper aims in producing a mechanical crusher which would be a helping hand for waste management. The machine has U-shaped composting tank, with a crusher, heater, mixing blades. These materialsif carried just like that would occupy more space and would require huge containers and transportation cost becomes an issue. These materials need to be arranged properly to increase the carrying capacity of the vehicle and as the organic waste being an indefinite shape needs to me made into uniform shape and size for easy decomposed. This is where the mechanical crusher comes into play. The crusher would crush the organic waste thus reducing the gap between them and make them to uniform size and shape so that the materials can be baled up according to the size of the crushing bin. The uniform size and shape of the materials can be obtained by providing a bin onto which the material is to be crushed. The crusher is designed to operate by both mechanical and electrical means. This crusher is designed in such a way that it is simple to construct and would require minimum effort for operating in both mechanical and electrical types of operation.

II. LITERATURE REVIEW

[1] Vivien Arief Wardhany et.al (2019)
Has studied in their paper named "Smart Chopper and Monitering System for Composting Garbage" concluded the results of research and testing that have been carried out, it can be concluded, by combining the technology, we can reduce the garbage pollution by utilize the chopper machine and monitored them. The garbage also can provide the benefit by recycling it into the compost, so it will help the environment by giving the supplement to the soil.

[2] Mansi Pare et.al (2019)
Has studied in their paper named "Design of Organic Compost Machine "concluded the designed machine is a fully automatic and highly compact composting machine, which uses special microorganisms to break down and decompose all kinds of organic waste into compost within 24 hrs with a volume reduction of 85-90%. The entire process is natural and biological. The outcome of this report is the basic knowledge of working of heavy-duty machines and the criteria behind their working in a brief manner**.**

[3] Mustafa Elalami et.al (2019)
Has studied in their paper named "Design and Test of the Smart Composter Controlled By SENSORS "concluded the design and the realization of a new composter destined to convert the residues food and all type of organic wastes in situ (to eliminate transport charges) to obtain a mature compost with high quality in 4 weeks.

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This system is based on the interndesign and automated and optimized control of all operating parameters. This solution will reduce up to 80% of waste produced per day.

III. PROBLEM STATEMENT

Now a day's most of the farmers are using chemical fertilizers for their crops. Due to this the productivity of crops as well as the fertility of soil is decreasing day by day. Also, the prices of these chemical fertilizers are more to farmers. Thus, it brings to our knowledge that the traditional methods are not sufficient and satisfactory for agriculture. Due to these, some major problems are identified & to over-come these problems some idea or concepts are developed and adopted.

Following are the Problems

- There is no more scope for organic farming which is required.
- The machines available for preparing organic fertilizers are costly which farmers cannot afford to buy.
- Available machines are operating at high power consumption which indirectly increases the cost.
- **Available Machines are Very Bulky.**

The aim is to design & develop a low-cost fertilizer preparing machine which will help farmers to fertilize their land by their self- prepared organic fertilizer i.e., compost instead of buying costly and harmful chemical fertilizers which decrease the nutritive value of soil. We are going to design and fabricate such a machine that will eliminate most of the problems of farmers such as high cost of machine, more floor space requirement, high power consumption, requirement of electricity which is not possible in rural areas. So, the machine will be designed & developed to reduce the human effort by introducing proper gearing mechanism, to make use without electricity manually thereby helping to earn more profit to farmers.

IV. DESIGN METHODOLOGY

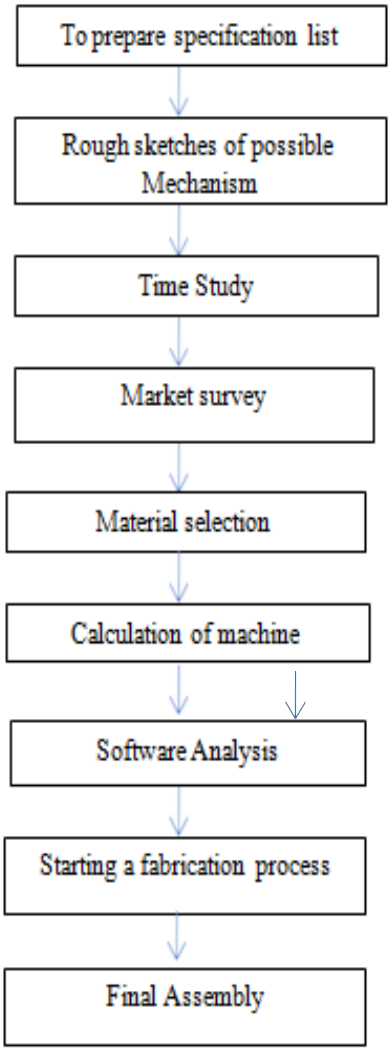

Fig 1: Methodology of Composting Machine.

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COMPONENTS FOR COMPOSTING MACHINE

1) Single Phase Induction Motor

Fig 2: Single Phase Induction Motor

Single Phase Induction Motor is shown in Fig 2. The speed of this motor is 1440rpm with 0.5 Horse Power (HP) work on 230 ACvolt supply.

2) Feed Grinder

Fig 3: Feed Grinder

3) Mixing Blade

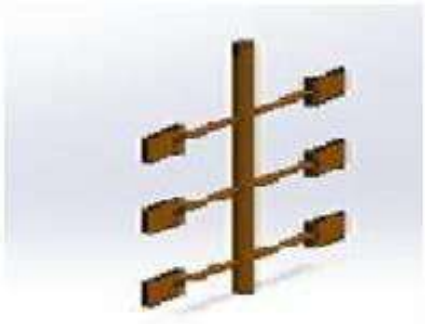

Fig 4: Mixing Blade

It is used to mix the waste properly in the tank. There is 4 mixing blade whose size is 5x2.5 (Inch)

4) Heater

Fig 5: Mica Flat Heater

Flat strip heaters of mica, also called flat mica heaters used for heating waste product after it gets mixed properly to form a finalproduct i.e. Fertilizer. This Heater is of 500watt.

V. Design and Calculation

SYSTEM DESIGN**: a. Motor Design**

Voltage = 230 AC/V, Current = 1.6 Amp, Speed = N = 1440 RPM, 0.5HP= 373WATT Allowable Shear Stress of Shaft Is 100Mpa

τ=100Mpa

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b. Belt and Pulley

A Section Type of Belt is Used (A-48)B Type Pulley

10inch Pulley for Crasher3inch Pulley for Motor

c. Hopper

Upper Diameter = 139.7mmMid Diameter = 101.6mm Lower Diameter = 30mm

d. Tank

Tank Size = 13inch (diameter)Height (depth) = 12.5inch Volume of Tank (V) =πr^2h V=1534inch

Capacity= 25litre

e. Frame

Frame Size = 27x28inchHeight = 35inch

f. Heater

500W Mica Flat Heater Maximum Temperature = 300℃

Following figures shows the designed machine in SOLIDWORKS.

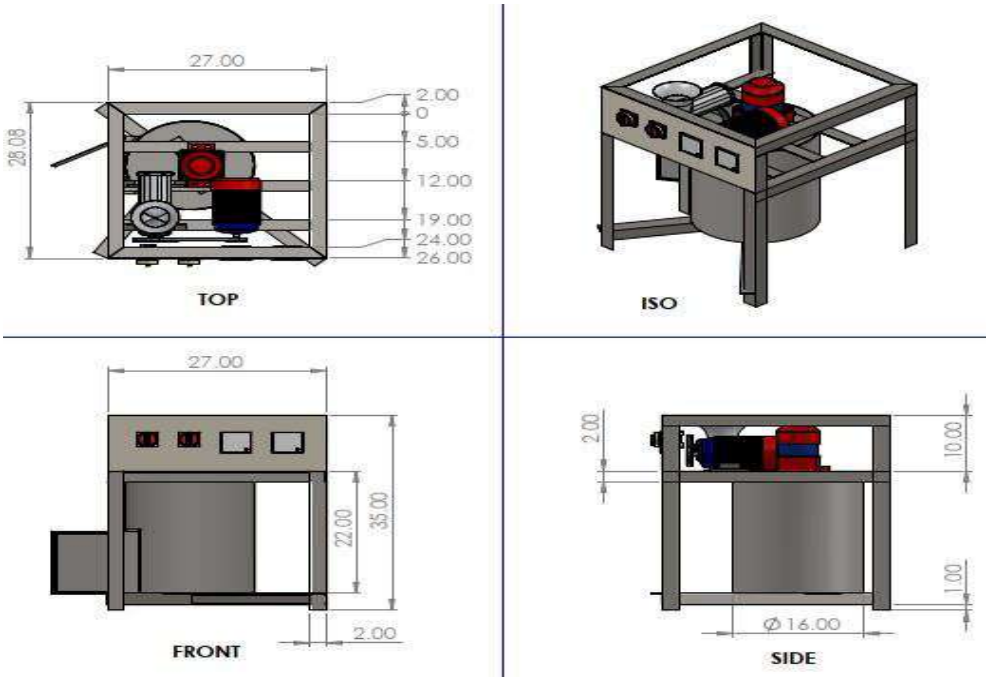

Fig 6: Assembly of Composting Machine

Fig.7: 3D view of compost machine designed in SOLIDWORKS

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VI. RESULT

- Organic wastes will compost fast best if the pieces were small.
- Soft tissue wastes such as orange don't need to be very small because it will decompose fast.
- The turning blades are playing the big role in the composting process because it prevents the waste from overheating atsome point inside the tank.
- After the process is completed, all weeds and weed seeds are killed, even insects, that is done by rising the temperature.
- The use of wood chips has increased the reduction in odors.
- To have the composting process as effective as possible, the input wasteshould have an approximate carbon to nitrogenratio of 30 to1.
- The process will work best if the moisture level of the input waste is about 50 percent. It is not also easy to measure.

Input	Time	Output
500 gm	1 Day	257 gm
1 kg	1 Day 2 Hours	500 gm
3 kg	1 Day 6 Hours	2.5 kg

VII. CONCLUSION

Proper evaluation of the design is performed and created something even better. Finally, we conclude that fertilizer preparing machine is better option to use by the farmer as its cost is low as compared to other machines. The machine is designed taking into consideration the various demands of farmers & other customers. Since this machine is made for small businessman or for farmers, therefore the work carried out by this machine is less. The capital required for purchasing the bigger size fertilizer preparing machine is very high & also the substitute way of using chemical fertilizers is also very costly. And also, we Study the different factors within the composting process &the effect of bacteria on the composting process.

VIII. REFERENCES

[1] Vivien Arief Wardhany, Alfin Hidayat, Muhammad Doni Sururin A., Subono, Akhmad Afandi, "Smart Chopper And Monitoring System for Composting Garbage," in International Research Journal of EngineeringandTechnology (IRJET)Published on 2019.

[2] Mansi pare, Mohd.Aman, "Design of Organic Compost Machine," in International Research Journal of Engineering andTechnology (IRJET) Published on 2019.

[3] Mustafa Elalami & Moha Arouch, "Design and Test of the Smart Composer Controlled by Sensors," in InternationalResearch Journal of Engineering and Technology (IRJET) Published on 2019.

[4] Katiyar, Abhay, et al. "Design and Construction of a Shredding Machine for Recycling and Management of OrganicWaste." (2019).

[5] Emmanuel Adeleke Fagbemi, AgbolahanOkeeseni, Baldwin Omonigho et al. "Forms and design analysis of mechanicalShafts used in agricultural machineries," 2014.

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DESIGN OF SAND BLASTING MACHINE

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ABSTRACT
When a metal is exposed to atmosphere, it gets corroded by atmospheric air. To overcome this sand blasting process are used. When machining leaves the sharp burrs or edges on an object, sandblasting can smooth it until it is safe to handle. Sand blasting is a method used to clean, polish or strengthen metal with the help of abrasive material. Sand blasting is used in almost every industry that uses metal, including aerospace, automotive, construction, shipbuilding, rail, and many others. Sand blasting machines uses abrasive material like steel grit, glass bead, sand etc. The blast media is pneumatically accelerated by compressed air and projected by nozzles onto the component to roughen a smooth surface, shape a surface or remove surface contaminants. For the application of sand blasting process on a big component, which may require secondary surface treatment, which is carried out in a confined space, so many times we have to shift jobs to confined room. Due to this material handling cost increases. To avoid this, there is need of design of portable type of sand blasting machine.

Keywords: Sand Blasting, Abrasive Material, Surface Treatment Process, Material Handling Cost, Portable.

I. INTRODUCTION
Sand Blasting is a surface treatment process using high velocity steel abrasive. Sand blasting is used to obtain excellent cleaning and surface preparation for secondary finishing operations.

- The cleaning of iron, steel, non-cast parts, forgings, etc.
- Mechanical cleaning of sheets, rods, coils, wire, etc.
- Shot peening to alter mechanical properties (increasing resistance to fatigue for springs, gears, etc.)

Sandblasting is also known as abrasive blasting. Basically, it is the process of bombarding a stream of abrasive material to the surface which we want to clean. The sandblasting operation is done with high pressure to smooth a rough surface. There are several types of sandblasting process like Soda blasting, Shot blasting and Bead blasting. Sandblasting is an extremely useful procedure in a welding applications and industries for removing excess weldments as well as for cleaning the surface. Whether a material needs to be cleaned, deburred, prepped for powder-coating, de-rusted, shot-peened or otherwise just have its paint removed, sandblasting is the process for the job. These machines are mainly useful in the auto industry, in ship and rail yards and in a range of industrial applications. Certain degrees of skill and safety training are required to use the sandblaster as abrasive material may cause some injuries. The sand blasting machine which was used in the industry are big in size and cannot be mobile so our main objective of our project is to make the machine mobile and less space occupying machine with reduction in weight, also reducing the cost of machine to make it budget friendly for small scale industries too.

II. LITERATURE REVIEW
Rupesh Narkhede Et.Al. (2019) [1], The study shows that the portable sand blasting machine is very economical & useful for heavy fabrication company. Big size products require sand blasting process before painting. The sand blasting machine are generally immovable and used in confined space, so every time we need to shift such big products in confined space of blasting after welding small components, this increases the material handling cost. After using portable sand blasting machine, we can do blasting on small components which we welded after first blasting process; this can be done on same location where we can manufacture, therefore we do not need to shift same again to confined space of blasting room. In this way we can save handling time as well as handling cost also. It helps to reduce human fatigue by considering handling process.

D Dudek Et.Al. (2018) [2], The study shows that the surface roughness after the abrasive blasting process is undetermined that is random. As a result of the treatment with low granulation grains, an even distribution of roughness on the work surface is obtained. The using larger sizes of abrasive grains may affect smoothness of surface. The surface after blasting is more susceptible to corrosion, hence the abrasive slurry should contain corrosion inhibitors.

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Chuanli Yu Et.Al. (2022) [3], The study shows that under ultrasonic fatigue test, the effect of sand blasting and hot isostatic pressing (HIP) on VHCF performance on IN718 fabricated by selective laser melting (SLM), X Ray Computed tomography (CT) and 3D optical profiler are used to characterize the defects, including size and location

Meike Stiesch1 Et.Al (2020) [4], The study shows that the within the limitations of this study, it was shown that the residual stress correlates with the mean surface roughness Rz after sandblasting. The highest residual stress and surface roughness was found after sandblasting perpendicular to the surface. Among the parameters blasting angle, the blasting pressure showed the greatest effect on surface roughness and residual stress with the parameter range tested in this work. Further research is needed to evaluate the effect of these different surface treatment regimens on the adhesive bond strength after veneering with feldspar ceramic.

Kubilay Barutcigil DDS Et.Al (2015) [5], The study shows that Surface treatments of hybrid ceramic resin blocks could enhance the bond strength to resin cement; however, using Single Bond Universal without surface treatment showed a higher bond strength value.

III. PROBLEM STATEMENT

- Eliminate the oil and scale present on a superficial level, the projection of the abrasives eliminates consumption from the surface also, giving a particularly surface condition which has simple bond to the paint.
- We realize that around 80% of the surface disappointments happen when the pre-treatment of the surfaces isn't finished appropriately.
- Consequently, this progression of sandblasting the surface, earlier to painting, galvanization or such a covering should not be neglected as it is considered as the most basic stage for a great pre-treatment of surface.
- It is one of the most straight forward and the quickest approach to eliminate old paint and rust from the metal surface.

IV. OBJECTIVE

- To reduce the cost of the sand blasting machine which are available in market so that these machines can also be used in the small industry and it does not occupy more space.
- These machines are used to reduce the weight and reduce the time by manually removing the rust from the object.
- The main aim of our project is to make it compactable by reducing the size of the tank and make it movable.

V. RESEARCH AND METHODOLOGY

Fabrication of Sand blasting machine is consisting of the Following components to full fill the requirements of complete operation of the machine.

1. LPG Tank
2. Ball Valve
3. Hose Pipe
4. Blast Pot
5. Pressure Gauge
6. Nozzle
7. T Joint
8. Coupling
9. Wheels
10. Stand

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Fig: Solid works Design

Sandblasting can be defined as a surface treatment process using high velocity of abrasive material to remove the rust paints and other surface impurities. Stationary sandblasting is done in cabinets and portable sand blasting can be done anywhere, thus; it is also known as a portable sand blasting machine. It can be related to garnet sandpaper for their similar effects. After sand blasting,the material receives a completely new look and a better finish. This method involves blasting of air on very small surface of work piece at very high pressure in order to etch or clean or to smooth surface.

Air + selected abrasive material + portable sandblasting machine + appropriate sandblasting nozzle + on/off control + blast surface = high-speed erosion (removal of rust particles from the blast surface). Sandblasting is also called as Abrasive blasting. Itis the operation of forcibly propelling a stream of abrasive material against a surface under high pressure to smooth a rough surface, to remove the surface contaminants. There are several variants of its process, such as bead blasting, sandblasting, shot blasting and soda blasting etc.

- The height of the tank is 630 mm and the diameter of the tank will be 317 mm.
- The materials used for the air receiver will be cast iron. The tank can hold the pressure of 2000 psi.
- There will be two Ports of ½ Inch in LPG tank one for inlet of compressed air which is connected with T-Joint and ball valveand at the other end the Pneumatic male connector of ½×8 mm is fitted. The other end is used for the outlet of compressed air which is connected to hose pipe by means of ½ Inch nut joint and ½ Inch ball valve.
- There will be two T-Joint, one at the inlet side to fitting the Pressure Gauge and another one for fitting of pneumatic male connector to the blast pot.
- The blast pot is basically the reservoir for media and maintains the pressure necessary for blasting. The blast pot contains fabrication of barrel nipple of ½ inch diameter and 6-inch length to sand storage tank is of 2-inch diameter and 6 inch in length welded at right angle tringle. At the top of sand storage tank, a coupling is welded for joining of ¼ inch ball valve.
- While the diameter of the hose will be for 20x1500mm.
- The size of pneumatic tube will be 8mm.
- The pressure for the compressed air will be nearly 7 to 8 bars.
- Nozzles permit media to be sprayed at variable speeds depending on type of nozzle is used.
- Inlet and Outlet valves monitor the inflow and outflow of air and confirm whether or not the blast pot is pressurized.
- The pop-up or inlet valve responds to pressure place into the system and pops up to pressurize the system.
- The Sandblasting Media valve regulates the flow of abrasive from the blast pot.
- The abrasive lure prevents abrasive from traveling through the outlet valve.
- After media is loaded into the machine, variety of events should occur to start blasting.
- The jet flow valve is used to force the mixture of abrasive material and air towards to nozzle which increases the velocity ofjet.
- A mixture of air and abrasive can spray through the nozzle.

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VI. CONCLUSION

The portable sand blasting machine is very economical & useful for heavy fabrication company. There are such big products in size and it requires sand blasting process before painting, so every time we need to re-shift such big products in confined space of blasting after welding small components or some rework on small attachments, this increase material handling cost. After manufacturing portable sand blasting machine, we can do local blasting on small components which we welded after first blasting process; this can be done on same location where we can manufacture, in this way we need not to shift same again to confined space of blasting room. On same place we can do blasting with the help portable sand blasting machine & same time we can release to painting. In this way we can save handling time as well as handling cost also. It helps to reduce human fatigue by considering handling process.

VII. FUTURE SCOPE

For some more Improvement in Portable Sand Blasting Machine using LPG cylinder, we can use some following points.

- We can use nozzle of tungsten carbide which will have higher life than stainless steel nozzle.
- As in sand blasting machine we store the air pressure in air receiver, so for safety and security purpose we can use the PressureRelief Valve and set it at 10 bar pressure.
- As compressed air contains moisture in it, we can use the moisture separator at the inlet of compressed air to remove themoisture contaminants

VIII. REFRENCES

RESEARCH PAPER

1. Rupesh Narkhede, Ganesh Jadhav, Jagruti Rane, Design of portable sand blasting machine, International Journal of Researchin Engineering, Science and Management, volume-2, Issue-8, August 2019.
2. Comparative research on abrasive blasting of 145Cr6 steel, D Dudek 2018 IOP Conf. Ser.: Mater. Sci. Eng. 461 012015
3. Chuanli Yu, Zhiyong Houng, Zian Zhang, Jian Wang, Jirbin shen, Zhiping Xu, “Effect of Sandblasting and HIP on very high cycle fatigue performance of SLM Fabricated IN718 superalloys,”, Journal of Material Research and Technology, pp.29-43,February 2022.
4. Christin Finger, Meike Stiesch, Michael Eisenberger, Bernd Breidenstein Sarah Busemann, Andreas Greuling, Effect of sandblasting on the surface roughness and residual stress of 3Y TZP (zirconia), Received: 8 June 2020 / Accepted: 3 September 2020 / Published online: 14 September 2020.
5. Kubilay Barutcigil DDS, Çağatay Barutcigil DDS, PhD, Esra Kul DDS, PhD, Mehmet Mustafa Özarslan DDS, PhD, Ulviye Sebnem Buyukkaplan DDS, PhD, Effect of Different Surface Treatments on Bond Strength of Resin Cement to a CAD/CAM Restorative Material, previously presented at the 39th Annual Conference of the European Prosthodontic Association; September 3–5, 2015, Prague, Czech Republic.

WEBSITES

1. https://blog.iseekplant.com.au/blog/air-compressor-sizing-for-sandblasting
2. https://www.bigrentz.com/how-to-guides/size-air-compressor-sandblasting
3. https://shotblasting.org.in/how-does-sandblasting-machine-equipment-work.php
4. https://blog.swantonweld.com/different-types-of-sand-blasting
5. https://www.finishingsystems.com/blog/4-necessary-precautions-for-keeping-sandblasting-safe

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GENERATION OF POWER BY WASTE HEAT OF AUTOMOBILE

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ABSTRACT
More than 30% of an automobile's engine energy is wasted throughexhaust gases and in form of heat. So there is a scope to develop a system to utilize this waste heat and generate power. This power can be further used to charge mobiles, power banks or the automobile's battery which in turn will reduce the consumption of fuel.

I. INTRODUCTION

Automobile industry is one of the world's most important economic sectors. Automobiles use IC engines, which have huge amount of energy The loss up to 30% in the form of heat. In the recent times, scientists have tried and refined the automobile technology appreciably, but could not control the loss in IC engine in the form of waste heat. This project focuses its attention not to control the waste heat in IC engine, rather it focuses on trapping the waste heat to generate electricity by using a suitable device called thermoelectric generator (TEC). The temperature of the 'exhaust bend pipe surface' through which exhaust gases are flowing, ranges between 200 °C to 300°C,by attaching a copper plate to this bend pipe hot junction of the thermoelectric module is made, other cold junction is created by aluminum heat sink. As this potential difference is created, voltage is produced using seebeck effect. The produced voltage is further amplified by usingbooster circuit and is tested across the load. Tzer-Ming Jenget. al. (2016) have carried out a study on Design, Manufacture and Performance as between TEC output voltage and generated power/efficiency.

II. LITERATURE REVIEW

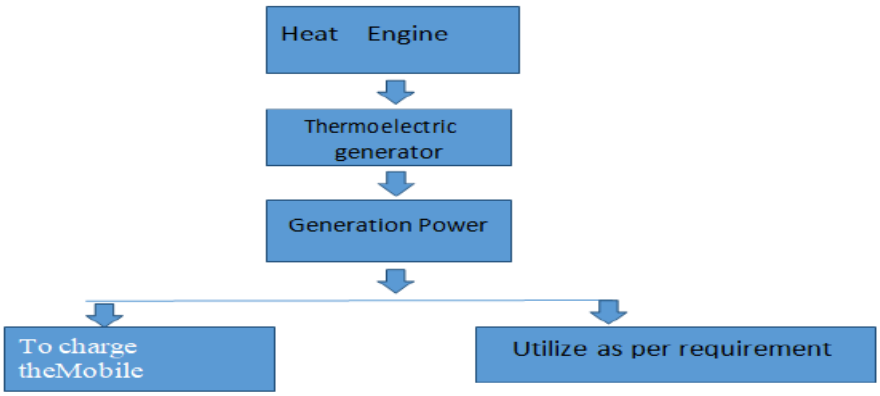
A.Rmit University, Bundoora, Victoria, Australia Fujikura Ltd, Kiba, Tokyo, Japan. The modelled system is predicted to produce approximately 1 kW. The Honda system used a simple design of a thin flat rectangular box with TECs placed on the top and bottom surfaces. Liquid cooling was used in this design. The system consisted of 32 30 mm × 30 mm TECs and produced a maximum of approximately 500 W. The claimed fuel consumption reduction is 3%.

B.Tzer-Ming Jeng and Sheng-Chung Tzeng Department of Mechanical Engineering, Chienkuo Technology University, Changhua County, 500, Taiwan. This study constructed an efficiency testing platform for the thermoelectric conversion system for recovering waste heat of real vehicles. Using a Toyota 2200

c.c. vehicle with four-cylinder four-cycle engine as the test vehicle, it successfully measured the relation of engine speed of real vehicle and external cooling air flow to the engine exhaust temperature and flow rate, and discussed the influence of the vehicle's engine speed and external cooling air flow on the energy output of the waste heat recovering thermoelectric conversion system. This study found that the energy output increases with the engine speed.

C. T. Kashid, S. H. Barhatte and D. S. Ghodake. Results show that voltage, current, power developed and efficiency of the system increase with the increase in engine speed & mass flow rate of exhaust gas. At the engine speed of 3736 rpm, the power generated is 13.106W and efficiency of the system is 5.28%.

III. METHODOLODY



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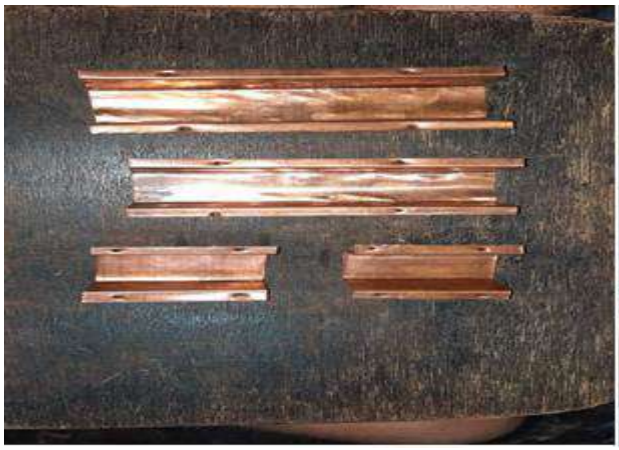
IV. WORKING PRINCIPLE

A single thermoelectric couple is constructed from two 'pellets' of semiconductor material usually made from Bismuth Telluride (Bi2Te3). One of these pellets is doped with acceptor impurity to create a P-type pellet; the other is doped with donor impurity to produce an Ntype pellet. The two pellets are physically linked together on one side, usually with a small strip of copper, and mounted between two ceramic outer plates that provide electrical isolation and structural intecrity. For thermoelectric power generation semiconductor material A and B joint together, if a temperature difference is maintained between two sides of the thermoelectric couple (T1 and T2), thermal energy will move through the device with this heat and an electrical voltage, called the Seebeck voltage, will be created.

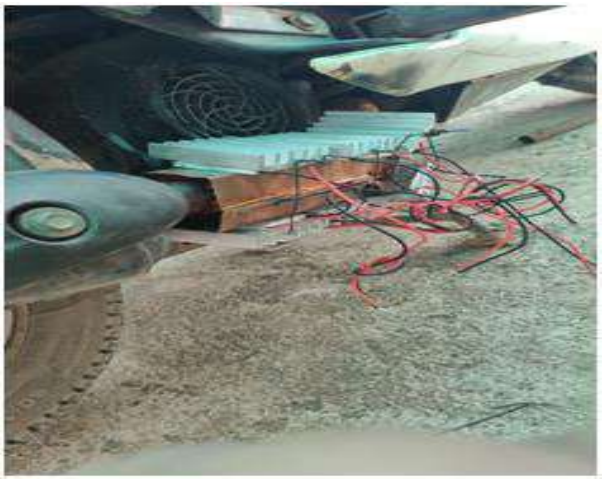
Componants



Copper Plate

Heat Sink

Booster Cercuit



Final Assembly

V. CONCLUSION

1. This project aims to find a possible way to recover the waste heat from the exhaust of I.C. engine as well as to design and fabricate one such system to servethe aim.

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2. Experimentally it is found that when six thermoelectric generator are connected in series. This generated power either directly used to run some auxiliary devices of an automobile or may be stored in the battery and used later.
3. The engine performance is unaffected by the designed system because heat extracted from the surface of the bend-pipe of the exhaust manifold which doesnot affected the working of engine.
4. If higher temperature range is required then TEC module must be changed to higher temperature range (200˚C). Thus, the above stated system may be successfully implemented in different automobile engines, with slight changes.
5. The power developed can be further used to charge mobiles, power banks orthe automobile's battery which in turn will reduce the consumption of fuel.
6. It can be used as a power source for the electronics accessories and chargingbattery of a vehicle.

VI. REFRENCES

A.RMIT University, Bundoora, Victoria, AustraliaFujikura Ltd, Kiba, Tokyo, Japan

B.Tzer-Ming Jeng and Sheng-Chung Tzeng Department of Mechanical Engineering, Chienkuo Technology University, Changhua County, 500, Taiwan

C. T. Kashid, S. H. Barhatte and D. S. Ghodake

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SPRING LOADED KNEE BRACES USING 3DMANUFACTURING

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ABSTRACT
Recent research on exoskeletons and braces has examined the ways of improving flexibility, wear ability or overall weight-reduction. Part of the challenge arises from the significant loading requirements, while the other part comes from the inflexibilities associated with traditional (rigid link-moving joint) system architectures. Compliant mechanisms offer a class of articulated multibody systems that allow creation of lightweight yet adjustable-stiffness solutions for exoskeletons and braces, which we study further. In particular, we will introduce the parallel coupled compliant plate (PCCP) mechanism and pennate elastic band (PEB) spring architecture as potential candidates for brace development. PCCP/PEB system provides adjustable passive flexibility and selective stiffness to the user with respect to posture of knee joint, without need for mediation by active Devices and even active sensors. In addition to the passive mode of operation of the PCCP/PEB system, a semi-active design variant is also explored. In this semi-active design, structural stiffness re-configurability is exploited to allow for changes of preload of the PEB spring to provide force and torque customization capability. The systematic study of both aspects (passive and semi-active) upon the performance of PCCP/PEB system is verified by a lightweight 3D printed physical brace prototype within a ground truth (optical motion tracking and six degrees-of-freedom (6DOF) force transducer) measurement framework.

Keywords: Knee osteoarthritis, braces, walking, knee arthroplasty, 3D printing, CAD.

I. INTRODUCTION
A knee brace is one tool in managing the discomfort of knee osteoarthritis. A brace might help reduce pain by shifting your weight off the most damaged portion of your knee. Wearing a brace can improve your ability to get around and help you walk farther comfortably. Osteoarthritis is a complex condition involving the entire joint. It's mainly known as a weasand-tear type of arthritis that commonly affects the knees of older people. The disease frequently affects one side of your knee more than the other. This unequal damage can cause your knee to align imperfectly (malalignment), which can make you look knock-kneed or bowlegged. As the damage progresses, this malalignment worsens. A knee brace can take pressure off the part of your joint most affected by osteoarthritis and help relieve pain. If your knee feels like it might buckle when you put weight on it, a knee brace can also help you stand and move around with more confidence.

Additive manufacturing (AM) is the industrial production name for 3D printing, a computer-controlled process that creates three dimensional objects by depositing materials, usually in layers. This revolutionary method for creating 3D models with the use of inkjet technology saves time and cost by eliminating the need to design print and glue together separate model parts. Creating a complete model in a single process is possible using 3D printing. The basic principles include material cartridges, the flexibility of output, and translation of code into the visible pattern. JD Printers are machines that produce physical 3D models from digital data by printing layer by layer. It can make physical models of objects designed with a CAD program or scanned with a 3D Scanner. It is used in a variety of industries. In most the industries such as manufacturing aerospace, automobile, jewellery, footwear industrial design, architecture, engineering and construction, dental and medical industries, education and consumer products, additive manufacturing is used for prototyping of various models for research as well as demonstrations of end products.

OBJECTIVES

II. RESEARCH & METHODOLOGY
- To create a Knee Brace that can be affordable for underprivileged people, especially the senior citizens that live in Old Age Homes.
- To provide the option of customization on the basis of shape, size & load.
- To use additive manufacturing (3D Printing) technology so that it can be manufactured in small quantities. Use additive manufacturing so that customization of knee braces can be done in much cheaper price than available in market.
- To create the awareness of Knee Arthritis among the people.

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Our aim was to design, construct & validate a knee brace that can be affordable to underprivileged, customized according to the need of patient & can be produced in small quantities for cost reduction. After running a trial & testing our model we conclude that we have successfully provided a solution for you knee related problem which is affordable for every class of people, can be customized according to the need, requirement & size & can be manufactured in small quantities even single unit in cheap affordable price.

Problem Statement

Knee braces available in markets are too costly for some underprivileged to afford since most of the knee braces are made using the traditional method of bulk manufacturing, customization is not easily available. The cost of customized knee braces is again too much costlier even for a well settled person to afford.

Only universal size of knee braces is available in the market, which sometime create the issue of fitting to the patients. Many people especially senior citizens are not aware about the problem of Knee Arthritis, they just tend to live with the pain While doing the survey with the people of old age home we came to the point that, most of them don't know about the Knee Arthritis & only few people knew about Knee Braces. They don't use knee braces if because either it is too expensive for them to afford or they can find one of their sizes.

The Steps & Method for the Production of 3D Printed Knee Braces Are:

Cad Modelling & 3d Modelling of the Part.

Creating A 3d Printed Prototype In Pla Material To Check The Function & Actual Product Look Of Model. Selection of Material. (Classified on The Basis of Strengts, Elaticity,

Production Price, Etc)

Selection of A 3d Printer. (Technology, Print Size, Etc) 3d Printing of the Individual Parts

Post Processing of the Individual Parts. Assembly Of The Parts As Designed.

Final Finishing Touch on the Product.

Running Physical Tests to Check the Strength & Compatibility of Knee Braces

III. Design of Equipment and Drawing Components

Stages of 3D Printing

3D printing also known as additive manufacturing, it is the process through which solid objects can be built from digital files. This can be achieved with using various 3D printing techniques. Most of these techniques involve the creation of an object by laying down thin layers successively.

- The main stages involved in 3D printing are:

1. Designing
2. Export as STL
3. Slicing
4. Preparing printer
5. Printing

1. Designing

The first stage of 3D printing is designing. In this stage digital blueprint of the object which has to be printed is prepared. The most common way of creating the digital blueprint is by Computer Aided Design (CAD).

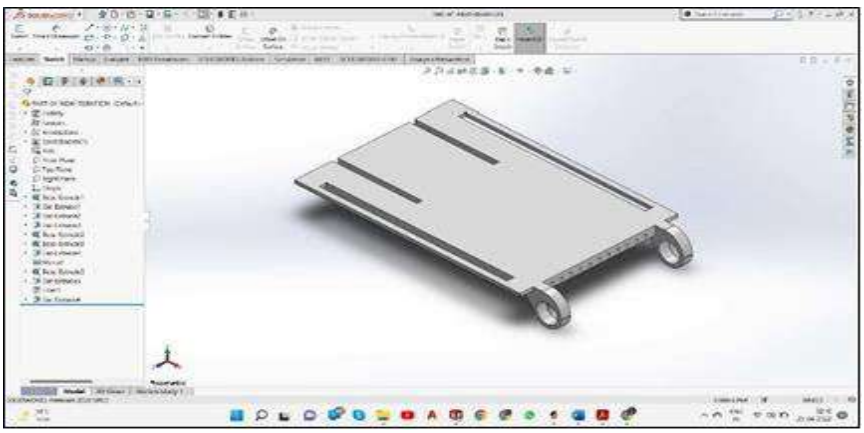

Fig 4.1: Solid Works Designing Page.

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2. EXPORT AS STL

Once you have a finished the CAD design, it is time to send it to the printer. First, we need to convert it into an appropriatefile format. The appropriate 3D Printing file format is called STL (Stereo-Lithography), named after the first ever 3D printing process. STL has several other meanings such as “Standard Triangle Language” and “Standard Tessellation Language”.

Extension OBJ can be used as an alternative for STL.

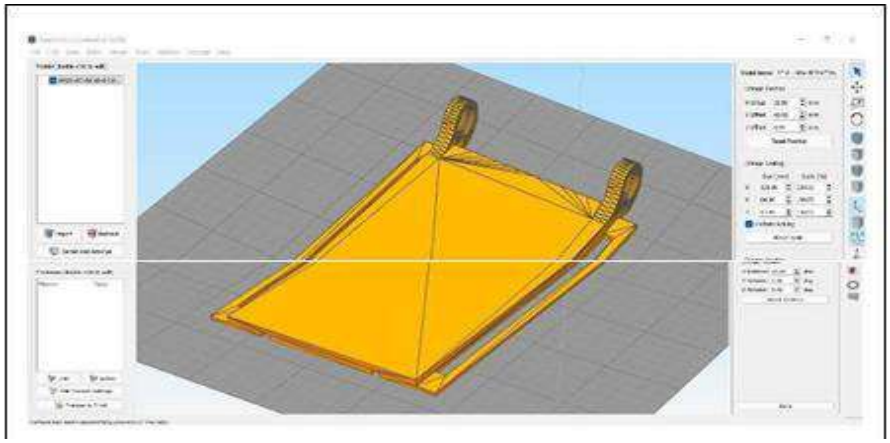

Fig 4.2: Conversion from CAD to STL.

3. SLICING

This is the process of translating the STL file into instructions for the 3D printer to follow. Basically, slicing is dividing orchopping the 3D model into hundreds or thousands of horizontal layers, telling the machine exactly what to do, step by step. After the files are sliced, a new file format is generated called G-code, with the file extension g-code. These G-codesare the codes which could be understood only by the 3D printer.

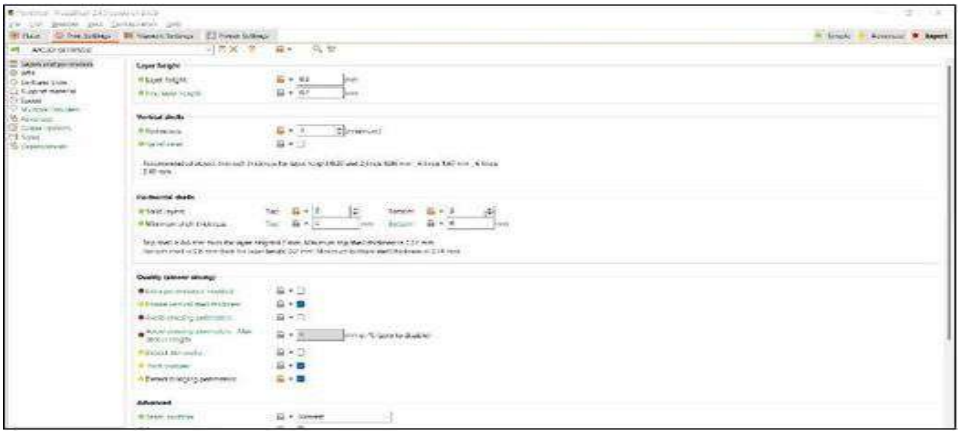

Fig 4.3: Slicing Parameters

Fig 4.9 **Sample G-Code.**

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4. Preparing Printer

The g-codes are then sent to printer. Before starting printer, we should set up the printer by setting some of the printer parameters according to the requirement and refiling the required filament.

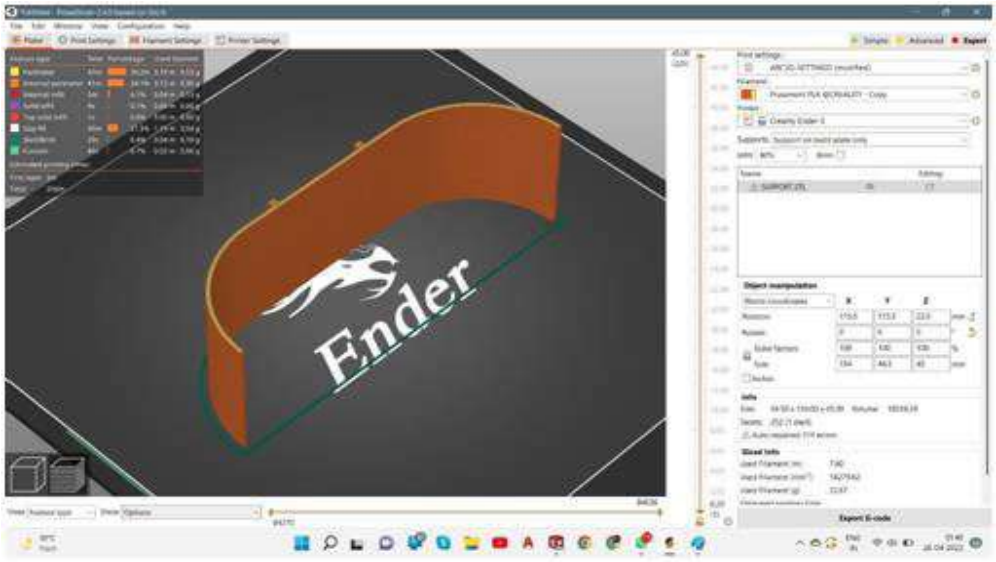
5. Printing

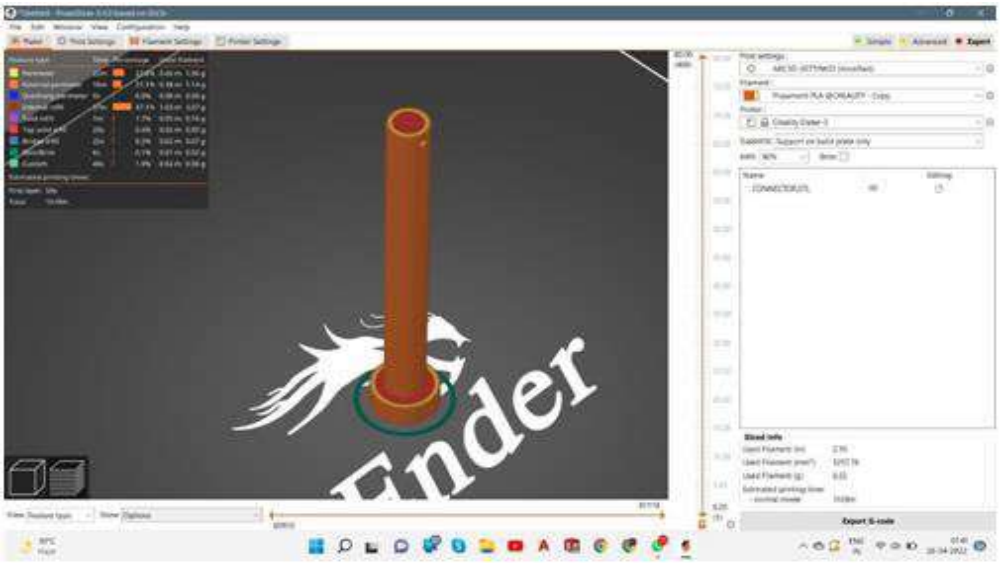
After setting up the printer, the printing begins. There are many methods for 3D printing. Here we use FDM (Fused Deposition Modelling) method for printing, as it is less expensive. FDM is additive manufacturing process that belongs tothe material extrusion family.

In FDM firstly, the material, usually ABS or PLA plastic, is melted down by the printer head and extruded onto the printerbed, similar to how ink is deposited onto a page on a paper printer. The extruder head of the printer is attached to the 3-axis which allows it to move in x, y and z direction. The printer lays down material layer by layer according to the instructions of G-code uploaded to the printer to build up a 3D model, and each layer fuses to the previous one as it cools. Sometimes the cooling can be accelerated by using cooling fans which can be attached to the extrusion head. This process can be repeated until we get the complete model.

IV. RESULTS AND OUTPUTS

During the trial run of our project model, it was observed the models is successfully working for both the age group. Feedback was taken from both the old man & cyclist & the outcome from both the parties was that our product is working successfully. The old man uses the knee brace on daily basis for at least 10-12 hrs while walking & doing other average work & it was observed that the knee brace has made the moment of his joint much easier than before, now he has to apply less force which results in easy moment & the reduction in pain. The cyclist uses the knee brace every time he goes for cycling & again it was noted that the knee brace has help him to improve his moment of keens & to provide more force while working out.





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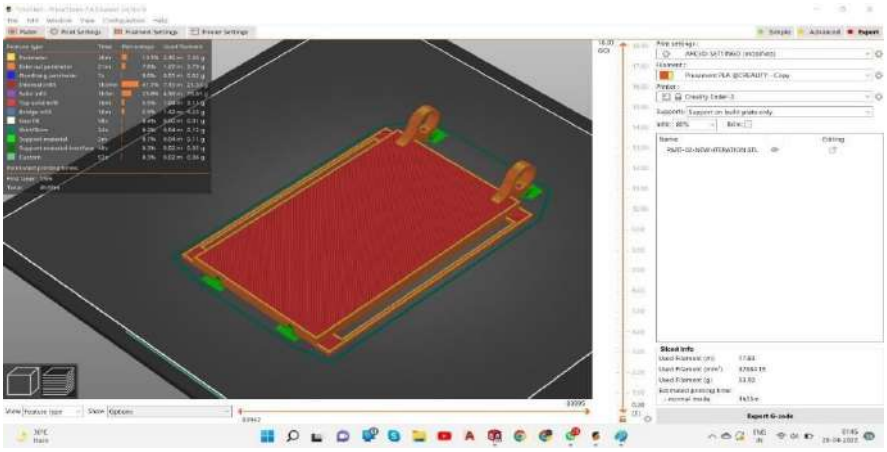

V. CONCLUSION AND FUTURE SCOPE

SPRING LOADED KNEE BRACES USING 3D PRINTING after trials & testing has been came out to be successful on all theconditions.

Our aim was to design, construct & validate a knee brace that can be affordable to underprivileged, customized according to the need of patient & can be produced in small quantities for cost reduction. After running a trial & testing our model we conclude that we have successfully provided a solution for you knee related problem which is affordable for every class of people, can be customized according to the need, requirement & size & can be manufactured in small quantities even single unit in cheap affordable price .

Knee braces available in markets are too costly for some underprivileged to afford Since most of the knee braces are made using the traditional method of bulk manufacturing, customization is not easily available. The cost of customized knee braces is again too much costlier even for a well settled person to afford.

Only universal size of knee braces is available in the market, which sometime create the issue of fitting to the patients. Many people especially senior citizens are not aware about the problem of Knee Arthritis, they just tend to live with the pain

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REFERENCES

[1] www.3dprinting.com

[2] www.3dprinter.net/reference

[3] www.3dprintingindustry.com

[4] Joseph T. Belter, Aaron M. Dollar, "Strengthening of 3D Printed Fused Deposition Manufactured Parts Using the Fill Compositing Technique", in https://journals.plos.org/, 2015.

[5] Rudi Kurniawan Arief, Erry Yulian T. Adesta, Irfan Hilmy, "Hardware Improvement of FDM 3D Printer: Issue of Bed Leveling Failures", in https://researchgate.net/publication/, 2019.

[6] P. Chennakesava and Y. Shivraj Narayan, "Fused Deposition Modeling – Insights", in https:// www. researchgate.net/publication/, 2014.

[7] Yin He, Wen Quangang, Lin Gang & Li Tingting, "Research on the control method of 3D printer based on FDM technology", in https://ieeexplore.ieee.org/document/, 2017.

[8] Ashish Patil, Bhushan Patil, Rahul Potwade, Akshay Shinde & Prof. Rakesh Shinde, "Design and Development of FDM Based Portable 3D Printer", in https://pdfs.semanticscholar.org/, 2017.

[9] Rafal Kudelski , Jacek Cieslik, Mykola Kulpa, Piotr Dudek, Krzysztof Zagorski & Rafal Rumin, "Comparison of Cost, Material and Time Usage in FDM and SLS 3D-Printing Methods", in https://ieeexplore.ieee.org/document/, 2017.

[10]Htin Lin Oo, Kyaw Zaw Ye & Ye Htet Linn, "Modelling and controlling of temperature in 3D printer (FDM)", in https://ieeexplore.ieee.org/document/, 2018.

[11]https:// www.researchgate.net/ publication/ 326353411_DESIGN_AND_DEVELOPMENT_OF_CARTESIAN_ CO-ORDINATE_ BASED_3D_PRINTER

[12]https://all3dp.com/2/auto-leveling-3d-printer-do-i-really-need-it/

[13]https://3dprinting.stackexchange.com/questions/10571/how-to-activate-power-lossrecovery-in-marlin

[14]https://octoprint.org

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DESIGN, ANALYSIS AND FABRICATION OFHUBLESS CYCLE

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ABSTRACT
The cycle is the common mode of transport. Bicycle can be driven by all kind of individuals like children and seniorcitizen. But the old school sort of wheel which is being utilized for centuries has been given a unused plan which progresses the aesthetics of the cycle. In old bicycle the effort required to ride the bicycle is more. In thehubless cycle the gear transmission is provided which reduces the riders effort to pedal and ride the bicycle. In normal cycle, the directing (i.e) the handle bar is joined to the center of wheel. But in hubless wheel, the handle bar is attached to the wheel edge which increments steering efficiency. The cycle with ordinary look (i.e) cycle with spoked wheel (center wheels)is continuously being used everywhere and an substitute for the look isn't considered in plan. As it were the outlines and chassis of the cycle has been altered all through the ages. The wheel has remained the same. So considering it as the most objective of our venture, the hubless cycle is designed.

I. INTODUCTION
In popular we recognize that the cycle run on chain power mechanism and it is ideal and famous manner of transportation in ruralas well as city area also. Due to the fact preliminary price may be very low, no gasoline is needed to run the bicycle. There is nothreat to pollute the environment because of no use of fuel. But the bicycle used for many years now change only in looks of theframeof bicycle. In the traditional bicycle the rider needs to put more effort to ride because of the spokes attached to the rim of the cycle. When the rider pedals the sprocket rotates because of the chain and the spokes attached to the rim were forcefully rotated which causes the rider to put more effort to ride the bicycle.

So considering it as the most objective of our venture, the hubless cycle is designed. In the hubless bicycle the rear rim have a internal gear mounted on it and the hub will behaving the spur gear mounted on it. Because of the use of gears for transmission the rider will be needing less effort to ride the bicycle and as the spokes are removed it also give a new and stunning look to the bicycle.

II. LITERATURE REVIEW
Algat V.V., Bhalerao R.S., Autade K.N., Shimpi G.B., Prof. Ghodake A.P., explained in journal "Hubless Wheel Bicycle With Gear Train Drive Mechanism" states that "The construction of Hubless wheel bicycle with gear train drive mechanism is designed to convert the human muscle power through pedalling work in to the mechanical work The systemis assembled with the combination of pedals, shafts, one small size alloy wheel and one large size Hubless wheel which is function as driving wheel. The pedal and shaft are receiving the human effort and convert in to rotational mechanical motion. This rotational motion is transmitted up to the driving wheel via the spur gear drive train. The gear drive train is the combination of four stages of gear pair. These gear pairs not only transmit the power but also improve the gear ratio step by step. The gears and pinions of drive train are fixing with the bicycle body by using deep groove ball bearings. The last spur gear in the gear train is coupled withthe driving wheel through the Hubless mechanism which also performs the holding function of driving wheel. The front wheel is small in size as compared to drive wheel and it only perform the system balancing function without actually participate in driving and driven mechanism. This system has ability to reduce the fatigue on bicycle rider by improving the power transmission efficiency and by extending the maximum limit of bicycle speed."

Bannetross said that the inventive device includes a frame having a seat structure and handle bar, rear bracket having rear bearings within that rotatably engages a rear wheel, a front bracket having front bearings within that rotatably engages a front wheel, and a drive train that engages the rear wheel for driving the rear wheel. The rear rim of the rear wheel includes a rear groove that

III. Fabrication of Hubless Wheel
1. Rear Wheel
The internal gear is mounted internally on the rim of cycle through welding. The spur gear is mounted on the hub through weldingand the sprocket is also mounted on the hub for transmission when the pedalling starts the chain rotates the fly wheel mounted onthe hub and the spur gear also rotates as it is also mounted on the hub. When spur gear rotates it meshes with the internal gear mounted on the rim and forces the rim to rotate and then the bicycle will be in motion.

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Fig.1: Internal Gear mounted on inner diameter of rim.

Spur gear is mounted on the hub by welding and the sprocket is mounted on one side of the hub where thread is present on the hub the sprocket is rotated when the rides stsrts pedallingthe sprocket rotates and chain rotates the sprocket. Sprocket and spur gear are mounted on the same hub so the spur also rotates.

Fig.2: Spur Gear mounted on the hub.

Spur gear will be in continuous mesh with the internal gear mounted on the rim through welding when the hub rotates the the spur gear rotates and it will rotate the internal gear so ultimately the wheel of the bicycle will rotates.

Fig.3: Position of spur gear in mesh with internal gear.

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Smaller three spur gear are mounter on the roller bearing which will be in continuous mesh with the internal gear. These 3 spurgear will act as a supporting gear so that while riding the wheel will not be able to roll out and cause harm to the rider.

Fig.4: supporting spur gear.

Side bearing is welded on the Mild Steel ring it will act as a barrier so that the M.S ring does not collide with the tyre and theinternal ring gear. A total of 4 bearings are used on each side of the tyre so that the ring does not collide with the tyre.

Fig.5: Side bearing.

2. Front Wheel.

In front wheel the roller bearing is mounted on the Mild Steel ring through nut and bolt and the bearing will be in continuous contact with the inner surface of the rim. These bearing will act as a supporting so that the front wheel will not roll out while riding and cause any incident. 3 small diameter bearing are also used as a barrier so that the M.S ring does not collide with the front wheel tyre. The small bearing will be in continuous contact with the side surface of the rim.

Fig.6: Support bearing mounted on M.S ring through nut and bolt and side bearing mounted on ring though nut and bolt.

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Fig.7: Front wheel mounted on the bicycle frame.

IV. METHODOLOGY

Improved aesthetics of the cycle was kept as the vision of the project. First of all the selection of cycle was done and the Roto bike 360 freestyle cycle was selected. Then according to the inner diameter of rim the internal gear was made having 116 teeth and then spur gear was made with 36 teeth and 3 small spur gear having 14 teeth each. Then in next step Mild Steel ring was made which is used to mount the gears on it and also the weight of the bicycle and also the riders weight will be handle by the Mild Steel ring.

Then a rectangular steel plate was welded on the M.S ring facing towards the rim. Drilled was done on the rectangular steel plate and then small bearing was fitted on the plate through nut and bolt on all the four rings total of four plates were welded on each ring so on each side of the wheel 4 bearings were mounted on rings so total 8 side bearings are mounted on the rear wheel. Then a rectangular steel plate of 3mm thickness and 50.8mm in height was welded on the surface of all the four rings total of 3 plates was welded on each ring. Drill was done on the rectangular plate welded on the surface of the ring and then a bolt of 127mm long was pass through out the plate to the ring which was on other side of the tyre. Small spur gear was mounted on the bolt and adjusted so that they are in mesh with the internal gear. Total of 3 small spur gear were mounted on ring of the rear wheel. These 3 spur gears having 14 teeth each acts as supporting gear so that the tyre does not roll out while riding.

Front wheel structure is same as the rear wheel a rectangular steel plate was welded on the M.S ring facing towards the rim. Drilled was done on the rectangular steel plate and then small bearing was fitted on the plate through nut and bolt on all the four rings total of four plates were welded on each ring so on each side of the wheel 4 bearings were mounted on rings so in total 8 side bearings are mounted on front wheel. Then a rectangular steel plate of 3mm thickness and 38.1 mm in height was welded on the surface of all the four rings total of 3 plates was welded on each ring. Drill was done on the rectangular plate welded on the surface of the ring and then a bolt of 127mm long was pass through out the plate to the ring which was on other side of the tyre. Bearings are mounted on the bolt and adjusted so that they are in contact of the inner surface of the rim.

Then a semi-circular arc was cut through laser cutting. Total of 8 semi-circular arcs was cut 4 for the front wheel and 4 for the rear wheel. 2 arc were welded on the surface of the M.S ring and 2 arc were welded to the cycle fork then all the 4 arc was drilled 2 whole on each arc then a bolt of 152.4mm was pass through out the drilled hole to the other side of the arc which is welded on the fork of the cycle. Then through nuts it is fitted to the cycle.

Then 2 Rectangular plate of 5mm thickness was on welded on the ring of rear wheel each plate is drilled. Spur gear having 36 teeth is welded on the hub. The hub is mounted on the rectangular plate of 5mm thickness which is mounted on the ring of the rear wheel and on hub a sprocket having 18 teeth is mounted. When Rider starts pedalling then it forces the sprocket to rotate. The sprocket is mounted on the hub and the spur gear having 36 teeth is also mounted on the hub so when rider starts pedalling the spur gear also rotates. The spur gear is in continuous mesh with the internal gear mounted on the rim of the cycle. So when spur gear rotates it rotates the internal gear mounted on the rim and when rim starts rotating the cycle is in motion.

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Fig.8: Hubless Bicycle.

V. CALCULATION

Internal Gear
M (Module) = 3

P (Pitch) = π x M = π x 3 = 9.494mm.T (Number of Teeth) = 116.

ID (Internal Diameter) = 342mm.OD (Outer Diameter) = 354mm

Spur Gear
M (Module) = 3

P (Pitch) = π x M = π x 3 = 9.494mm.T (Number Of Teeth) = 36.

ID (Internal Diameter) = 25mm.OD (Outer Diameter) = 114mm

Pedal Sprocket
M (Module) = 1.5

P (Pitch) = π x M = π x 3 = 4.71mm.T (Number of Teeth) = 54.

ID (Internal Diameter) = 25mm.

Hub Sprocket
M (Module) = 1.5

P (Pitch) = π x M = π x 3 = 4.71mm.T (Number Of Teeth) = 18.

ID (Internal Diameter) = 36mm.

Gear Ratio
Internal gear no of Teeth: 116 spur gear no of Teeth: 36 pedal sprocket no of Teeth: 54 Hub sprocket no of Teeth: 18

Pedal sprocket to Hub sprocket gear ratio: 54/18 = 3.

As Spur gear is mounted on the same hub so Spur gear also rotates 3 times on one rotation of Pedal sprocket. Spur gear have 36 teeth and Internal gear is having 116 teeth.

As spur gear rotates 3 times so 36 teeth x 3 = 108 Teeth.

Internal gear is having 116 teeth so when spur gear rotates 3 times then spur gear travels 108 teeth from 116 teeth.So the Gear ratio is 108 / 116 = 0.93.

So When Pedal sprocket completes One rotation then the rear wheel completes One rotation as well i.e The ratio of the cycle is1:1.

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VI. CONCLUSION

Thus the project enhances the aesthetics of the conventional cycle by giving it a good look. The use of gears also reduced the effort of the rider to pedal. The steering efficiency is also increases because the cycle fork is mounted on the ring directly. The load carrying capacity also increases because of the strength of Mild Steel ring which is welded to the bicycle frame. The weight of the cycle can be reduces by using nylon gears or composite nylon gears.

VII. REFERENCES

[1] Algat V.V., Bhalerao R.S., Autade K.N., Shimpi G.B., Prof. Godake A.P. "Hubless Wheel Bicycle With Gear TrainDriveMechanism" Volume 3, ISSUE 2, 01/04/2015.

[2] Bannet ross "Spoke-less bicycle system" Volume 3, ISSUE 2, 01/04/2015

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ANALYSIS OF COMBUSTION AND EMISSION PARAMETER OF CI ENGINE USING WASTE TRANSFORMER OIL AS ALTERNATIVE FUEL

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ABSTRACT
This project gives idea for the effective use of Waste Transformer Oil as an alternate option for petroleum based fuels. Rapid depletion of fossil fuels, increasing pollution and increasing prices of petroleum based fuels have given a base for the research of various fossil fuels. As we all know that, petroleum based fuels are limited in reserves, concentrated in certain regions of the world are shortening day by day. Huge amount of dollars are being invested in research of alternative fuels. Meanwhile, the disposal of waste products like waste transformer oil from different electric power stations from many electric transformers throughout the country is becoming increasingly complex. while biodiesel from certain vegetable oils like Jatropha, Karanja, Soyabean andRapeseed is acquiring much needed attention. The Waste Transformer Oil is a waste product which comes out from a electrical transformer is used for insulation and cooling purpose. This waste product can be used asansource of fuel for diesel engine applications. The WTO can be used after refining it by transesterification process or catalytic cracking process and then mixed with diesel fuel as an base fuel for evaluating different engineand emission parameters and to use it as an alternate source of fuel. The engine and fuel researchers are devoted to explore alternative fuels as the present world largely depends on petroleum fuel for generating power, vehicle movement and agriculture sectors. Price hike, limited reserve of petroleum oils and stringent emission regulation also forced researchers to find alternative fuels. In Bangladesh, there is limited petroleum reserve to meet the demand of the petroleum product and for this reason it is necessary to spend a lot of foreign currency for importing fuel every year. Recent price hike of petroleum oil incurs lots of money. Bangladesh imports most of the petroleumoils from Middle East. In this point of view, waste transformer oil (WTO) can be an alternative source for petroleum oils. WTO has significant physiochemical properties. WTO can meet a portion of our demand without any hesitation. There is a huge unused amount of transformer oil in Bangladesh which is rejected every year. This oil is not used for any other purpose. So, WTO is an important source for meeting the demand of diesel in Bangladesh.Bangladesh imports approximately 2.4 million ton diesel each year . It is well known that the transformer oil is used mainly in the electrical transformer for insulation purpose. Moreover, cooling is another purpose of using transformer oil in the electrical transformer while the transformer is running. Among various properties, one of the main properties of transformer oil is to sustain high temperature during operation. When an electrical transformer is in operation, the transformer oil is subject to mechanical and electrical resistance. For a certain period of time, it is recommended to check the electrical and chemical properties of the transformer oil. By using WTO, Bangladesh can reduce importing a huge amount of petroleum products from foreign countries. Our attention goes to the WTO. WTO results from the power generation and transmission station. At present 100 per cent transformer oil is not used in place of diesel fuel (DF) to run the engine rather blends of WTO and DF.

Keywords: Waste transformer oil, WTO characteristics, Diesel fuel

I. INTRODUCTION
The engine and fuel researchers are devoted to explore altermative fuels as the present world largely depends on petroleum fuel for generating power, vehicle movement and agriculture sectors. Price hike, limited reserve of petroleum oils and stringent emission regulation also forced researchers to find alternative fuels. In Bangladesh, there is limited petroleum reserve to meet the demand of the petroleum product and for this reason it is necessary to spend a lot of foreign currency for importing fuel every year. Recent price hike of petroleum oil incurs lots of money. Bangladesh imports most of the petroleum oils from Middle East. In this point of view, waste transformer oil (WTO) can be an alternative source for petroleum oils. WTO has significant physiochemical properties. WTO can meet a portion of our demand without any hesitation. There is a huge unused amount of transtormer oil in Bangladesh whichis rejected every year. This oil is not used for any other purpose. So, WTO is an important source for meeting the Demand of diesel in Bangladesh. Bangladesh imports approximately 2.4 million ton diesel each year [1]. It is well known that the transformer oil is used mainly in the electrical transformer for insulation purpose. Moreover, cooling is another purpose of using transformer oil in the electrical transformer while the transformer is running. Among various properties, one of the main properties of transformer oil is to sustain high temperature during operation. When an electrical transformer is in operation, the transformer oil is subject to mechanical and electrical resistance. For a certain

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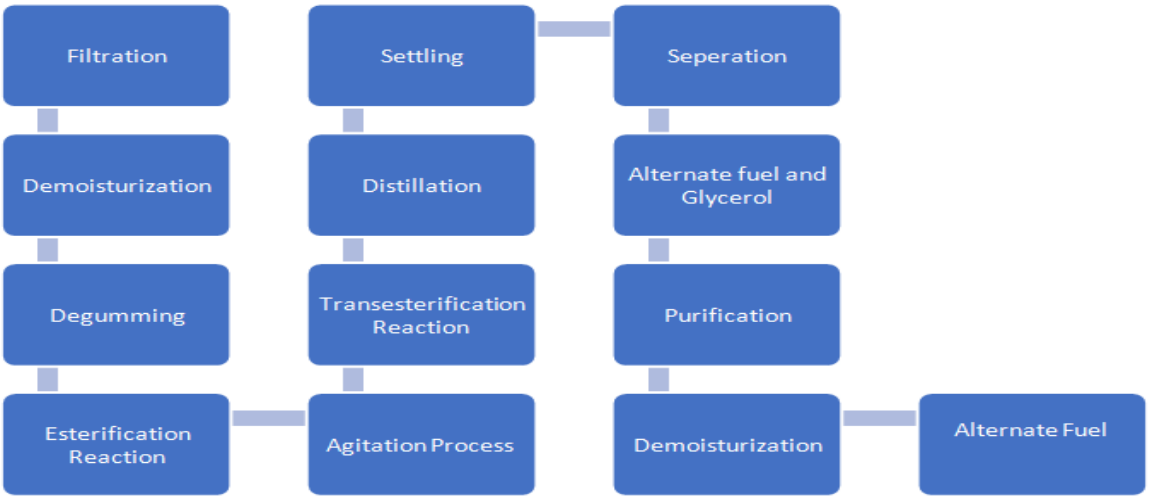
period of time, it is recommended to check the electrical and chemical properties of the transformer oil. By using WTO, Bangladesh can reduce importing a huge amount of petroleum products from forcign countries. Our attcntion goes to the WT0. WIO results from the power gencration and transmission station, At present 100 per cent transformer oil is not uscd in place of diesel fucl (DF) to run the cngine rather blends of WTO and DF

II. PROCESSES INVOLVED

The making of the Alternative fuel for the use of various diesel Engines consists of various steps from extracting the fuel from the Transformer to mixing it with diesel in a chemically balanced way without affecting the properties of diesel and waste transformer oil in a huge manner. These processes are carried out in a certain manner to get the efficient chemically balanced formula for the alternative fuel. The basic step before uing any fuel is Filteration where we just filter the obtained Waste Oil from the Transformer so that the impurities bigger insize can be extricated from the oil and it can be further taken to carry out the other processes with a bit more efficiency.



Filtration: This method removes impurities that have poor solubility at these reduced temperatures. Another potential method of purification is an energy-intense process that involves distillation of the final biodiesel product.

Demoisturization: The moisture from the waste transformer oil is removed by heating it at 110oC for 10 minutes.

Degumming: Degumming is the process of hydrating phosphatides present in an oil by adding water followed by centrifugation. There are only three reasons to degum oil: to produce lecithin (phosphatides), to provide degummed oil for long-term storage or transport, and to prepare for physical refining.

Esterification: Esterification is the chemical process that combines alcohol (ROH) and an organic acid (RCOOH) to form an ester (RCOOR) and water. This chemical reaction results in forming at least one product ofester through an esterification reaction between a carboxylic acid and an alcohol.

Agitation: Agitation refers to forcing a fluid by mechanical means to flow in a circulatory or other pattern inside a vessel

Transesterification: transesterification is the process of exchanging the organic group R″ of an ester with the organic group R′ of an alcohol. These reactions are often catalyzed by the addition of an acid or base catalyst. **Distillation:** It is the process of separating the components or substances (Alcohol) from a liquid mixture by using selective boiling and condensation.

Settling: Settling is the process by which particulates settle to the bottom of a liquid and form a sediment. **Separation:** A separation process is a method that converts a mixture or solution of chemical substances into two or more distinct product mixtures. Here, after settling the biodiesel is separated into two components i.e. Crude Biodiesel and Glycerol.

Purification: The obtained crude biodiesel is purified by water washing the fuel.

Demoisturization: Excessive moisture is removed from the fuel.

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IV. METHODOLOGY

Engine Details

ICEngine set up under test is Research Diesel having power 3.50 kW @ 1500 rpm which is 1 Cylinder, Four stroke , Constant Speed, Water Cooled, Diesel Engine, with Cylinder Bore 87.50(mm), Stroke Length 110.00(mm), Connecting Rod length 234.00(mm), Compression Ratio 16.00, Swept volume 661.45 (cc)

Combustion Parameters

Specific Gas Const (kJ/kgK): 1.00, Air Density (kg/m^3): 1.17, Adiabatic Index: 1.41, Polytrophic Index: 1.28, Number of Cycles: 10, Cylinder Pressure Referance: 4, Smoothing 2, TDC Reference: 0

Performance Parameters

Orifice Diameter (mm): 20.00, Orifice Coeff. of Discharge: 0.60, Dynamometer Arm Legnth (mm) : 185, Fuel Pipe dia (mm) : 12.40, Ambient Temp. (Deg C): 27, Pulses Per revolution: 360, Fuel Type: Diesel, Fuel Density (Kg/m^3): 830, Calorific Value of Fuel (kj/kg): 42000

BP= WxNx0.45 x 0.746/5000 (kW) ---------- (1)

Where, W is load in IB and N is engine speed in rpm.

Input Power=ṁf CV/3600 (kW) ---------- (2)

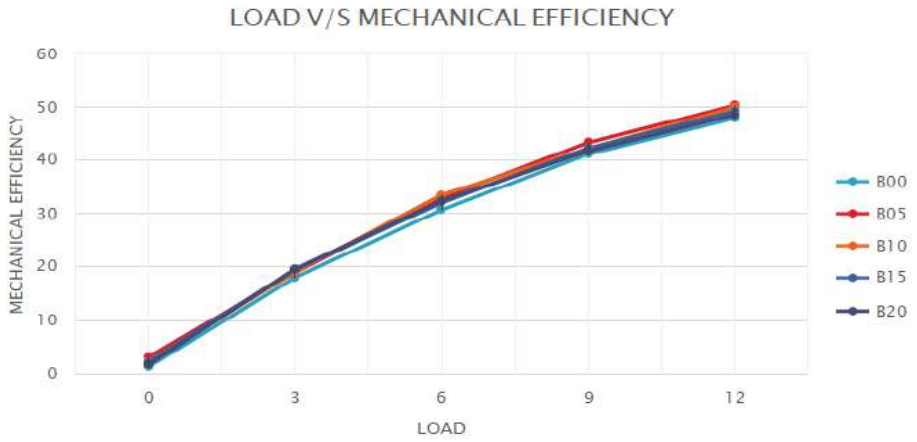
Where, ṁf is the mass flow rate of fuel in kg/hr and CV is the calorific value of fuel in kJ/kg.

BSFC= ṁf /BP (kg/kWh)---------- (3)

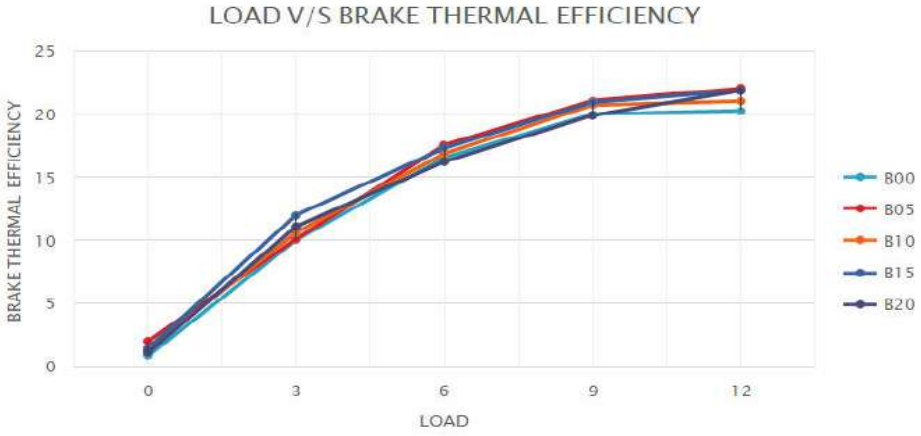
Brake thermal efficiency= 100/(ṁf /BP)(CV/3600) (%) ---------- (4)

V. RESULTS & DISCUSSIONS

(V.I)Effects of WTO on different engine parameters For CR16: LOAD VS MECHANICAL EFFICIENCY:-



For Cr16: Load Vs Brake Thermal Efficiency:-



(V.Ii) Effects of WTO on Different Emission Parametersfor Cr16: Load Vs Co Emissions:-

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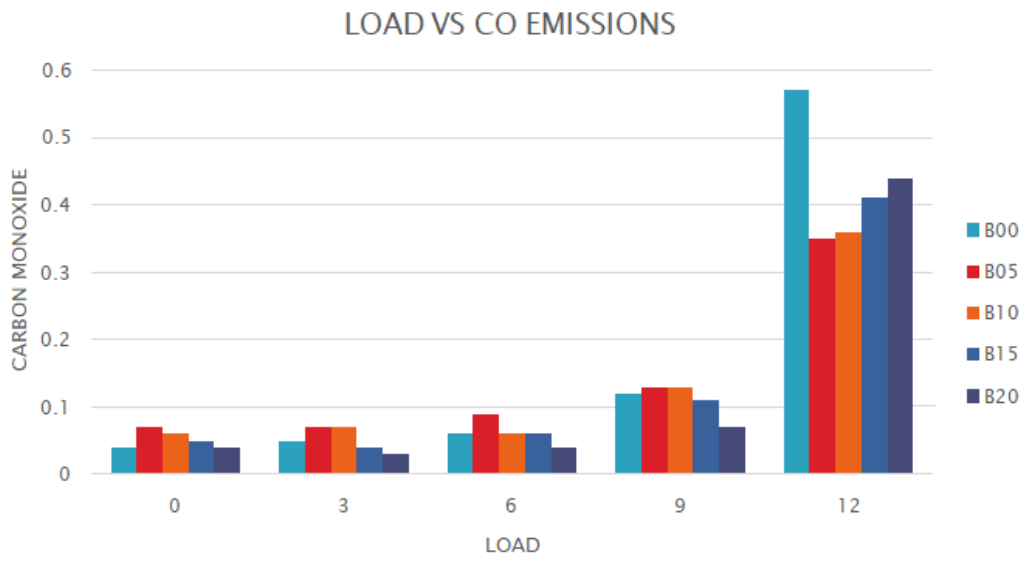

VI: CONCLUSIONS

The objective of this experiment was to use transformer oil as an alternative fuel. The pure diesel was used as base fuel for comparing the properties and pertormance parameters. The pertormance test was conducted on a diesel engine at a constant speed of 800. The results of the current investigation may be summarized as follows:

1. The viscosity of B05 blend is 2.4 and that of pure diesel i.e. B00 was 2.3 and the calorific value of WTO B05 blend was 41.7 compared to 42.1 of diesel. The flash and fire point of WTO was 72 and 82 respectively whilefor diesel flash and fire point were 66 and 72 respectively. This shows transformer oil is safer for storage
2. The brake thermal efficiency for each blend was found to be high because of proper combustion.The brake thermal efficiency of B05 was 22.05% whereas baseline diesel was 20.31% for the same power output.
3. The fuel consumption for B05 was higher as compared to DF due to the lower heating value.
4. The mechanical efficiency of B05 was 50.29 as compared to 47.88 of diesel fuel.
5. The exhaust gas temperature of blends were higher as compared to diesel fuel due to more residence time andhigher viscosity.

V.II REFERENCES

1] S. Yadav, C. Saravanan, M. Kanan, “Influence of Injection timing on DI diesel engine characteristics fuelled with Waste Transformer Oil”, Alexandria Engineering Journal, Alexandria University, 2015.

2] S. Yadav, C. Saravanan, R. Vallinayagam, S. Vedharaj & William L. Roberts, “Fuel and engine characterization study of Catalitically cracked Waste Transformer Oil”, Energy Conservation and Management, 2015.

3] S. Prasanna Raj Yadav, C. G. Saravanan, “Engine characterization study of hydrocarbon fuel derived through recycling of Waste Transformer Oil”, Elsevier Ltd. 2014.

4] S. Yadav, C. Saravanan, S. Karthick, K. Senthilnathan, A. Gnanaprakash, “Fundamental droplet evaporation & Engine application studies of an alternate fuel produced from Waste Transformer Oil”, Elsevier Ltd. 2019.

5] J. Ajay & G. Viswanath, “A study on Waste Transformer Oil blended with BD for IC Engine Application”, Materials Today: Proceedings. 2019.

6] P. Senthilkumar, G. Sankaranarayanan, “Effect of Jatropha Methyl Ester on waste plastic oil fuelled DI Diesel Engine”, Journal of Energy Institute by Elsevier Ltd. 2015.

7] M. Gad, Ahmed I. EL-Seesy, Hassan M. Abu Hashish, Zhixia He, W. Alshaer, “Combustionand Emission aspects of a diesel engine working with sheep fat oil biodiesel- diesel blends”, Case Studies in Themal Engineering Vol 26. 2021.

ISSN 2394 - 7780

8] Annisa Bhikuning, Ryunosuke Sugawara, Eriko Matsumura, Jiro Senda, "Investigation of spray characteristics from waste cooking oil, bio-hydro fined diesel oil (BHD) and n- tridecane in a constant volume chamber, Case Studies in Thermal Engineering Vol 26. 2020

9] Ashok Kumar Yadav, Mohd Emran Khan, Alok Manas Dubey, Amit Pal, "Performance and Emission characteristics of a transportation diesel engine operated with non-edible vegetable oils biodiesel", Case Studies in Thermal Engineering Vol26. 2016.

10] Mohammad Alrbai, Sameer Al-Dahidi, Mosa Abusorra, " Investigation of the main exhaust emissions of HCCI engine using a newly proposed chemical reaction mechanism of Biogas Fuel", Case Studies in Thermal Engineering Vol 26. 2021.

11] Indra Mamad Gandidia, M. Dyan Susilaa, Nugroho Agung Pambudid, "Production of valuable pyrolytic oils from mixed Municipal Solid Waste (MSW) in Indonesia using non-isothermal and isothermal experimental", Case Studies in ThermalEngineering Vol 10. 2017.

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FOOT OPERATED WASHING MACHINE

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ABSTRACT
The foot operated washing machine is a huge innovation all by itself. Foot operated washing machine is especially designed for its use for washing laundry by means of foot application. Today, because of non-renewable energy cries out its basic need to use energy in another way or to save energy. This project involves the construction and use of the foot operated washing machine. The next pages in the paper include the constructions of foot operated washing machine, its raw material, its operation , benefits of the foot washing machine in terms of the actual electronic washing machine save time, water, electricity and not very expensive. His main expectation is exercises with the application of the foot to wash the cloths.

Keywords: foot operated, pedal, chain, cloths, washing, rinsing

I. INTRODUCTION

The project covers one of the daily activities of the washing clothes but solves many other problems with her as well. Wewash our garments either by hand or using electric washing machines. Over the years, this has been a process that requires a lotof efforts and time. The project aims to solve the problem so many people have encountered in their daily lives. In rural areas and undeveloped countries, where electrical power is unavailable and expensive, electric washing machines become almost impractical. It uses a simple mechanism that utilizes a chain drive and converts human power into mechanical energy to wash cloth. The foot operated washing machine permits human beings to wash clothes in a more efficient manner with less effort and strain than using hand/manual washing.

The Project has the Following Objectives

1. Low-cost and low maintenance.
2. It should operate with less water.
3. It will be easy to repair when things go wrong.
4. Easy to operate and maintain as readily available parts.

6. Women do not have to be in contact with soapy water which may damage there hands.

5. Another way to reuse energy that we don't utilize during exercise.

LITERATURE REVIEW

A. Pedal Powered Washing Machine (PPWM)

By: Adarsh Ranjan, Kushagra Sharan and Sudeep Mazumdar

This project not only covers one of the daily household activities (laundry), but also solves many other problems related to it. We all wash by hand or use an electric washing machine. This project aims to solve the problems that many people face in their daily lives. In rural areas where electricity is not available and expensive, electric washing machines are almost impractical. The main goal is to provide the product with another way to wash clothes when there is no electricity .but this project has more Product and manufacturing cost. this also has intricate shape.it also require more maintenance due to more mechanicalarrangements.

B. Design and Fabrication of Pedal Powered Washing Machine

By: Gaurang Bhatawadekar, Budye Salman, Nilesh Chiplunkar, Swapnil Devrukhakar, Singh Akashdeep Rajendra Mane

The pedal power washing machine is different from any other method of the cleaning device. The community may be reluctant to try a new machine. They have carry out a trial period in groups such as women's associations that are familiar with pedal drivers. they have achieved our goal of building a low-cost, manually operated pedal-operated washing machine that useslocally available materials to easily perform the required cleaning and rinsing functions.

C. Design and Analysis of a Pedal Operated Washing and Drying Machine

By: Hakizimana E*, Masengesho P, Cyusa O, Niyigena M

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This washing machine is made from easily available parts at rural area thus, does not required to import any part or component. It uses the parts of bicycle for precision parts. therefore it is inexpensive and easy to build. this machine can also runs without electricity. we can easily perform washing and rinsing cycle on it. peoples in the city can be use this for exercise as well as washing clothes thus utilizing energy.

D. Pedal Operated Washing Machine Using 4-Bar Crank Mechanism
By: Blair Fargose, Mihir Raorane, Manas Dhumal, Chinmay Khanvilkar, Prathamesh Bidaye

In this pedal operated washing machine they have designs using 4 bar crank mechanism and bevel gear arrangement to transfer power. they have done calculation, modelling and analysis of their machine. From that they concluded that there machine will work smoothly and effectively. their machine allows cloths to wash faster.

E. Design & Fabrication of Pedal Operated Multi Purpose Machine
By: Yash Hiragar, Ketul Dantani, Gautam Prajapati, Rixit Kakani

This project aims to develop pedal operated multipurpose machine. this machine can be operated when electricity is not available. There main objective is to make machining operation cost effective and eco friendly.it can run with zero operating cost. unskilled worker can also operate this machine. This machine can perform drilling & grinding operation on materials like wood, aluminium & steel which having less hardness & thickness.

F. Pedal Power Generation: An Implementation of Stationary Bike Generator
By Ron Edward Guia, Aodrel Dave Ilagan, Lorenz Gerald Sauz, Engr. Favis Joseph Balinado

This study shows the design and development of an alternative source of electricity in supplying one household that is in rural areas. With the use stationary bike, the user can be productive in different ways beside of being active in cardio workout but also productive in such away the calorie burned upon using the pedal can produce a certain amount of voltage that is a part of power.

G. Design and Fabrication of a Foot Operated Washing Machine
By: Chetan rajoria, Deepali Gautam, harsh Rajput, Abhinav vats, amit singh

The current research project aims to solve the problem of electric supply to people because of which many in rural area are unable to wash clothes. Nowadays there is electric supply which is provided in most parts of the world but we cannot neglect those who don't have access to electricity. In India most of village and hilly areas are suffering from lack of electricity supply. So, to overcome above problem we select the washing machine, which is operated manually. It requires no power supply. It is a machine which use the power generated by human pedalling and with the use of bevel gears and shaft converts the pedalling motion into required rotary motion of the inner drum of washing machine. This is a low cost project and can be transported veryeasily.

H. Design and Fabrication of a Pedal Operated Power Generator
By: Anyanwu s. Ikechukwu, ashinze e. Anthony

In conclusion, this project was designed to serve as a model/prototype to meet specific need in our locality. The device can also serve as an alternative power source in extreme case scenario even in urban centres. Since the device is manually operated, it can be used in areas where there is no power supply and would always be readily available. The device is environmentally friendly as it produces no waste in the process of its operation, and the device work with little or no noise. The system proved efficient since even with a minimum peddling speed, the system produced enough voltage required to charge the battery inorder for the system to be usable by almost anybody at anytime.

I. Development of A Human Powered Pedal Washing Machine
By: M A Fajobi, E Y Salawu, J Azeta, J O Dirisu, O O Ajayi, P Onwordi

Human powered pedal washing machine has been designed using materials suitable for its application. An existing bicycle was used as the pedal and other parts of the machine such as the drum, the frame was fabricated using galvanized steel. The material selection was put into consideration, such as corrosion because of the machine's involvement with water. The human powered pedal washing machine was tested with a used dirty Laboratory coat. The peddling washing was first done for the first 15 minutes, using water and sunlight detergent soap. The washing testing was done on cloth and it was excellent because the cloth was clean. The human powered pedal washing machine performed well with all the designed parts functioning well. This is an eco-friendly machine, maintenance cost free, energy conservation machine and highly sustainable for underdeveloped nationsof the world.

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II. PROBLEM STATEMENT

The problems that we are currently facing in current trends:

A. High cost of electricity powered washing machines.

B. It require electricity to run electric washing machines, it can't be run if there is power cut-off.

C. Water requirement is more for washing.

D. Manually washing of clothes can cause detergent to come in contact with human hands which may cause allergicreactions to there hands.

III. FABRICATION METHODOLOGY

- First, as the inner drum was open from one side we have to close that side of the drum so we cut a plate of same diameter as the inner drum and welded it to the drum. Then on the outer and inner drum we cut the door. Then on the outer drum we created a hole on both sides on its centre which will be greater than the shaft diameter. And then on the inner drum shaft was welded by argon welding on both the sides and also hinges and latches were welded for opening and closing the door. As the washing chamber was as tank it was open from one side so argon welding was done to close that opening.

- Then for the frame MS pipes were cut using the hack saw as per the required sizes for the main frame of the machine. First the side frame were welded together and then the bottom parts were welded to the side frame and was made sure that is stands still without any wobble then two more square pipes were welded to give support to the drum so is cannot be moved while operating the machine. And after the welding we made sure that there were any wobbling even after the load of the drum is placed. Then on the side frame at top side holes were drilled so that the plummer block can be fitted on that spot.

- A cycles centre frame was cut which will works as the driving parts main frame, then from the cycles rare hub was cut and it was fitted on to the left side of the shaft. Then cut section of the cycle frame was welded to the stand and then the handle was welded to it. The on the main frame bolt arrangement was made so that the cycles frame can be removed or attached easily. And after all the fittings were completed we painted the both the frame of the machine.

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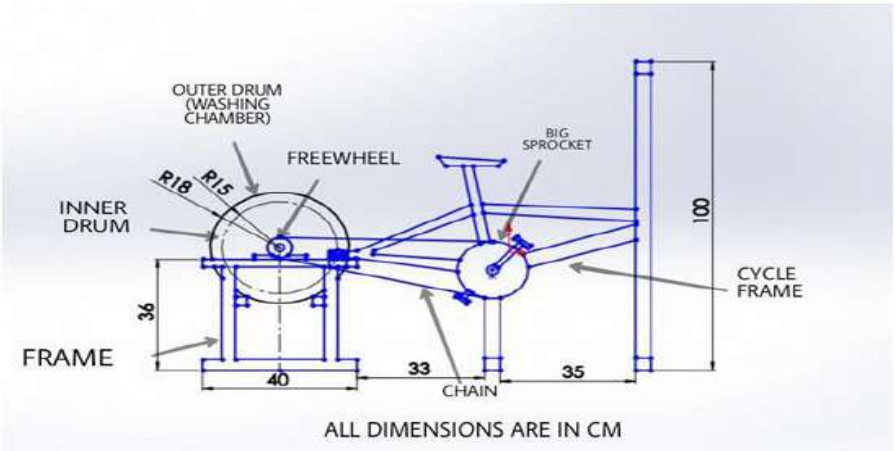
IV. WORKING

First of all open the outer and inner drum doors. put the clothes in inner drum and close the door of inner drum. Then fill 8 to 9 litre water for 1.5 kg clothes and add some detergent as per requirement. Then close the outer drum and then sit on seat provided on cycle frame. Then start cycling slowly at the begin, then rear freewheel also starts rotating due to chain sprocket arrangement. then inner drum also starts rotating which creates turbulence between clothes. when pedalling at a rate of 30rpm the inner drum rotate with speed of 90rpm.after about 6 to 7 mins of continuous pedalling the washing cycle gets completed. Then remove the soapy water by opening the drain valve located at the bottom of outer drum. Then add about 2 to 3 litre water for rinsing cycle, it requires faster pedalling rate i.e. when pedalling at 60rpm, at that time inner drum rotates at about 180rpm. Then approx. after 5min rinsing of cycle get completed. then remove the clothes from the washing machine.

V. Fabricated Model

VI. Calculation

Dimensions,



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For inner drum,

Diameter of inner drum= 30cmLength of inner drum= 42cm

Volume of inner drum = 29688cm^3 = 30litre

For outer drum,

Diameter outer drum= 36cm

Length of outer drum= 50cm

Volume of outer drum = 50893cm^3 = 50litre

For big sprocket and rear gear freewheel,Big sprocket diameter =

Rear sprocket diameter =

No. of teeth on big sprocket = 42 No. of teeth on rear sprocket = 14

Gear ratio= No. of teeth on big sprocket = 42 = 3No. of teeth on rear gear14

Water required for 1kg laundry = 5-6 litre Maximum weight of cloth that can be wash= 3kg Average weight of human= 60

Average rpm can human produce at big sprocket = 60rpmAverage rpm at inner drum = 180rpm

Average power transferred by human during pedalling = 125kw (assumed)

VII. RESULT

Observations made while testing of washing machine:-

Trial no.	Load (in kg)	Washing time (in min) at average 90 rpm	Rinsing time (in min) at average 180 rpm	Total time(in min)
1	1.5	7	5	12
2	2.5	8	5	13
3	3	9	6	16

VIII. CONCLUSION

We have made foot operated washing machine with the use of chain and sprocket mechanism. this project can be feasible in our day to day life. Middle class family can also afford this. operation time for this product is also less without applying much great efforts.it also consumes less water. Also strain of washing clothes on women's get reduce. from this we are concluding that this concept can be use at rural as well as urban areas.

IX. FUTURE SCOPE

A. Increasing capacity, so that more clothes can be washed, thus utilizing the wasted energy.

B. The energy wasted during washing can be utilized in most fruitful way by using it in another household machine which would work simultaneously as the washing goes on. Load on the new machine would be such that entire energy is consumed and not wasted. The excess energy can be used to generate electricity to charge battery. It can be used to operate pedal powered pumps. Many machines operated on pedal power have been developed such as, Cassava graters, Coffee/grain hullers, cracking of oil palm nuts, Potter's wheels, Flexible shaft drive for portable grinders, saws, etc., Tire pumps, Sewing machines.

C. Designing and Implementing the Drain Valve mechanically A normal washing machine uses an electronic control valve in the drainage system to control the flow of waste water out. This valve can be designed mechanically using bicycle brakes. The brakes would block the rubber outlet pipe when the clothes are being washed, rinsed or dried. The blockage would open to make the waste water flow out after a washing cycle or during drying.

D. We can use gear shifter as used in gear cycle to vary speed.

REFERENCES

[1] Adarsh Ranjan, Kushagra Sharan, Sudeep Mazumdar, Pedal Powered Washing Machine (PPWM) International Journal Of Scientific & Technology Research, Volume 3, ISSUE 11, NOVEMBER 2014

[2] Gaurang Bhatawadekar, Budye Salman, Nilesh Chiplunkar, Swapnil Devrukhakar, Singh Akashdeep, Design and Fabrication of Pedal Powered Washing Machine, International Journal of Engineering Research and General Science, Volume 3, Issue 1, January-February, 2015

ISSN 2394 - 7780

[3] Hakizimana E, Masengesho P, Cyusa O, Niyigena M, Design and Analysis of a Pedal Operated Washing and Drying Machine, : journal of applied mechanical engineering

[4] Blair Fargose, Mihir Raorane, Manas Dhumal, Chinmay Khanvilkar, Prathamesh Bidaye, Pedal Operated Washing Machine using 4-bar Crank Mechanism, international journal for research in engineering application and management, volume 07, issue 02, may 2021

[5] Yash Hiragar, Ketul Dantani, Gautam Prajapati, Rixit Kakani, Design & Fabrication of Pedal Operated Multi-Purpose Machine, international journal of science technology and engineering, volume 4, issue 10, April 2018

[6] Ron Edward Guia, Aodrel Dave Ilagan, Lorenz Gerald Sauz, Engr. Favis Joseph Balinado, Pedal Power Generation: An Implementation Of Stationary Bike Generator, laguna journal of engineering and computer studies, volume 4, no 3, October 2020

[7] Chetan rajoria, Deepali Gautam, harsh Rajput, Abhinav vats, amit singh, Design And Fabrication Of A Foot Operated Washing Machine, international journal of trend in scientific research and development, volume 2, issue 4

[8] Anyanwu s. Ikechukwu, ashinze e. Anthony, Design and fabrication of a pedal operated power generator, innovative systems design and engineering, volume 7, no 3, 2016

[9] M A Fajobi, E Y Salawu, J Azeta, J O Dirisu, O O Ajayi, P Onwordi, Development of a human powered pedal washing machine, 6th international conference on advance engineering and technology

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COMMON EFFLUENT TREATMENT (BY PHYTORID TECHNOLOGY)

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ABSTRACT
Constructed wetlands are artificial wastewater treatment system of shallow experimental tanks, ponds or channels that are planted with locally available wetland plants. They work on natural capacity of plants to treat wastewater from different sources. In view of rising concern about pollution of water bodies due to discharge of waste in them, it is necessary to initiate alternative thinking as conventional methods through STPs (Sewage treatment Plants) have had limited success. In recent years the application of specifically designed wetland based technology (popularly known as Phytorid technology) for treatment of wastewater- municipal, urban and agricultural, is becoming widely acceptable. It treats the wastewater in natural manner without the use of chemicals. In short, Phytorid technology is an improved wetland system for treatment of wastewater. The main objective of present research work is to provide and popularize a simple, feasible, practically sound, ecofriendly and cost effective technology for wastewater treatment. Phytorid technology is such a type of system, which reduces the impact of sewage and converts into useful water for gardening and irrigation purpose.

Keywords: Constructed wetland, wastewater treatment, locally available Phytorid plants species and Phytorid technology.

1-INTERODUCTION
The Earth is called the blue planet, since freshwater is a scarce resource available in earth. Only 2.5% of all water resources are fresh water, of the 2.5% which are freshwater, nearly 70% is not accessible, because it is bound in snow and ice, thus only 0.5% of the total water on earth is accessible for drinking and other fresh water uses. Primary water source Is polluted to a great extent through the discharge of harmful substances. It is estimated that every 1m3 of contaminated water once discharged into water bodies will contaminate further 8to10m3 of pure water. In addition to this, the effects of the globe warming has increase the water source in one side and scarcity in the other part in major uses such as agriculture. Population in India is growing by geometric proportion whereas food production is growing by arithmetic proportion. Rapid industrial development and increasing population is increasingly exerting pressure on limited natural resources. The population growth has not only increased the fresh water demand but also increased the volume of wastewater generated. Total waste water generated in India is 38255 MLD and 30% of it is treated by different means. Similarly in Maharashtra 26469 MLD wastewater is generated and 16% is treated, (CPCB, 2010).

When toxic substances enter a body of water, they will be dissolved, become suspended in water or get deposited on the bed of the water body. The resulting water pollution causes the quality of the water to deteriorate and affects aquatic ecosystem. Pollutants can also seep down and affect the ground water deposits. If waste water is left untreated in water source then there after it increases load on water treatment plant and thus increases cost of water treatment. Following are the impacts of emitting the untreated water in the water source: 1. Odour problems 2. Mosquito nuisance and breeding of insects 3. E-coli and other pathogenic micro-organisms can contaminate drinking water sources. 4. Spreading of communicable diseases like cholera, dengue, malaria, etc 5. Impact on bathing quality of rivers, beaches etc.

2- STATEMENT OF THE PROBLEMS
Problem concerning water sanitation stem from the rise in urban migration and the practice of discharging untreated wastewater. The uncontrolled growth in urban areas has made planning and expansion of water and sewage systems very difficult and expensive carry out. In addition, many of those moving to the city have low incomes, making it difficult to pay for any ware system upgrades. It is common practice to discharge untreated sewage directly into water bodies of water or put onto agricultural land, causing significant health and economic risks. Water-related diseases include dengue, filariasis, malaria, and yellow fever etc.

3-OBJECTIVES OF THE PROJECT
- To Survey the selected site
- To collect the waste water sample from these respective resources
- To perform physical test on waste water samples
- To collect the various plants species

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4-PURPOSE OF THE PROJECT

It achieves standards for tertiary treatment with low cost, no electricity, no chemicals for pH adjustment. It enhances landscape and gives site a green look. Use of plants species along with their root zone system along with the natural attenuation processes can be combined together to get the Phytorid technology. Use of untreated waste water in agriculture is of public concern due to possible phyto-toxicity and incorporation of metal cat ions into the food gradient.

5-APPLICATION

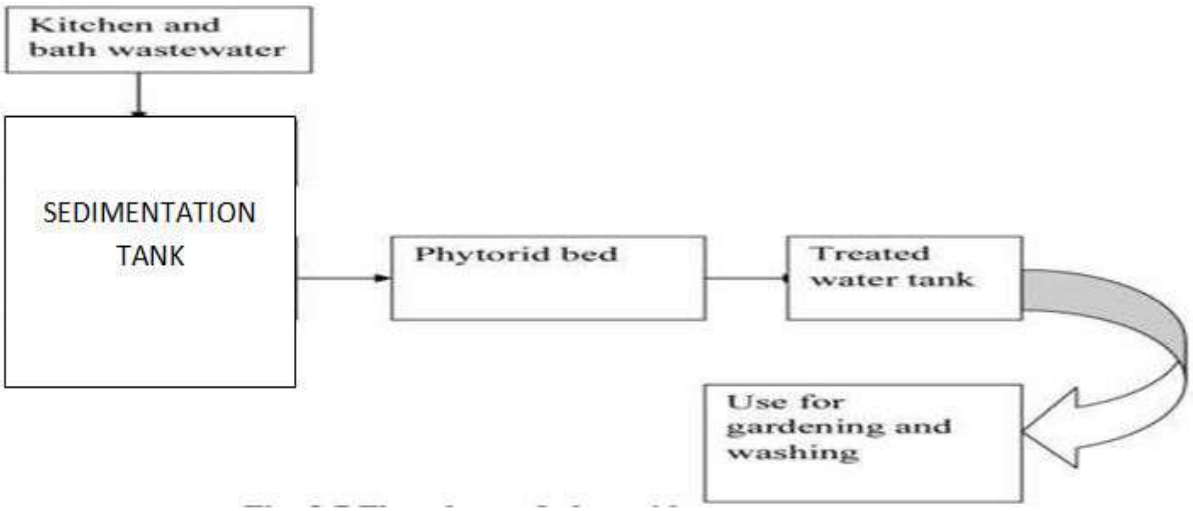
Phytorid system is useful for treatment of waste water in following applications: -

- Domestic wastewater (including decentralized Municipal waste water treatment)
- Colonies
- Airports, Commercial complexes, Hotels Open drainage cleaning of nallah water
- Agricultural wastewater
- Dairy waste
- Slaughter House Waste
- Fish pond discharges.
- Pretreated industrial wastewater
- Municipal and fill leachates
- Several other applications

6-GREEN POINTS

Best Adoptable technology of in-situ treatment and Reuse of wastewater. Phytorid Technology carryout on-situ treatment and reuse of Grey water up to95%,which would attract total of 5 credits on Indian Green Building Certification(IGBC).

7-METHODOLOGY



Volume of Sewage: 35 liters.

Source: Abhadnya bungalow, at post Chikhle, vadakati pada, Dahanu.

Volume of Phytorid Tank: 90 litres. It depends upon quantity of sewage. (Note: Volume of tank should be more than two times the volume of sewage with 24 hrs detention time.)

Use of Baffle Walls: Baffle walls are provided to increase the travel time in order to maintain the detention period i.e. 24 hrs, they are spaced at 12 cm, 18 cm, 18 cm, 12cm from inlet to outlet respectively.

Size of Phytorid Tank: Depth of phytorid tank depends on depth of root zone in case of common arrow head the depth of root zone is around 0.5m in fully matured plants. Depth of roots of small Plants is around0.2m and

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hence we have adopted tank depth of 0.5m. After knowing depth of tank, from volume of tank the length and breadth of tank are obtained as following:

Length of tank =0.6m

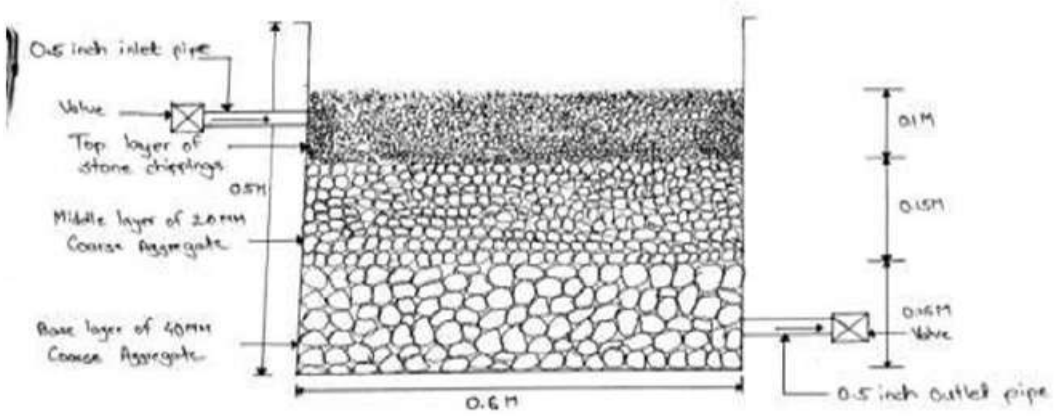
Breadth of tank =0.3m

Inlet and outlet holes of size 0.75 inch are provided to the phytorid tank based on the size of the pipe used. Pipe used to convey waste water is of diameter 0.5 inch. For regulating the flow two valves are provided at inlet and outlet pipe.

Sedimentation/ Storage Drum: Volume of the drum is equals to volume of sewage (i.e.30 lit.) An Inlet pipe of phytorid tank is connected to the storage drum.

Aggregate: Aggregates of two different sizes are provided in three different layers. Number of layers are decided from depth of tank. Three layers of aggregates are provided of depth 12mm, 13mm, 15 mm from bottom to top of size 40 mm, 20 mm respectively and third layer of stone chippings. Max size is kept at bottom as it act as a supporting media to the layers above.

Storage Tank at Outlet: For collection of treated water storage tank is provided at outlet of phytorid tank and is used of same volume as of sewage.



7-WORKING PROCESS

1. Firstly the waste water is collected form source and stored in the storage/sedimentation tank where sedimentation of suspended solids takes place under the process of anaerobic decomposition.
2. After this waste water is allow to enter in the phytorid tank by regulating valve with designed velocity. Once the water is passed through the root zone of cannaindica actual treatment process is started.
3. When roots of plants come in contact with waste water they uptake the nutrients present in waste water which are in form of nitrates, potash etc. and used as food.
4. Simultaneously oxygen is added in waste water from roots due to process of photosynthesis an hence B.O.D. removal takes place after the 24 hrs. detention period treated water is collected into storage tank.

Treated water can be either send for tertiary treatment or directly used for gardening.

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8-RESULTS & DISCUSSION

For performing experimental analysis of phytorid technology a working model (prototype) was built in Abhadnya bunglow.

Dimensions of the tank (0.6m*0.3m* 0.5m) are already discussed in chapter 3. Keeping the top freeboard of 0.1m. Therefore, revised volume of tank = 0.6*0.3*(0.5-0.1) = 0.072 cubic meters = 72litres

Now, since the aggregates and roots of phytorid plants have their certain volume, sample water was poured into the model (up to the top most point of the stone chiping layer) for checking its maximum capacity. About 35 litres of sample was drained to achieve its capacity. Hence maximum capacity of the model come out to be 35 litres perday.

Test on Wastewater Sample

Various test was conducted on waste-water are pH, Turbidity, Hardness, etc. These tests were conducted to know properties of waste-water before using it in Phytorid treatment plant.

Determination of Ph Procedure

Take the liquid sample which the pH is to be determined in class beaker. Note the sample temperature. Rinse the electrode thoroughly with distilled water and carefully wipe with a tissue paper. Dip the electrode into the sample solutions and find out the reading on the pH meter. The final value will give the pH of the sample.

Result: Ph value of sample = 8.6

Determination of Turbidity Procedure

Switch the instrument on. Open the lid of the sample compartment. Insert a test tube filled with distilled water into the sample compartment. Close the lid. Adjust 'SET 0' control to get '0' displayed on the read out. Open the lid. Replace the test tube filled with distilled water with a test tube filled with form azine standard. Close the lid. Adjust the 'SET 100' control to get '100' displayed on the read out. Repeat the above operation to get consistent values of 0 to 100 within 1% to 2%. Thoroughly shake the sample. Wait until air bubbles disappear and pour the sample into the nephelometer tube. Read the turbidity directly from the instrument.

Result: Turbidity of sample = 39.24 NTU

Determination of Hardness Procedure

Dilute 25 mL with distilled in an Erlenmeyer flask. Add 1 ml of buffer solution . Add two drops of indicator solution. The solution turns wine red in color. Add the standard EDTA titrate slowly with continuous stirring until the last reddish tinge disappears from the solution. The colour of the solution at the end point is blue under normal conditions. Note down the volume of EDTA added.

Result: Hardness of sample = 745.25 PPM

Determination of chloride Procedure

Take 20ml of the sample in a conical flask and add1-5mlofK2CrO4 solution. Titrate the contents against 0.01N AgNO3 until a red tinge colour appears.

Result: Chloride of sample = 365 CaCo3/litr.

9-CONCLUSIONS

Based on the above analysis, It can be concluded that the test performed on waste un treated water should be between permissible value after treating the water. It can be concluded that phytorid technology is a kind of constructive wetland and a successful approach towards decentralization and reuse of wastewater, which gives fair quality results. Moreover, the treated water has its application in: Irrigation, River dilution, Flush tanks, Gardening etc. Water of high quality can be obtained if the retention period is increased (48 or 72 hours according to NEERI). The materials and methodology used to treat the wastewater with Phytoridtechnology.

10-REFERENCES

1) Mhaske, A.R, 1 Jan 2017, "Using Box-Behnken Experimental Design," International Journal of Innovative Research in Science, Engineering and Technology, Volume 7, Issue3.

2) R.B.Biniwale, 2012, "Application of Natural Methods for Sewage Treatment and Polishing of Treated Wastewater," Journal for Application of Natural Methods, Volume 7, Issue3.

3) Binita Desai, And Pratibha Desai, 2014, "Root-Zone Technology," International Journal Of Pharmacy And Bioscience, Volume8.

4) Ram Kripal Yadav, 2014, "Sub-Surface Flow Type," Ministry Of Drinking Water And Sanitation, Volume5.

ISSN 2394 - 7780

5) Amol B.Mankoskar, 2018, "Reed Bed Technique," Anantrao Pawar College Of Engineering, IJIRT, Volume2.

6) Ram Kumar Kushwah, Avinash Bajpai and Suman Mali, 2014, "Hydroid Technology," Journal of Chemical and Pharmaceutical Research, Volume3.

7) R. Kaalipushpa, S. Karthika, S. Revathi, 2017, "Domestic wasterwater treatment by using phytorid technology", International Journal of Engineering Research & Technology (IJERT), ISSN 2278-0181, Volume 5, Issue13.

8) Koranne Manas Dwarkanath, Patil Ganesh Dilip, Barne Pratik Kailas, Pasalkar AniketSunil, 2018, "Urban Wastewater Treatment using Phytorid", International Journal for Scientific Research & Development (IJSRD), ISSN 2321-0613, Volume 6 , Issue3.

9) Sanjay MurlidharKarodpati and Alka Sunil Kote, 2013, "Energy-Efficient And Cost- Effective Sewage Treatment Using PhytoridTechnology," International Journal of Advanced Technology in Civil Engineering, ISSN 2231 –5721, Volume 2, Issue1.

10) Swapnil .S. Navaghare, Vipul A. Kadam, Suraj .T. Sawant, Saurabhswamy And Prof. Archana N. Mahajan, April 2016, "New Invention On Reuse Of Sewage And Wastewater by phytoridTechnology," International Journal On Recent And Innovation Trends In Computing And Communication, ISSN 2321-8169, Volume: 4, Issue 4.

11) Anuradha Manikrao Patil1, Sagar Gawande, June 2016, "Implementation Of Sewage Treatment Plant ByUsingPhytoridTechnology,"InternationalJournalOfInnovativeResearchIn Technology, Volume 3 Issue1

12) AnwarTahseen, Singh Bihari, Kumar Rakesh, July 2016, "Treatment Of Municipal Wastewater Through Constructed Wetland," International Journal of Research in Chemistry and Environment, Vol. 3 Issue6.

13) A.R.Mhaske, S.M. Taleyand R.B. Biniwale, October 2014, "Removal Of Tubidity From Sewage Water By Phytorid Sewage Treatment Plant: A Study Using The Response Surface Methodology," International Journal Of Innovative Research In Technology, Volume 7, Issue 2.

14) Debosmita Kundu, Dymphna Joyce John, Teresa Adhikari, Purnam Ghosh, 29 Feb 2016, "Study Of Rhizospheric Association In Improving The Effectiveness Of A Phytorid Plant Towards Bioremediation," International Journal Of Innovative Research In Technology, Volume 5,issue 3

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SELF-ILLUMINATING ROAD

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ABSTRACT
"Theobjective of this research was to develop a soy-based luminescent sealant for use on concrete surfaces. The luminescent sealant is a mixture of soy methyl ester polystyrene (SME 50 PS) and strontium aluminate; a phosphorescent powder that slowly luminesces after being excited by light. A test procedure was developed to quantify the magnitude and duration of the luminance of the coated concrete surface, which is key to evaluating the performance of the luminescent sealant. The luminescent sealant was excited in a consistent manner with a xenon lighting system that simulates sunlight, a photometer (light measuring instrument) that measures the luminance of the excited concrete surface, and a housing unit to prevent extraneous light from the surroundings to influence the test results. The results of the tests performed indicate that the luminescent surface emits light i.e Glows) for approximately 24 hours in a dark space after it was excited. It was found that larger particles of strontium aluminate luminesce for a longer time than smaller particles. The excited sealant's luminance was independent of time exposed to Light coming from the xenon lighting system.

The researchers introduced different quantities of strontium aluminate to traffic paint to achieve phosphorescence. Factors to consider for his study are charging time, lux received, luminance emitted, and amount of SrAl2O4: Eu added and its effects through abrasion. It was found out that the luminance emitted vs. time follows a power (x) = axn where x is in minutes. There are positive trends when relating lux emitted with charging time with per cent strontium aluminate added with millimeters of paint removed.

INTRODUCTION
New developments in road construction use different technologies in a myriad of ways. Technologies like water-absorbing and silent asphalt, or intelligent traffic light systems, improve a road's ability to fulfil its current function, namely: enabling transportation in the most secure and comfortable way.

But next to these improvements, another branch of innovative technology has been created technologies that not only enhance the current functionality of a road, but add a new aspect or even a whole new function to it. These 'smart-road technologies' make use of principles and materials that are not a necessity to construct a road (like asphalt is), but are used in many settings, (like solar panels). The road becomes smart by integrating technologies, previously used in other contexts, in order to add a new function or enhance the driving experience. Three examples of these smart road technologies are solar roads, paint-related technologies and charging lanes. They will be the object of investigation in this magazine, because they are currently in the furthest state of development and can have an enormous impact on society in several different ways. In order to have solid base for further analysis, the smart-road technologies will be now introduced in regard to their function and then explained in detail in subsequent chapters.

1. LITERATURE

RESEARCH PAPER 1

Topic: - Luminescent Technologies

Author Name: - Wiedemann, E. and H. Ebert. (1888), 1889.
Highway lighting and roadway safety goes hand in hand. The usage of roadway lighting is still one of the most effective methods to prevent roadway accidents. Integration of other safety features of a road is also part of the highway design. The integration of the mixed strontium aluminate and paint to the highway system together with the lightings seems ineffective as observed by the researchers since both emit light that produced silhouette, and it is obvious which one is more beneficial. This mixture works best when there are absolutely no lighting present at night since this only produces small amount of luminance. Nonetheless, this might have the potential to still save lives when worked properly.

RESEARCH PAPER 2
Topic: - Character of the light emitted by incandescent zinc oxide

Author Name: - Nichols, E. L.., and B. W. Snow. (1892).
Sunlight is measured from the lux meter throughout the month of September to October during the monsoon season. Light source emitted an hour before dark is assumed crucial since it charges the strontium aluminate

mixed paint. In this test, the researchers obtained the average illuminance from 5pm-6pm from previous testing and replicate the conditions in a controlled environment and compare the illuminance emitted. Depending on the amount of lighting present during the day, the amount absorbed by the glow in the dark traffic paint depended on the illuminance present throughout the entire day.

RESEARCH PAPER 3
Topic: - History of Luminescence

Author Name: - E. Newton Harvey. (1957).
There are two types of paint use in road one is glowing paint and other is dynamic paint glowing paint is glow at night and dynamic paint glows in special circumstances like low temperature. Many accidents occur or can be correlated precisely with weaker visibility of road markings. When drivers due to weaker conditions visibility cannot see road markings, often lose their orientation to their current position, as in the highly mortised countries of the world, a significant proportion of accidents occur at night.

RESEARCH PAPER 4
Topic: - Advance in immunomodulation & research

Author Name: - R. John Koshel (2013)
A phosphorescent material is simple material that absorbs light but does not emit instantly but fluorescent material emit instantly. The intensity of phosphorus paint is more than fluorescent paint on the road causing the cross section of the road that is designed for the vehicles from the opposite direction or landing from the road because they are not able to detect in time where the edge of the pave mentor landing from the road because they are not able to detect in time where the edge.

RESEARCH PAPER 5
Topic: - Illumination of Road

Author Name: - Jack L. Lindsey (1997)
The paint is highly durable with a life of 12 years. the strength of glow is hardly impacted by aging Many accidents occur or can be correlated precisely with weaker visibility of road markings. When drivers due to weaker conditions visibility cannot see road markings, often lose their orientation to their current position on the road. If the lifespan of this mixture could last for more than or equal to a year, then this would be a big contribution to the roadway safety. The Bureau of Research Standards continues to innovate new or better materials in the field of civil engineering. With this advancement in research, this study has the prospect to be further improved, later might be adopted by the government.

RESEARCH PAPER 6
Topic: - Illustration design with non-imaging optics

Author Name: - Richard C. Ropp (2013)
Fluorescent paint has two variants one is visible and invisible (transparent). Where visible use for glowing at night. And invisible use for dynamic lighting Information to the driver is usually related to objects that transmit a message Typically, there is very little technology that goes into roads. They tend to be made out of asphalt or concrete, which is compacted into a smooth, Solid surface and painted upon to indicate certain restrictions, routes and information. And that's pretty much it.

RESEARCH PAPER 7
Topic: - Properties of green phosphor in LDPE and polymer

Author Name: - D.B. Bem, H.C. Swart, A.S. Luyt, E. Coetzee, F.B. Dejene (2009)
GID green colour is pale green colour glows luminescent green in dark this paint produces brightest glow.GID aqua blue colour is pale green colour luminescent blue in dark GID yellow is a bright neon colour which glow yellow in uv light. This yellow paint is not preferred because of fade colour.

In the near future, the road (road markings) will "glow" in the dark without being illuminated by headlights of the vehicle, thanks to a new type of material for road markings, modern technologies and new materials for the road.

RESEARCH PAPER 8
Topic: - The luminescent properties of persistent

Author Name: - D. Haranath, Virendra Shankar, Harish Chander (2003)
Multi-colour emissions of Eu2+ doped SRA samples have been prepared using high temperature treatment. Addition of a stoichiometric excess of alumina or introduction of a rare-earth halide impurity shifted the

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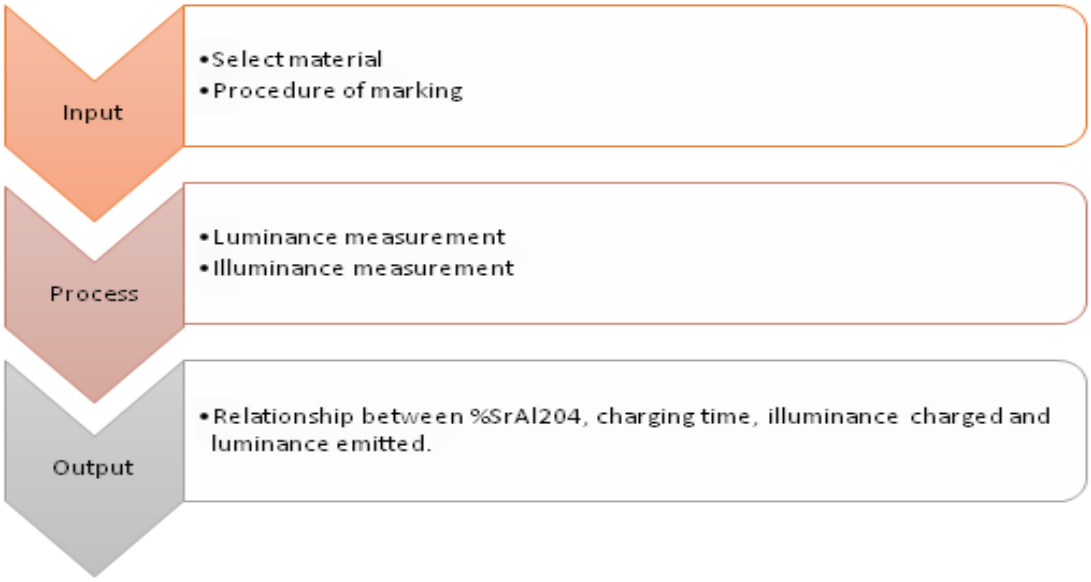
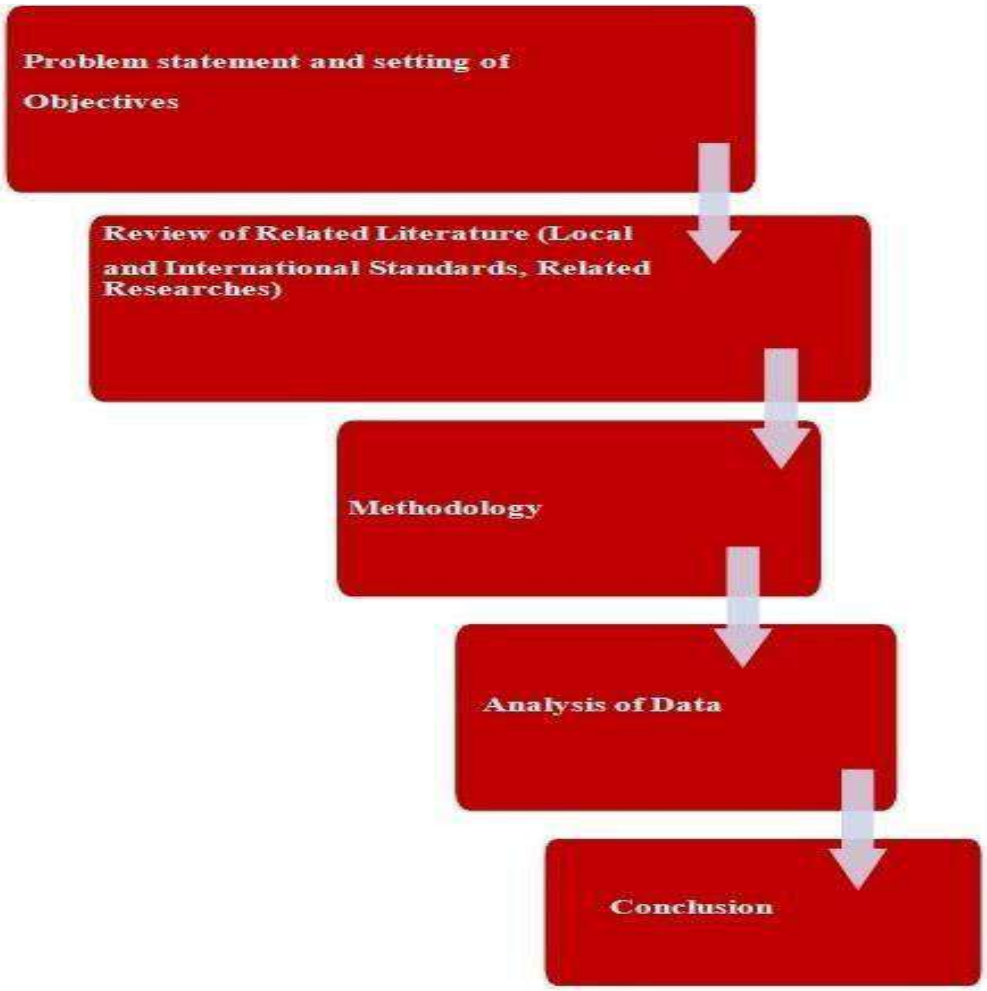
emission colour of the phosphor towards the blue part of the visible spectrum, whereasa change in the type of reducing atmosphere from CO tourea vapour shifted it towards yellow-green. The colourcoordinates mentioned in the emission spectra clearly indicate the exact location of emission wavelengths in the colourspace. The phases and the melting behavior of various SRAphosphors noted in this study were checked by XRD and SEM observations.

2. DESIGN METHODOLOGY

1) Conceptual Framework



2) Analytical Framework



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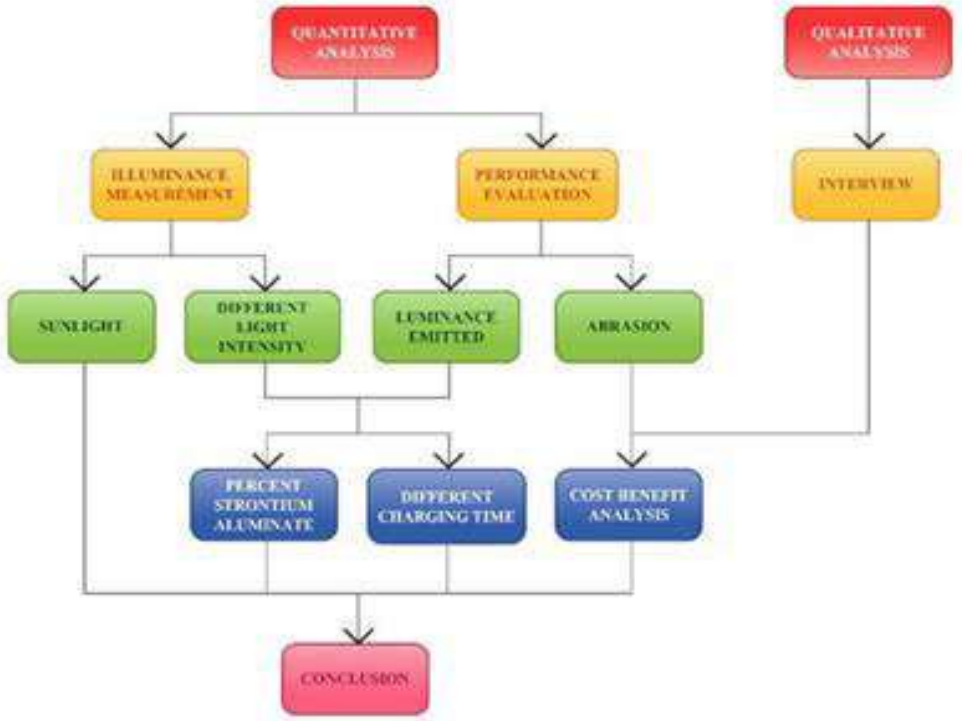
Overview of Methodology



I. CONCLUSION

Traffic signalization is a visual guideline of traffic situation and affects the behavior of all the participants, and also provides unambiguous and clear information to all road users, especially drivers in pursuit of the chosen path and adjusting the speed technical elements of the road. Drivers in driving should detect, recognize and understand traffic signalization, and for that greatest impact has her visibility cannot see road markings, often lose their orientation to their current position on the road causing the cross section of the road that is designed for the vehicles from the opposite direction or landing from the road because they are not able to detect in time where the edge of the pavements is. Information to the driver is usually related to objects that transmit a message. (E.g., Traffic sign or road makings).

II. REFRENCE

1. http://www.cie.co.at/publ/abst/51-2-99.html: ISBN 978 3 901 906 03 9
2. https://www.slideshare.net/abdultayyebshabbir/smart-road-in-future
3. https://newatlas.com/smart-highways/24836/
4. https://www.fastcodesign.com/3037527/glow-in-the-dark-highways-open-in-the-netherlan

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MOVABLE ROAD DIVIDER

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[1, 2, 3,4]Student and [5]Professor & HOD, Department of Civil Engineering, Theem College of Engineering, Boisar

ABSTRACT
This paper presents Smart Movable Road Divider for controlling the traffic congestion in metropolitan cities and to provide a free path for the ambulance. The work presented in this paper focuses on reducing the latency in traffic and free path for ambulance. The existing Road Dividers consists of equal number of lanes. Usually, in morning and evening peak hours the opposite side of the Road Divider is generally underutilized. To overcome this, Smart Movable Road Divider is implemented where the divider is moved based on the density of the traffic using IR Sensors. If the density of the traffic is high on one side, the divider is moved to the other side. Then the density of traffic is stored in cloud which is possible through IoT. A free path for Ambulance is provided using RF Module by controlling the traffic signal. A Prototype is developed and tested for the Congestion control which also works on safety measures by intimating the drivers about the movement of the Divider.

INTRODUCTION
In recent years, with an ever increasing rate of development in metro cities around the world, there has been proportional increase in numbers of automobiles on the roads. Although the number of vehicles using the roads has increased, the static road infrastructure is almost the same and is unable to cope with changes like congestion, unpredictable travel- time delays and road- accidents that are taking a serious shape. Traffic congestion has been one of the major concerns faced by the metropolitan cities today in spite of measures being taken to mitigate and reduce it. It has emerged as one of the main challenge for developers in urban areas for planning of sustainable cities. In developing countries, like India, traffic is inherently chaotic and noisy. Identification of magnitude of traffic congestion is an essential requirement for defining the congestion and finding appropriate measures. The main focus of this paper is aimed at understanding the recurring urban congestion, its measurement, precautionary measure and suggests a remedial measure for the same. The implication of widening existing roads or building new ones will only results in additional traffic that continues to rise until peak congestion returns to the previous level. The total available space within the city for the construction of roads, railways and other transportation is restricted. The paper discusses implementation of movable traffic dividers as congestion release strategy for metropolitan areas instead of traditional solution of widening the roads. The moveable traffic divider helps in there configuration of road capacity, so as to attain optimum benefit from roadway usage on the existing road. The problem with Static Road Dividers is that the number of lanes on either side of the road is fixed. Since the resources are limited and population as well as number of cars per family is increasing, there is significant increase in number of cars on roads. This calls for better utilization of existing resources like number of lanes available.

I. LITERATURE REVIEW
II. Implementation of Movable Road Divider Using Internet of Things (IOT) [1]
In this project the road is connected to cloud where continuous monitoring of the traffic is done and intensity of traffic is Uploaded to cloud. Traffic intensity which is available in cloud can be used for various purposes like traffic updates on various apps such as HERE maps. After uploading traffic updates on cloud by considering traffic intensity in three variables like LOW, MEDIUM and HIGH road divider is moved accordingly. If intensity is LOW then divider stays in its position.

If intensity is MEDIUM then divider moves by a small distance. If intensity is HIGH then divider moves by a large distance. The project also provides solution to traffic clearance for the ambulance. Using RFID a cloud is made to detect the arrival of ambulance and then to make a way specially for ambulance by moving divider of the road accordingly. Hence it is concluded that it is possible to avoid congestion in a given route by moving the divider to widen or narrow the road and clear the traffic. Also it is possible to provide a free way for the ambulance irrespective of the traffic on the road.

Controlling of Traffic Using Movable Road Dividers [2]
In this paper, we have successfully designed and developed a demo model of 'Controlling of traffic using Ultrasonic sensors', in which the results are satisfactory. Since it is a demo model, we have only shown it through one way of traffic using ultrasonic sensors . The traffic congestion data from the sensors is given to the nearest traffic control room using a wi-fi module .The data from the sensors is updated automatically. But in real time traffic congestion can be in more than one direction and then also this module can be used by using image processing rather than the basic sensors.

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Design and Implementation of Movable Road Divider [3]
In this paper, we had designed and implemented a demo model of „Movable road divider". The data from the sensors is updated automatically and driven to the nearest traffic control room using a Bluetooth module. In real time traffic congestion can be in more than one direction, then this module can be implemented using image processing instead of the basic sensors.

Automatic Movable Smart Road Divider Using IOT [4]
The proposed structure helps to reduce the chances of traffic jams and to provide clearance of road for the emergency vehicles to an extent. In these proposed work we are aimed to clear the traffic in accordance to priority. It will help in to reduce the traffic highway. Also it is helpful for the government to apply traffic rules. And people will follow the rules of traffic. It's applicable in almost all areas in the Pune city. It will be applicable in the cross road and traffic zone.

IoT Deployed Automatic Movable Smart Road Divider to Avoid Traffic Problems [5]
The proposed structure helps to reduce the chances of traffic jams and to provide clearance of road for the emergency vehicles to an extent. In these proposed work we are aimed to clear the traffic in accordance to priority. The Blob analysis and the traffic density victimization morphological filtering has discovered in these system. The road with best priority (with very high traffic level) is cleared first. The proposed system mainly focuses on the motor cars. Using the victimization image processing emergency vehicles is detected.

Smart Road Divider… Solution for Traffic Congestion [6]
The movable divider is capable of providing extra lanes with certain specified width to traffic congested side of road, by acquiring one lane of another side which carries light traffic at that time. Provision of lanes to a congested side totally depends on 'either another directing side of the road is also congested or not?' Thus by providing the suggested mechanism, we can use the width of the road to its full efficiency.

The divider is said 'Smart' because it can detect the congestion through sensors and thus microcontrollers sends signals to divider to slide. So, basically movable divider is used to solve problems of traffic congestion on one side of the road with other side is free from heavy traffic. By doing this we can use road width at its full efficiency without widening of road which ultimately helps to preserve acquired land for other purposes besides of road from the unnecessary widening of road, which also leads to reduce cost of the widening of road, land acquisition and compensation. By using renewable energy sources, we can reduce the operating charge of the movable divider.

A. AIM & OBJECTIVES
Aim: The main aim of this project is to the proposed structure helps to reduce the traffic jams and also reduce the time required for travelling and to provide clearance of road for the emergency vehicles to an extent.

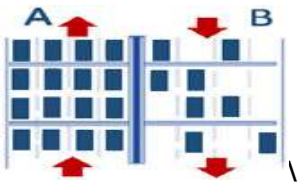
OBJECTIVES
The issue with Static Road Dividers is that the number of paths on either side of the street is constant. Since the resources are constrained and population just as number of vehicles per family is expanding, there is huge increment in number of autos or cars on streets. This calls for better use of existing resources like number of paths accessible. The primary point of this undertaking is to take the traffic controlling to another time.

The goals of this paper as follows,

- To control high Traffic Intensity.
- To avoid the Traffic Congestion.
- To reduce time of journey during rush hours.

III. DESIGN METHODOLOGY
The main aim of this module is to detect the count of vehicles according to which the movement of divider depends. IR Sensors are placed at the start of the divider. It is used to get the count of the vehiclesindicating the traffic density. If the traffic density is high, then the divider moves towards less density side. If the traffic density is normal then no type of action is taken and the divider is in the middle.

A. Functionality of Proposed System



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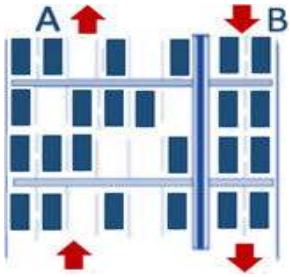
High Traffic Density in One Direction

This creates traffic congestion and delay. This traffic density, calculated by the IR sensors and the Arduino uno microcontroller determines the movement of the movable traffic divider. The ratio of lane A and lane B is 3:1. Hence a divider needs to move 25% towards lane B. this reduces the traffic congestion in lane A. After the movement of the movable divider, lane A occupies 75% of the entire stretch (lane size expanded) and lane B occupies 25% of a road.



Adjusted Lanes to Balance Traffic Density on Both Directions

The proposed methodologies are implemented in this project around the data that is received from sensors fitted alongside of the road, and then the data is gathered regarding the standing of every vehicle by utilizing a IR transceivers and conveys this to microcontroller. This data is then computed to determine the density of the traffic at that given time. When the density reaches beyond the present threshold, the microcontrollers perform a forward and reverse movements of a actuators using an H bridge, this operates the divider.

In addition to this, an RFID reader will also be equipped at a reasonable distance which can read the RFID tag of the emergency vehicle prior to its arrival at the traffic signal. This allows time for the divider to move and create a lane. The RFID reader also forwards input to the microcontroller in order to operate the divider.

The proposed methodology contains the following modules:

a) **Data Input Module:** Used to estimate a traffic density and determines a priority of a vehicle.

b) **Processing Module:** Analyzes a data and perform operations.

c) **Motor Driver Module:** Used to control and drive a motors based on a input.

B. Hardware Used:

- IR Sensors
- RFID Reader/Tag
- Actuators
- Arduino

C. Components

1) Arduino
2) IR Sensors
3) Liquid Crystal Display
4) AC Motor
5) RFID
6) SP8266 Wi-Fi Module

IV. RESULT

- A module has been developed based on microcontroller that consists of an ultrasonic sensor which is used for measuring the traffic density and to move the dividers automatically.
- When the signal turns red**,** the traffic density is measured and the action should take place before the signals turns green.
- If the traffic density is high then the divider moves to low traffic side and road gets widened for high density side.
- If the traffic density is normal then no type of action is taken and alerts a message stating traffic normal.

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V. CONCLUSION

The movable divider is capable of providing extra lanes with certain specified width to traffic congested side of road, by acquiring one lane of another side which carries light traffic at that time. Provision of lanes to a congested side totally depends on 'either another directing side of the road is also congested or not?' Thus by providing the suggested mechanism, we can use the width of the road to its full efficiency.

The divider is said 'Smart' because it can detect the congestion through sensors and thus microcontrollers sends signals to divider to slide. So, basically movable divider is used to solve problems of traffic congestion on one side of the road with other side is free from heavy traffic. By doing this we can use road width at its full efficiency without widening of road which ultimately helps to preserve acquired land for other purposes besides of road from the unnecessary widening of road, which also leads to reduce cost of the widening of road, land acquisition and compensation.

VI. REFRENCE

1) https://en.wikipedia.org/wiki/Traffic_barrier
2) https://www.google.com/search?q=dahisar+check+naka+images&rlz=1C1RXQR_enIN974IN974&oq=dahisar+check+naka+images&aqs=chrome..69i57j0i22i30l2.13729j0j7&sourceid=chrome&ie=UTF-8
3) https://www.passco.de/en/home/faq/steel-safety-barrier-installation/
4) https://akstudysource.com/traffic-studies/
5) www.ijcstjournal.org

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PAVEMENT DESIGN ON LIQUIFIED SOIL

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[1,2,3,4]Student and [5]Professor, Department of Civil Engineering, Theem College of Engineering, Boisar

ABSTRACT
The research presented in this paper introduces a new liquefaction mitigation measure, "Induced Partial Saturation (IPS)", which will be a cost-effective and practical solution for new as well as existing structures. The liquefaction mitigation measure that is being explored improves earthquake resistance of loose sands by introducing some amount of air/gas in the voids of the sand. This research explores two different methods to introduce air/gas in the fully saturated sands. These methods include; generation of hydrogen and oxygen gases in the sand through electrolysis and air entrapment in the voids by draining and reintroducing water in the fully saturated sand. Uniform cyclic simple shear tests performed, using a shaking table, on air/gas entrapped specimens demonstrated that air/gas entrapment reduces the pore pressure build-up significantly, thus preventing initial liquefaction. Also, the tests performed on air entrapped specimens under vertical upward/downward and lateral flow regimes showed that air/gas bubbles remain entrapped in the sand. The research reported in this paper demonstrated that induced-partial saturation (IPS) in sands can prevent liquefaction and the technique holds promise for use as a liquefaction mitigation measure. Based on the observations and the results from the study being presented here, further research focuses on the development of a methodology for predicting liquefaction strength of the partially saturated sand specimens, to be applicable in practice, and on exploring the field application techniques

INTRODUCTION
Liquefaction occurs when the structure of loose, saturated sand breaks down due to a rapidly applied load. As the structure breaks down, the loosely packed individual soil particles attempt to move into a denser configuration. In an earthquake, however, there is not enough time for the water in the pores of the soil to leak. Instead the water is trapped and prevents the soil particles from coming into contact with each another. This is accompanied by an increase in soil water pressure, which reduces the contact forces between the individual soil particles, thereby softening and weakening the soil deposit, (University of Washington 2000). Many research attempts have been done to analyze the liquefaction phenomenon qualitatively and quantitatively. Several researchers attempted to investigate possible remedies to the different aspects of the liquefaction problem. This paper attempts to present some of these efforts and propose other types of investigations and ideas.

Liquefaction occurs when saturated and cohesion-less soils lose strength as a result of increased pore water pressures and thus decreased effective stresses caused by earthquake packing. Due to earthquake ground motion and some other dynamic vibration, liquefaction reduces the stiffness and hardness of soils. Liquefaction occurs in saturated fields, where water entirely fills the gap between individual particles. This water exerts a force on the soil particles, affecting how tightly the particles are packed together.

The phenomenon of liquefaction of saturated sand deposits is one of the most drastic causes of structural damage during earthquakes. If the soil is moist and largely unable to drain during shaking, loose sand continues to contract under the cyclic loading exerted by earthquake shaking, which may shift normal stress from the sand matrix to the pore water. As a result, the successful stress confining stress within the soil decreases, resulting in a lack of strength and stiffness that leads to soil deposit deformations.

I. LITERATURE REVIEW

1.) Dr. R.P.Rethaliya and Kanan Thakkar (P.G.Scholar, SPIT, Mehsana, Gujarat.) Volume - 5 | Issue - 1 | Jan Special Issue - 2015 |

According to them liquefaction is a phenomenon in which saturated cohesion less soil under oscillatory motion during earthquake loses all is shear strength due to pore water pressure and flows like a liquid.

Liquefaction occurs when the structure of a loose sand breaks down due to some rapidly applied to the structure breaks down, the loosely-packed indie particles attempt to move into a denser configurate earthquake, however, there is not enough time for in the pores of the soil to be squeezed out. Instead, is "trapped" and prevents the soil particles from closer together. [Increased water pressure is caused soil particle s trying to rearrange and pushing on the increased water pressure reduces the contact between the individual soil particles, thereby softening weakening the soil deposit.

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2.) Hadi Haeria, Vahab Sarfarazib , Alireza Bagher Shemiranic , Hoshang Poyan Gohard , and Hamid Reza Nejatie (Young Researchers and Elite Club, Bafgh Branch, Islamic Azad University, Bafgh, Iran) Received February 28, 2017:

This group of researchers have taken the sample of fine grained sandy soils and had further studied about their properties and by performing certain test they finally reach to the conclusion that, Prior to carrying out any measures for improving soil vulnerable to liquefaction, the type of soil and earth conditions in that region should be completely studied and the potential liquefaction rate of the soil should be completely specified. In order to better understand the condition after liquefaction, if feasible, rupture mechanisms in the previous earthquakes are studied and safety conditions necessary for the structure with regard to structure type and site conditions for the structure are provided. Also, in order to use an efficient rehabilitation method, the most efficient method for soil reinforcement is chosen with regard to soil type, grading curves, and economical considerations.

3.) Rupam saikia (Indian Institute of Technology Kharagpur) discussions, stats, and author profiles for this page was uploaded on Jan 2013

In this paper a review of the liquefaction potential studies of Guwahati city is endeavored. It has been more than 50 years from now Assam has not experienced an earthquake of intensity close to 8. But the study of the tectonic movements and faults has predicted a probable earthquake of magnitude close to 8 in near future. In such a scenario earthquake induced liquefaction has to be considered as a serious hazard to the people of Guwahati. So, a proper evaluation of the liquefaction potential of Guwahati city is necessary. As per two evaluations almost the entire Guwahati city is found susceptible to liquefaction on the contrary according to one analysis only 25 % results were susceptible to liquefaction. In this paper the common areas that were found to be vulnerable to liquefaction were figured out and the congruencies and differences in the previous evaluations were shown along with the probable reason behind these differences. It is also seen that in order to give a more precise evaluation of liquefaction potential further research is necessary as most of the analysis were based on simplified empirical methods.

4.) J. Chu (School of Civil and Structural Engineering, Nanyang Technological University, 2263 Singapore):

Researcher J. Chu have taken the sample of Dilating granular soils and had further studied about their properties and by performing certain test they finally reach to the conclusion that, Conventionally, liquefaction is studied under undrained conditions. An experimental study was carried out to investigate the liquefaction occurred under non-undrained condition. It was observed that a special type of liquefaction can occur before the failure is reached and can even occur for dense sand. Although pre-failure liquefaction is also mainly a result of generation of pore water pressure, it is essentially different from the liquefaction observed in undrained tests. Thus, the steady state approaches cannot be applied to this kind of liquefaction.

5.) E. E. Bayat1, M. K. Yegian, A. Alshawabkeh, S. Gokyer (WCCE – ECCE – TCCE Joint Conference: EARTHQUAKE & TSUNAMI):

Induced partial saturation (IPS) was introduced as a new cost-effective liquefaction mitigation measure which can be applicable for new as well as existing structures. Gas generation through electrolysis and air entrapment by drainage-recharge (D-R) were developed as the induced partial saturation techniques to prepare large partially saturated specimens in the laboratory. A liquefaction box that permitted the application of cyclic simple shear strains in large loose sand specimens using a shaking table was designed and manufactured. Fully and partially saturated sand specimens were tested under constant cyclic simple shear strains. The experimental results demonstrate that small reduction in the degree of a fully saturated specimen can lead to significant reduction in excess pore pressures generated in loose liquefaction susceptible sand, hence increases the liquefaction strength. Furthermore, large scale constant head flow tests were performed on large soil columns in vertical and lateral directions to investigate the endurance of air/gas bubbles in the voids. The test results led to the observation that air bubbles remained entrapped in the sand without any significant indication of diffusion.

A. AIM & OBJECTIVES

Aim: The main aim of this project is to design a pavement on liquified soil such as coastal sand by adding waste plastic and waste rubber in sub base of pavement layer.

Objectives: The use of waste plastic and rubber in road construction also solves the problem of their effective disposal. Besides that, the soil having necessary characteristics required to construct a pavement is fast depleting, thus increasing the cost of pavement resulting from the transportation of soil to the site. some recycled materials are allowed to be used for certain purposes in Britain, no standard includes definitions of these materials or the levels of acceptable contamination. The main aim of the research project was to examine

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the properties of recycled materials; it was expected that the conclusions would be a basis from which to develop the production of a standard for recycled rubber and plastic. We are adding this waste material in Natural subgrade

II. METHODOLOGY

The main aim of the research project was to examine the properties of recycled materials; it was expected that the conclusions would be a basis from which to develop the production of a standard for recycled rubber and plastic. We are adding this waste material in Natural subgrade

Mix Proportion

For this we have to take sample of coastal sand in the quantity as 25kg and we have to calculate CBR value of that sand.

Then we have to take waste such as waste plastic and waste rubbers. Then In first case we have to take 5kg soil sample and add 10% of both rubber and plastic waste and perform CBR test on it.

In second case we have to take 5kg soil sample and add 12% of both plastic and rubber waste each and perform CBR test on it.

In third case we have to take 5kg soil sample and add 5% of both rubber and plastic waste each and perform CBR test on it. In fourth case we have to take 5kg of soil sample and add 5% of rubber waste and perform CBR test on it.

CBR: The California Bearing Ratio test is penetration test meant for the evaluation of subgrade strength of roads and pavements. The results obtained by these tests are used with the empirical curves to determine the thickness of pavement and its component layers. This is the most widely used method for the design of flexible pavement.

In this method, the CBR values are used to determine the total thickness of the flexible pavement and the thickness of various layers. Fig. 29.5 give the design curves for different wheel loads and traffic condition the design curves are based on the data collected on a large number of pavements which performed satisfactorily. The curves give the required thickness of construction above a material of a certain CBR value. As it is evident, the required thickness of construction above a material decreases as the CBR value increases.

The Indian Road Congress (IRC) has recommended the design chart given in Fig. 29.6. The chart is similar to one used in U.K. The soaked CBR value of the subgrade is evaluated and the volume of the traffic is estimated. The total thickness of the pavement is determined using the appropriate curve. Likewise, the CBR value of the sub-base material is used to determine the thickness of construction over that material. Obviously, the thickness of the sub-base is equal to the total thickness above the subgrade minus the thickness of construction above the sub-base Likewise, the thickness of the base is determined.

Formula:

$$N = \frac{365 \times [(1+r)^{n}-1] \times A \times F \times D}{r}$$

Where:

N = The cumulative no. of standard axles (8160 kg) to be carried by the pavement during the design life in term of msa.

A = Initial traffic in the year of completion of construction.

$A = P(1 + r)$

P = No commercial vehicle as per last count.

D = Lane distribution factor. F = vehicle damage factor.

n = Design life in year.

r = annual growth rate of commercial vehicle.

x = no. of years of construction.

III. RESULT

FOR 110msa, 15 YEARS LIFE SPAN

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Sr. no.	TEST SAMPLE LIQUIFIED SOIL	C.B.R. (%)	THICKNESS OF PAVEMENT
1	SOIL	6.3	680
2	SOIL + 10% RUBBER + 10% PLASTIC	6.4	680
3	SOIL + 12% RUBBER + 12% PLASTIC	5.6	760
4	SOIL + 5% RUBBER + 5% PLASTIC	10	550
5	SOIL + 5% RUBBER	10.8	550

IV. CONCLUSION

After performing CBR Test on sand sample the

CBR value was 6.3% and pavement thickness for that is 680 mm, we keep this value of sand as our bench mark to compare our results with other mix proportions.

1.) In sample 1 we had added 10% waste rubber and waste plastic and got CBR value as 6.42% and thickness of pavement as 680 mm. There is no changes as compare to sand.

2.) In sample 2 we had added 12%of waste rubber and plastic and we got CBR value as 5.2%, and thickness of pavement as 760mm. which are higher than our bench mark and we need to increase pavement thickness by 11% as compare to bench mark. This result are less effective for our project point of view.

3.) In sample 3 we had added less amount of waste rubber and plastic such as 5% of waste rubber and plastic each, we can get CBR value as 10% and pavement thickness as 550mm. which are lesser than our bench mark and we can successfully reduce pavement thickness by 20% as compare to bench mark.

4.) In sample 4 we had added only 5% waste rubber and, we can get 10.8% CBR value and pavement thickness as 550 mm. Which is lesser than our bench mark an we can successfully reduce pavement thickness by 20%.

After comparing all Mix proportions, we can finally conclude that if we are adding 5% waste rubber with soil sample we can reduce pavement thickness by 20%, which means it is cost effective and we can use less construction material.

V. REFRENCE

1.) Bolt, Bruce. A., Earthquakes: A primer, pp.25-27, Publ. W.H. Freeman Company,1978.Castro, G., "Liquefaction of Sands", Harvard Soil Mechanics Series 87, Harvard University, Cambridge, Massachusetts, 1969.

2.) Committee on Earthquake Engineering, Commission on Engineering and Technical Systems, National Research Council, Liquefaction of Soils During Earthquakes, 1985.

3.) Committee on the Alaska Earthquake of the Div. of Earth Sciences, National Research Council, The Great Alaska earthquake 1964, Engineering, Geology, and Summary Volumes, National Academy of Sciences,1973

4.) Seed, H. Bolton, "Landslides caused by soil liquefaction", Eng. vol. P. 73 ff. Reprinted from Journal of Soil Mechanics and Foundations Division, September 1968, "Landslides during Earthquakes due to Soil Liquefaction".

5.) Seed, H. Bolton, Wilson, D. Stanley, "Turnagain Heights Landslide", Reprinted from Journal of Soil Mechanics and Foundations Division, July 1967, " Turnagain Heights Landslide, Anchorage, Alaska".

6.) Glaser, Steven D.; Chung, Riley M., "Estimation of Liquefaction Potential by In Situ Methods", p. 431, Earthquake Spectra, Vol. 11, No. 3, August, 1995.

7.) Holtz, Robert D.; William, Kovacs D., An Introduction to Geotechnical Engineering, publ. Prentice Hall, 1981.

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GENERATION OF OIL AND METHANE GAS BY USING WASTE PLASTIC

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ABSTRACT
Due to increasing population & rise in the standard of living of people, plastics have woven their way into our daily lives and now pose a tremendous threat to the environment. Over 368 million tonnes of plastics are produced annually worldwide, and the used products have become a common feature at over flowing bins and landfill. The process of converting waste plastic into value added fuels is explained as a viable solution for recycling of plastics. Pyrolysis runs without oxygen and in high temperature of about 300°C which is why a reactor was fabricated to provide the required temperature for the reaction. Converting waste plastics into fuel hold great promise for both the environmental and economic scenarios. Thus, the process of converting plastics to fuel has now turned the problems into an opportunity to make wealth from waste. The conversion of oil from plastic has dual benefits. First of all the oil and methane produced can be used as a fuel for domestic purposes and also in vehicles and industries when further refined. Secondly the various types of pollution caused due to waste plastics can be minimized.

Keyword: Polyfuel, Pyrolysis, Plastic, Methane.

1. INTRODUCTION

Waste disposal is one of the major problem being faced over the world and India is no exception. Plastics have become an integrated part of human life due to its adaptive and resourceful properties like cost effective, light weight, flexibility, durability and faster production rate. It is used I almost every field. Plastics are non-biodegradable polymers mostly containing carbon, hydrogen, and few other elements like nitrogen. Due to non-biodegradable nature, the plastic waste contributes significantly to the problem of waste management. As per the record provided by Central Pollution Control Board (CPCB) for the year 2018-2019 in Mumbai about 409 tonnes of plastic waste is generated per day of which only 90-110 tonnes of plastics are sent for recycling whereas in Maharashtra its around 409,630 metric tonnes per annum. In India the number rises to 34 lakh tons of plastic waste per annum the efficiency of plastic waste collection is 67% of which only 60% was recycled and more than 9,400 tonnes ends up in the seas, oceans or gets piled up on lands devoid of source segregation. Pyrolysis is a commonly utilized method for destruction of waste products. It is often considered as an alternative to incineration, wet oxidation and other treatment processes. The products of pyrolysis are typically gases, liquids and a solid char, although the process can be designed to avoid the formation of hydrocarbon liquids by having a secondary pyrolysis (cracking) stage. From the perspective of management of waste streams in a space environment, pyrolysis offers certain advantages as a means of solid waste Disposal. One significant advantage is the partial Decoupling of issues of CO2 management from the waste stream disposal problem, since some of the carbon will end up in the char residue and some will end up as CH4 and other hydrocarbons (as well as CO and CO2).

2. EXPERIMENTAL SET-UP

2.1 The Equipment's used for set-up

- A Iron Container
- 2 Plastic container for storage
- A bucket half filled with water
- PVC pipe of 15mm diameter
- 1ft Iron pipe of 20mm diameter
- 5-6 PVC pipe fitting
- Crushed HDPE waste plastic

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Fig. 1 Experimental set-up for pyrolysis process

3. METHODOLOGY

A plastic waste was collected from site. Firstly this plastic waste is needed to be identified according to there types and need to be segregated carefully as different plastic contains different properties with it. For this experiment we selected HDPE type plastic. Selection and segregation of types of plastic is very much essential and most important step. The segregated plastic waste is need to be crushed or shredded into the smaller particles of size around 1.2cm to 5cm. This shredded plastic waste is then filled into a furnace. This small particle must be filled properly and not much compacted and loosely filled.

A proper attachment and connection of the pipe should be made and it should be taken care properly that there should be no leakage from the joints. Special care of furnace should be taken as there are high chances of leakage from joints and any case of leakage may lead to setup failure. This furnace filled with granular plastic waste is then subjected to heat around 150℃ - 300℃ temperature. The continue heating for around 1hr 30 min to 2 hrs. is required for degradation of plastic waste and converting this solid waste into a steam (gaseous form). When this gas will pass through the pipe and settle in the 1st container which is already immersed in half filled bucket of water it will turn this gaseous steam into in the form of impure oil or polyfuel (liquid form) and will settle at the bottom of container. This polyfuel contain carbon contents along with it which makes it impure and requires to be refined. The remaining steam will again pass through PVC pipe and will be collected in 2nd container in the gaseous form as a methane. This process will be continued for around 2hr. The left out residue in the furnace will be char and some non-sticky, slippery material will be formed in 1st container in the form of grease.

Fig. 2: Polyfuel

Fig. 3: burning of extracted methane gas

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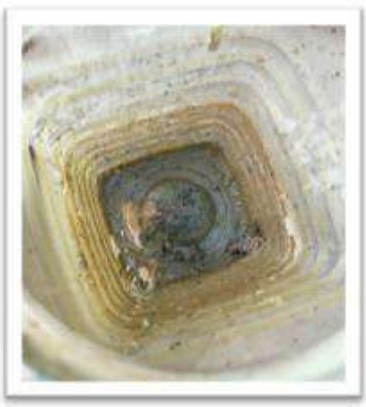

Fig. 4: Grease formation in 1st container

Fig. 5: Char

Bi-Products Obtained from Pyrolysis Process

Bi-Products	Polyfuel	Grease	Methane	Char
Extraction Quantity	620gm	153gm	---	568gm
Physical properties	• Cool in feel • Smell • Blackish colour • Flammable • Flash point (15˚C - 18˚C)	• Oily • Non-sticky/ slippery • Semi-solid •Whitish-yellow in colour	• Highly-flammable • Cool in feel • Smell	• Dark brown or black in colour • Smell • Semi-solid and Semi-liquid • High carbon content
Removal %	20.67%	5.1%	---	18.93%

Table: 1: Physical properties of Bi-products

4. RESULTS

In this experiment, where we took 3kg of shredded HDPE type plastic waste. Which was set for burning and the plastic waste was 100% burned with minimal pollution emission from it. As compared to open field burning of plastic this amount can be even negligible. Bi-product such as polyfuel, methane, grease and char was obtained which can be useful not only reducing the price of this fossil fuel but also can reduce the dependency for it on gulf countries. The Bi-product obtained are not in the pure form so it further requires refinery so that it can be used as per its requirements.

5. CONCLUSION

From the experiments on the HDPE pyrolysis, three types of products can be produced which include non-condensable gases, condensed liquid hydrocarbons and char. The distribution of the product varies greatly under different reaction conditions. Conversion of waste plastics into polyfuel can solve the problem of plastic waste recycling and the shortage of liquid fuel in developing countries like India, Brazil, Argentina, and Guyana etc. pyrolysis by using HDPE waste plastics can be done easily with economic means. The yield of the product can be increased by varying the process parameters like temperature, pressure, good investment etc. The fuel produced in this study was found to be comparable to the regular diesel fuel used in automobiles. So it can be concluded that the "Polyfuel" may be an alternative fuel of the future which can solve many issues thereafter. This process can be called as zero discharge process as no wastage is found in this technique.

The implementation of this project can develop so many opportunities in the city. It can be a solution to control waste plastic, develop a new technique or idea, and detect the source of diesel for the country. Bangladesh is such a country where this kind of project could be very promising and effective in the future the use of plastic pyrolysis oil in diesel engine in the aspect of technical and economical is compared and found that oil is able to replace the diesel oil. Though the plastic pyrolysis oil offers lower engine performance, the plastic waste amount is enormous and it needed to be process to reduce the environmental problems. Moreover, the engine can be modify follow the combustion condition of plastic pyrolysis oil. The waste plastic used in the process must be PE or PP or LDPE in order to protect the contamination of chlorine in the oil

6. FUTURE SCOPE

It has been found by many surveys and studies that the nature and volume of solid waste has been changing over time and with development of society. Popular cities of developed countries have more consumption of

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plastic waste and their quality. ex. Calorific value is much higher. In this situation energy from waste production process may help significantly to get rid of problem of waste management.

- The obtained fuel could be utilized in diesel generators, vehicles such as tractors.
- The fuel has to be refined at the industrial establishments, based on the results of which small scale industry can be established.
- As there is a high demand of crude oil and due to its sky reaching prices, we could take up this project to setup large or small scale industries and produce the fuel locally at much cheaper rates directly benefiting the National economy and also a step towards SWAACH BHARAT by recycling the waste plastics
- The application of this project could help in reducing the dependency on the gulf countries and promote a step towards innovation.

7. REFERENCES

[1] Sharmina Begum, M. G. Rasul, and Delwar Akbar, An Investigation on Thermo Chemical Conversions of Solid Waste for Energy Recovery,Vol:6, No:2, (2012),1307-6892/9976.

[2] S. T. Tan, H. Hashim, W. S. Ho, and C. T. Lee, Optimal Planning of Waste-to-Energy through Mixed Integer Linear Programming, Vol:7, No:6, (2013),ISNI:0000000091950263

[3] U.S. Department of Energy, Report on Waste-to-Energy from Municipal Solid Wastes, August 2019

[4] JuanA. Conesa, NúriaOrtuño & Damià Palme, Estimation of Industrial Emissions during Pyrolysis and Combustion of Different Wastes Using Laboratory Data,(2020) 10:6750

[5] Michael A. Serio, Joseph E. Cosgrove, and Marek A. Wójtowicz, Methane Production from Pyrolysis of Mixed Solid Wastes, July (2012), AIAA 2012-3567

[6] R.Jagadheeswari, P.M.Thamilppavai, R.Thamizhlakshmi, S.Thendral, Review Paper on Partial Replacement of Cement with Various industrial Waste, May (2020), ISSN: 2395-0056

[7] Yoichi Koderaa, Tetsushi Yamamoto, Eiji Ishikawac, Energy and economic-balance estimation of pyrolysis plant for fuel-gas production from plastic waste based on bench-scale plant operations, April (2021), 100016

[8] Hassan A. Arafat, Kenan Jijakli, Modeling and comparative assessment of municipal solid waste gasification for energy production, April (2013), 1704–1713

[9] O N Medvedeva, S D Perevalov, Mathematical Modeling of the Process of the Gas Generation and Gas Purification of the Biogas on Polygon of Residential Solid Waste, (2020), Earth Environ. Sci. 459 032004

[10] Changwei Liu, Pingyun Chen, Kewen Li, A 1 KW Thermoelectric Generator for Low-temperature Geothermal Resources, February (2014), SGP-TR-202

[11] T.Subramani, M.Nallathambi, Mathematical Model for Commercial Production of Bio-Gas from Sewage Water and Kitchen Waste, August (2012), ISSN: 2249-6645

[12] Ali, A. H., Abdul Razaq, Z., Tlaiaa, Y. andKhishala, A. D., Methane Biogas Production from Mixing of Algae and Municipal Solid Waste By Anaerobic Digestion, September (2016), ISSN: 1735-6865

[13] Mr. G R Narsimha Rao, Mr. T.Senthil Kumar, Mr. M Nagarajan, Mr. S Satish Kumar, Ms. U Swarna Lakshmi, Concept Paper on Power Generation from Municipal Solid Waste, September (2015), Project Report No. 2015IB33

[14] Saad Mohammed Khan, Rakiba Rayhana, Tahsin Hassan, Towfiqur Rahman4, Mohammad Mosaddidur Rahman, Study on the Electricity Generation from Municipal Solid Waste of Dhaka city, August (2015), ISSN: 2278-800X

[15] Ksenia Vershinina, Galina Nyashina and Pavel Strizhak, Combustion, Pyrolysis, and Gasification of Waste-Derived Fuel Slurries, Low-Grade Liquids, and High-Moisture Waste: Review, January (2022), Appl. Sci. 2022, 12, 1039

[16] Feng Gao, Pyrolysis of Waste Plastics into Fuels, (2010)

[17] Saba Seyedi, Kaushik Venkiteshwaran and Daniel Zitomer, Toxicity of Various Pyrolysis Liquids From Biosolids on Methane Production Yield, February (2019),fenrg.2019.00005

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REMOVAL OF OIL AND GREASE USING NATURALADSORBENTS

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ABSTRACT
There are several pollutants that can harm our environment. Oil and grease are one of the examples of a pollutant that can cause a severe environmental problem. The highest concentration of oil and grease inside the sewer system can cause the sewer to clog that can lead to overflow. It can affect not only to the environment but can also affecting our health. There are various methods of oil and grease removal that oneof the examples is by using adsorption method. This study objective is to determine the ability of adsorbents, which are sugarcane bagasse and banana pith, Honeycomb, Neem curry leaves, pineapple peels, organoclay

INTRODUCTION
Organic toxic waste (oil and grease (O&G)) causes ecology damages for aquatic organisms, plant, animal, and equally, mutagenic and carcinogenic for human being. They discharge from different sources to form a layer on water surface that decreases dissolved oxygen. O&G layer reduces biological activity of treatment process where oil film formation around microbes in suspended matter and water. This lead to decrease dissolved oxygen levels in the water. Then oxygen molecules are difficulty to be oxidative for microbial on hydrocarbon molecules and cause ecology damages to water bodies. The conventional techniques remove oiland grease using skimming tanks and oil and grease traps in treatment plants but the main disadvantage of these methods is their low efficiency of removal. The most important pollutants in the oil processing wastewaters are conventional pollutants such as oil and grease, suspended solids and pH, and non- conventional pollutants such as phenolic compounds, COD, sulphide and ammonia. Among these pollutants,oil and grease is one of the most complicated pollutants to remove. This paper summarizes available technologies to remove oil and grease, and should assist oil and grease discharges in compying with their effluent limits. A major challenge wastewater treatment comes from a category that includes emulsions or solids composed of esters of glycerol, fatty acids, or triglycerides derived from animal or vegetable sources.Stubbornly insoluble in water.

LITERATURE REVIEW
The conventional techniques remove oil and grease using skimming tanks and oil and grease traps in treatment plants but the main disadvantage of these methods is their low efficiency of removal. In view of water pollutants, they are becoming more complex and multi pollutants simultaneous removal is paid more and more attention to be removed. Recent composite materials such as aluminum oxide, nano particles, amorphous zeolite and laterite adsorbents are used to treat complex wastewater that have high adsorption capacities. With these points in view, the present research studies new approach to degrade toxic waste (oil and grease) form industrial wastewater. The work presented lipase hydrolysis stage using Pseudomonas strains as a producer of lipase and assess their degradation capabilities. This approach included enzyme unit coupling with adsorbent materials as efficient method to complete removal. Adsorption technique uses zeolite (laterite and amorphous materials) as easily and cheaply available adsorbent. Over the years, oil spill contaminations has become a major hazard to the environment especially the marine areas thus drawing vast consciousness to the researchers as it is an appalling problem that set both the marine life and

ecosystem at atrocious danger. The term ‘oil spill’ is usually applied to marine oil spills, where oil is released into the ocean or coastal waters when oil is manufactured, stored, and shipped but spills may also occur on land. If oil is explored, transported, stored and used too widely, the space to spill it will cause a severe problem and impose serious damage on the environment. Oil spills may be caused by the release of crude oil from offshore platforms, tankers, drilling rigs and wells, fuels used by large ships such as bunker fuel, or the spill of any oily byproduct or waste oil by household. This affects the cleanliness and allure of the ocean or coastal waters, and the survivalof the marine life. Regardless of the optimum efforts to control oil spill, it is not impossible for theoil to pollute shorelines of the ocean and reservoirs, and the edges of watercourses and brooks. To assist in preserving these water resources from destruction for our future generation and for the sustainability of various marine species, the cleanup of the water resources especially the ocean is crucial. Thus, a well-organized system is extremely vital for the retrieval of the spilled oil.

METHODOLOGY
Fresh pineapple that bought from market was peel off. The peels were washed and chopped into small pieces. The peels were dried under direct sunlight for 5 hours and 30 minutes in air oven at 60 °C. Dried pineapple peels were weighed using an analytical balance and was placed in 500 mL beaker. The samples were then rinsed

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with distilled water and soaked with acetic acid for 30 minutes at room temperature to neutralize the sample . The treated samples were ground using mechanical grinder and were sieved to get the finest powder for the next step of the experiment. Along with the pineapple peels there were 2 more adsorbents which were experimented i.e neem and organoclay. The setup of 20litres of water was used in which 20ml of oil was immersed which was let out through the kitchen waste along with it we have used lubricants used from the garage. This was then allowed to pass through 100 ml beaker with the natural adsorbents used neem, pineapple peel, organoclay. This were kept for some time for the observations. At 4hours of interval four readings were taken on which based calculations were done.

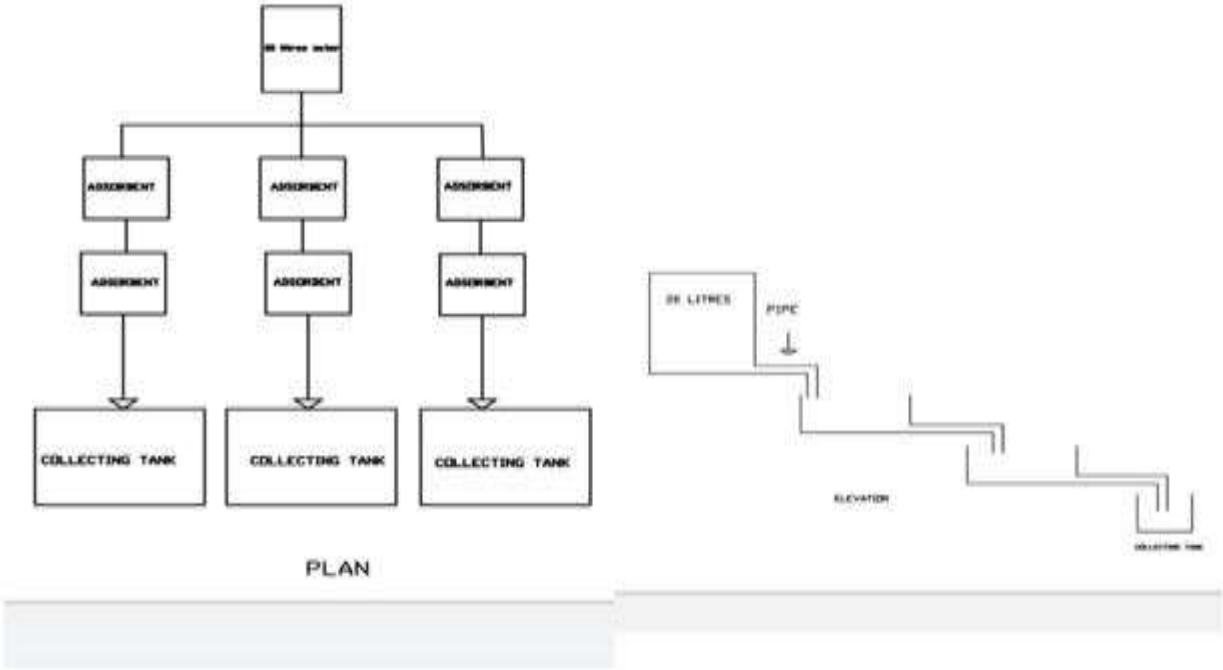

Fig 1.1 Experimental Layout

ADSORBENTS	TIME (INMINS)	VOLUME	DOSAGE of adsorbent gm/100ML	% REMOVAL
NEEM	20	20LTS	0.5	49.9
	40	20LTS	1.0	63.35
	60	20LTS	1.5	78.81
	80	20LTS	2.0	87.90
PINEAPPLE PEEL	20	20LTS	0.5	24.40
	40	20LTS	1.0	41.80
	60	20LTS	1.5	55.69
	80	20LTS	2.0	87.20
BENTONITE	20	20LTS	0.5	33.49
	40	20LTS	1.0	43.6
	60	20LTS	1.5	68.75
	80	20LTS	2.0	69.03

RESULTS AND CONCLUSIONS

In this study, pineapple peel waste was productively prepared by soda treatment method for oil adsorption for the cleanup and recovery of spilled oils. The oils can be speedily removed from water surface by affixing the pineapple peel waste in oil and water mixture, and the oil sorption capacity of the pineapple waste is in the range of 19.5% - 752%. Furthermore, it can be explained that the viscosity of oil affects the percentage of oil removal by adsorbent capacity. The viscosity of lubricant oil is 0. 213Pa.s while cooking oil is 0. 073Pa.s according to Li et al., (2012). The used lubricant oil has a higher viscosity hence, can remove higher amount of oil. The pineapple peel waste is collected easily from water surface, and the absorbed oil can be kept in the pineapple peel waste assembly well in the form of semisolid after removing oil-loaded pineapple peel waste from water surface. This pineapple peel waste, which has the advantages of low cost, abundant, high sorption capacity, and fast sorption rate, may be a promising substitute for synthetic oil absorbing fiber used for oil adsorption and for the removal of spilled oil.

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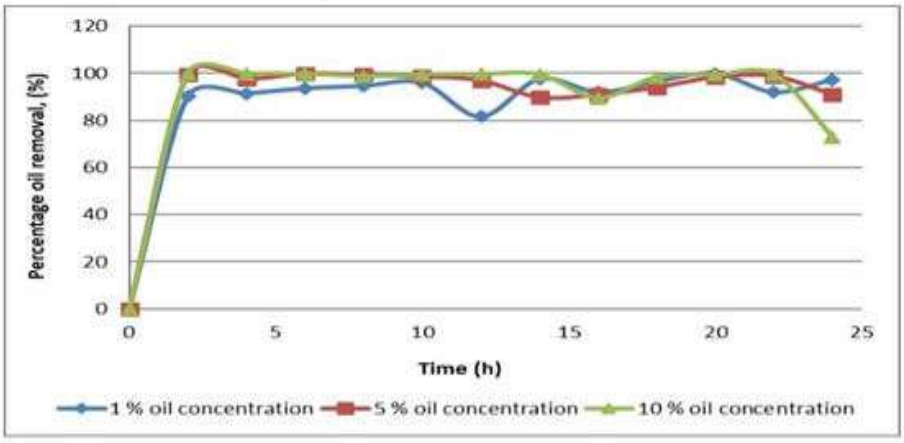
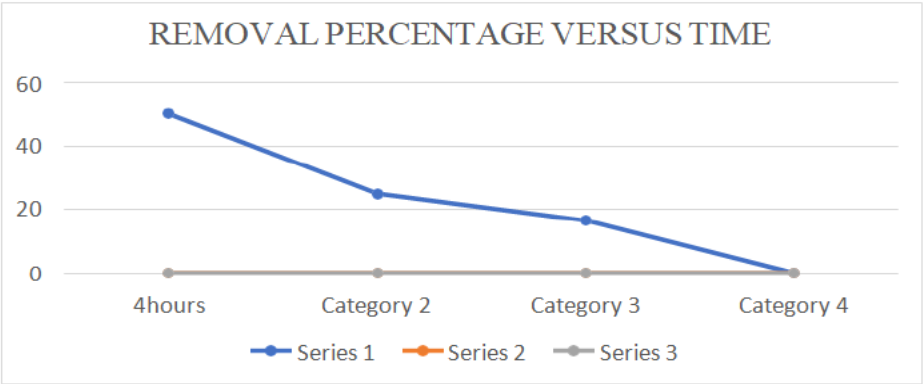
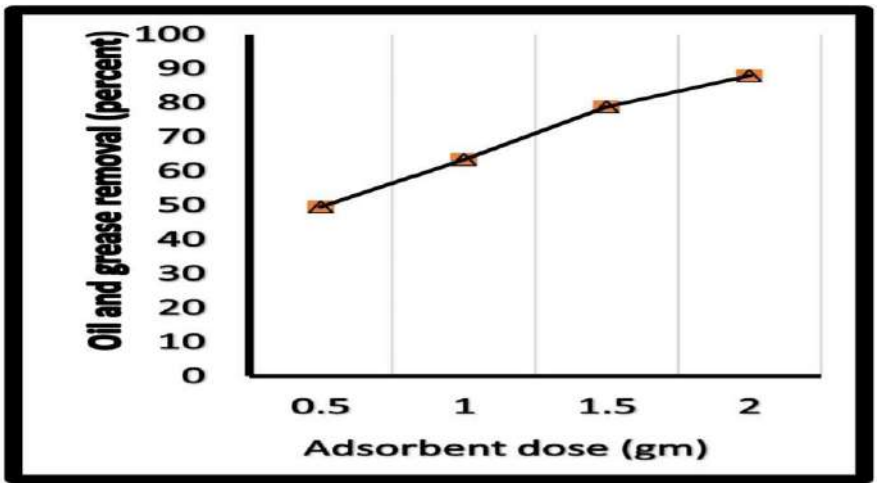
Graph: Shows the Removal %



Bentonite



Pineapple



NEEM

REFERENCES

[1] Abdullah, M.A., Rahmah, A.U., Man, Z.,. Physicochemical and sorption characteristics of Malaysian Ceiba pentandra (L.) Gaertn. as a natural oil sorbent. J. Hazard. Mater.(2010) 177, 683-691.

[2] Wang, J.T., Zheng, Y.A., Wang, A.Q., 2012. Effect of kapok fiber treated with various solvents on oil absorbency. Ind. Crops Prod. 40, 178-184

[3] Adebajo, M.O., Frost, R.L., Kloprogge, J.T., Carmody, O., Kokot, S., 2003. Porous materials for oilspill cleanup: a review of synthesis and absorbing properties. J. Porous Mater. 10, 159-170.

[4] Maheshwari, C. U., Reddy, K. O., Muzenda, E., Guduri, B. R., Rajulu, A. V. (2012). Extraction and characterization of cellulose microfibrils from agricultural residue - Cocos nucifera L. Biomass and Bioenergy, 46, 555-563

ISSN 2394 - 7780

[5] Walter, J. & Wiber, J. (n.d.) Adsorption process. P.375-392.

[6] Li, M., Wang, L., Li, D., Cheng, Y., Adhikari, B., (2014). Preparation and Characterization of Cellulose Nanofibers from De-Pectinated Sugar Beet Pulp. Carbohydrate Polymers 102, 136-143.

[7] Paul, B., & Moulik, S., 2015, Ionic liquid-based surfactant science: Formulation, characterization and applications.

[8] Vieira, R., 2014, Alternative minerals- potential for Guyana (Part 1). Guyana Geology and Mines Commission.

[9] WITS (2021). World Integrated Trade Solution, Guyana Clays; bentonite, whether or not calcined imports by country in 2018.

[10] BCDHE, 2021, Barnstable County, Department of Health and Environment, Grease and oil in restaurant wastewater. [ONLINE] https://www.barnstablecountyhealth.org/resource s/publications/compendium-of-information-on-alternative-on site-septic-system-technology/grease-and-oil- in-restaurant-w wastewater.

[11] Stabroek News, 2014, GWI urges installation, cleaning of grease traps after manhole accident, [ONLINE] https://www.stabroeknews.com/2014/02/05/news/guyana/gw i-urges-installation-cleaning- grease-traps-manhole-accident/.

[12] O'Shields, S., 2019, FOG (Fats, Oils and Grease) Pollution. Factsheet/HGIC 1878, [ONLINE] https://hgic.clemson.edu/f actsheet/f-o-g-fats-oils-and-grease-pollution/

[13] Sariyer Council, 2021, Never pour away used cooking oil, [ONLINE] https:// www. bis. k12. tr/ Page Gallery Files/Files/60 35_Recycling%20of%20Cooking%20Oil.pdf.

[14] Chu, W., & Hsu, W., 1999, Pollution source identification and waste loading reduction at Chinese fast-food restaurants. Journal of Environment International, 25(1).

[15] FOG Toolkit, FOG Program, 2021, Fats, Oils and Grease. FOG program booklet. Clean Water Services

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ENERGY UTILIZATION OF KINETIC PAVING TECHNOLOGY

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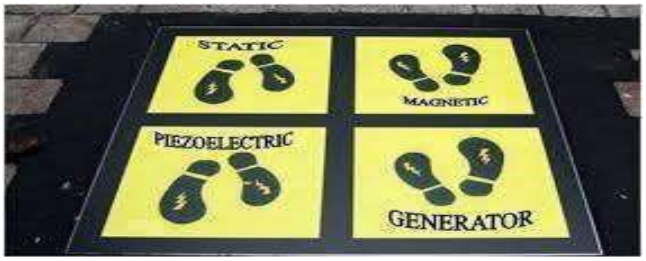
ABSTRACT
Nowadays, India is the developing country and now a days the demand for energy has been increasing at an alarming rate and there has been a decrease in the availability of energy resources electricity has become a priority in daily life and can even be considered as a primary human need. On the other hand, the excessive use of electricity or energy and the increase in population is one of the factors that can increase energy requirements. In Indonesia, the use of electricity comes from very limited natural resources. Therefore, energy savings should be implemented, either by using as necessary or even making an update that can sustain existing electrical energy. Apart from saving energy, it would be better to create new energy with minimal effort. Like producing energy from daily human activities, one of it is walking. The result is the creation of Kinetic Paving material technology that when people step on it will produce electricity. The benefits of this technology can create electricity that can be used for the environment of this kinetic paving. As for lighting in paving as lighting art or as a source of energy for surrounding buildings. Kinetic Paving is applied in pedestrian traffic spaces. This energy is expected to help the community and the surrounding environment. This is an update that should have been implemented. When natural resources are getting low and energy prices are getting higher, we need all these reforms.

I. INTRODUCTION

The population in India is increasing each day. Therefore, the needs are also increasing. One of them is the need for electricity. Electricity is now a primary need in daily life because many things are done every day using electricity. The use of electricity in the house or other building functions is not effective where the excessive use of electrical energy. So that the energy spent is very much and not proportional to the energy produced. So that resources are increasingly depleting. Therefore, we need technology that can create its energy. To produce electrical energy, the easiest method is the result of the transformation of kinetic energy. The kinetic energy that is easily obtained in the middle of the city is the movement of the human itself. It can be concluded that human energy in walking can be used as kinetic energy which will be a source of electrical energy. India is one of the countries with quite a large number of young people. Youth tend to have more outside activities than other groups. So that at some point the place is quite active with the activities of this young man. This can be an advantage in terms of creating electrical energy from kinetic energy.

Previous research has shown that excessive use of energy will lead to the extinction of natural resources and the possibility of fossil fuels and oil will be depleted around the 21st century. What is needed in this research is kinetic paving which is connected to a USB port and street lights. The top surface of the paving uses materials from recycled mattresses, athletic tracks or tires where the material is flexible. Installation of kinetic paving is quite easy because there is no need for excavation and it must be in an area with a high pedestrian level.

One alternative source of energy generation could be human energy harvesting, where the source of energy generation is energy expended by the human body such as work in everyday activities such as walking, opening doors or even typing etc. Much research has been carried out in the field of personal energy generators, where a device is attached to an individual and the generated energy used for portable loads. Recently however, there appears to be a trend towards developing devices embedded in the urban environment, and provides the focus of this thesis.



II. PROBLEM STATEMENT

1) Clean, renewable and environmentally friendly energy generation has always been an issue that needs to be solved. Technologists have created various methods such as solar panels, wind turbine, hydro electricity etc.

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However, Pavegen has come up with another innovative idea, which is to generate electricity from kinetic energy.

2) Pavegen tiles is a device that generates electricity by converting kinetic energy that is obtained when mechanical stress is applied on the device. When someone steps on the tile or moving vehicle's, a certain amount of energy will be generated and stored in the built-in battery, which will use for power low energy consumption appliances such as street light, mobile battery charger, small electric vehicle's, street indicators, etc.
3) Pavegen Company state that the durability of its product is 20 million steps. Each footstep on a tile can generate about 3-4 watts per hour on average. And by vehicle it can be generated upto 8 watts.

III. METHODOLOGY

Piezoelectricity, discovered by Curie brothers in 1880, originated from the Greek word “piezenin”, meaning to press.

A force is applied along a neutral axis (y) of a crystal and the charges are generated along the (x) direction, perpendicular to the line of force. The amount of charge depends on the Geometrical dimensions of the respective piezoelectric element. The pressure applied.

Present day we are using asphalt roads (Tar road) on which thousands of vehicles run on it. When a vehicle passes over a road, the road deflects (vibrates) vertically. These vibrations are released as thermal energy which is being wasted.

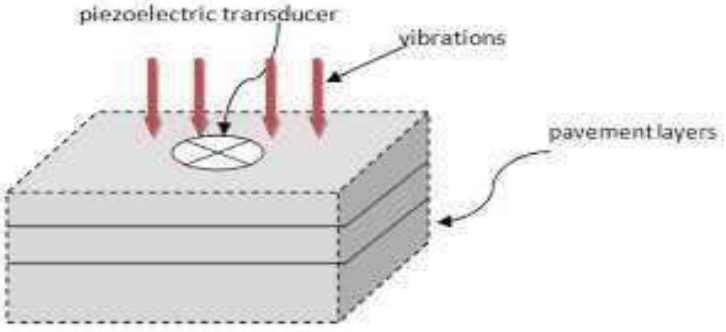
The first layer is laid with fine gravel and sand content. Then a thin layer of asphalt is laid which acts like a strong base for the generators. Piezoelectric generators are placed in quick drying concrete and left for 30min.

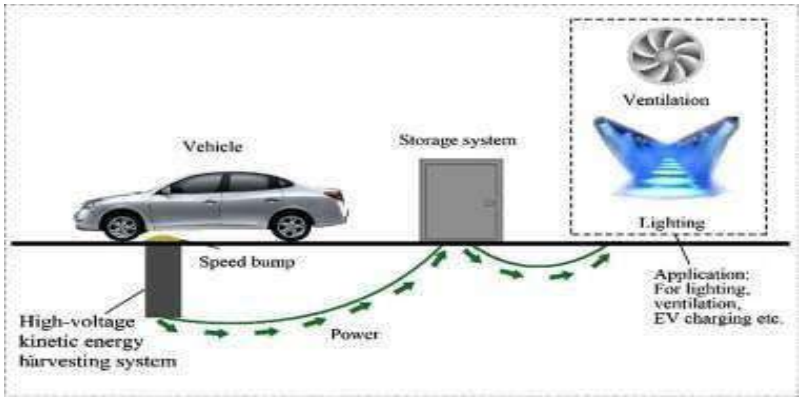
Then all the generators are wired in series to get collective output. A bitumen sheet is used to cover all the generators to provide better adhesion of concrete to asphalt. Finally a thick layer of asphalt is laid which finishes the construction.

Generators harvest the mechanical energy of the vehicles and converts to electrical energy. Then it is charged into the battery on one side of the road. From there it is distributed. Yield:

For one km of piezoelectric road of one lane we can generate 44000 KWh/yr.

This is a green solution for power generation. It is relatively inexpensive and easy to install. Even the most untouched and remote areas can be electrified. Dependence on thermal electricity is minimized which in turn saves the nature.This Technology is also applicable to airport runways and rail systems.This is an excellent alternative to reach the increasing demands for electricity. It should be implemented in India also to accelerate the development.





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IV. CONCLUSOIN

Paving kinetic when viewed on environmental aspects, there are many positive aspects. Starting from the energy source, namely the power from the footrest that previously did not mean anything, but after the existence of this paving kinetic technology, the power from the footing is very meaningful because of the source of kinetic energy for this technology. The Pavegen technology used in the installation of flooring that transfers the kinetic energy of pedestrians into electrical energy and data. As people step on the top surface, their weight causes generators underneath the tiles to rotate, generating off-grid power via electro-magnetic induction. The walkways are equipped with wireless technology to transmit data on how people are interacting with them. We also connect to people's smartphones, showing how much energy is being harvested and converting this into rewards and permission-based relationship data. Launching a new technology that operates in urban environments was always going to be challenging. Unlike an app, we're designing and building a complex physical product that must operate reliably in all conditions. City streets are constantly undergoing challenges, from extreme temperature variations to a wide range of forces and impacts. Engineering this versatility into our system has been a big challenge, and it has been a highly iterative process to get to where our design is today. Our latest model comes as a modular system to simplify the installation process. It is retrofitted and easy in maintenance. When stepped on, the tile surface flexes between 5-10mm. This downward pressure creates a rotation in the electro-magnetic generators beneath, producing around 3 joules per footstep or around 5 watts of continuous power while the person is walking. We can either store that energy in batteries or use it to power local applications such as lighting, sensors and data collection and transmission.

V. REFERENCE

Mohammadreza Gholikhani1, Syed amid Tahami1, and Samer Dessouky11Department of Civil and Environmental Engineering, University of Texas at San Antonio, San Antonio: **- "**Harvesting Energy from Pavement Electromagnetic"

Dr. Zahid Hossain, Arkansas State University, USA.Professor Christiane Raab, EMPA Laboratory for Concrete and Asphalt in Duebendorf, Switzerland: "International research of Pavement and technology".

Al-Qadi, I. L., Brandon, T. L., Smith, T., and Lacina, B. A., "How Do Geosynthetics Improve Pavement's Performance," Proceedings of Material Engineering Conference, San Diego, CA. 1996, pp. 606-616. "Utilization of Rubber Waste in Construction of Flexible Pavement".

Ali W Ibrahim S, "Power Enhancement for Piezoelectric Energy Harvester," in Proceedings of the World Congress on Engineering, 2012. Kumar P, "Piezo-Smart Roads," Journal of Enhanced Research in Science Technology & Engineering, 2013. "Energy Harvesting from Road Pavement: A Cleaner and Greener Alternative".

L.Pavan Kumar, C.Chinna Suresh babu, M.Vineetha, S.Surya, 5A.Suman "An Experimental Study on recycled plastic paving stone"

S. Kanuganti, R. Agarwala, B. Dutta, P.N. Bhanegaonkar, A.P.Singh, A.K. Sarkar, Road safety analysis using multi criteria approach: a case study in India, 2017." Pavement condition assessment using soft computing techniques".

Archit Hardikar, Omkar Borhade, Swapneel Wagholikar, Abhishek Shivdeo, Rohit Bhikule. "Comparative Analysis of Tiles Made from Recyclable LDPE Plastic Waste."

Ralph Haas1, W. Ronald Hudson2 and Lynne Cowe Falls**.**"Evolution of and future challenges for pavement management".

Nurulain C. M.1, Ramadhansyah P. J., Norhidayah A. H "A Review of Advance

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FORMATION AND COMPARISON BIOMEDICAL WASTE BRICKS

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ABSTRACT
Bricks are most important construction material ,but there are so many different type of brick but we trying to make a brick by using biomedical waste like surgical mask ,ppe kit ,due to the covid pandemic them biomedical waste numbers are increase in large amount , we are going through another big crices in called biomedical waste crises , so we decide to make brick to reduce biomedical waste and also give a another option to people to save the environment .this brick in standard size and also give better strength than mud bricks ,the price of this brick will be less because it made by paper waste , surgical mask ,ppe kits , and binding agent.

I. INTRODUCTION
Since ancient days from stone age to modern days age humans need food, cloths and shelter out of three needs of humans shelter that means house building is placed a prominent need. to build a house building humans choose mainly types of materials for the construction but during time course since olden days according to the house building after developed some civilization man build dams canal along with house building.all these built to modern construction main item and materials is the brick in time to time making of brick man developed some sophisticated technologies. Basically in making of brick clay and soil is the main material and ever standard materials but in modern days we making cement brick by using and mixing some chemical admixtures and formulas, and in recent age we are using light weight cement bricks for the structures of the building. these light brick are most used for the building of multi storied building. an effort for an alternative investigation the manufacturing of the brick was accomplished. By using industrial byproducts like fly-ash, silica fume, lime, gypsum, stone dust as key ingredients. In india thermal power plants are generating fly-ash in large quantities. industrial waste are hazardous in nature, their disposal is of major concern. recycling such a waste by utilizing them in to building materials is a modern solution for the pollution issues. So we are making an economical and eco-friendly brick which will provide good strength with standard size.

II. LITERATURE REVIEW
the mask wastes are increased across the world as the people are not following the appropriate disposal methods for the used mask. Thus, it creates a new environmental challenge. Further, there are no appropriate mask or plastic waste collecting method specified in whole countries or part of the region in sri lanka, india, pakistan and china (sangkam 2020). This is adding a vast amount of plastic and plastic particle waste in the environment, which may end up in the streets and landfills. Besides, it gets into the waterways and reaches the fresh water and marine water. This adds the presence of the plastics into the aquatic medium. The health and environmental effects of plastic and plastic particles due to the inappropriate disposal of facemasks were also highlighted by number of literatures. Furthermore, the production of the face masks also contributes the emission of co_2, which will potentially con- tribute to the global warming . the processes of propylene, small aluminum strips and polypropylene in the production of n95 and surgical mask contributes the significant amount of co_2 emission to the environments. Furthermore, production of fabric, sewing and weaving process of cloth mask fabrication also contributes the co_2 emission to the environments .the n95 mask production release 50 g co_2-eq per single mask, excluding the transportation. Surgical mask is embodied with 59 g co_2-eq per single and the highest share is from the transportation process. Whilst, the cloth mask production contributes about 60 g co_2-eq greenhouse gas emission per single mask. However, this would create a massive impact to the atmosphere because; millions of face masks are pro- duced all over the world to control the pandemic situation. The face masks used by medical examiners in hospitals are carefully collected as its hazardous waste. A study was conducted in the uk and analyzed that if each individual uses one disposable surgical mask every day for a year, this would create over 124,000 tons of unrecyclable plastic waste 66,000 tons of contaminated waste and 57,000 tons of plastic packaging. However, there is currently no specific waste stream for these products if it used by the public. Mostly, it is thrown recklessly in the streets or collected as a mixed waste. In the handling of urban solid waste and hazardous medical waste, the pandemic has led to a significant challenge. The collected hospital face masks and other mixed waste are sent to the incineration and landfill. However, due to the existence of the plastics in the mask, such methodologies often have the potential to cause adverse environmental effects. Most plastics are chemically stable, resistant to corrosion and, dificult to degrade by microorganisms yet they prefer to remain in the soil and pose environmental

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threats. The solution that allows the chemical energy content of plastics to be recovered for useful purposes is the incineration of medical waste coupled with waste heat recovery. for medical waste incineration, the who has suggested 900 °c and 1200 °c to guarantee safe destruction, but most of them are unaware of the temperature range however, with heat recovery, there are limitations to the widespread use of incineration. Public worries about dioxin and furan trace emissions can become trouble some. the transportation of those waste to relevant disposal site also consume energy and release greenhouse gases to the environment. recent study by stated that 10 ton of ppe waste including face masks travelled 10 km for the relevant disposal site resulted in total global warming potential (gwp) impact of 2.76 kg co_2-eq. the mask littered in the soil can impact the fauna in which it causes entanglement and can cause death for instance, it is reported in columbia that a bird was tangled in a discarded corona virus facemask in a tree. then died after the mask is wrapped around its **body and beak . further,when the mask is mistaken for food.**

A. AIM & OBJECTIVES

Aim: Making bricks by using biomedical waste

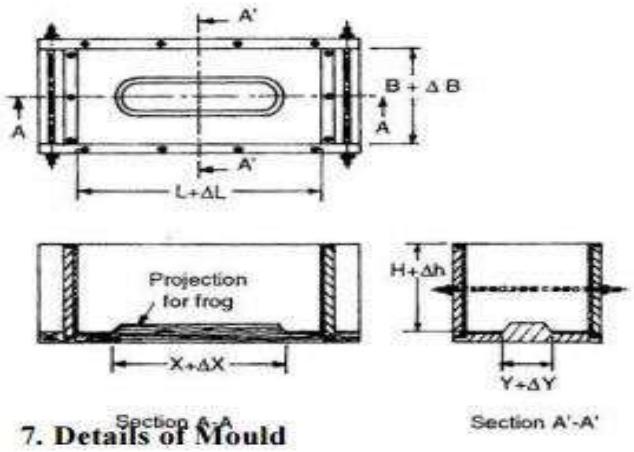
OBJECTIVES

1. To make eco-friendly brick.
2. To increase strength of brick.
3. To reduce the biomedical waste (mask, ppe kit).

Reduce cost of construction.

III. DESIGN METHODOLOGY

In this project our main aim is to reduce covid waste and use it of the construction ,so firstly we started to collect some information about covid waste and we get know that covid waste using for construction is very dangerous .so we firstly collect covid mask with full precautions and we disinfect covid mask by disinfection process and after that we collect paper waste and cut mask and paper waste in small pieces after that the pieces of mask soaked in water for 48 hours and paper waste soaked in water for 24 hours after all this process are raw materials are ready to use and we used cement as binding agent.we make different samples of brick and perform some test on them to cheak their compression strength ,water absorption and compare the with mud brick and fly ash brick by this way we make brick by using some covid related waste try to reduse some covid waste which is very harmful of nature and humans



7. Details of Mould

Matarial Containt Table:

Contains	Sample 1	Sample 2	Sample 3
Cement (in kg)	3.036	2.42	3.64
Mask waste (in kg)	1.214	1.21	1.21
Paper waste (in kg)	1.81	2.43	1.21
Water (in liters)	1.51	1.21	1.82

IV. Procedure

1) Make mould should of 230x110x85mm by using wood , steel.
2) Clean the mould properly.

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3) Mixed shredded mask, paper , cement in each other.
4) Apply oil in side of mould.
5) Fill the mould with mixture.
6) Lets the mould in sunlight for 48 hours.
7) After that carefully took out the brick from mould let it dry for 10 hours.

(**Filled Mould**)

V. OBSERVATION

1) **Compression Strength Test Table:**

No	Area (MM^2)	Load (N)	Compression strength = Load /area (N/MM^2)
Sample 1	25300	32000x9.81= 313920	12.40
Sample2	25300	30000x9.81= 294300	11.63
Sample3	25300	28000x9.81= 274680	10.85
Mudbrick	25300	15000x9.81= 147150	8.60
Fly ash brick	25300	29000x9.81= 284490	11.24

2) **Water Absorption Test Table:**

No.	Wet weight (kg) W1	Dry weight (kg) W2	Percentage = (w1-w2)/w2 X100
Sample1	2.17	1.92	13
Sample2	2.8	2	9
Sample3	1.99	1.8	10.55
Mud brivk	3.5	3	16.66
Fly ash brick	2.8	2.5	12

3) **Various Test Comparrison on Bricks:**

Test	Sample 1	Sample 2	Sample 3
Size and shape	230x110x85	230x110x85	230x110x85
Compression test	12.40	11.63	10.85
Water absorption test	13	9	10.3

4) **Comparison With Mud Brick and Fly Ash Brick:**

Test	Sample1	Sample2	Sample 3	Mud brick	Fly ash brick
Size and shape (MM)	230x110x85	230x110x85	230x110x85	190x90x90	230x110x75
Compression Test (N/MM^2)	12.40	11.63	10.85	8.60	11.24
Water Absorption Test (%)	13	9	10.5	16.66	12

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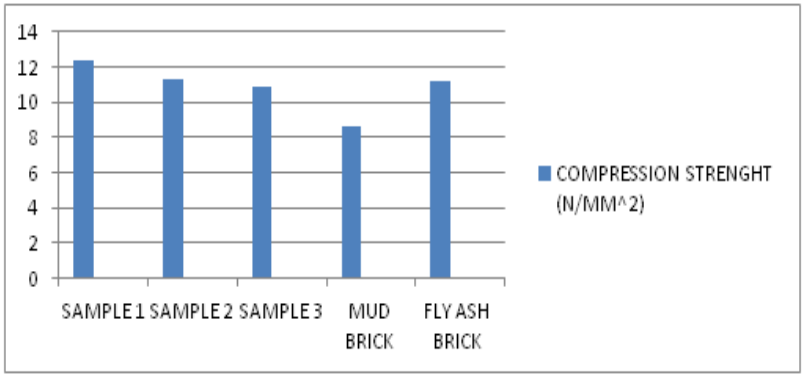
5) **Bricks Price Comparison**

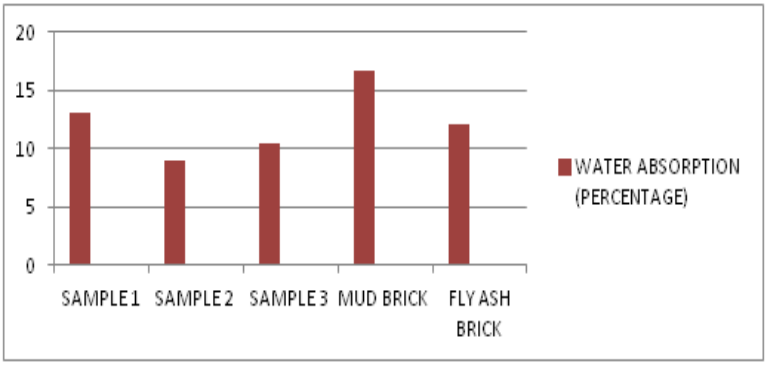
Types of Brick	Size and Shape (MM)	Price of Brick (Rs)
Fly Ash Brick	230x110x75	7
Mud Brick	190x90x90x	10
Sample 1	230x110x85	8
Sample 2	230x110x85	7
Sample 3	230x110x85	8.5

VI. RESULTS & DISCUSSION

1. Compression Strenght Graph



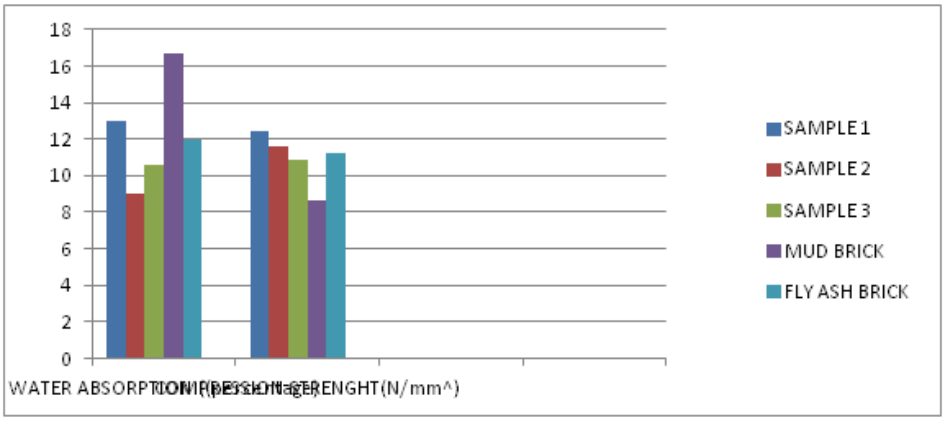
2. Water Absorption Graph



❖ DISCUSSION

1) Water absorption of all brick samples if less as compared to mud brick.
2) Sample 2and sample3 water absorption is less than fly ash brick.
3) The compression strength of all samples is high as compared to the mud brick.
4) Sample 1and sample 2 compression strength is high compared to fly ash brick.

3. Water Absorption and Compression Strength Comparison of Each Sample With Mud Brick and Fly Ash Brick:



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VII. CONCLUSION

1) To Reduce Biomedical Waste

The main aim of the project is to reduce the biomedical waste like (mask,ppe kits),by using mask as material we reduce some infections mask waste the waste which is very harmful for environment .

2) High Compression Strength

The compression strength of brick is high as compared to mud brick, and its almost equal to the strength of fly ash brick. Its shows that the brick strength is also high.

3) Economical and Eco Friendly Brick

By using paper waste and mask as materials it reduce the cost of brick. The brick will used not only reduce the cost but it also helps to reduce the cost.

4) Reduce The Cost of Construction

By using mask and paper waste the cost of brick is less as compared to mud brick and fly ash brick. this brick gives high strength low cost ,so by using this brick in construction, it will reduce the cost of construction.

VIII. REFRENCE

1. https://www.who.int/
2. https://cpcb.nic.in/covid-waste-management/
3. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5784295/
4. .https://www.mumbaiwastemanagement.com/

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SIMULATION AND HARDWARE DESIGN OF SINGLE PHASE FIVE LEVEL ACTIVE NEUTRAL POINT CLAMPED CONVERTER

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ABSTRACT
This Project presents a Simulation and Hardware style of Single section Five-Level Active Neutral Purpose Clamped Converter. so as to get construction output voltage wave-forms, a switch strategy supported through switch angles is explained. Simulation and Output results of construction voltage wave-forms are given for 5 levels. Five-Level Active Neutral Purpose Clamped Convertor is shown during this project and therefore the steps to synthesize the 5 level voltages are given. The Simulation diagram and triggering diagram of the circuit is explained. We have a tendency to are victimization MATLAB/Simulink for simulation of Single section Five-Level Active. Neutral purpose Clamped converter. This topology we have a tendency to use power Switches (MOSFET) as a covering device and check performance of resistive load and output wave form.

I. INTRODUCTION

A medium voltage drives in industrial applications. In order to obtain the best performance in medium voltage and high-power electrical transmission, dv/dt and harmonics should be minimized. By introducing more output voltage levels. This puts forward the theory of multi-level inverters for industrial drives to overcome the above short comings. The voltage generated at high frequency and low switching frequency has almost no distortion. Multi-level inverters play an important role in high performance and medium voltage conditions, such as rolling mills, SVCS, HVDC pumps, blowers, compressors, etc. It plays a role in the electronics field and is widely used in industry and renewable energy to convert direct current to alternating current. It can not only provide high performance, but also use renewable energy. Various configuration can be used for shaping multi-level inverter multi-level inverter with diode clamp multi-level inverter with floating capacitor clamp multi-level inverter with cascaded H-bridge flying capacitor multi-level inverter use attached to the circuit breaker Capacitor Voltage level. This design allows the inverter to provide high power, especially in the case of a power outage due to the reduced switching state provided by the holding capacitor.

The demand for high-voltage and high-power converters that can generate high-quality signals through low-voltage devices and lower switching frequencies has led to the development of multi-level inverters that take into account the voltage limitations of semiconductor power switches. The capacitor voltage source generates a stepped voltage at its output. By switching the switch, the capacitor voltage can be added, and a high output voltage can be achieved, while the power semiconductor only needs to withstand a low voltage.

II. LITERATURE SURVEY

Single phase Five-Level Active Neutral-Point-Clamped Converter where we want to generate for medium-voltage and high-power applications, including renewable energy conversion. Considering the voltage rating of commercially available semiconductors, the five-level active neutral point clamped converter (5LANPC) is one in all the foremost advantageous topologies among five-level multilevel converters. The multilevel inverter is in a position to produces five level pulses for medium voltage application.

In [1], A three-level neutral point clamped voltage source converter (NPC VSC) is widely employed in high-power, medium voltage applications. To beat its major drawback – the unequal loss distribution among the semiconductors – the employment of active NPC switches (ANPC) was proposed previously. During this paper, an easy feed forward loss-control scheme for the ANPC converter is presented.

Active-Neutral-Point-Clamped (ANPC) Multilevel Converter Technology [2] An idea for multilevel power conversion has been presented during this paper. The structures discussed throughout the paper are a mixture of neutral-point-clamped (NPC) and floating capacitor converters. A careful selection of the redundant switching states enables the control of the floating capacitor voltages without the connection of passive networks.

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III. SYSTEM STRUCTURE

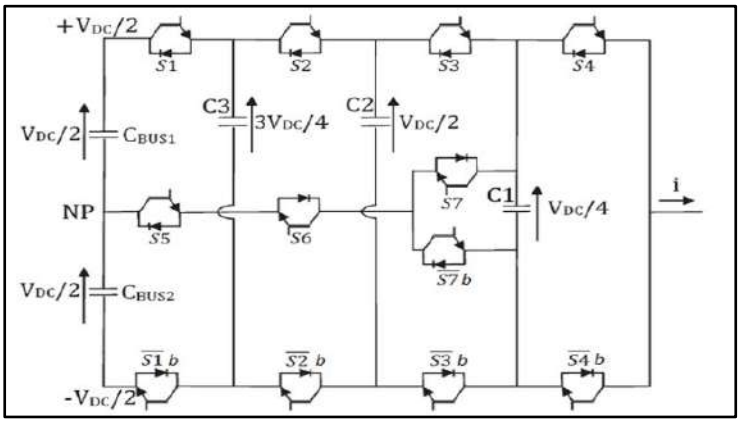

Figure 1:- Single Phase Five Level Active Neutral Point Clamped Converter

- **OPERATION**

In the present work, attempts have been made to the five-level active neutral point clamped converter. Combines the capabilities of neutral point clamped and flying capacitor topologies. only one neutral point is used just like three level ANPC. In addition, the required volume is determined by Flying capacitors are reduced compared to FC A topology that allows you to build converters. That is, the five-level active neutral point clamped converter Requires the same number of voltage sensors to control Previously used five level active neutral point clamped converter. previously in flying capacitor there were a greater number of capacitors in which the voltage used to imbalance therefore in this proposed topology we have reduced the capacitor and by using active neutral point clamped converter we have balanced the voltage level which leads to lower switching losses.

- **WORKING**

The converter has 5 voltage levels ($+V_{DC}/2$, $+V_{DC}/4$, $-V_{DC}/4$, $-V_{DC}/2$ and 0). Converter operation It can be divided into two different half cycles: positive and Negative half cycle of output voltage. Between Positive half cycle of output voltage, C_{Bus1} and C1 are used Voltages of 0, $+V_{DC}/4$, and $+V_{DC}/2$ are obtained, Negative half cycle of output voltage, C_{BUS2} and C1 are used Voltages of 0, $-V_{DC}/4$ and $-V_{DC}/2$ were obtained.

Table 1: - Switching Table

State of the Switch												Output
S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	Vo
1	1	1	1	0	0	0	0	0	1	0	1	**$+V_{DC}/2$**
1	1	1	0	1	0	0	0	0	1	0	1	**$+V_{DC}/4$**
0	1	1	1	0	0	0	1	1	1	0	1	**$+V_{DC}/4$**
0	1	1	0	1	0	0	1	1	1	0	1	**0(+)**
0	1	0	1	0	1	0	1	1	1	1	0	**0(-)**
0	1	0	0	1	1	0	1	1	1	1	0	**$-V_{DC}/4$**
0	0	0	1	0	1	1	1	1	0	1	0	**$-V_{DC}/4$**
0	0	0	0	1	1	1	1	1	0	1	0	**$-V_{DC}/2$**

$+V_{DC}/4$ during half a cycle of positive output voltage It is obtained by adding the C1 voltage (V_{C1}) to NP. + Subtract V_{C1} from $V_{DC}/2$. These two different shifts the condition has the opposite effect on V_{C1}. Similarly, half cycle of negative output voltage can be $V_{DC}/4$ It is obtained by adding V_{C1} to $V_{DC}/2$ or subtracting V_{C1} from NP. These two different switching states also have the opposite effect. Impact on V_{C1}. Therefore, V_{C1} can be put under control Choosing the right switching state.

The frequency of PMW determines how fast a PMW completes a period. The frequency of a pulse is shown in the figure.

Frequency of the proposed system: -

$$\mathbf{Fm = 50\ Hz}$$

Total time period of one cycle: -

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$$\mathbf{T = \frac{1}{Fm} = 0.02s}$$

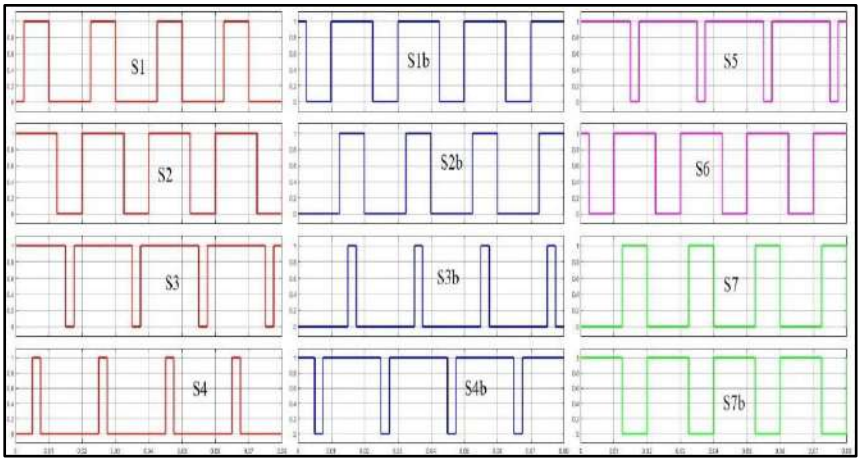

Figure 2: - Duty Cycle for MOSFET

IV. Simulation of Multilevel Inverter: -

A twelve-switch model using MOSFET as a switching device is used in positive and negative region using MATLAB model. To evaluate the performance of the Active neutral point clamped converter inverter, MATLAB/Simu-link models were built and simulated. A structure shown in fig 3.

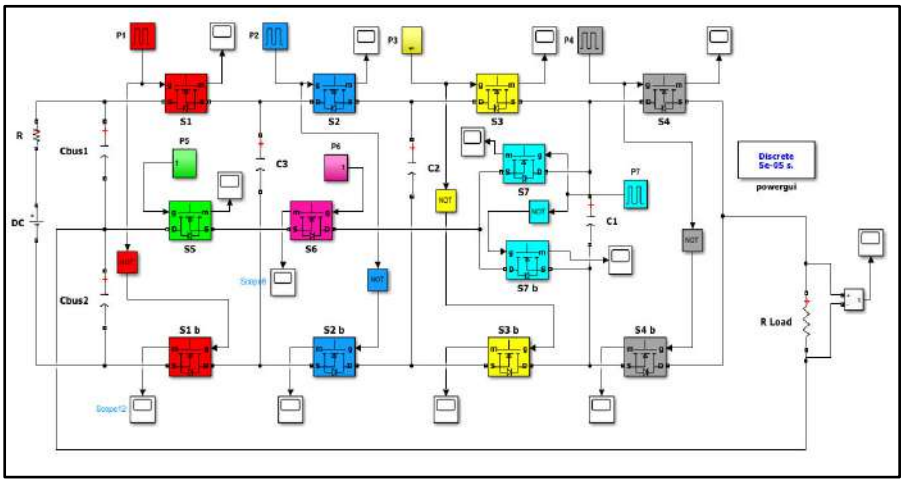

Figure 3: - Structure of the active neutral point clamped inverter

- Output voltage, Vo = 1200V
- Input voltage, Vin = 600V
- Output Frequency, F = 50Hz

Input is a 1200V, DC source with a load resistance. The expected output of 600V frequency of 50 Hz is obtained as shown in Fig.4 output of the multilevel inverter is also achieved in steps like ($+V_{DC}/2$, $+V_{DC}/4$, $-V_{DC}/4$, $-V_{DC}/2$ and 0).

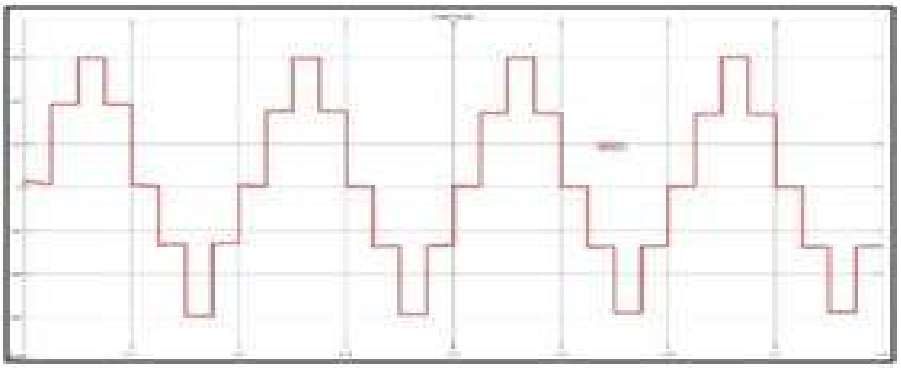

Figure 4: - Output voltage of simulation model

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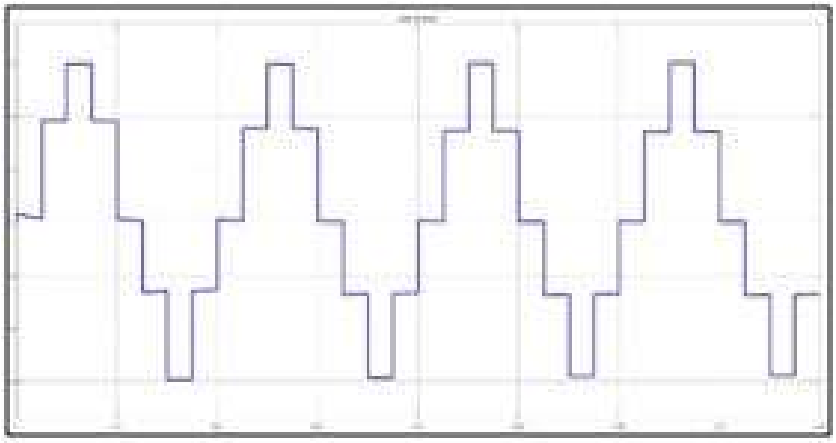

Figure 5: -Output current of simulation model

V. Hardware Design

A laboratory level prototype of the circuit which has been developed and tested. Circuit consists of five capacitors, twelve switches and one resistor as load. Selection of switches and capacitor has been done based on simulation.

The system is designed for 12 V input supply. Thus, for considering a safety factor, the ratings have been selected 5 to 10 times more than the input supply. Thus, high voltage rating i.e., 500 V MOSFETs has been selected. The hardware model shown in Fig.9 comprises with the main power circuit as well as the driver circuit for the switches. Input of 12V will be given to the Driver circuit to obtain an output of 15V with a pulse-width. Designing and implementing of Single phase Active Neutral Point Clamped Converter Multilevel topology in hardware is done by scaling down the simulation circuit parameters.

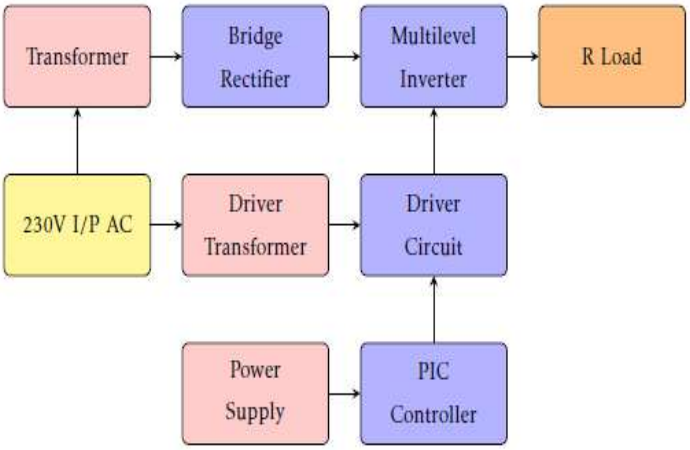

Figure 6: - Black Diagram

VI. Hardware Results

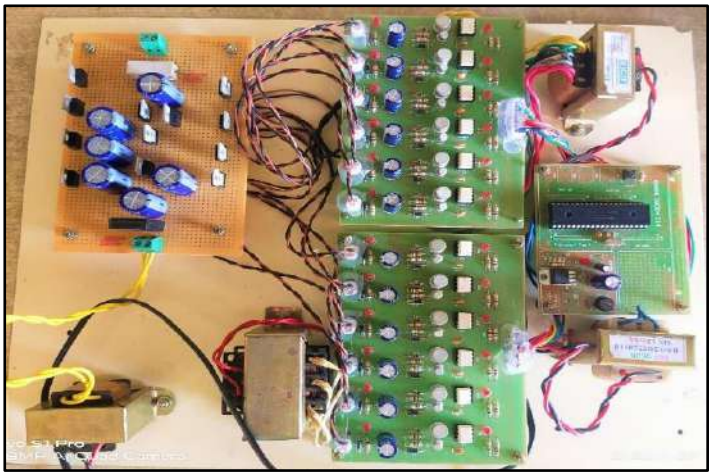

Figure 7: - Hardware Setup

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The laboratory hardware a multilevel converter shown in fig 7. circuit consisting of 12 power switches is designed. There are three capacitor, 2 Dc link capacitor and one resistive load. The system is designed for 12 V input supply.

An input of 240V AC is given to the transformer which converts it into a 12V AC An input of 12V AC is given to the multilevel circuit which converts it into a 12V DC using a bridge rectifier. This 12V DC is passed through filter capacitors to get a smoother, ripple-free output and is fed to the terminals of driver IC. Signals of magnitude 5V produced by the PIC16F877A are fed to the driver IC. Later, the driver circuit steps-up the voltage of these signals and a 15V gate pulse obtained is fed to the switches (MOSFET) of multilevel inverter. Also, there is a 12V DC supply to the Driver circuit through the transformer.

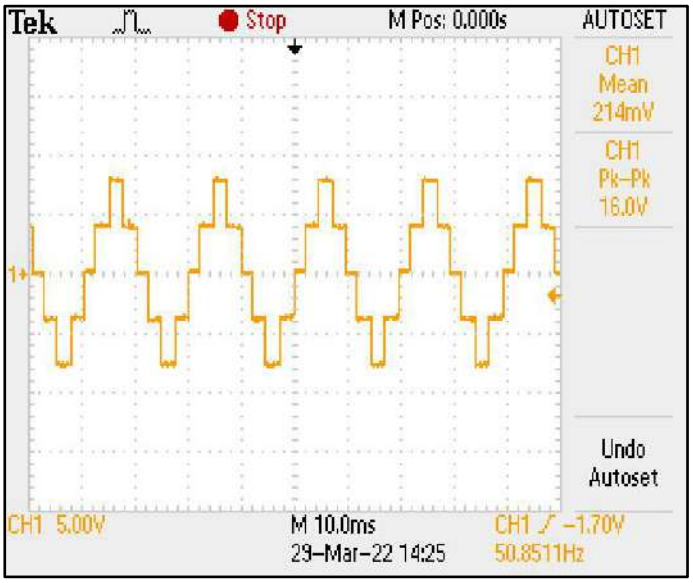

Figure 8: - Output of hardware

An important observation here is that the simulation outputs are nearly perfect the output of multilevel inverter if 6 volts steps smooth output as shown in fig 8 it also gives a 50 Hz cycle with stepped output.

A laboratory level prototype of the circuit which has been developed and tested. Circuit consists of five capacitors, twelve switches and one resistor as load. Selection of switches and capacitor has been done based on simulation.

As they have high power application, they are widely used for form medium and high-power ranges. The simulation of 5 level multi-level inverter is carried out with a simple control strategy. They have switches which are triggered to a suitable delay with an appropriate firing angle. The output of waveform obtained from the power switches and hence design five level multilevel inverter was successfully done with respect to its resistive load. In this project it reduces the uneven degradation of power switches, switching losses when compared to the conventional PWM technique and harmonics are reduced and the output waveform level is increased. And also increase the efficiency.

VII. CONCLUSION

In five-level active neutral point clamped converter topology, it is famous for its own benefits the devices used for its circuitry are quite sufficient and are also economically stable or controlled. The multilevel is famous its goal power quality and also for its performance according to the waveform we have studied that in multi-level inverter the output consist of 5 output voltage level. In this voltage level the output goes in positive as well as in negative sign periods in which the capacitor of multi-level inverter can charge as well as also can discharge this are the analysis that have been carried out in the 5 level multi-level inverter.

As they have high power application, they are widely used for form medium and high-power ranges. The simulation of 5 level multi-level inverter is carried out with a simple control strategy. They have switches which are triggered to a suitable delay with an appropriate firing angle. The output of waveform obtained from the power switches and hence design five level multilevel inverter was successfully done with respect to its resistive load. In this project it reduces the uneven degradation of power switches, switching losses when compared to the conventional PWM technique and harmonics are reduced and the output waveform level is increased. And also increase the efficiency.

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REFERENCES

- Thomas Brückner, Steffen Bernet, "The Active NPC Converter for Medium-Voltage Applications", 0-7803-9208-6/05/$20.00 © 2005 IEEE.
- Peter Barbosal, Peter Steimer, Jurgen Steinke, Manfred Winkehnkemper, and Nikola Celanovic', "Active-Neutral-Point-Clamped (ANPC) Multilevel Converter Technology", 90-7581508-5 © 2005 IEEE.
- Jörg Meili, Srinivas Ponnaluri, Leonardo Serpa, Peter K. Steimer, Johann W. Kolar, "Optimized Pulse Patterns for the 5-Level ANPC Converter for High-Speed High-Power Applications", 1-4244-0136-4/06/$20.00 © 2006 IEEE.
- Jun Li, Yu Liu, Subhashish Bhattacharya, Alex Q. Huang, "An Optimum PWM Strategy for 5-Level Active NPC (ANPC) Converter Based on Real-time Solution for THD Minimization", 978-1-4244-2893-9/09/$25.00 © 2009 IEEE.
- F. Kieferndorf, M. Basler, L. A. Serpa, J.-H. Fabian, A. Coccia, G. A. Scheuer, "A New Medium Voltage Drive System Based on ANPC-5L Technology", 978-1-4244-5697-0/10/$25.00 © 2010 IEEE.
- Kui Wang, Yongdong Li, Zedong Zheng, Lie Xu and Hongwei Ma, "Self-Precharge of Floating Capacitors in a Five-Level ANPC Inverter", 978-1-4577-2088-8/11/$26.00 © 2012 IEEE.
- Sridhar R. Pulikanti, Kashem Muttaqi, Danny Suntanto, "Control of Five-level Flying Capacitor Based Active-Neutral-Point-Clamped Converter for Grid Connected Wind Energy Applications", 978-1-4673-0332-3/12/$31.00 © 2012 IEEE.
- Jun Li, Jing Xu, Lisa Qi, Rolando Burgos, "Fault Tolerant Operation of 5L-ANPC Converter", 978-1-4799-4032-5/14/$31.00 © 2014 IEEE.
- Kui Wang, Lie Xu, Zedong Zheng, and Yongdong Li, "Capacitor Voltage Balancing of a Five-Level ANPC Converter Using Phase-Shifted PWM", 0885-8993 © 2014 IEEE.
- Eduardo Burguete, Jesús López, and Mikel Zabaleta, "New Five-Level Active Neutral-Point-Clamped Converter", 0093-9994 © 2014 IEEE.

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ULTRASONIC RADAR SYSTEM USING ARDUINO MEASURING DISTANCE AND ANGLE

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ABSTRACT
RADAR can see things at long distances before humans can see with naked eyes. Radar acts as both an early warning device and tracking device. Radar based systems are used as object detection systems which utilizes electromagnetic waves. This Radar System is controlled via Arduino. Ultrasonic sound sensors are used instead of Electromagnetic waves. A servomotor is used to continuously monitor an area of limited range .The project aims at making RADAR that is cost-efficient and accurate. Due to its insensitivity it can withstand harsh working conditions such as dirt, dust, rain. The system constantly monitors a limited range and alerts the presence of obstacles if any. If the object is very close to the sensor then it is alerted using a buzzer and a red LED while if an object is at short distance buzzer and green LED turn on but if the object is out of limited range alert system is off.

Keywords: Object Detection System, Arduino, Ultrasonic Sensor.

INTRODUCTION
Target detection is easier when an object is near or easily visible. But, the same doesn't stand true when the object is far away or is not visible due to weather conditions. Thehistory of radar actually dates back to the 1880s, when Heinrich Hertz showed that radio waves exist and could be both generated and detected. American physicists Gregory Breit and Merle Tuve developed usable radar in 1925, but its use remained limited until shortly before World War II.During the Second World War, technological advances by Germany, England, and the United States resulted in significant improvements to radar in terms of technology,reliability, and power.

The project works on the principle of radar echo effect of thetransmitting signal. In this Project we are using the Ultrasonic Sensor to operate by emitting a burst of sound waves in very rapid Succession. These sound waves hit the intended target, bounce back to the sensor, and travel at known speed .An ultrasonic Sensor, radar is much less affected by temperatur improving consistency and accuracy. Servos are small but powerful motors that can be used in a multitude of products ranging from toy helicopters to robots. Arduino controls the servo motor for the direction of theultrasonic sensor and it moves from 0 degree to 180 degree. Ultrasonic sensor transmits the signal in all directions and if any obstacle that is the target is detected then echo pulse sense. With the help of this echo pulse arduino program, find out the distance and direction angle of the target. The angle of rotation is displayed on a 16x2 LCD screen. Whenever an obstacle is detected, the buzzer turns on and it is also displayed in the LCD display.

LITERATURE REVIEW
Subsequent to experiencing a portion of the papers with respect to usage utilizing ultrasonic sensors and ARDUINO, it was found that this idea is searched a lot and is a mainstream idea which is still in advance. The advances utilized were not just productive and solid yet in addition financially achievable. Not only this, here other very useful applications of ultrasonic sensors were observed too.

This paper discusses about a monitoring system which is designed measure to speed of waves and height of river through ultra-sonic sensor using micro-controller (Arduino). On the off chance that the waterway can't oblige the volume of water, then all the water will submerge with land and this phenomenon is called as flood or surge. We can overcome this flood problem by earlier identification in height of water and observing speed. If we identify problem earlier we can overcome this problem before it become crisis. By testing the system i.e. simple water level, it was observed that ultra-sonic have accuracy of 96.6%. But when it is implemented in the rivers there are many errors because of different type of water levels due to heavy waves and speed of water and also due to floating of heavy objects. Unlike Previous testing results, author directed this analysis on tracking of speed of water improvement or modification and level of water in flooding. The test was completed when the Arduino used as controller of application. For more research, information of depth level and speed of water of this system will be sent to database server website to be checked regularly.

This research is about a blind walking stick made for blind people through which they can avoid obstacles while they walk and recognize currency. With the thought of visually impaired individuals, it is to some degree troublesome job to distinguish the cash or any unexpected obstacle. Despite the fact that currency dependent on size could possibly be recognized however it is relatively hard to distinguish that whether the note is unique or phony. So to overcome this issue the authors have designed the Currency Recognition Blind Walking Stick. A

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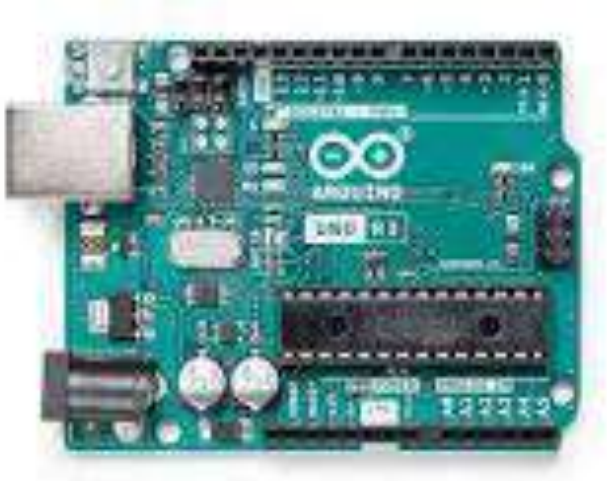
lot of work is done on currency recognition and obstacle detection using advanced technologies like optical character recognition, SURF and pattern extraction through colors. But none of these systems had the feature for obstacle detection for blind people. Therefore this framework is efficient as the other ones having an extra feature for helping the visually impaired.

COMPONENTS:-

1) Arduino Uno

Arduino is a free open source microcontroller. Having input and output digital and analog pins which enables it to get interfaced with different components. We have interfaced Ultrasonic sensor which is like the heart of the radar. Then to display output LCD (16*2 module). It can be operated in read/write mode. For our purpose we have operated it at write mode. It has enable pin which indicates as acknowledgement.



(Fig a)

Arduino is a free open source microcontroller. Having input and output digital and analog pins which enables it to get interfaced with different components. We have interfaced Ultrasonic sensor which is like the heart of the radar. Then to display output LCD (16*2 module). It can be operated in read/write mode. For our purpose we have operated it at write mode. It has enable pin which indicates as acknowledgement.

Arduino controls the servo motor in angle between 0 to 180 degree therefore covering the radar range. On this servo motor we are mounting the Ultrasonic sensor. The LED's and a buzzer is used for the indication of the obstacle.

2) Ultrasonic Sensor Hc-S304

The ultrasonic sensor works on the same principles as a radar system. An ultrasonic sensor can convert electrical energy into acoustic waves and vice versa. The acoustic wave signal is an ultrasonic wave traveling at a frequency above 18 kHz and HC SR04 ultrasonic sensor generates Ultrasonic waves at 40 kHz frequency.

(Fig b)

An ultrasonic sensor is an electronic device that measures the distance of a target object by emitting ultrasonic sound waves, and converts the reflected sound into an electrical signal. Ultrasonic waves travel faster than the speed of audible sound. The sensor measures the time it takes between the emissions of the sound by the transmitter to its contact with the receiver

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3) Servo Motor

A servo motor is a rotary actuator or a motor that allows for a precise control in terms of the angular position, acceleration, and velocity. Basically it has certain capabilities that a regular motor does not have.

(Fig c)

Consequently it makes use of a regular motor and pairs it with a sensor for position feedback. Positional rotation servo motor is the most important servo motor. Hence it is also the most common type of servo motor. The shaft output rotates in about 180 degree. Additionally it includes physical stops located in gear mechanism to stop turning outside these limits to guard the rotation sensor.

4) Liquid Crystal Display:-

It is a kind of electronic display module. These displays are mainly preferred for multi-segment light-emitting diodes and seven segments.

(Fig d)

The main benefits of using this module are inexpensive; simply and programmable, animations, and there are no limitations for displaying custom characters, special an even animations, etc.

5) Buzzer:-

A buzzer is an audio signalling device, which may be mechanical, electromechanical, or piezoelectric.Typical uses of buzzers include alarm devices, timers, and confirmation of user input such as a mouse click or Keystroke

(Fig e)

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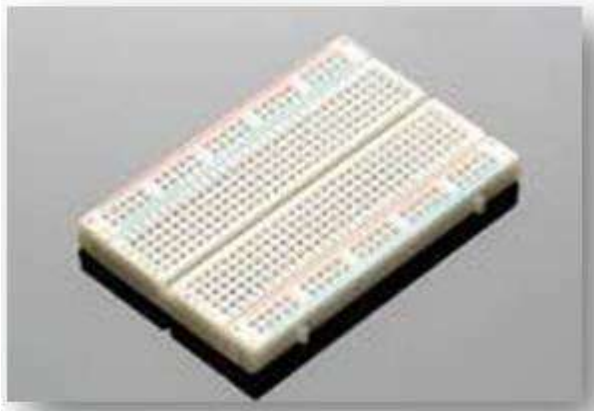
6) Light Emitting Diode (Led)

A LED is a semiconductor light source that emits light when current flows through it. It is a special type of PN junction diode. Light is produced when the particles that carry the current combine together within the semiconductor material.

(Fig f)

7) Breadboard

It is a solderless breadboard, which does not require soldering, it is reusable. It is easy to use for creating temporary prototypes and experimenting with circuit design.



(Fig g)

8) Connecting Wires

Connecting wires allows an electrical current to travel from one point on a circuit toanother, because electricity needs a medium through which to move.

(Fig h)

METHODOLOGY

The system is an Arduino base radar system for measuring distance and angle which uses radio waves to decide or get the range, height, heading, or speed of items or objects. Radar frameworks or system arrive in an assortment of sizes and have distinctive performance particulars. Some radars are utilized for aviation authority at air terminals and others are utilized for long range observation and early cautioning frameworks. There are some ways to show radar working data. There are also some modified radar systems which have advance technology of handling the systems. These modified system are used at higher levels to get or extract the helpful or important data. working principle components which are is ultra-sonic sensor connected to the

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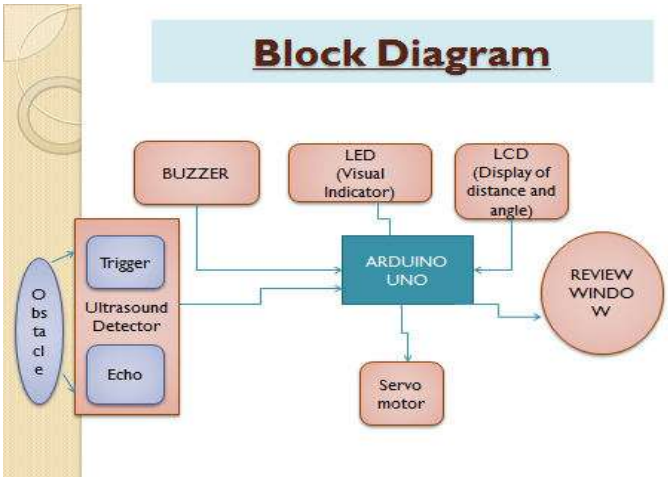
microcontroller (we have chosen Arduino) digital input and output pins. Then we have servo motor which is also connected to digital output and input pins. Our both main components ultra-sonic sensor and servo motor are connected simultaneously, so that when our servo motor rotates from 0 degree to 180 degree from extreme right to extreme left the motor will rotate nearby its axis. We utilize Computer screen to demonstrate the data (distance and angle) through.

In order to testify the working of this system, after its designing, construction and programming we placed few objects in front of the ultrasonic sensor. As the motor started to rotate, our monitor started to display the output through processing IDE. Hence, when the sensor crossed over the object it showed a red segment with the distance and angle where the object is placed.

Block Diagram:-

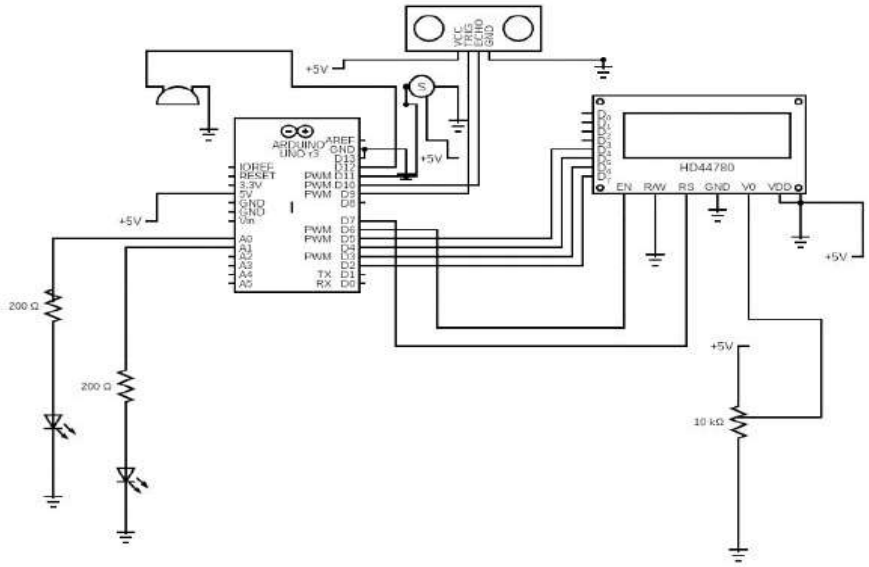
The above figure represents a brief overview of this radar system. Here, as it is shown the controller we are using is Arduino, with the input Ultrasonic sensor and the output is the servo motor which rotates 180 degrees. The microcontroller controls all the operations of this system, from rotation of the motors to the obstacle detection of the ultrasonic and representation of the result on the screen.



(Fig1). Block Diagram of the Ultrasonic Radar System using Arduino measuring Angle and Distance

The sensor is going to sense the obstacle and determine the angle of incident and its distance from the radar. The servo motor is constantly rotating to and fro, hence making the sensor move. The data obtained is encoded and fed to the processing IDE which represents it on the screen. The results are displayed further in this paper. All these operation are done by Arduino microcontroller from the rotation of the servo, data collection from the sensor, feeding the data to encoder to transferring it to the display.

Circuit Diagram



(Fig2). Circuit Diagram of the Ultrasonic Radar System using Arduino measuring Angle and Distance

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This is the circuit diagram of Ultrasonic Radar system Measuring Angle and Distance ,there are three major components they are 31 Arduino Uno, Ultrasonic Sensor, Servo motor. Firstly we connect Vcc of servomotor and Vcc of ultrasonic sensor to 5v of Arduino. Connect the gnd of ultrasonic sensor and servo(black wire) to ground of the Arduino .Connect trig and echo pin of ultrasonic sensor to 9 and 10 of Arduino.. Connect signal pin of servo to pin D12 of Arduino Uno. Servo Motor rotates (0 degree to 180 degree) continuously. The Ultrasonic Sensor sense till 400 cm and our Output Range is set to 20cm. Digital PWM is connected to pin 2 to 7 of LCD D4 to D6. Analog Pin (A0 and A1) are connected to LED. First LED gives the green colour notification when the object is in 20 cm range then object is Detected and the Distance and Angle of the object is measured. Second LED gives warning in Red colour that the Object is in 10 cm range. We are using IDE Processing Software.

Application
This Radar System have various applications for security purposes and it is mainly used for mapping.

Applcation in Air Force
It is used in airplanes or aircraft machines which have implemented radar system in it to detect the objects that comes in a way. It is also used to calculate height readings.

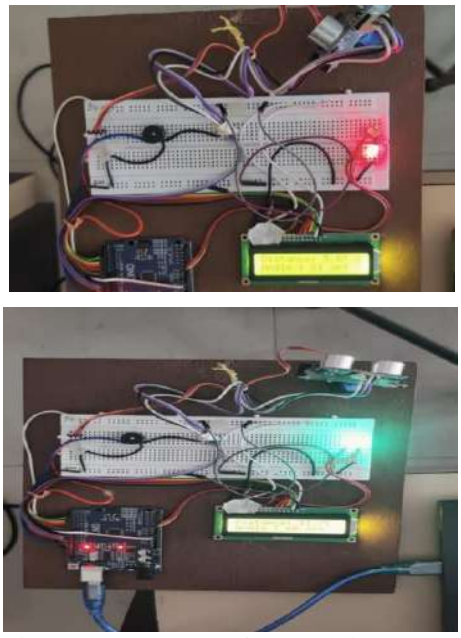
Application in Marine
This radar system also used in ships or marine. It is implemented on big ships to calculate the distance of other boats or ships, with the help of this sea accidents can also be reduced by not colliding. It can also be implemented on ports to see the distance of other ships and to monitor or control the ship movements.

APPLICATON IN METEROLOGY: - Meteorologists also uses radar systems to track or monitor the wind. It has been become an 47 important equipment for climate testing. For example to detect tornados, storms.

ADVANTAGES
- It is not affected by the colour or transparency .The ultrasonic sensor transmit the sound off the object and so the colour and transparency has no effect on radar.
- Easy to design at low cost.
- Sensor is not affected by dust and dirt.

DISADVANTAGES
- Detection range depends on which ultrasonic sensor is used.
- Object with soft fabrics tends to absorb more sound waves so it becomes difficult to detect them.

RESULTS
Begin with uploading the code to Arduino after interfacing all the components and completing all the connections. It is observed that the servo is sweeping from 0o to 180o. Reading are displayed on the LCD.



(Fig3). Picture of Ultrasonic Radar System using Arduino measuring Angle and Distance

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FUTURE SCOPE

a) This project as modification with Wifi connection between Arduino and Android can be introduced in order to monitoring through internet

b) GPS can be introduced for Security purposes.The project can be developed and modified according to rising need and demand.

CONCLUSION

The importance of the project is calculating accurate distance from any obstacles that we want to measure. The device can used in many different fields and categories like distance calculating in construction fields,robots to avoid obstacles and many other application.

ACKNOWLEDGMENT

We would like to acknowledge and extend our heartfelt gratitude to all those people who have been associated with This Project and have helped us with it thus making it a worthwhile experience.

REFERENCES

1) Haraa Raheem Hatem 1, Ali I. Abdalla 2, Zainab Najeeb Addulhameed Al-Rawi 3,``Design and Implementation of ultrasonic radar system for DistanceMeasurements``,(2018),DOI 10.14419/ ijet. v7i4. 18103.

2) Ahman Emmanuel Onoj 1,Abdusalaam Maryam Oluwadamilola 3, Lukman Adewalwe Ajao 4,``Embedded system based Radio Detection and ranging system using Arduino and ultrasonic sensor"(2017),DOI 10.11648/j.ajesa.20170501.12

3) Sarmad Hameed Naqi Jafri Dania Rashid Fabiha Shoaib Mechatronics department, Shaheed Zulfikar Ali Bhutto Institute of Science and Technology, Karachi, (Pakistan)

4) Ahman Emmanuel Onoja, Abdusalaam Maryam Oluwadamilola, Lukman Adewale AJAO-"Embedded System Based Radio Detection and Ranging (RADAR) System using Arduino And Ultrasonic sensor" American Journal of Embedded system and Application 2017.

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IOT BASED HOME AUTOMATION

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ABSTRACT
The home automation system is implemented for decades but due to the costing and budgeting of the project, it remains a niche product for high-end consumers. The Intelligent Home Automation System, security is one of the major factors that does not implement the home automation system. The hectic daily life routine sometimes makes them forgetful to switch off the devices at home. The clumsiness attitude plus with our packed daily routine life that sometimes makes ourselves such in hurry situation that sometimes makes us forgot to switch off the lamps. It will cause the electricity bill rose sharply. Besides, it is one of the electricity wastage that will lead the earth became an unhealthy one. The strength of this project is to control the devices such as lamp and door at home using a smartphone. The system is related to home appliances using PIC MCU. Home appliances that can help the user to control the devices at home and develop a good condition of house area that will prevent any loss and damage to the property of any organization. The hardware that is being used in this project is a relay, WIFI module, PIC MCU, Relay Driver IC, Relay, Sensor's Etc.

INTRODUCTION
A smart home incorporates sensors, Relay, and a WIFI network and has two major interacting components which is a Adityakumar Dubey, Department of electronics and telecommunication engineering. Mumbai University, India.

Smart network and a smart load. The Smart home known as House automation, with the use of new technology, to make the domestic activities more convenient, comfortable, secure and economical. The Internet of things can be defined as connecting the various types of objects like smart phones, personal computer and Tablets to internet, which brings in very new-fangled type of communication between things and people and also between things. With the introduction of IoTs, the research and development of home automation are becoming popular in the recent days. Many of the devices are controlled and monitored for helps the human being. Additionally various wireless technologies help in connecting from remote places to improve the intelligence of home environment. An advanced network of IOT is being formed when a human being is in need of connecting with other things. IoTs technology is used to come in with innovative idea and great growth for smart homes to improve the living standards of life. Internet helps us to bring in with immediate solution for many problems and also able to connect from any of the remote places which contributes to overall cost reduction and energy consumption.

Background Research: - The process of improving and upgrading the living standard of the house has been raised due to the advanced technology applied in this era society. Home Automation System is implemented for decades but due to the costing and budgeting of the project, it still remains as a niche product for high end consumers. Although the concept of smart home automation has been around for quite a long time, but an actual smart home has only established a short time. The invention of home appliances such as a television with a remote control which is a simple home automation system was patented in 1893 . Other than that, more home appliances have been invented since that. In early 2000, the popularity of smart home automation began to increase due to different of technology started to arise. Smart home automation turns into a more affordable choice and therefore a viable or available technology for consumers. With the uprising of the prestige of smart home, home networking, domestic technologies and other gadgets began to emerge on store shelves Today's smart home automation are more emphasize about smart living, living greener and security. Our smart home is sustainable and it ensures that our home is not utilizing unnecessary energy. In addition, the smart home also can prevent any intruders by alerting us with alarm or send any signal to us through smartphone related application. The current trend in smart home automation includes automated lights, remotely mobile control, remote video surveillance and receiving notifications of mobile, email and text.

The System Suitable for Below Applications:
1. Security Alarm System applications;

2. Building, home and industrial Automation system

3. Supervision and monitoring alarm systems;

4. Automatic monitoring system;

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5. Pumping Stations, Tanks, Oil or Water levels;

6. Buildings and Real Estate;

7. Weather Stations;

8. River Monitoring and Flood Control;

9. Oil and gas pipelines;

10. Temperatures, water leakage applications

11. Energy saving, street lights control system;

12. Valve controls;

13. Transformer stations;

14. Unmanned machine rooms;

15. Control room application;

16. Automation System.

CIRCUIT EXPLANATION

Micro Controller Interface

The project is based on a pre-programmed PIC16Fxx micro controller. The circuit used in this kit uses only one IC – the PIC16Fxxx. It is one of the RISC architecture Based high-performance flash micro controllers from MICROCHIP. The IC is preprogramed. Using a micro controller greatly reduces the component count while providing more features than could be found using dedicated logic ICs. Cost is also lower. It is pre-programmed with software to provide all the timing functions. PIC16Fxxx is an 8-bit, low-cost, high-performance flash micro controller. Its key features are 8K words of flash program memory, 1536 bytes of data RAM eleven interrupts, three ports, 10-bit ADC and only 35 powerful single- cycle instructions (each 14-bit wide). The full circuit of the IOT controlled switch is shown in circuit diagram. The brain of the switcher is the Microchip PIC16Fxxx Fxxx micro controller (U1). User Send Command to operate device on and off by IOT webpage & is transferred to the MCU Using WIFI and Hotspot Network. As per the AT commands given by the microcontroller to the wifi module, the control signal from the IOT is extracted and is used to control the devices connected to it. MCU process is necessary to decode the message from IOT. A program (for extracting the control signal part from received IOT) is loaded into M MCU, and then the circuit is connected to the modem.

Mcu Cock

Clock signal for the micro controller provided by crystal Y1 (4 MHZ) and two 33PF (C1, C2) capacitors hanging off it ensure correct loading for the crystal, so that it starts reliably. The frequency of the oscillator is internally divided and to get the operating frequency. This high frequency clock source is used to control the sequencing of CPU instruction.

Sensor Interface

A maximum of three sensors can be connected to the system via CN5, and CN6 ; these can be found in the circuit diagram. These sensors need to have their contacts open when in the inactive state (i.e. normally open) or active low signal @ 5V DC. A power supply voltage of +5 VDC is available for each sensor at the corresponding wiring terminals (CN7). There are many type of sensor available you can connect with the projects. External detection Sensor's interface to micro controller via Port, RA0 to RA3, (pin no 2 to 5). Port RA Used as a digital Input Port and is pulled up via 10K resistors s network (R-pack – RN1)

• PIR (Passive Infrared Detector) Sensor

• Smoke detector

• Flame Sensor

• Alcohol sensor

• Glass Break Sensor

• Sound Sensor

• Vibration sensor

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- LPG GAS detector
- Magnetic door sensor
- FIRE sensor (Temperature sensor with active Low output)
- Ultrasonic motion sensor
- Water Overflow Level Sensor
- Oil Overflow Level Sensor,
- Water Leak Sensor,
- Temperature Sensor
- Shock Sensor
- Power failure sensor, etc. WIFI communication

Circuit Explanation Micro Controller Interface The project is based on a pre-programmed PIC16Fxx micro controller. The circuit used in this kit uses only one IC – the PIC16Fxxx. It is one of the RISC architecture Based high-performance flash micro controllers from MICROCHIP. The IC is preprogramed. Using a micro controller greatly reduces the component count while providing more features than could be found using dedicated logic ICs. Cost is also lower. It is pre-programmed with software to provide all the timing functions. PIC16Fxxx is an 8-bit, low-cost, high-performance flash micro controller. Its key features are 8K words of flash program memory, 1536 bytes of data RAM eleven interrupts, three ports, 10-bit ADC and only 35 powerful single- cycle instructions (each 14-bit wide). The full circuit of the IOT controlled switch is shown in circuit diagram. The brain of the switcher is the Microchip PIC16Fxxx m

User Send Command to operate device on and off by IOT webpage & is transferred to the MCU Using WIFI and Hotspot Network. As per the AT commands given by the microcontroller to the Wi fi module, the control signal from the IOT is extracted and is used to control the devices connected to it. MCU process is necessary to decode the message from IOT. A program (for extracting the control signal part from received IOT) is loaded into MCU, and then the circuit is connected to the modem.

MCU Cock Clock signal for the micro controller provided by crystal Y1 (4 MHZ) and two 33PF (C1,C2) capacitors hanging off it ensure correct loading for the crystal, so that it starts reliably. The frequency of the oscillator is internally divided and to get the operating frequency. This high frequency clock source is used to control the sequencing of CPU instruction. SENSOR INTERFACE A maximum of three sensors can be connected to the system via CN5, and CN6 ; these can be found in the circuit diagram. These sensors need to have their contacts open when in the inactive state (i.e. normally open) or active low signal @ 5V DC. A power supply voltage of +5 VDC is available for each sensor at the corresponding wiring terminals (CN7). There are many type of sensor available you can connect with the projects. External detection Sensor's interface to micro controller via Port, RA0 to RA3, (pin no 2 to RA Used as a digital Input Port and is pulled up via 10K resistors network (R-pack – RN1).5). Port RA Used

WIFI communication WIFI is a wireless technology standard for exchanging data over short distances (using short-wavelength radio transmissions in the ISM band from 2400–2480 MHz) from fixed and mobile devices, creating personal area networks (PANs) with high levels of security. it was originally conceived as a wireless alternative to RS-232 data cables. It can connect several devices, overcoming problems of synchronization.

WIFI technology is a short-range communications technology that is simple, secure, and everywhere. You can find it in billions of devices ranging from mobile phones and computers to medical devices and home entertainment products. It is intended to replace the cables connecting devices, while maintaining high levels of security. The key features of WIFI technology are robustness, low power, and low cost. The WIFI Specification defines a uniform structure for a wide range of devices to connect and communicate with each other. When two WIFI enabled devices connect to each other, this is called pairing. The structure and the global acceptance of WIFI technology means any WIFI enabled device, almost everywhere in the world, can connect to other WIFI enabled devices located in proximity to one another. Connections between WIFI enabled electronic devices allow these devices to communicate wirelessly through short-range, ad hoc networks known as piconet. Piconets are established dynamically and automatically as WIFI enabled devices enter and leave radio proximity meaning that you can easily connect whenever and wherever it's convenient for you. Each device in a piconet can also simultaneously communicate with up to seven other devices within that single piconet and each

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device can also belong to several piconets simultaneously. This means the ways in which you can connect your WIFI devices is almost limitless. A fundamental strength of WIFI wireless technology is the ability to simultaneously handle data and voice transmissions. which provides users with a variety of innovative solutions such as hands-free headsets for voice, calls printing and fax capabilities, and synchronization for PCs and mobile phones, just to name a few. The range of WIFI technology is application specific. The Core Specification mandates a minimum range of 10 meters or 30 feet, but there is no set limit and manufacturers can tune their implementations to provide the range needed to support the uses cases for their solution.

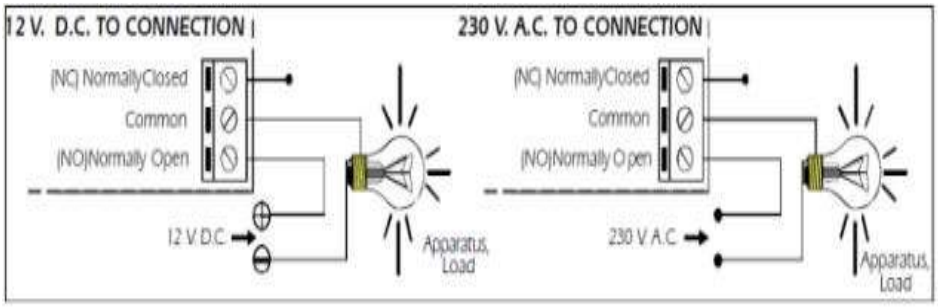
WIFI Module Connect to MCU Rx & Tx Pin. Its Communicate With MCU and Cloud Server. MCU Send Sensor Data To Cloud using WIFI Module, & Received Command To Operate Relay by User from Cloud

LED INTERFACE Four LEDs (L6 to L9) indicate the status of the sensor inputs. When the external sensor has been detected / activated, the LED (L6 to L9) of the sensor that caused on for 5 to 10 seconds. LED's Connected to, MCU Port pin RC0 to RC3 (PIN no 11 to 14) via, 220E current limiting resistor

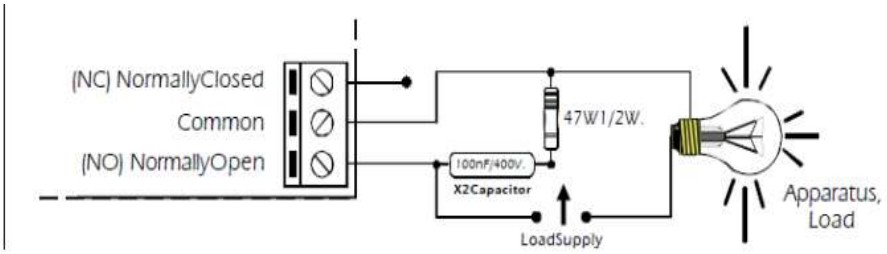
Relay Driver

The micro controller controls the outputs over port RB. The relay requires 12 volts at a current of around 100 ma, which cannot provide by the micro controller. So the driver IC is added. The most commonly available driver chip which ULN2003, we are used. A single pole dabble throw (SPDT) relay is connected to port RB0 to RB3 of the micro controller through a Relay driver IC (ULN2003 – U2). The relay is used to operate the external high Voltage Load or appliance or any other electrical device. Normally the relay remains off. As soon as pin of the micro controller goes high, the relay operates. LED L1 to L4 indicates relay status. The relay contacts are rated at 10 amps. However the PCB tracks can only take around 5 amps. You may need to add wire links on the bottom of the PCB to increase the current carrying capacity if you want to draw over 5A. The relay outputs are rated to switch up to 240VAC mains voltages.

HOW to Connect Load with Relay?



The output of the projects is controlled by a relay, allowing any load until 230V AC / 3 Amp. as maximum consumption. The relay has 3 output terminals the normally open at quiescent (NO), the normally closed at quiescent (NC) and the common. The operating of this mechanism is the same as a switch with two (2) terminals NO and common, if you wish that the output will be activated during the timer, or between the NC and the common to obtain the reverse operating. In the drawing, you could appreciate the typical connection for a devices operating at 12 VDC and to operate at 230 VAC. When the project is working and according to its load, it could happen an incorrect operating of the output. If it is the case, you have to install a circuit between 2 relay's contacts used for the connection. See the drawing map.



External Outputs

Output (CN1 to CN8), Its controlled by a 12V SPDT relay and can switch up to 230V AC/DC This is more than enough for all common signal sources such as Electronic lock, door strike, motor light or any other appliances.

NOTE - Extreme Care Should Be Taken When Switching Mains Voltage. Don't Do This Unless You Are Experienced And Know Exactly What You Are Doing. Mains Voltages Can Be Lethal!

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POWER SUPPLY

The power supply circuit. It's based on 3 terminal voltage regulators, which provide the required regulated +5V and unregulated +12V. Power is deliver initially from standard 12V AC/DC adapter or 12V_1000ma Transformer. This is fed to bridge rectifier (Diode D1 ~ 4) the output of which is then filtered using 1000uf electrolytic capacitor and fed to U4 (voltage regulator). U4 +5V output powers the micro controller and other logic circuitry. LED L9 and its associate 1K (R9) current limiting resistors provide power indication. The unregulated voltage of approximately 12V is required for relay, and Relay Driver Circuit.

PART EXPLANATION

Micro Controller PIC16F886 / 16F72

Special Micro controller Features:

• High performance RISC CPU

• Operating speed: DC - 20 MHz clock input

DC - 200 ns instruction cycle

• 2 ~ 4K FLASH Program Memory,

• 128 bytes of Data Memory (RAM)

• 10-bit multi-channel Analog-to-Digital

Converter

• Power-on Reset (POR)

• Power-up Timer (PWRT) and Oscillator Start-up Timer (OST)

• Watchdog Timer (WDT) with its own on-chip RC oscillator for reliable operation

• Programmable code protection

• Power saving SLEEP mode

• Selectable oscillator options

• Low power, high speed CMOS FLASH / EEPROM technology

• Fully static design

• Single 5V In-Circuit Serial Programming

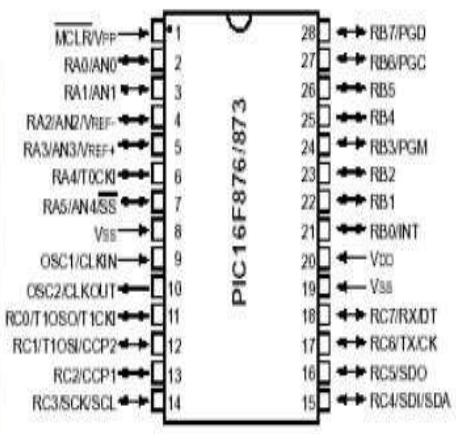
Capability

• Wide operating voltage range: 2.0V to 5.5V

• High Sink/Source Current: 25 mA

•Commercial, Industrial and Extended Temperature ranges

• Low-power consumption:



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PIC (Peripheral interface controller) is the IC while was enveloped to control the peripheral device, dispersing the function of the main CPU. PIC has the calculation function and the memory like the CPU and is controlled by the software. However the throughput, the memory capacity isn't big. It depends on kind of PIC but the maximum operation clock frequency is about 20MHZ and the memory capacity to write the program is about 1K to 4K words. The clock frequency is related with the speed to read the program and to execute the instruction. Only at the clock frequency, the throughput cannot be judged. It changes with the architecture in the processing parts for same architecture; the one with the higher clock frequency is higher about the throughput. The point, which the PIC convenient for is that the calculation part, the memory, the input/output part and so on, are incorporated into one piece of the IC. The efficiency, the function is limited but can compose the control unit only by the PIC even if it doesn't combine the various IC's so, the circuit can be compactly made. More information please refer Data sheet 0f PIC 16Fxx

ESP8266 WIFI Module

The ESP8266 WI Fi Module is integrated TCP/IP protocol stack that can give any microcontroller access to your Wi Fi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor. Each ESP8266 module comes pre programmed with an AT command set firmware, meaning, you can simply hook this up to your Arduino device and get about as much Wi Fi-ability as a Wi Fi Shield offers (and that's just out of the box)! The ESP8266 module is an extremely cost effective board with a huge, and ever growing, community. This module has a powerful enough on-board processing and storage capability that allows it to be integrated with the sensors and other application specific devices through its GPIOs with minimal development up-front and minimal loading during runtime. Its high degree of on-chip integration allows for minimal external circuitry, including the front-end module, is designed to occupy minimal PCB area. The ESP8266 supports APSD for VoIP applications and Bluetooth co-existance interfaces, it contains a self-calibrated RF allowing it to work under all operating conditions, and requires no external RF parts.

Light Emitting Diode (LED)

A light-emitting diode (LED), is an electronic light source. Luminescence from an electrically stimulated crystal had been observed as early as 1907. The LED was introduced as a practical electronic component in 1962. All early devices emitted low-intensity red light, but modern LEDs are available across the visible, ultraviolet and infra red wavelengths, with very high brightness. LEDs are based on the semiconductor diode. When the diode is forward biased (switched on), electrons are able to recombine with holes and energy is released in the form of light. This effect is called electroluminescence and the colour of the light is determined by the energy gap of the semiconductor. The LED is usually small in area (less than 1 mm2) with integrated optical components to shape its radiation pattern and assist in reflection.[2] LEDs present many advantages over traditional light sources including lower energy consumption, longer lifetime, improved robustness, smaller size and faster switching. However, they are relatively expensive and require more precise current and heat management than traditional light sources. Applications of LEDs are diverse. They are used as low-energy indicators but also for replacements for traditional light sources in general lighting, automotive lighting and traffic signals. The compact size of LEDs has allowed new text and video displays and sensors to be developed, while their high switching rates are useful in communications technology.

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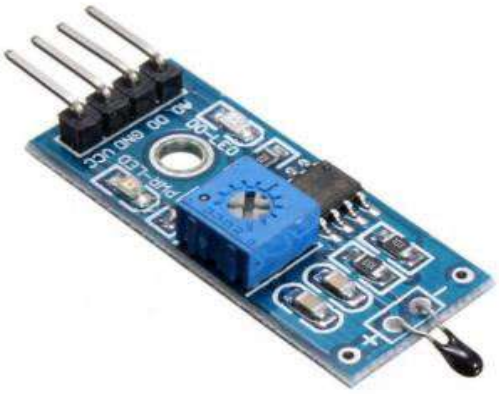
Door Sensor

The door sensor is an essential component used in-home security system. The designing of these sensors can be done with two parts which are arranged in parallel to each other. So that the circuit can be formed. When someone tries to open the door then these parts will get separated and breaks the circuit. So the control panel will activate to generate an alarm. These sensors are very easy to install and portable

Temperature Sensor Module Thermistor Thermal Temperature Sensor is consists of an NTC thermistor that measures temperature changes. This module is able to provide both digital and analog outputs. NTC thermistor is a variable resistor that's resistance value changes according to change of temperature. The word of NTC means Negative Temperature Coefficient. The sensitivity of the module will be change by the on board potentiometer. At first, we need to connect the temperature sensor module to the 5v power supply. Then set the threshold voltage according to the normal temperature of the environment by rotating the pre set knob for setting the sensor sensitivity.



Water Level Sensor The working of the level sensor is pretty straight forward. The wire probe with two exposed conductors, acts as a variable resistor (just like a potentiometer) whose resistance varies according to the water content. This resistance is inversely proportional to the water: The sensor produces an output voltage according to the resistance, which by measuring we can determine the water level. The sensor also contains an electronic module that connects the probe to the Micro controller. The module produces an output voltage according to the resistance of the probe and is made available at an Analog Output (AO) pin. The same signal is fed to a LM393 High Precision Comparator to digitize it and is made available at an Digital Output (DO) pin. The module has a built-in potentiometer for sensitivity adjustment of the digital output (DO). You can set a threshold by using a potentiometer; So that when the moisture level exceeds the threshold value, the module will output LOW otherwise HIGH. This setup is very useful when you want to trigger an action when certain threshold is reached. For example, when the moisture level in the soil crosses a threshold, you can activate a relay to start pumping water. You got the idea! Apart from this, the module has two LEDs. The Power LED will light up when the module is powered. The Status LED will light up when the digital output goes LOW. Fire Sensor A Flame Sensor module or Fire Sensor module is a small size electronics device that can detect a fire source or any other bright light sources. This sensor basically detects IR (Infrared) light wavelength between 760 nm – 1100 nm that is emitted from the fire flame or light source. The flame sensor comes with a YG1006 Phototransistor sensor which is a high speed and high sensitivity. Two types of IR Infrared Flame Sensor Module available in the market one having three pins (D0, Gnd, Vcc) and another one having four pins (A0, D0, Gnd, Vcc) both are can be easily used with Arduino and other microcontroller boards.

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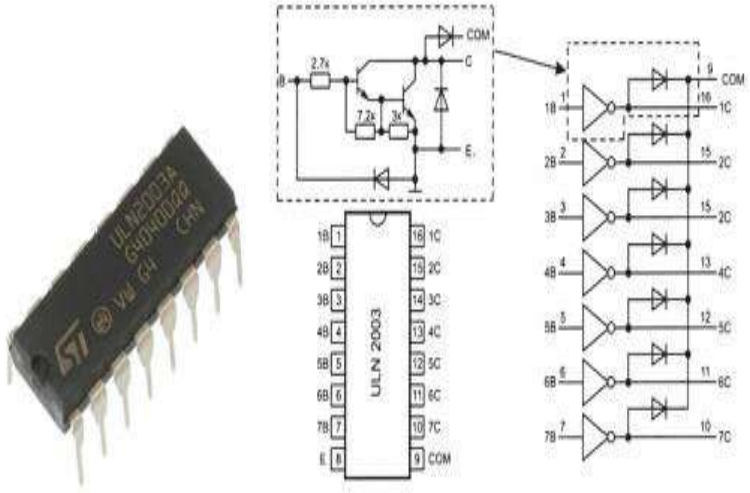
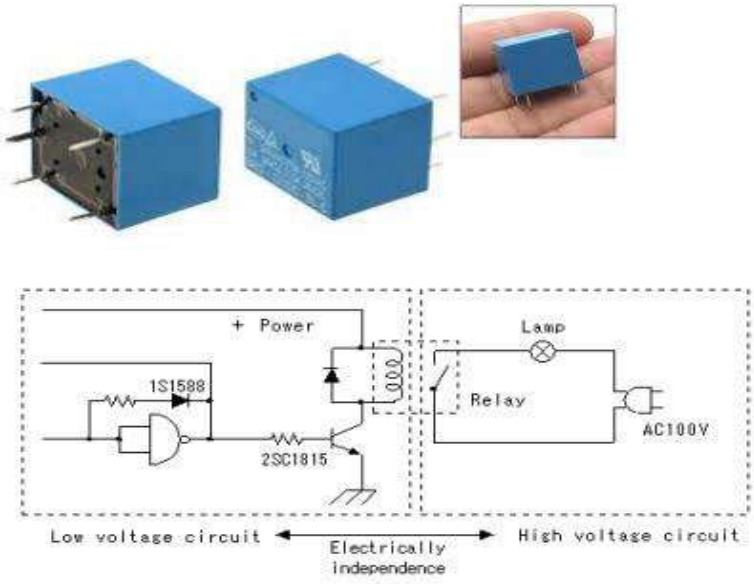
ULN2003A (Relay Driver IC

The ULN2003 is high voltage, high current Darlington arrays each containing seven open collector Darlington pairs with common emitters. Each channel rated at 500 mA and can withstand peak currents of 600 mA. Suppression diodes are included for inductive load driving and the inputs are pinned opposite the outputs to simplify board layout. These versatile devices are useful for driving a wide range of loads including solenoids, relays DC motors; LED displays filament lamps, thermal printer heads and high power buffers.



SPDT RELAY – 12V It closes the voltage less point of contact while the remote control works to control the equipment outside. The relay takes advantage of the fact that when electricity flows through a coil, it becomes an electromagnet. The electromagnetic coil attracts a steel plate, which is attached to a switch. So the switch's motion (ON and OFF) is controlled by the current flowing to the coil, or not, respectively. A very useful feature of a relay is that it can be used to electrically isolate different parts of a circuit. It will allow a low voltage circuit (e.g. 5VDC) to switch the power in a high voltage circuit (e.g. 230 VAC or more). The relay operates mechanically, so it cannot operate at high speed.



Part (Components) List Iot Based Sensor Networking & Automation Sys R1 ~ 6 - 1k [Brown, Black, Red] (6 Nos) R7 ~ 10 - 220e [Red, Red, Brown] (4 Nos) Rn1 - 10k – 5 Pin R-Pack C1, 2 - 33pf Disc (2 Nos) C3 - 1000uf / 16v Electrolytic C4, 5 - 0.1uf Disc (104 / 100nf) (2 Nos) Y1 - 4mhz Crystal D1 - 1n4148 Diode D2 ~ 5 - 1n4007 Diode (4 Nos) L1 ~ 4 / L6 ~ L9 - 3mm Or 5mm Red Led (8 Nos) L5 - 3mm Or 5mm Green Led U1 - Pic16f72 Or Pic16fxxx Micro Controller (Pre Programmed Mcu) U2 - Uln2003 Relay Driver Ic U3 - Lm7805 – +5v 3 Terminal Voltage Regulator 2nos - 14 Pin Ic Socket For U1 (14 + 14 = 28 Pin) 1nos - 16 Pin Ic Socket For U2 Cn5, 6, 7 - 2 Pin Terminals Block (3 Nos) Rl1 ~ 4 - 12v Spdt Relay (Pcb Mount) (4 Nos) Bz1 - 12v Dc Buzzer.

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CONCLUSION

The internet of things involves associate increasing range of sensible interconnected devices and sensors (e.g. cameras, biometric and medical sensors) that area unit typically non-instructive, clear and invisible. An IOT has been transportation new set of technological changes in our daily lives, that successively serving to America to form of our life less complicated and lighter. IOT applications believe a communication infrastructure for exchanging info thus it's vital from a public policy purpose of read to confirm that IOT applications, that embody aid, energy management, transportation, or the other innovative applications, can enjoy a good access to the present infrastructure.

REFERENCES

1. Sirsath N. S, Dhole P. S, Mohire N. P. Naik S. C & Ratnaparkhi N.S Department of Computer Engineering, 44, Vidyanagari, Parvati, Pune-411009, India University of Pune, "Home Automation using Cloud Network and Mobile Devices"
2. Jayavardhana Gubbi, Rajkumar Buvya, Slaven Marusic, a Marimuthu Palaniswamia, "Internet of Things (IoT): Vision, Architectural Elements, and Future Directions"
3. Deepali Javale, Mohd. Mohsin, Shreerang Nandanwar "Home Automation and Security System Using Android ADK" in International Journal of Electronics Communication and Computer Technology (IJECCT) Volume 3 Issue 2 (March 2013)
4. **1.**Luigi Atzori, Antonio Iera and Giacomo Morabito, "The internet of things: A survey", Computer Networks, vol. 54, no. 15, pp. 27872805, 2010.
5. Somayya Madakam, R Ramaswamy and Siddharth Tripathi, "Internet of things (iot): A literature review", Journal of Computer and Communications, vol. 3, no. 05, pp. 164, 2015.
6. Kang Bing, Liu Fu, Yun Zhuo and Liang Yanlei, "Design of an Internet of things-based Smart Home System", Intelligent Control and Information Processing (ICICIP) 2011 2nd International Conference on, vol. 2, pp. 921-924, 2011.
7. Md Sarwar Kamal, Sazia Parvin, Kashif Saleem, Hussam Al-Hamadi and Amjad Gawanmeh, "Efficient low cost supervisory system for Internet of Things enabled smart home", Communications Workshops (ICC Workshops) 2017 IEEE International Conference on, pp. 864-869, 2017.
8. R. Piyare and M. Tazil, "Bluetooth based home automation system using cell phone", Consumer Electronics (ISCE) 2011 IEEE 15th International Symposium on, pp. 192-195, 2011.
9. Kumar Mandula, Ramu Parupalli, CH AS Murty, E Magesh and Rutul Lunagariya, "Mobile based home automation using internet of things (iot)", Control Instrumentation Communication and Computational Technologies International Conference on, pp. 340343, 2015.

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MODIFIED FRACTIONAL FREQUENCY REUSE TECHNIQUE TO REDUCE INTERFERENCE IN LTE NETWORKS

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ABSTRACT
The LTE (Long Term Evolution) is a wireless standard communication which result in high spectral efficiency, high data rates and flexible frequency bandwidth. By using frequency reuse mechanism high spectral efficiency is achieved. Because of frequency reuse mechanism it may cause interference in this networks. Here we proposed Modified Fractional Frequency Reuse technique with hybrid DAS (Distributed Antenna Aided) algorithm in the Long Term Evolution (LTE) networks that is based on OFDMA technique. MFFR generally divides the cell into center and boundary area and based on these deviation the proposed scheme may follow various different steps to select the optimal FFR technique. The first step is totally depend on creating proposed technique with hybrid DAS algorithm and increasing throughout with increase in user satisfaction and the second step defined on the maintenance of power optimization. The MFFR technique calculate the SNR, optimized power based user support and throughput and again uses these technique to evaluate throughput and user satisfaction. Simulation result will show that the SNR value is higher than previous technique hence throughput will also high with user satisfaction. The proposed technique results better than previous technique as per result showed further.

Keywords: LTE Networks, interference reduction, OFDMA, Modified FFR, co tier and cross tier interference.

INTRODUCTION
Mobile communication and several wireless standard based system utilize orthogonal frequency division multiple access (OFDMA) as a very desirable and current technique [1][2]. The reason behind this is because from the subcarriers band each end point engage one subset and at one time one user can occupies one traffic channel.

OFDMA system considered several techniques for mitigating complexities of cell boundary and interference issues. OFDMA provides dynamic allocation of sub bands to various users with their time requirements, to take report of channels between variations in between many users for many channels [11][12][13]. The weak user utilized the bandwidth with active fraction part of power decided by sub channelization. When cell sectors are allocating sub bands to the boundary area that time important issues are also considered the interference among users.

Cellular network have concept of frequency reuse which improves the network capacity and coverage [14][15]. In Long Term Evolution (LTE) network MFFR is used to reduce the co tier problem. The MFFR technique divide one cell into two different regions center area of cell and boundary area of cell [4][11]. Divide the one frequency band into different parts, sub parts and assign them to center and boundary region respectively. MFFR shows results as, eliminate the cross-tier interference and also mitigate co-tier interference [16][18] with this the throughput of system is increased. Bandwidth allocated to each region with utilizing transmitted power and various interference reduction parameters.

This paper have basic aim as evaluating and presenting an interference management Modified FFR technique with hybrid distributed antenna system aided algorithm for LTE networks. The technique will evaluates the MFFR technique based on parameters: power optimization, signal-to-noise ratio, and throughput and user satisfaction. The Modified FFR technique examines the radius and frequency of inside cell and will evaluates each user based SNR, throughput and capacity. For calculation of throughput with user satisfaction these calculated SINR values are useful. Now, the particular mechanism will select optimal modified FFR technique and algorithm which will either increase the user satisfaction or the user throughput. This paper also gives simulations to examine the MFFR technique.

Further, the paper is organized as below, some short summary about previous work and problem definition in section II, then will introduce the proposed mechanism and calculation of SNR, throughput, user satisfaction and power optimization with interference is explained in section III. Evaluation of technique and simulation results is explained in section IV, while section V will conclude the paper and explain some future work.

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Related Work and Problem Definition

The related work about FFR with OFDMA system has mainly noted with cellular network and LTE standards. F-ALOHA technique were proposed based on OFDMA and was not able to work with full bands [5]. DFP was also proposal for interference reduction but inappropriate in terms of femtocell organization [6]. LIP algorithm was also a good technique for interference reduction under general wireless networks but interference between femtocell and macrocell was not estimated [7]. OFDMA system based Private and Coupled method [8] was beneficial for location disputation but doesn't apply FFR properly which cause interference. The FFR technique was proposed as femto and macro suited but there would be an interference at the border linking cell center and edges known as cross tier interference [9][10].

Spectrum swapping [11][12] was another technique suggested for assuring macrocell based near and far problems. For interference reduction all the femtocell were allotted different sub bands. Further, the femtocell were united through join detection of the received signal which is also useful to upgrade the global error performance but it seems more complex. Optimal Frequency Partitioning [13] [14] used to maximize the frequency capacity but because of resource allocation reduce the system capacity and spectral efficiency.

All the above techniques are good as per their own requirements they are giving good results also but some techniques are not proper with system capacity some have high rate of interference. To reduce this problem we are proposing Modified Fractional Frequency Reuse technique with Hybrid DAS algorithms, the result will be shown letter with comparison and analysis. The proposed algorithm will be explain in next part.

Femtocell Appraoch and Working

Femtocells are the cellular base station having specification like it is tiny, low fetch, low ability, short span that can be positioned in houses and bridged to the backhaul. While measuring connection of network such as a fixed connection some devices like optical fiber and asymmetric digital subscriber line. If user's are trying to insert network connection then these are some very good tools that user can utilize without previous knowledge also. Though, these devices have to be acquired from the mobile network employed by anyone desired to have in their accommodations. The femtocell has various benefits of it's like the inside cell coverage capacity can be improved, if any coverage holes occur than it also able to overcome those issues and at the boundary area of cell the operator can have better signal services.

The basic point of view of the 4G (LTE-A) network has to it have some different steps with new features and profit for both the users and the operative operator also. The benefits can be measure in terms of the maximizing the throughput, improving the coverage and capacity by locating femtocells. Femtocells are of three types; Private, Organization and Metro-Femtocell.

Private: Four channel unit required for this femtocell. It has capability to support number of callas at a single time and other some cells are available for support. It is nothing but a building or an office or any house specific femtocells.

Organization: It works under very slow speed environment; it is a type which is able to handle the more number of channels as compare to private femtocells. It handles channels between 8 and 32. It is suitable at company and any organization based areas.

Femtocell-Metro property: To cover big areas and high traffic data this femtocell is utilized. It is new concept of femtocell in which the operator themselves create huge number of femtocells as per their needs. This is new technology which is beneficial for latest network technology like LTE and 4G networks.

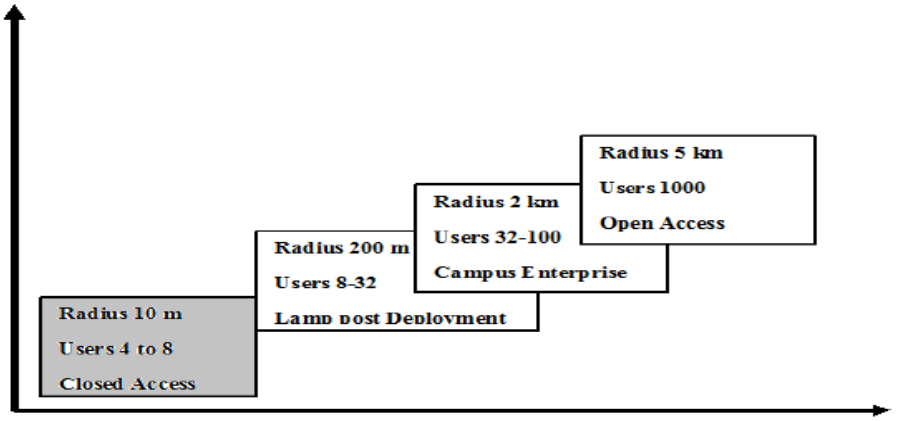

Figure 1: Types of Cells

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Working of Femtocell

If a cell phone is receiving any call and the particular person suddenly responded to that call and he knows that the particular phone is connected to the near femtocell, instead of connecting to the particular base station it will directly get connected to the nearby femtocell. Femtocell essentially covers a small area or any communication. The femtocell use various modems like and wired cable to the house or DSL modem to convey the particular voice data till the particular receiver. This way the femtocell is very beneficial for people to save money on calls by posting calls on any IP address. Femtocells primarily work for the mobile phones because they are only mobile phone base station.

If the signal is weak or changed then it will inform to that particular connection by using respected gateway of femtocell. This way femtocell are able to connect themselves with each other and will have same design as per the network requirement and also this will affect the outdoor area of the cell.

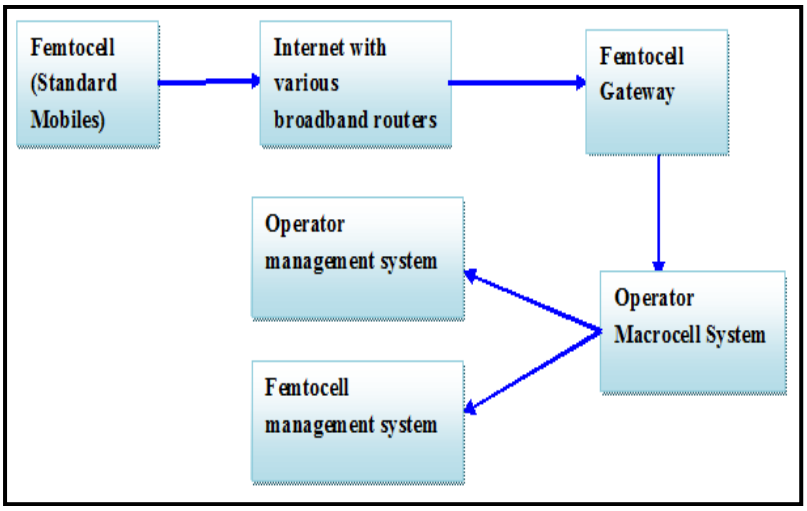

Figure: Working of Femtocell

SYSTEM MODEL

A. Distributed Antenna System

DAS is basically a system which is utilized by the cellular network to create the small cells whenever they need. DAS is a managed hub based system and antennas with remote access which able to provide wireless signal to the indoor and outdoor sub bands and multi bands. To provide cellular signal with proper coverage at the head end they locate base stations. The hub receive that signal digitize the signal, and distribute it to the other hubs via optic fibre network with high bandwidth. The digitized signal via fibre are able to transport to the other station with full signal, doesn't matter how far this is from hub and base station. By focusing on the base stations signal on a particular area by different antennas it provides higher capacity and consistent coverage over particular area.

DAS can support multiple frequency bands and service providers with single set of antennas. DAS is not only useful for small cell delivery but also efficient for small cell backhaul.

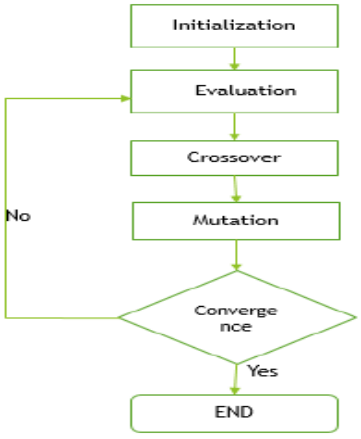

Fig: Standard DAS Flow Chart

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B. Proposed Hybrid Das Algorithm

The hybrid DAS is a combination of RSSI and DAS algorithm. The RSSI algorithm basically work with MFFR technique to split the macro cell into two parts that is centre and edge region. One frequency band is split into four different parts which will further allotted to the macro and femtocell. One part of sub band will be allocated specifically to the centre are and other three will be divided to the boundary area. When femtocell get on at that time it will first check neighbour macro cell's signal. The RSSI values will be generated for each and every sub bands. Whenever it will detected that at the centre area the signal strength is very good then femtocell will detected. Again this will calculated for other femtocell location. The femtocell will choose the sub bands which are utilized by the macrocell because they are having high signal strength.

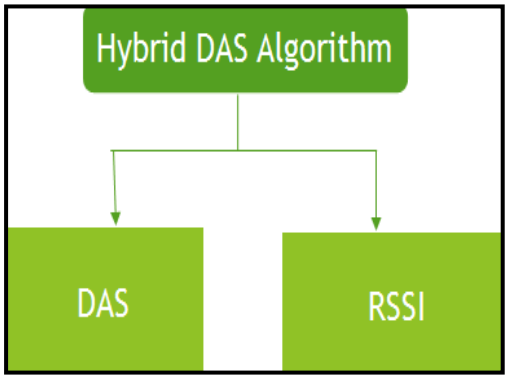

Figure: Classification of Algorithm

If the signal strength of centre area is poor at that time femtocell will be located at the boundary region. In this RSSI work with MFFR and then the DAS algorithm will work. DAS have antennas at each and every base station so that system capacity can be maintained properly. As per shown in figure 1, flowchart the DAS will calculate the power optimization with interference maintenance by using carrier to noise ratio.

The DAS algorithm will evaluate the number of supportable users with optimized power. In crossover level it will calculate throughput and user satisfaction method which generally known as fitness calculation. After cross over it will go for mutation evaluation where it will compare the throughput with other technique if the possible result will found then will show the results, otherwise again will go to first step for doing RSSI based signal strength calculation and allocation of cell and the whole procedure will continue.

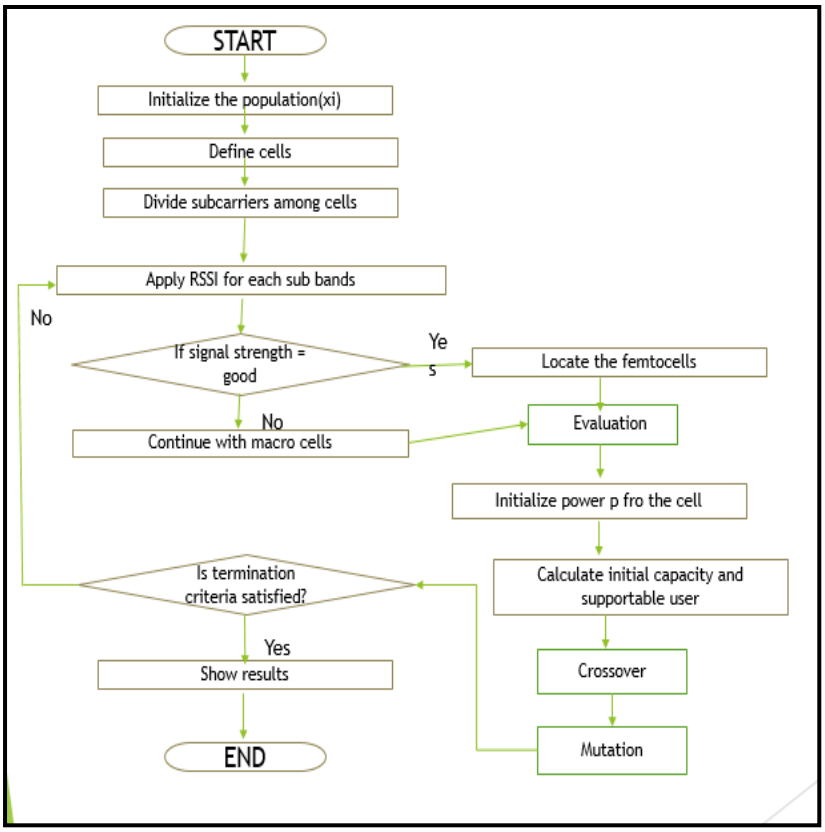

Figure 1: Flow chart of Hybrid DAS algorithm

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C. Hybrid DAS With MFFR

In MFFR technique, the one frequency band get divided among four equal parts known as orthogonal frequency based sub bands written as, $F = F1 + F2 + F3 + F4$, where one of them is reserved for the center area and the remaining three are utilized by the cell boundary area. Hence, the macro cell at the center area will not get affected by the interference because of DAS is available within the same macrocell base station. In MFFR technique the cell center area and cell boundary area have their own mobile base station as per requirement with antenna system. As per the comparison result the center area mat less affected in this as compare to previous technique.

And the received SNR of the mobile users at the particular radius and with antenna angle may expressed as,

$$\gamma_u = \frac{\frac{P_b}{A} d_0^{-\alpha} h}{\sum_{i \neq 0} \frac{P_b}{A} d_0^{-\alpha} h + \sum_{i \neq 0} \frac{P_b}{A} d_0^{-\alpha} h_{i,j} \sum j} (1)$$

When the mobile user is roaming around the cell boundary area at that time no interference will occur which is imposed by the main base station. Whereas, this output will depends on the interference reduction from both the mobile base station and the interfering femto base stations by utilizing the different and same frequency band as per the bands changes.

$$\gamma_u = \frac{\frac{P_b}{A} d_0^{-\alpha} h}{\sum_{i \neq 0} \frac{P_b}{A} d_0^{-\alpha} h + \sum_n \frac{P_f}{AW} d_f^{-\alpha} g_n} \quad ..(2)$$

D. Throughput Calculation with User Satisfaction

This part defines the mathematical calculation of the signal to noise ratio, network throughput with user satisfaction. These are the factors of the networks. Let assume that whole network has composed of N number of neighboring cells. A group is defined to allocate subcarriers to the users of each cell. Two cases are here where users is found inner region and outer region of cell because we are applying FFR. The typical wireless cellular networks calculate SNR as follows for the user y which served by base station b having sub carriers s,

$$SNRu, s = \frac{G_{b,u} P_{b,s} h_{b,u,s}}{\sigma_n 2 \sum_j^k G_{b,u} P_{b,s} h_{b,u,s}} \quad (1)$$

In this equation (1), $G_{b,u}$ is referred as the particular related path loss with the utilized channel of base stations and users. $P_{b,s}$ the base station relevant power for performing transmission on the sub bands s, $h_{b,u,s}$ is the distributed power affected by exponentially fast fading and $\sigma_n 2$ is the Additive White Gaussian Noise channel based noise power. The symbols j and k are referred as set of base stations facing interference. Their physical definition is that co-channel cells are defined by k and index of cells are shown by j. In this paper, we are considering transmit power in equal amount, $P_{b,s} = P$ which is applied for all the base stations. The distributed power channel coefficient $h_{b,u,s}$ will replaced by its minimum value which is approximate =1that is $h_{b,u,s} = 1$ in equation (1).

Interference in inner and outer region comes from the disjoint set of downlinks in network. In a cell the center area assigned one specific frequency band which may cause interference for the other center area of cell which is working on same band. Specifically, base station necessarily divided into two categories. The first category consist of interfering base station which may transmit to the center area of cell on similar band as user u and the second may consist of all the base stations interfering transmitting to the boundary area of cell on the same band as user u.

After estimating SNR, will proceed with calculation of throughput. The capacity of user u on the sub carrier of s can be calculated by the following equation:

$$C_{u,s} = \Delta f . log_2(1 + SNR_{u,s}) \quad (2)$$

Where, Δf refer as bandwidth which is available for every subcarrier divided by the number of users that share the specific subcarriers. Furthermore, the throughput of particular user u can be represent as follows:

$$T_u = \sum_s \beta_{u,s} C_{u,s} \quad (3)$$

Where, $\beta_{u,s}$ represents the macro user based subcarriers. When, $\beta_{u,s} = 1$, then basically subcarrier is registered for macro users. Otherwise, $\beta_{u,s} = 0$. The performance of the experiments evaluated successfully, now to define User Satisfaction (US) is as the addition of all the users' throughput divided by the product of the

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maximum user's throughput and the number of users (u). This method easily presents the relationship between user's throughput and the maximum throughput of particular area. Hence,

$$US = \frac{\sum_{u=1}^{U} T_u}{max\_throughput * U} \quad (4)$$

US have range from 0 and 1. All the users in the correspondence cell will have similar throughput and it will show by user satisfaction = 1. The user satisfaction 0 shows huge throughput differences between users in the cell.

E. Carrier to Noise Ratio

Carrier to noise ratio $C/N_\circ$ is defined as the received power level of carrier to the ratio of noise power level measured in Hz. The calculation of $C/N_\circ$ is referred as it predicts the receiver performance under the impact of interference signal and its value determines the precision of the pseudo range and carrier evaluation.

When there is no loss of tracking loops because of interference signal, the interference signal may affects the tracking loop performance which shows result in a pseudo range based error. The pseudo range and $C/N_\circ$ relationship can be degrade by the receiver based specific feature. It is receiver manufacturer responsibility to supply the data. This data are utilized by the $C/N_\circ$ also known as pseudo range error factor.

The usual value for the $C/N_\circ$ in normal applications is around 40 dB [4], but this range is totally depend on the receiver quality. The standard range that can handled by the receiver is of $C/N_\circ$ is from 25 to 40dB. The noise of signal can be captured by the antenna or can be generated by the inside amplifiers of receiver. The noise has a PSD flat which can be written as,

$$N_\circ = K\ (T_{ant} + T_{amp)} \quad (5)$$

Where, K is Boltzmann constant, $K = 1.38 \times 10^{-23}(J/K)$, T_{ant} the antenna noise temperature (K), $T_{amp)} = 290(N_f - 1)$ the amplifier temperature and N_f is nothing but amplifier based noise ratio (dB) at 290K.

The power density of interference at the output shown in [W/Hz] unit and written as,

$$N_I = P_I.T_d \quad (6)$$

Where, P_I is the output power of interference signals? The noise power at the output described with [w] unit,

$$P_N = N_\circ/T_d \quad (7)$$

The post correlation $C/N_\circ$ can be expressed as

$$C/N_\circ = \frac{P_G}{(N_\circ)_{post}} \quad (8)$$

Where, P_G is the signal power at the correlator output, and $(N_\circ)_{post}$is the post correlation noise density with interference signal and also additive white Gaussian noise (AWGN). Can be defined as,

$$(N_\circ)_{post} = N_\circ + N_I \quad (9)$$

Substituting the (9) into (8) will give correlation $C/N_\circ$ with presence of interference and AWGN:

$$C/N_\circ = \frac{P_G}{N_\circ + N_I} = \frac{P_G}{N_\circ + T_d P_I} \quad (10)$$

The above equation shows that interference increases the noise level in the correlator output causing simple drop loss in the value$C/N_\circ$.

Performance Study

A. Scenarios and Environments

The necessary simulation parameters for the experiments are presented in the Table 1. Here we have consider a 11MHz of bandwidth based system known as Long Term Evaluation (LTE), which is spitted among 27 subcarriers and each subcarriers are working on bandwidth of 380KHz. OFDMA technology is used by all the base stations. Number of femtocell vary according to the signal strength and coverage of macrocell. Femto and Macro cell users are randomly divided in the whole network.

The users of macro and femtocells are randomly divided by the sub carriers. One band is divided like half is assigned to center area and the other half remains for boundary area. One omnidirectional antenna with three small sectors antenna are installed for macro base station, and for center area the transmit power is of 16 W and for boundary area transmit power is of 21 W, respectively.

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Table 1; Simulation Parameters

Parameters	Values
Cellular Network Model	Hexagonal grid, 3 cell
MBS coverage radius	2 Km
FBS coverage radius	0.9 m
Carrier frequency	2000 MHz
Inter-cell Distance	500 m
Radius of Femtocell	10 m
MBS transmit power	43dBm
FBS transmit power	15dBm
Path loss Model (O to O)	28+35*log10(d), d in meters
Path loss Model (O to I)	40*log10 (d) + 30*log10(f) + 49; f in MHz, d in km
Path loss Model (I to I)	38.5 + 20*log10(d) + Lwalls Lwalls = 7 dB, 0 < d < 10 Lwalls = 10 dB, 10 < d < 20 d in meters
White Noise Power Density	-174dB
Path loss exponent (a)	4 (Outdoor)
Path loss exponent	2 (Indoor)

At other side, macro base station will utilize 19 W transmit power if the particular MFFR technique is not utilized properly. The femtocell utilize the 19 mW transmit power. When, path loss is a dominant factor, then for indoor and outdoor network different sub carrier channels are utilized.

Then for each and every sub carrier the SNR values will be calculated. By using this SNR value the throughput and user satisfaction will calculate by user located in the center area of macrocell.

B. RESULT AND COMPARISON

In figure 1, it shows the supportable users as per allotted power. When signal strength = 0.25, this value shows that at the 10^{-4}whole users are get activated. With signal strength 0.5, this will start activating users from $10^{-4}$and activate all the users at 10^{-3}. For signal strength 1 and 1.25 all the users are activated permanently at $10^{-3}$and after this. So here we get that at the 1.25 value all users get activated permanently.

In figure 2, throughput for femtocell user area shown in femtocell coverage as the number of users varies. In this proposed scheme, at each location, the femto users can be able to get the sub bands which are not utilized by the macro users. This may result in avoidance of interference between femto and macro users. The throughput is calculated for three level maximum, minimum and average respectively.

But the proposed scheme shows that it effectively utilize the power and reduce the interference as per allocated power. It is a technique with optimized power and improved throughput and SNR values. The SNR value is calculated by using mathematical formulae. As shown in all the figures, the proposed scheme improve the overall throughput and reduce the interference with optimized power for both center and boundary users.

In figure 3, the throughput comparison between 0 to 50 densities of femtocell is shown. The three level of throughput is there like minimum level, maximum level and the average level, that figure is clearly showing us that our throughput is better than previous one with reduced interference.

At other side sub bands are allocated to the femtocells which are used by the macro cells in previous schemes. If femto and macro cells are very near to each other it may happen they will utilize the same sub bands for both cells. Hence, this may cause higher interference between femto and macro users which is higher than proposed technique.

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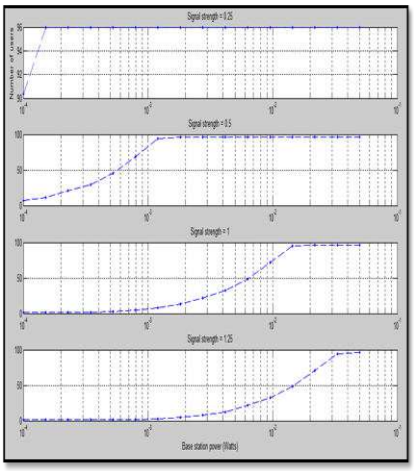

Figure 1. Supportable Users With Optimized Power

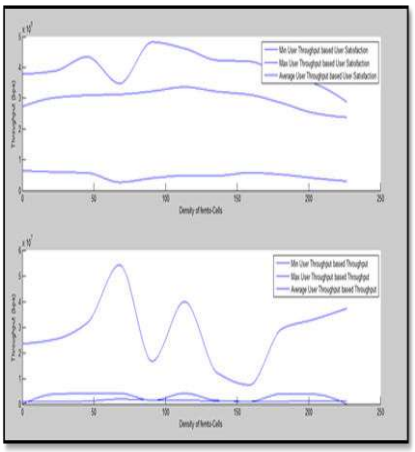

Figure 2. Throughput Comparison Between Previous and Proposed Scheme Based on Density of Femtocell

The proposed scheme and previous scheme have big gap as per femtocell increases. Proposed scheme avoids this interference, and also show less degradation. Figure 3, shows the sub carrier allocation for the inner area users. In cellular system performance is weak in the inner area because of inter cell interference. The proposed scheme shows an effective way of allocating sub bands to inner area at the boundary level which is good for throughput and user satisfaction improvements.

The bandwidth allocation done here is based on different considerations. The bandwidth allocation is based on throughput and user satisfaction with or without adaptation.

The figure 4, shows three technique comparison based on optimized power and improved throughput with user satisfaction. The FFR-1 scheme shows that it activates all numbers of users before the allocated power so the remaining power is not useful for any further work and get waste. The FFR-2 technique required more power to activate all the users as per allocated in the figure 1.

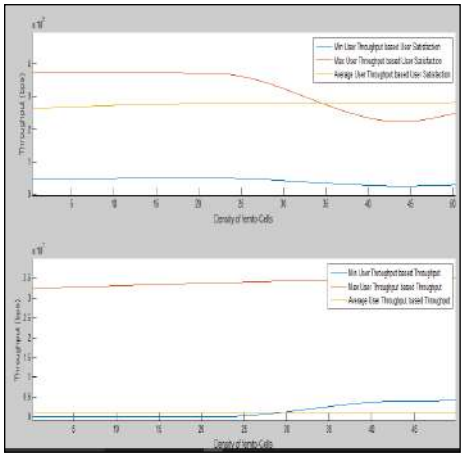

Figure 3: Throughput Comparison With Deep Analysis Between 0 To 50 Femtocell Density

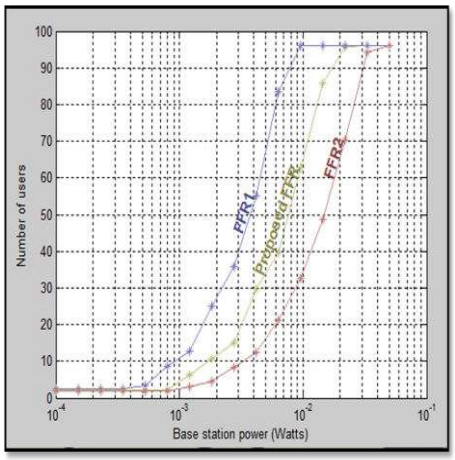

Figure 4. Technique Comparison With Optimized Power And Improved Throughput

CONCLUSION

In this paper we proposed an interference reduction MFFR technique that calculate the SNR mathematically, optimized power based user support and throughput and again uses these technique to evaluate throughput and user satisfaction. Based on these calculated values the scheme may follow different approaches for selecting optimal technique of FFR. The first approach is based on the maximization of throughput with user satisfaction and the second approach is based on the maintenance of power optimization.

Furthermore, we have taken some parameters to perform simulation experiments and then we have compared three techniques. As per general consideration we can say that the technique that is based on Modified FFR with hybrid DAS algorithm is represent better result than other techniques. It gives positive result with improved SNR and throughput with user satisfaction.

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Hence, hybrid DAS algorithm with MFFR technique in the LTE networks is beneficial for next generation communication with interference reduced technique. The working flow that is followed by the mechanism could be extend in order to support proper coverage issues according to mobility.

REFERENCES

[1] Amitabh Ghosh, Jeffery G. Andrews, et al,. "Heterogeneous Celular Networks: From Theory to Practice", IEEE Communication Magazine, June 201.

[2] Alecksandar Damanjanovic et al., "A Survey on 3GPP Heterogeneous Networks", IEEE Wireless Communication, June 2011.

[3] Heli Zhang, Shanzhi Chen, Xi Li, Hong Ji, And Xiaojiang Du, "Interference Management for Heterogeneous Networks with Spectral Efficiency Improvement", IEEE Magazine Wireless Communication April 2015.

[4] Mayur C Akewar, Dr Nieshsingh V. Thakur, "A Study of Wireless Mobile Sencor Networks Deployment", IRACST-International Journal of Computer Networks & Wireless Communications (IJCNWC), ISSN-2250-3501, Vol 2, No 4, August 2012.

[5] Chandrasekhar, J. Andrews, "Spectrum Allocation in Two-Tier Networks", IEEE Asilomar Conference on Signal System and Computers, Oct. 2008.

[6] Lopez-Perez et al., "Interference Avoidance and Dynamic Frequency Planning for WiMax Femtocells Networks", IEEE International Conference on Communication Systems (ICCS), Nov. 2008.

[7] Zeng, C. Zhu, and W. Chen, "System Performance of Self Organizing Network Algorithm in WiMax Femtocells", ACM International Conference on Wireless Internet (WICON), Nov. 2008.

[8] Sundaresan, S. Rangarajan, "Efficient Resource Management in OFDMA Femto Cells", ACM International Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc), May 2009.

[9] Esfahani, M.N & Ghahfarokhi, B. S. "Improving Spectral Efficiency in Fractional Allocation of Radio Resources to Self Organized Femtocells Using Learning Automata", In Telecommunications (IST), 2014 7th International Symposium on, September 2014, pp. 1071-1076.

[10] Fradi, N. Najeh , S. & Boujemaa, H. "Resource Allocation in OFDMA Networks with Femto and Macrocells Coexistence using Fractional Frequency Reuse (FFR)", In Communications and Networks (ComNet), 2014 International Conference on, March 2014, pp. 1-5.

[11] Jin, F. Zhang, R. & Hanzo, L. "Fractional Frequency Reuse Aided Twin Layer Femtocell Networks: Analysis Design and Optimization", Communications, IEEE Transactions on, 61(5), 2013, pp. 2074-2085.

[12] Benkhelifa, F., Rezki, Z., & Alouini, M.S. "Cooperative Decoding in Femtocell Networks: Performance Complexity tradeoffs" In Signal Processing Advances in Wireless Communications (SPAWC), 2012 IEEE 13th International Workshop on June 2012, pp. 404-408.

[13] Jeon, W. S., Kim, J., & Jeong, D. G. "Downlink Radio Resource Partitioning with Fractional Frequency Reuse in Femtocell Networks", Vehicular Technology, IEEE Transactions on, 63(1), 2014, pp. 308-321.

[14] Tran G K, Tajima S, Ramamonjison R, et al. "Study on Resource Optimization for Heterogeneous Networks[J]", Ieice Transactions on Communications, 2012, 95(4), pp. 1198-1207.

[15] T. Kim, T. Lee, "Throughput Enhancement of Macro and Femto Networks By Fractional Frequency Reuse and Pilot Sensing," IEEE International Performance, Computing and Communications Conference (IPCCC), Dec. 2008.

[16] Mustafa Y. Arslan, Jongwon Yoon, et al. "A Resource Management System for Interference Mitigation in Enterprise OFDMA Femtocells", IEEE Transaction on Networking, Vol. 21, No.5, October 2013.

[17] Husam Eldin Elmustasim Osman Mohamed Elfadil, et al. "Fractional Frequency Reuse in LTE Netwokrs", IEEE Magazine 2015.

[18] Dimitrios Bilios, et al. "Optimization of Fractional Frequency Reuse in Long Term Evolution Networks", IEEE Wireless Communications and Networking Conference; Mobile and Wireless Networks, 2012.

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CENTRIFUGE LIQUID SEPARATION MACHINE

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ABSTRACT
This paper introduce, Centrifugation is a method of separating molecules having different densities by spinning them in solution around an axis (in a centrifuge rotor) at high speed. The major components of the centrifuge include; an electric motor, a rigid frame, rotating wheel, three sedimentation vessels and a centrally mounted shaft. The centrifuge was designed to withstand vibration caused by the rotating masses and fabricated using locally sourced standard material. Performance test analysis gave a specific energy consumption and optimal separation time of 30 minutes respectively. Thus the centrifuge constitute a variable option for production of pure and quality industrial products in small and medium scaled industries. The main purpose of making machine is to check our product before going for batch production, for avoiding losses time and material.

INTRODUCTION
A centrifuge is a device that uses centrifugal force to separate various components of a fluid. This is achieved by spinning the fluid at high speed within a container, thereby separating fluids of different densities (e.g. cream from milk) or liquids from solids. It works by causing denser substances and particles to move outward in the radial direction. At the same time, objects that are less dense are displaced and move to the centre. In a laboratory centrifuge that uses sample tubes, the radial acceleration causes denser particles to settle to the bottom of the tube, while low-density substances rise to the top. A centrifuge can be a very effective filter that separates contaminants from the main body of fluid.

There are three of centrifuge designed for different application, Industrial scale centrifuges are commonly used in manufacturing and wast processing to sediment suspended solids, or to separate immiscible liquids. An example is the cream separator found in dairies. Very high speed centrifuges and ultracentrifuges able to provide very high accelerations can separate fine particles down to the Nano-scale, and molecules of different masses.

Large centrifuges are used to simulate high gravity or acceleration environments (for example, high-G training for test pilots). Medium-sized centrifuges are used in washing machines and at some swimming pools to draw water out of fabrics.

Gas centrifuges are used for isotope separation, such as to enrich nuclear fuel for fissile isotopes.

REVIEW OF THE LITERATURE
In this Literature Survey, an overview of important of laboratory centrifuge rotor design and other parameter selection is presented. It is mainly focused on studying the different parameters of laboratory centrifuge rotor to improve the strength of the rotor and safety of the product.

[1] Anon Wang boon, Pattarapong Phasukkit, Computational Analysis of Blood Parameters Separate by Centrifuge Technique: This article is purpose of the computational fluid dynamic (CFD) simulation for blood parameters separated by centrifuge machine which has different spinning velocities. The structure of the machine, as a fixed tube at 30 degrees from the base is used to prove that the precipitate of the blood's 2 parameters, such as blood cell and plasma, by using the simulation from computer In three dimensional (3D) symmetry modelling to study the change of the precipitate in centrifuge at different velocity of spinning. At 2000 rpm, 3000 rpm, 4000 rpm and 5000 rpm(round per minute) the result of this simulation showed the density of blood as low density in the top of the blood it's mean plasma and high density at the bottom of the tube it's mean blood cell. From the model in centrifuge can prove that in each different level of the density from velocity of spinning that useful for study to improvement of blood parameters separated by used computer simulation

[2] Neethu S.1 and B.G. Fernandez Design, Analysis and Optimization of High Speed Axial Flux Permanent Magnet Synchronous Motor for Centrifuge Application: This paper presents novel design and analysis of a high speed axial flux permanent magnet motor for centrifuge application. The centrifuge motor is designed to rotate at a speed of 45000 rpm inside an evacuated casing for a long time. The proposed axial flux motor has light, yet strong, well-balanced rotor that can run for about 25 years continuously. The designed motor is optimized for obtaining superior performance. Magnet 3-D and OptiNet are used for the Finite Element Analysis (FEA) and optimization of the motor respectively and the results are presented. Finally, the fabricated motor is testedusing sensor less Field Oriented Control (FOC) for experimental verification

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[3] Mr Himanshu J Gajjar1, Mr Nikunj Modh2, Mr Killol Kothari3, A Review On Optimization Of Laboratory Centrifuge Rotor Using Simulation Tools, Vol.2, and March 2016: In the present review paper an effort is made to study the previous investigations which have been made in the different structural analysis and optimization techniques of Rotor of Laboratory High Speed Micro Centrifuge. That analysis may be static or dynamic analysis. A number of analysis techniques like analytical and experimental are available for the structural analysis of High Speed Micro Centrifuge Rotor. Same as no of optimization techniques are available for optimization of it like Taguchi method. In this scenario, a structural optimization tool like topology optimization is becoming more relevant and attractive in product design processes. Determination of the different structural or topology analysis and optimization through the various methods like FEA, in high speed laboratory centrifuge rotorhas been reported in literature.

Inertia Plate Fabrication

1. SS 316 Plate 12 mm thickness marking And cutting With plasma cuttingMachine
2. Material cutting , 350 long 240 width, 12mm thickness,
3. Grinding In order to get surface right angle.
4. SS Rod diameter Cutting of SS 316 (Bearing Housing)
5. Rod diameter cutting of 100mm and 70mm length
6. SS plate of 12 mm should be cut 100 mm dia at center for welding of Rod
7. Rod of diameter 100mm Should be done rough machining before welding on Inertia plate, Rod is held on True jaw lathe machine for Boring purpose that will reduce Time for final machining with inertia plate
8. Welding with inertia plate of rod diameter 100mm with maintaining height of 28mm with respect to top side of inertia plate.
9. Welding Height Will be 5 mm With Argon Gas Welding.
10. With DP i.e. Developer And penetrant Flaw check of welding Joint. 11.Cutting of pipe diameter 180mm *30mm length *3mm thickness ss 316 for Bottom Shell.
12. Machining of pipe by holding true on jaw chuck of lathe machine, lightcut of 1mm on both side.
13. Ring cutting of diameter 225mm, 8mm thickness , SS 316
14. machining of ring by light cut on face ,OD and ID of 180mm tolerance(+0.2)
15. Welding of pipe with ring fillet of 5mm outside and 3mm inside (bottom shell).
16. Welding of bottom shell with inertia plate fillet of 5mm inside and outside
17. Machining of bottom shell with inertia plate and rod of diameter 100mm (Bearing housing) with maintaining diameter of 62mm inside on one side and width of 18mm, now machining of bottom shell maintaining height of 30mm and diameter of 215 mm.
18. Machining of other side of bearing housing with inner diameter of 62mm and 18mm width.

Body Fabrication of Centrifuge Machine

1. SS 316 pipe of diameter 180mm.
2. Pipe cutting of diameter 180mm and 120mm length , 3mm thickness
3. Machining of pipe holding on true Jaw chuck for Face Cutting operation to make diameter 180mm length 115mm.
4. Cutting of ring ID 170 mm & OD 220 SS 316 Grade
5. Rough machining of ring by light Cut of 1 mm.
6. Welding of ring on both side with diameter of 220mm welding size will be 5mm on bottom side and 4mm on top side one round argon gas welding
7. Machining of body shell by maintaining size of diameter 215 mm on the side one side machining grove of 6*6mm for Teflon type gasket fitting.
8. Top side machining of ring maintaining light cut on face by maintaining diameter 215mm.

Lid Fabrication of Centrifuge Machine

1. Diameter 215mm, 3mm thickness circle cutting and used pressing machine for maintaining depth of 15mm

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inside.

2. Cutting of ring diameter of 185 ID and 220 OD.
3. Machining of ring with light cut (0.5mm)
4. Welding of ring with circle of fillet size of 5mm inside and 3mm outside.
5. Machining of lid circle by light cut on ring face(0.5mm) and OD will be 215mm. & grove size of 4.8mm for O ring fitting (rubber type) of 5mm diameter.

Basket Fabrication of Centrifuge Machine

1. Cutting of pipe diameter 150mm length 80mm.
2. Machining of pipe with light cut on face, cutting of circle 25mm thicknessdiameter 15mm OD.
3. Machining of circle with maintaining OD 140mm and step of 50mm*16mm depth IS 24mm for locating.
4. Welding of plate with basket pipe (shell) inside and outside of fillet 5mmone round.
5. Drilling of basket pipe 115mm pitch and light cut on base by maintainingID of 25mm(-0.02).
6. Shaft machining of 30mm diameter with bearing size diameter 32mm(+0.02).
7. Nylon gear coupling alignment with motor & shaft with using diameter16mm OD 180mm long.

WORKING

First ensure of tightening of basket nut with silicon gasket fix the filter bag inside surface of basket properly so that it stick to basket and after rotating of basket it should not get stuck to pipe line nozzle Close the Lid & body Shell with provided I bolt screw Rotate basket for 30sec freely So that the filter bag get fixed properly And feed by water inside for cleaning and filtering of bag You can Pour Slurry Liquid from feed pipe Constantly and equally while rotatingof basket, so a constant ML liquid can be separated from Slurry Liquid i.e. (drug,Chemical, High Density liquid, Etc.,.

Rotating times depends on density of material which is used to separate. Sight Glass is provided to ensure Working and material can be seen through it. After obtaining Cake or Powdered material in filter bag Shut the Supply of motor Open the lid and the whole Filter bag can be removed out manually.

RESULT

We used ammonium nitride scullery liquid for trial we get the result in the formof cake powder.

High Flow Material

Curd was inputted in the machine and the result is in the form of strained yogurt.Low Vibration has observed.

CONCLUSION

The main boon of using the ideology is to reduce the cost for testing of Chemicalsin lab before taking any heavy batch of material in use so that the drug cost will be saved, also to obtain a very simple drive with any other misconceptions. Timeand vibration has been reduced to obtain results with more effective by increasing RPM and Power.

A Better design for maintenance and cleaning purpose

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REFERENCES

1. Anon Wang boon, Pattarapong Phasukkit, June 2018 "Computational Analysis of Blood Parameters Separate by Centrifuge Technique" "1 International Conference on Transportation, Mechanical, and Electrical Engineering (TMEE)" 1 International Conference on Transportation, Mechanical, and Electrical Engineering (TMEE) Vol.10 pg. no: (323-327)
2. Neethu S.1 and B.G. Fernandez, 24, may 2017 "Design, Analysis and Optimization of High Speed Axial Flux Permanent Magnet Synchronous Motor for Centrifuge Application international electric machines and derives" "International Conference on Advanced Intelligent Mechatronics" vol.12 pg.no(316-320)
3. Mr Himanshu J Gajjar1 , Mr Nikunj Modh2 , Mr Killol Kothari 3, March 2016: "A Review On Optimization Of Laboratory Centrifuge Rotor Using Simulation Tools" "E International Conference on Condition Monitoring and Diagnosis" Vol.2, page no :(2105-2110)
4. Mahajan Ashwini, Prof. B.V. Jain. Dr Suraj Sarode Jul 2015 "RESEARCH CENTRIFUGE- ADVANCED TOOL SEPERATION" "International Journal of Parma Sciences and Research (IJPSR)"Vol. 6 pg no:(7-15)
5. Hamidreza Minaiepour 27 September 2012, "Investigating the causes ofbody failure of MV electromotor in centrifuge equipment" "InternationalConference on Mechanical, Control and Computer Engineering" Vol. 74 No. pg no:(513-518)
6. Zhou Li-kun1, 1 Dec 2011 "Faculty of Mechanical and Precision Instrument Engineering of Technology" "Operating parameter optimization of centrifuge based on APSO-RBF" Vol . 8 , pg no: (756-760)
7. Xuan Hai-jun, Song Jian, 2007 "Failure analysis and optimization design of a centrifuge rotor" "Science Direct, Engineering Failure Analysis" Vol. 14 Pages: 101–109
8. Mahesh M. Swamy, and Yoshiaki Yukihira, Member of IEEE, Shiuichi Fujii, and Mitsujiro Sawamura "Transactions On Power Electronics"VOL. 19, NO. 4, JULY 2004
9. F. N. Werfel, U. Flogel-Delor, R Roth Feld, D. Wippich, T Ridel,2001 "Centrifuge advances using HTS magnetic bearings" Physic Vol. 4. Pages:13-17
10. James R. Kannolt and Rodney B. DePoy, Oct 2000 Innovative ElectricMotor Drive Centrifuge ProducesRapid Onsenecay Rates Provides Safer,More Precise

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DESIGN & FABRICATION OF MULTI-PURPOSE MECHANICAL MACHINE

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ABSTRACT
This is paper presents the concept of ''Multi-Purpose Mechanical Machine'' mainly carried out for production based industries. Industries are basically meant for Production of useful goods and services at low production cost, machinery cost and low inventory cost.. So in this project we have a proposed a machine which can perform operations like drilling, cutting, grinding some lathe operations at different working centers simultaneously which implies that industrialist have not to pay for machine performing above tasks individually for operating operation simultaneously. In this machine we are actually giving drive to the main shaft to which a bevel gear is attached, all four shafts have a bevel gear attached to each other to form a differential mechanism, and three of the four operations are both engageable and disengageable.

Keyword: Multipurpose, Power transmission, Concurrent Engineering, FMS (Flexible Manufacturing System), Cutting.

1. INTRODUCTION
Every industry desire to make high productivity rate maintaining the quality and standard of the product at low average cost .in an industry a considerable portion of investment is being made for machinery installation .so in this project work is propose where a machine is designed which can perform operations like cutting, buffing, milling, and drilling.

Our Research describes the design of a "Multi-Purpose Mechanical Machine" which is based on the concept of concurrent engineering to perform multi-operations such as cutting, drilling, grinding. I have worked on the same project at my college presenting a synopsis showing its basic construction and working. The project work subject is one, in which actually we are learning the theoretical concepts in practical way. Also the practical experience is one of the aim of this subject. For a developing industry these operating performed and the parts or components produced should have its minimum possible production cost, then only the industry runs profitably

2. LITERATURE REVIEW

2.1 Rakesh S. Ambade, Komal D. Kotrange Et.Al. "Paddle Operated Multipurpose Machine"
The survey of the literature regarding pedal driven machine are listed: Dharma Chaitanya Kirtikumar was design and develop of multipurpose machine which does not required electricity for several operation like cutting and drilling etc. This is a human power machine runs on chain drive mainly with human effort. But if we wanted to operate this machine by electric power this machine can also does that. This design is ideal for use in the developing world because it does not required electricity and can be build using metal base, pulley, rubber belt, chain, grinding wheel, saw, bearing, foot pedal for operated by human effort.

2.2 Krishnappa R1, Venkatesh G2, ET. Al. "Motorized Multipurpose Machine"
Industries are basically meant for Production of useful goods and services at low production cost, machinery cost and low inventory cost . Today in this world every task have been made quicker and fast due to technology advancement but this advancement also demands huge investments and expenditure, every industry desires to make high productivity rate maintaining the quality and standard of the product at low average cost.

2.3 Dr. Toshimichi Moriwaki (2006) "Multi-Function Operating Machine"
Recent trends in the machine tool technologies are surveyed from the viewpoints of high speed and high performance machine tools, combined multifunctional machine tools, ultra precision machine tools and advanced and intelligent control technologies. Frankfurt-am Main, 10 January 2011. The crisis is over, but selling machinery remains a tough business.

2.4 Mr.Gawari Tushar1, Mr. Gawade Rahul2, Et.Al. 'Multi Purpose Machine'
This model of the multi operational machine is may be used in industries and domestic orientation which can perform mechanical operation like drilling , cutting and shaping of a thin metallic as well as wooden model or body. Economics of manufacturing: According to some economists, manufacturing is a wealth-producing sector of an economy, whereas a service sector tends to be wealth-consuming.

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3. ELEMENTS OF PROJECT

3.1 Drilling: - A drill is a tool fitted with a cutting tool attachment, usually a drill bit used for drilling holes in various materials. The attachment is gripped by a chuck at one end of the drill and rotated while pressed against the target material. The tip of the cutting tool does the work of cutting into the target material.. Specially designed drills are also used in medicine, space missions and other applications. Drills are available with a wide variety of performance characteristics.

Fig 1: Drill bits

3.2 Cutter: - Cutting is used to machine flat metal surfaces especially where a large amount of metal has to be removed. Other machines such as milling machines are much more expensive and are more suited to removing smaller amounts of metal, very accurately.. The cutting tool removes the metal from work which is carefully bolted down. The shaping machine is a simple and yet extremely effective machine. It is used to remove material, usually metals such as steel or aluminium, to produce a flat surface.

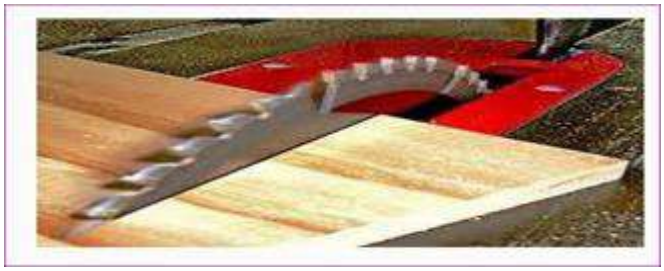

Fig 2: cutting

3.3 Frame: - The frame of setup for the Multi-Operational Machine consist of four ends inclined at certain position to transmit power from AC motor connected to shaft at one end having Scotch Yoke Mechanism such that the power to another parallel shaft is transmitted via chain sprocket system having drill chuck fitted with drill bit at one end and grinding wheel at other end for the other two operations to be performed under single workstation. The frame is made up of mild steel which holds the mainframe of the project such that to minimize the vibrations and oscillations during it working operation ,all the four ends of the frame is clamped at fixed position by means of mechanical clamps.

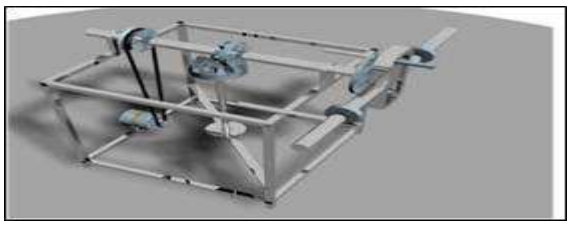

Fig 3: Frame

3.4 Bearings: - A bearing is a device to permit constrained relative motion between two parts, typically rotation or linear movement. Bearings may be classified broadly according to the motions they allow and according to their principle of operation. Low friction bearings are often important for efficiency, to reduce wear and to facilitate high speeds. Essentially, a bearing can reduce friction by virtue of its shape, by its material, or by introducing and containing a fluid between surfaces. Rolling-element bearings such as ball bearings and roller bearings are used for this purpose. In this project roller ball bearing such as bearing no: - (SKF-6294) is used for this purpose.

3.5 A.C. Motor: - An AC motor is an electric motor driven by an alternating current (AC). The AC motor commonly consists of two basic parts, an outside stator having coils supplied with alternating current to produce a rotating magnetic field, and an inside rotor attached to the output shaft producing a second rotating magnetic field. The rotor magnetic field may be produced by permanent magnets, reluctance saliency, or DC or AC electrical windings.

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3.6 Shaft: - A shaft is a rotating machine element, usually circular in cross section, which is used to transmit power from one part to another, or from a machine which produces power to a machine which absorbs power. The various members such as pulley & belt and bearings are mounted on it. The material used for ordinary shafts is mild steel. When high strength is required, an alloy steel such as nickel, nickel-chromium or chromium-vanadium steel is used. Shafts are generally formed by hot rolling and finished to size by cold drawing or turning and grinding.

Fig. 4: Shaft

3.7 Belt and Pulley: - A belt is a loop of flexible material used to link two or more rotating shafts mechanically, most often parallel. Belts may be used as a source of motion, to transmit power efficiently or to track relative movement. Belts are looped over pulleys and may have a twist between the pulleys, and the shafts need not be parallel.. They run smoothly and with little noise, and cushion motor and bearings against load changes, albeit with less strength than gears or chains.

Fig. 5: Belt and pulley

3.8 Gears: - Bevel gears are used as the main mechanism for a hand drill. As the handle of the drill is turned in a vertical direction, the bevel gears change the rotation of the chuck to a horizontal ratio. Bevel gears are gears where the axes of the two shafts intersect and the tooth- bearing faces of the gears themselves are conically shaped. Bevel gears are most often mounted on shafts that are 90 degrees apart, but can be designed to work at other angles as well. The pitch surface of bevel gears is a cone.

Fig. 6: Gears.

3.9 Buffing: - Buffing is defined as a finishing process that involves the use of a loose abrasive on a wheel. To polish a work piece, a manufacturing company may use a wheel that's covered with an abrasive disc. Generally, the wheels used in the buffing process are made up of cloth or the fiber which is charged with loose abrasive grains. The buffing belts are made in the same way as wheels. A very fine abrasive is used for being charged to these wheels or belts and charging is generally done by using sticks made up of abrasive or/and wax.

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Fig. 7: Buffing wheel.

3.10 Milling: - Milling is the process of machining using rotary cutters to remove material by advancing a cutter into a work piece. This may be done varying direction on one or several axes, cutter head speed, and pressure. Milling covers a wide variety of different operations and machines, on scales from small individual parts to large, heavy-duty gang milling operations. It is one of the most commonly used processes for machining custom parts to precise tolerances.

4. METHODOLOGY

Power is transmitted through the motor to the shafts with the help of belt and pulley mechanism, this helps is transferring the power of the motor to the shafts. The shafts are held on to the frame with the help of pedestal bearings which are bolted to the frame. Bevel gears are used in this condition and they are strong and rigid and can work in dry condition as well. Splines are ridges or teeth on a drive shaft that matches with grooves in a mating piece and transfer torque to it, maintaining the angular correspondence between them. For instance, a gear mounted on a shaft might use a male spline on the shaft that matches the female spline on the gear. The splines on the pictured drive shaft match with the female splines in the center of the clutch plate, while the smooth tip of the axle is supported in the pilot bearing in the flywheel. An alternative to splines is a keyway and key, though splines provide a longer fatigue life, and can carry significantly greater torques for the size.

5. OPERATIONS PERFORMED

1) Drilling
2) Cutting
3) Milling
4) Buffing

6. PROPOSED PROJECT FIGURE

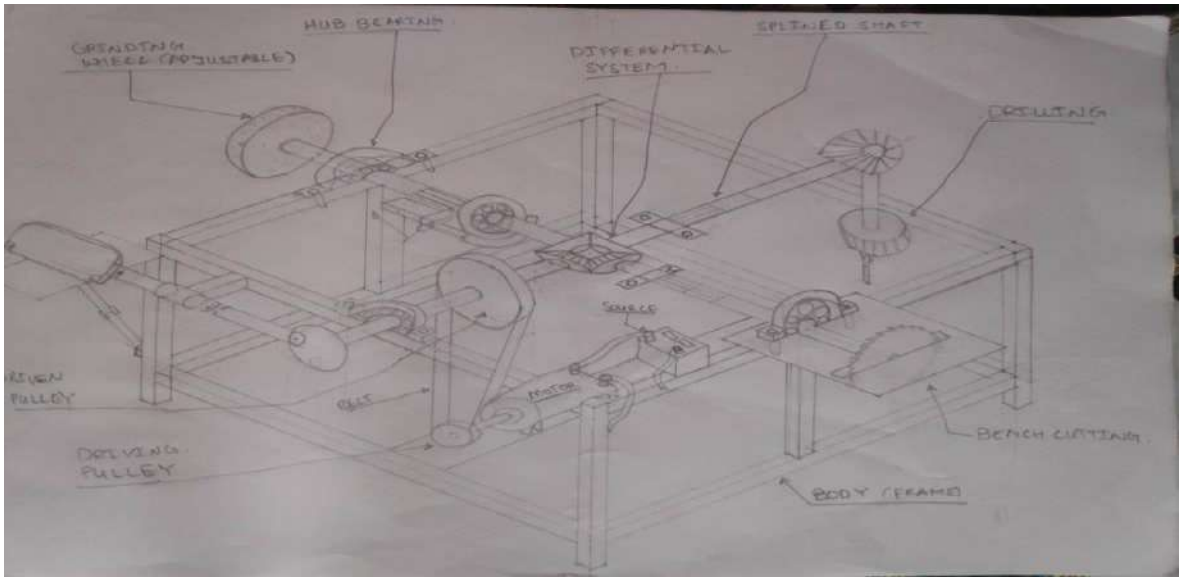

Fig. 8: Design of Multipurpose Mechanical Machine

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7. FINAL DESIGN OF PROJECT

Fig. 9: Final Design of Multipurpose Mechanical Machine.

7. SPECIFICATIONS OF COMPONENTS

- Frame of the model: length=2.5 ft., width=2.5 ft., height=3.5 ft.
- Shaft dia. =20 mm (main.), shaft length=360 mm
- Splined Shafts (3)

o Bush Dia.= 25mm (outer), 16mm inner dia., 2mm splined, for 85mm length.

o Shaft Dia. = 20mm for 260mm length; 18mm outer dia., 2 mm deep cut, for 100mm length.

- Roller bearings of inside dia. =20 mm and 25 mm
- Roller bearing no:- SKF 6294
- Shaft is also of mild steel.
- Frame is also made of mild steel
- Belt length= 4.5 ft., Pulley dia.=3”
- Drill bit length=6mm
- Cutting wheel dia.=110mm.
- Centre to centre dist. Of pulley and shaft=48cm.
- Speed of motor = 1440 rpm, 0.5 H.P.
- Torque transmitted = 2455.5 N.mm

8. RESULT

- Performing operation on more than one Job at a time.
- Performing multiple operation in one cycle and easy operation and attachments.
- Easy to install and use anywhere.
- Low maintenance cost.
- Simple in construction.

9. ADVANTAGES AND APPLICATION

- Machine cost is minimum.

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- Five operation work at a time in machine.
- Maintenance cost is low.
- Easy to assemble. Simple in operation.
- Simple in operation.
- No need of skill operator.
- All operation is performing by only one motor.
- This machine can be used in Steel industry.
- It can be used for multiple operations in workshop.
- It can be used in part manufacturing work.

11. CONCLUSION

We can see that all the production based industries wanted low production cost and high work rate which is possible through the utilization of multi-function operating machine which will less power as well as less time, since this machine provides working at different centre it really reduced the time consumption up to appreciable limit. In an industry a considerable portion of investment is being made for machinery installation. So in this paper we have proposed a machine which can perform operations like drilling, cutting, grinding at different working centers simultaneously which implies that industrialist have not to pay for machine performing above tasks individually for operating operation simultaneously.

12. FUTURE SCOPE

- Other operations can also be incorporated in to the machine
- The machine can be made more portable
- Cost can also be reduced to some extent by manufacturing it on a mass scale.
- Regulator can also be incorporated onto the AC motor to regulate the speed of moving motor (varying speed of motor).

13. REFERENCES

[1] Rakesh S. Ambade1, Komal D. Kotrange2, Khushal D. Nakade3, and Raksha R. Dange4] February 2016, Volume 4, Issue 2, ISSN 2349-4476 'Paddle operated multipurpose machine'.

[2] Krishnappa R1, Venkatesh G2, Shriram M V3, Gowtham T4, U A Varun Prasad5, Venkatesh Patki6 h (IJRTER) Volume 03, Issue 06; June – 2017 [ISSN: 2455-1457] "Motorized multipurpose machine"

[3] Model IOSR Journal of Mechanical and Civil Engineering (IOSR-JMCE) e-ISSN: 2278- 1684,p-ISSN: 2320-334X, Volume 11, Issue 3 Ver. III (May- Jun. 2014), PP 69-75 .Multi- Function Operating Machine: A Conceptual

[4] Volume 5, Special Issue 04, Feb.-2018 (UGC Approved) 'International Journal of Advance Engineering and Research Development'Multi Purpose Machine.

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DESIGN AND FABRICATION OF GYROBIKE

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ABSTRACT
This paper contains detailed description of designing and analysis of Gyro wheel used for the stabilization of the mono bike. The Gyro wheel is a special kind of wheel which is designed as an alternative to the training wheels used in bicycle for new learners. The Gyro wheel works on the principle of gyroscopic effect cause by the rotating flywheel. The Gyro wheel consists of a solid disk flywheel inside it which is spinning independently. The flywheel rotates at a high speed and creates a gyroscopic effect known as gyroscopic precession. It is design as a special type of wheel working on mechanical aspects that would be able to balance it-self i.e. it would maintain vertical position because the rotating flywheel nullified all the forces acting upon the wheel. For designing of the Gyro wheel, 3d modeling software used is Solid Works. As the title of the project gives a rough idea of this research which is about aconcept which can be implemented on bike with which the bike can be balanced itself without any support. This self-supporting bike will be powered with the help of DC hub motor which will be connected to a lithiumion battery .The purpose of this project is to design and build a mono wheel bike which can be used for ease of transportation and balance itself with the help of gyroscopic effect. The gyroscope balances the bike by countering external disturbance by the use of precision effect. This technology is generally used in heavy ships for balancing purpose to neutralize the effect of waves force. The same principle we can use with bikeas well. The gyro wheel will be mounted to same shaft as the mono bike's main wheel and it will be powered with dc motor which will also be connected to the same battery output. When in rotation, it resists any change inorientation of its spin axis.

Keywords: Flywheel, Gyro wheel, Monowheel, Precision Effect.

I. INTRODUCTION

Developing a one- wheeled electric vehicle which has features that can cover the problems such as ease of transportation, decrease atmospheric pollution ,using less parking space, mentioned above since it has small longitudinal length and low carbon footprint. Moreover, they are suitable for all age groups; and do not require any registration, taxes. Most humans can learn to ride a bike without any problem because humans are skilled to balancing laterally left to right and the gyroscopic effect of the wheels makes it easy to stay up onceon the move. Remove one of the wheels to make it a unicycle and the tendency to topple backwards or forwards around the single axle is almost impossible to avoid. Seasoned unicyclists manage it by using the directly connected pedals to constantly adjusting the wheel backwards and forwards underneath them.

II. OBJECTIVE OF THE PROJECT

A. To Maintain the Wheel in Vertical Position.

The Gyro wheel consists of a flywheel which is co-axially aligned with the wheel. The flywheel needs to be rotated at a desired speed to obtain the required gyroscopic effect. When the flywheel rotates at the respective all the forces acting on it are nullified due to the rotation. The flywheel is coupled to a DC motor with friction drive method and these motor drives the flywheel which creates a gyroscopic effect helps in processing of the wheel in vertical direction.

B. To Rotate the Flywheel to the Desired Speed.

To create the gyroscopic effect in the Gyro wheel the flywheel needs to be rotated at the respective speed (rpm). This is done by using a D.C motor. D.C motor has a high starting torque and starting time is also less so it is used for the purpose. The D.C motor is coupled to the flywheel by a friction wheel.

III. DESIGN AND COMPONENTS

Following general components of Gyro wheel are to be designed and selected:

1. Flywheel
2. Bearing
3. Axel
4. Motor
5. Motor controller
6. Battery
7. Tire

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IV. CALCULATION

1. Calculation for Motor to Rotate the Flywheel

DC Motor Speed (N) = 2650 rpm

Voltage (V) = 24 V

Watts = 250 W

Torque of the motor

Torque (T) = $\frac{\text{power}\times 60}{2\pi\times N}$

T = $\frac{24\times 60}{2\times 3.14\times 2605}$

T = 0.0865

Torque = 86.5N/m

2. Calculation for Battery Range

Battery used Lithium ion = 48 V

Ampere = 24 Amp

Watts Hour (WH) = Voltage × Ampere

Watts Hour (WH) = 48×24

WH = 1152 Watt Hour

Charging time depends upon the charger

If the charger is of 6 Amps it will take 4 hours to charge the battery to its full capacity.

To run a 750 watt motor for 1 hour it will consume 750 WH.

If the motor running at speed of 25 kmph for 1 hour 32 min it will be fully drained giving us the range of 33km.

V. DESIGN OF GYRO WHEEL

Figure 1: Gyro wheel design solidworks

This is the first step making Gyro bike. Gyro wheel is the main component on this project it's powered with a 250 Watt motor which produces 2650 rpm. The Flywheel is an important part of the gyro wheel. The gyro wheel is made using a normal tire which is a section of (90/90-12) dimension. A flywheel is a mechanical device with a significant moment of inertia used as a storage device for rotational energy. Here diameter of the flywheel is 241.1 mm and weight of the flywheel is 10kg. Minimum occurs at the center of the flywheel. It is made of mild steel material and has hole in the middle of it to pass the axel through it. The flywheel inside the tire is held with the help of 8 total mild steel strips which are welded through the rim of the tire as shown in the figure above and the shaft which is also made with mild steel is connected with 2 box housing bearing so that shaft rotates freely as well as the gyro wheel. When powered the gyro wheel with battery and motor as mentioned above the result are that flywheel inside the wheel starts to rotate at a high speed making the wheel stabilize.

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VI. DESIGN OF FRAME

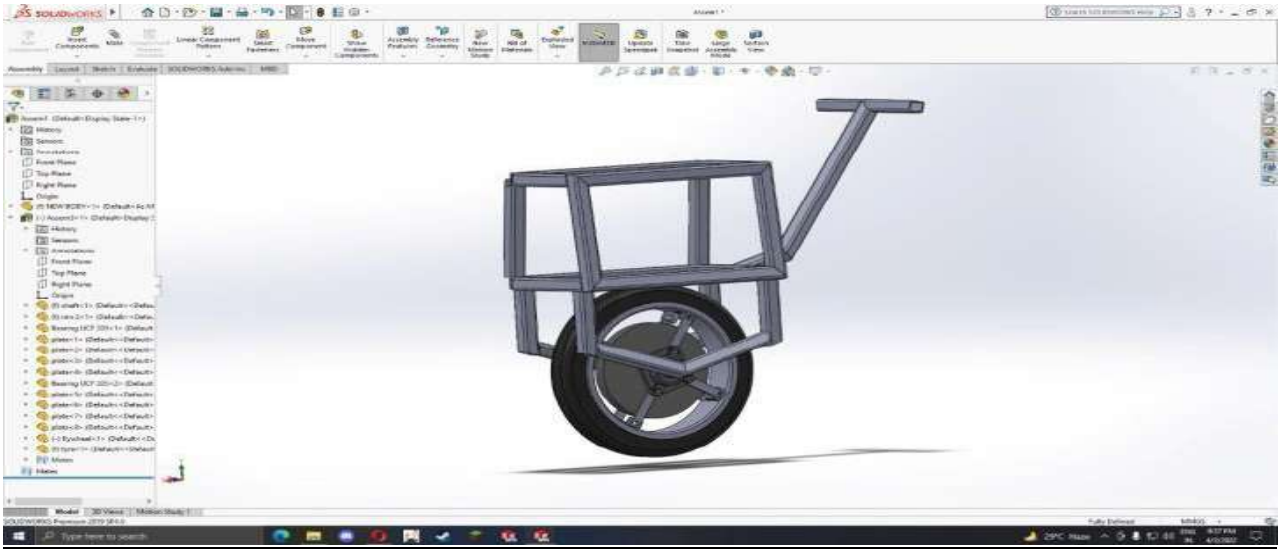

Figure 2: Gyrobike frame solidworks design

Frame is designed with help of computer software Solidworks Design. This design is to make compact so that it can take less space, light weight and can be comfortable will sitting and riding it. The body is made as a one whole structure and it is welded. The hollow squared metal tubes are used and it is stronger enough and it will not bend while riding after facing a bump.

VII. CONCLUSION

In the course of this project, the design and analysis of Gyro wheel was done. The attempt to replace or find an alternative use of transportation. The main objective is to achieve space utilization, making it cost efficient, less complicated and simpler in use. Thus, the mono- wheel is much helpful in the large campuses like airports, universities, space centers and in large industries etc. This system reduces the work of humans as well as no pollution it provides eco- friendly environment. The use of Gyro wheel has a wide range of applications that can be harnessed in the near future.

VIII. REFERNCES

[1] French craftman rousseau(1869) A research paper on “first mono wheel cycle” at (IJRASET).

[2] Bombardier (2003) “conceptual design for the vehicle is powered by hydrogen fuel cell”at https://en.wikipedia.org/wiki/Electric_unicycle.

[3] Trevor Blackwell (2004); “functional self-balancing” International Research Journal of Engineering and Technology (IRJET).

[4] Janick and Marc Simeray(2006) ; US patent for a compact seat less device at research article.

[5] Ryno motors; Prototype unit of their Ryno bike at http://rynomotors.com/

[6] Ford Motor Company(2015); “A self-propelled unicycle research paper at IRJET.

[7] Ji-Hyun Park and Baek-Kyu Cho(2018) ; International Journal of Advanced Robotic Systems March-April 2018: 1–11. The Author DOI: 10.1177/1729881418770865

[8] Prof. Mayur Shelke , Abhinav Tingne , Sajal Chandrakar , Prathamesh Bharti , Vishal Meshram , Tejas Dahikar (2018) International Journal for Research in Applied Science & Engineering Technology (IJRASET) ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 6.887 Volume 6 Issue III.

[9] A. Kadis, D. Caldecott, A. Edwards, M. Jerbic, R. Madigan, M Haynes, B. Cazzolato and Z. Prime, The University of Adelaide, Australia; Modelling, simulation and control of an electric unicycle.

[10] Shishir S, Manjunath P, Pavanasudan R , Ravi Sathyajith (2015) , Design and Fabrication of Foldable Bicycle. SSRG International Journal of Mechanical Engineering (SSRG – IJME) – Volume 2 Issue 6.

[11] Mariana DELIU “MONOWHEEL DYNAMICS”, November 2009, (Pg.3)

[12] Moore, Bill, “EV World's first test drive of the Segway personal mobility machine”, Jul. 24,2002 [Online].

[13] Mr. Sandeep Kumar Gupta and Mrs. Veena Gulhane, "Design of Self-Balancing Bicycle using Object State Detection", International Journal of Engineering Research & Technology, (IJERT) ISSN: 2248- 9622, april 2014.

[14] Stephen C. Spry and Anouck R. Girard, "Gyroscopic Stabilization of Unstable Vehicles:Configurations, Dynamics, and Control", March 31 2008.

[15] Mr. Sandeep Kumar Gupta and Mrs. Veena Gulhane, "Pose Estimation Algorithm Impication for Bicycle using Gyroscope and Accelerometer", International Journal of Scientific and Research Publications, volume 4, issue2,February 2014.

[16] Self-Stabilizing Two Wheeler using Gyroscope", (IJARET), volume 5, issue 12, December 2014, pp. 4854.

[17] Sreevaram Rufus Nireektion Kumar, BangaruAkash and T. Thaj Mary Delsy "Designing the Monowheel by Using Self Balancing technique", 2016, (Pg.1, 4, 20,)

[18] MaanyamSairam, SeetharamSandeep, SaiPrahallad, S. SachinGogoi, Sukumar Reddy "Fabrication of Mono Roue", Oct 2014, (Pg.1, 17, 18) 3)

[19] Manpreet Singh, Ankit Sharma, AnshulAgnihotri, PranabeshDey, DigantaKalita, SushobhanShekharDutta "An Investigation Study Based on Emerging Demand of Electric Unicycle Vehicles", May 2015, (Pg.3, 4) 4).

[20] Gheorghe DELIU, Mariana DELIU "MONOWHEEL DYNAMICS", November 2009, (Pg.3)

[21] C. C. Chan and K. T. Chau, "Modern electric vehicle technology" Oxford university press, New York, 2001

[22] Sheikh Mohibul Islam Rumi, I.S.M. Shanamul Islam "System Design of a two wheeler self-balanced Vehicle" IEEE publisher, Jan 2015

[23] N.Tamaldin, H.I.M.Yusof,M."Design of self balancing bike" International journal of Robotics &Automation .Malaysia 2017

[24] A.Geetha,VishwanathKannan,"Design & Development of a Self Balance Mono Wheel Electric Vehicle, MALADINDIA,2018,IOSRJEN

[25] Pallav Gogoi, ManishNath, "Design and Fabrication of Self Balancing Two Wheeler Vehicle Using Gyroscope" Internation journal of emerging technologie, ASSAMINDIA,2017.

[26] Pom Yuan Lam" Gyroscopic Stabilization of a Kid-Size Bicycle",IEEE journal SINGAPORE,2011

[27] The New York Times, "How New Gyro Car Worked In London,"May-17-1914, [Online].

[28] Chapman, Giles (2009). "Schilovski Gyrocar". The Illustrated encyclopedia of extraordinary automobiles. New York, USA: Dorling Kindersley Limited. p. 37. ISBN 978-0-7566-4980-7.

[29] Ray Jarvis ''Do-it-Yourself Segway Mobile Robot Platform''ARC Centre for Perceptive and Intelligent Machines in Complex Environments: Intelligent Robotics Monash University, 2005.

[30] Carter, De Rubis, Guiterrez, Schoellig, Stolar. "Gyroscopically Balanced Monorail System Final Report" (2005) Columbia University.

[31] Beznos AV, Formalsky AM, Gurfinkel EV, Jicharev DN, Lensky AV, Savitsky K V, et al. "Control of autonomous motion of two-wheel bicycle with gyroscopic stabilization." In: Proceedings of the IEEE international conference on robotics and automation, 1998, p. 2670-5.

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MULTIPURPOSE WHEEL HOE FOR COST AND WORK EFFICIENT FARMING

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ABSTRACT
It is said that Farmers are the backbone of the country, But nowadays they are leaving or either selling their farms and moving towards different profession for their living. And, by this our country is affected in all aspects. Due to lack of financial support, taxes on goods in market and low market value of the grown crops. Because of these reasons farming has becamed one of the expensive occupation or profession. So, we have decided as being an engineer and the citizen of this country we should contribute our knowledge and skills towards country and the people living in this country. By making our KISAN strong to face any situations.

We have created an 'All Purpose Farming Machine' which can does almost everything in the field which creates farming cost and work efficient named as 'Multipurpose Wheel Hoe'.

Our Main Motive is to

1) To make agriculture easy and affordable.
2) To support agriculture and the farmers willing to do farming.
3) To bring back the farmers who left their profession as a farmer.
4) To gather new generation towards farming for country's growth.

I. INTRODUCTION

Development and Fabrication of "Wheel Hoe" is aimed to produce the multifunction tools according to the agriculture field conditions. Wheel Hoe has three implements which is used to trim weeds (WEEDER), to cultivate a soil (CULTIVATOR), to make the drainage (FURROWER) on the dried soils. But, we have enhanced traditional wheel hoe by developing two more attachments which is to plain soil (PLAINER) and to separate grains from waste material (HARVESTER) and we have named it as "Multipurpose Wheel Hoe".

Today's world requires speed in each and every field. Hence rapidness and quick working is most important. Now a day for achieving rapidness, various machines and the equipment are being manufactured. In such a modern era of liberalization, small scale industries are contributing in a big way to the growth of our country. New machines and techniques are being developed continuously to manufacture various products at cheaper rates and high quality. Taking into account the above contribution we have tried to manufacture a machine which can reduce human workload and can do various agricultural activities. The organic food system or often mentioned the organic agriculture is one of the activities Indian Government Program to decrease usage of chemical fertilizers and pesticides which is causing reduced soil fertility and an environmental damage. An organic agriculture is defined as the holistic and integrated system of agricultural productions, through optimizing the health and productivity of agro economy so, it will be producing the good quality of food. There are principles of organic agriculture that is the fertility and soil biological activity must be maintained, the soil must behave right humus and loose, trimming weed is using mechanical or semi- mechanical way of farming. Indian farmers problems are lack of agricultural mechanization to support the productivity of agricultural product. The Indian farmers are still using the traditional tools in their agricultural activities. Therefore, the outcome is less than the efforts they are putting in their fields.

II. LITERATURE SURVEY

A. Development and Evaluation of Wheeled Long-Handle Weeder

Silas O. Nkakini a,Ψ, and Abu Husseni b Department of Agricultural and Environmental Engineering, Faculty of Engineering, Rivers State University of Science and Technology, Nigeria (E-mail: nkakini@yahoo.com, E-mail: abusky4u@yahoo.com) Ψ - Corresponding Author. A push-type operated wheel weeder with an adjustable long handle, was designed, constructed and tested. The hoe performance from the tests on a field of Okra plant having an inter-row spacing of 800mm, showed that it could weed satisfactorily, and eliminate the drudgeries associated with the use of the short handle hoe such as backache, pains at the spine and lower waist region.

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Field capacity and efficiency of 0.050ha/hr and 87.5% were obtained respectively. Furthermore, the average weeding index and performance index obtained were 86.5% and 1108.48, respectively. At a speed of 0.04m/s, a high efficiency of 91.7% at 0.4m depth of cut was obtained. The developed wheeled long-handle weeder was found efficient.

B. An Ergonomic Study on Evaluation of Single Wheel Hoe in Reducing Drudgery

Shilpi Verma, Shobhana Guptaand C.P. Pachauri

Women constitute a major task force in agricultural operations in India. Therefore, it becomes necessary to study the ergonomics of women operators involved in weeding and to suggest modifications for further reduction of human drudgery. Heart rate is one of the accurate means to evaluate the functional demands of work on the worker. Hence, the study was done to know the performance of improved weeder that is single wheel hoe in reducing drudgery among women engaged in weeding activity. The results showed that the total cardiac cost of work was 285.0 beats, the physiological cost of work was 6.33 beats/min, the average working heart rate during weeding was 112.5 beats/min and the average energy expenditure was 9.16 KJ/min during the weeding activity performed by improved tool , the single wheel hoe. Weeding activity was performed for maximum number of days in a year from morning till evening in squatting position majority of women perceived it as moderately heavy activity.

III. COMPONENTS

A. Main Frame

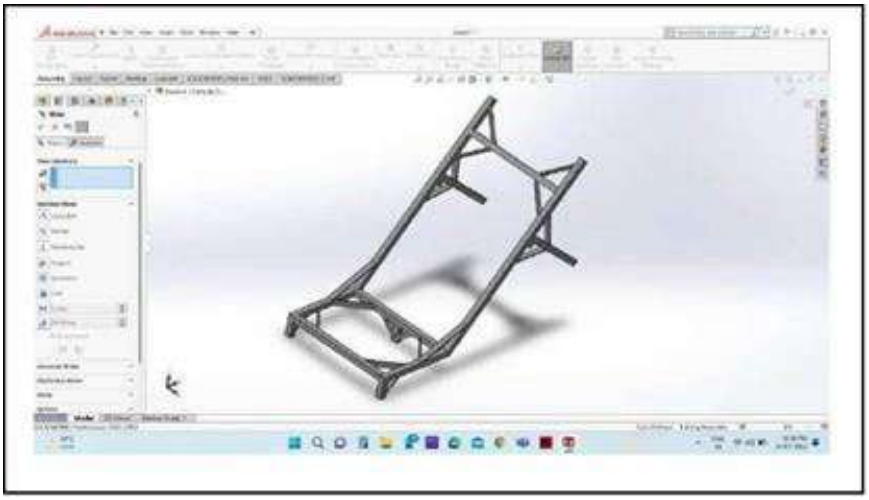

Figure 1: Main Frame

The main frame is the most important part of the project as it holds all the attachments and all the work is totally dependent on it.

B. Handle and Stand

Figure 2: Handle

Figure 3: Stand

1) Main Frame with Handle (for Cultivator, Weeder, Furrower and Plainer attachment). Main frame consists of handle which is removable, the main job of the handle is to steer the project and to do push and pull operation efficiently.

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2) Main Frame with Stand (for Harvester attachment). The handle itself is the stand of the project. It's main job is to keep project stable while using Harvester attachment and to make project stand while not in use.

C. Attachment Holders

Figure 4: For Cultivator, Weeder and Furrower and Plainer

Figure 5: For Harvester

1) For Cultivator, Weeder, Furrower and Plainer attachment. It's job is to hold the following attachments mentioned above.
2) For Harvester attachment. It's job is to hold Harvester attachment, which is use to spin the Harvester.

D. Attachments

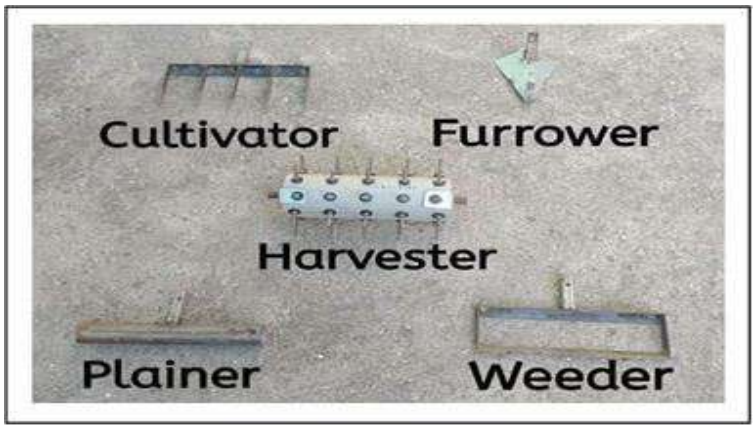

Figure 6: Attachments Attachments are designed specially as per the job's desired requirement.

The Attachments are as Follows,

1) **Cultivator:** It is used to loose the soil for making field ready to get seeds sow in the soil.
2) **Plainer:** It is used to plain the soil.
3) **Weeder:** It is used to remove weeds from the field.
4) **Furrower:** It is used to make sections on the land or to make small gaps for planting.
5) **Harvester:** It is used to harvest crops by separating unwanted straws and waste materials.

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E. Wheels

Figure 7: Wheels

The job of the wheels is to move the body of the project from one place to the another with ease. It plays the main role in reducing efforts required during various operations done on the field.

F. Assembly

Figure 8: For Cultivator, Weeder, Plainer and Furrower.

Figure 9: For Harvester.

IV. METHODOLOGY

A. Working Methodology

1) Start of Project
2) Study regarding the project (Multipurpose Wheel Hoe)
3) Design parameters
4) Designing

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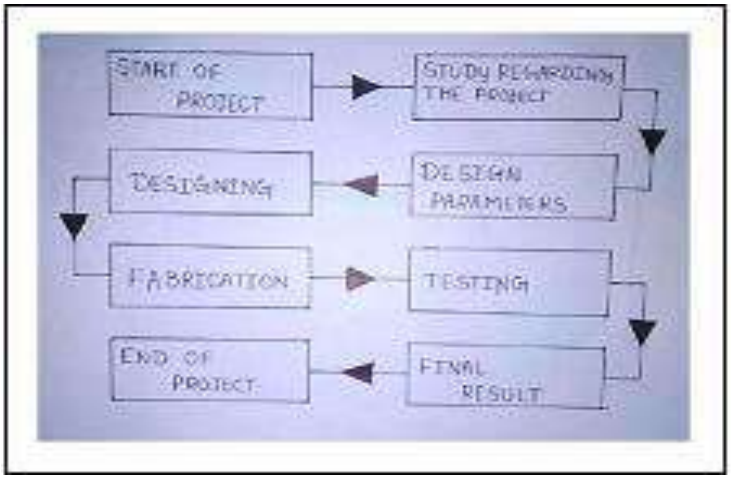
5) Fabrication
6) Testing
7) Final results
8) End of Project



a) Design of the Equipment: The first stage of our project is to make proper plan and preparing the design of the equipment as per approximate suitable dimensions.
b) Fabrication of the Working Model: Once Designing is over we are planning to fabricate the working model using suitable materials.
c) Testing of the Model: Once the fabrication is over testing the equipment in the agricultural field by using different material.
d) Result and Conclusion: Once testing is over compare the results with manual wheel hoe and this is helps to give conclusion of our project work.

V. DATA AND ANALYSIS

A. Time v/s Working Methods Graph.

The tests were done on (2m × 2m) ground for (Cultivator, Furrower, Weeder and Plainer) and for Harvester (10kg) of crops were tested.

Figure 10: Field Work

Table 1: Time and Working Methods.

Sr No.	Methods	Cultivation	Weeding	Furrowing	Harvesting	Plaining
1.	Traditional	20 min	17 min	10 min	12 min	15 min
2.	Multipurpose Wheel Hoe	15 min	15 min	7 min	10 min	10 min

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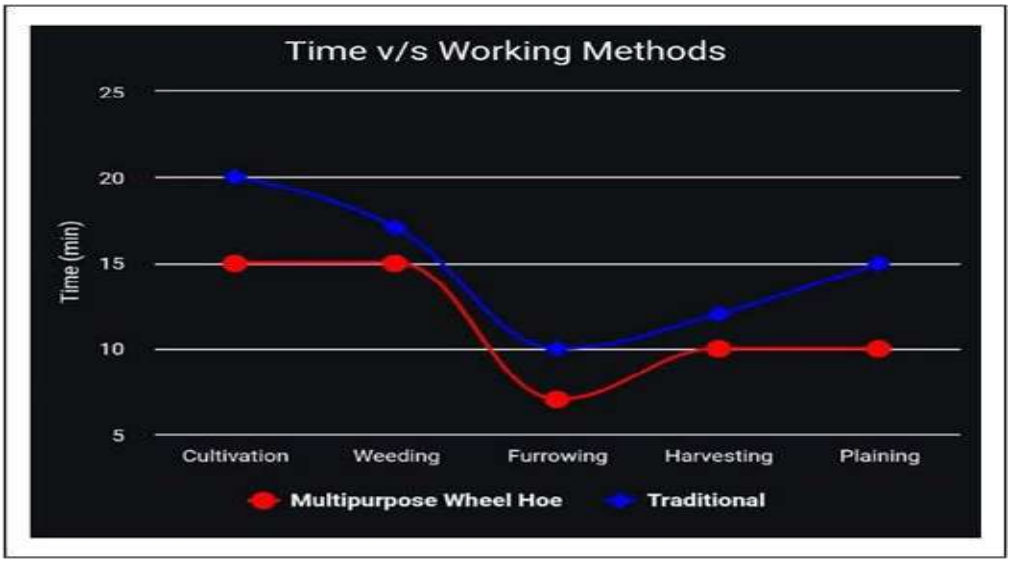
Note: Time is taken in minutes.



Graph 1: Time v/s Working Methods Graph

The above given graph shows us the time comparison between traditional methods and the Multipurpose Wheel Hoe. Conclusion: Multipurpose Wheel Hoe is more time efficient than traditional methods.

B. Ergonomical and Field Performance Evaluation of the Multipurpose Wheel Hoe.

Five male subjects of age group (25 to 35) were selected for ergonomical investigation from the agricultural labour community; medical fitness test was carried out prior to the experiment and details are furnished in Table.2 The maximum aerobic capacity of the selected subjects was varied from 1.40 to1.84 l/min (lpm).

The varied individual differences in maximum aerobic capacity (VO2max) was observed due to the differences in the ability to supply oxygen to the muscles and also due to genetic factors (Bridger 1995), whereas, Noakes (1988) suggested that failure of muscle power might be the reason for variation of the VO2 max among the subjects.

Table 2: Details of the subjects participated in the study.

Sr No.	Subject	Age (years)	Average of MaximumHR, (bpm) For all 5 working procedures.	Average of Maximum aerobic capacity VO2 max (lpm)	Height (mm)	Weight (kg)
1.	S1	34	186	1.61	165	63
2.	S2	30	190	1.74	163	74
3.	S3	36	184	1.55	173	68
4.	S4	36	184	1.41	168	67
5.	S5	27	193	1.84	156	56
6.	Mean	32.6	187.4	1.63	165.4	65.6
7.	SD	3.97	3.97	0.17	6.95	6.65

Here, (bpm = beats per minute; lpm = litres per minute)

C. Assessment of Physiological Cost of Work

The energy expenditure (KJ/min) was estimated using the following formula proposed by Varghese et al. (1994) for Indian housewives.

Energy expenditure = 0.159 x HR (bpm) – 8.72

Following formulae were used for calculation of physiological cost of work (PCW) and total cardiac cost of work (TCCW).

Cardiac cost of work = Average heart rate (AHR) x Duration of activity where,

AHR = Average working heart rate – Average resting heart rate

CCR = (Average recovery HR - Average resting HR) x duration TCCW = Cardiac cost of work (CCW) Cardiac cost of rest, (CCR is taken 0).

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Therefore, PCW = TCCW / Total Time of Work. Calculations,

Table 3: For Traditional Methods.

Sr No.	Methods	Energy Expenditure (EE)	Total Cardiac Cost of Work (TCCW)	Physiological Cost of Work (PCW)
1.	Cultivation	21.0766	3748	187.4
2.	Weeding	21.0766	3185.5	187.4
3.	Furrowing	21.0766	1874	187.4
4.	Harvesting	21.0766	2248.8	187.4
5.	Plaining	21.0766	2811	187.4

Table 4: For Multipurpose Wheel Hoe.

Sr No.	Methods	Energy Expenditure (EE)	Total Cardiac Cost of Work (TCCW)	Physiological Cost of Work (PCW)
1.	Cultivation	21.0766	2811	187.4
2.	Weeding	21.0766	2811	187.4
3.	Furrowing	21.0766	1311.8	187.4
4.	Harvesting	21.0766	1874	187.4
5.	Plaining	21.0766	1874	187.4

CONCLUSION: Total Cardiac Cost of Work:

(Traditional Farming Methods > Multipurpose Wheel Hoe).

Hence, less efforts and same outcome with Multipurpose wheel Hoe.

D. Health issues due to Traditional Methods on Human Body.

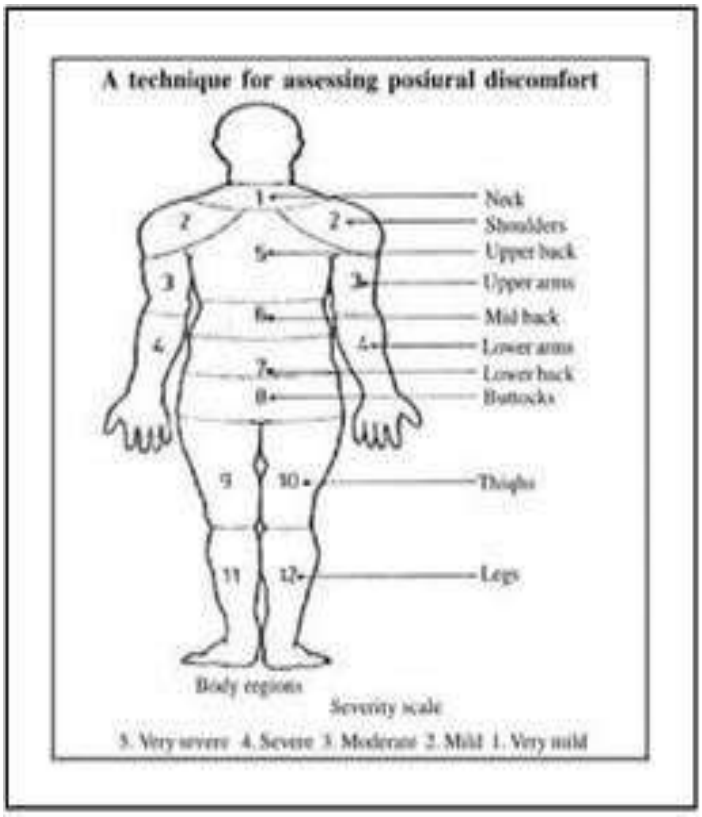

Figure 11: Technique for Assessing Posiural Discomfort after Using "Multipurpose Wheel Hoe".

Table 5: Responses on Musculo-skeletal problems and perceived exertion experienced by respondents

Sr No.	Methods Used	Musculo-skeletal problems	Rating of perceived Exertion (RPE)
1.	Traditional	Severe pain in shoulders, upper and lower back and upper arms	Very heavy
2.	Multipurpose Wheel Hoe	Moderate to light pain in shoulders, hands and arms	Moderately heavy

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CONCLUSION: Traditional method was leading to posiural discomfort and drudgery

VI. SOLIDWORKS MODEL

Figure 12. Main Frame

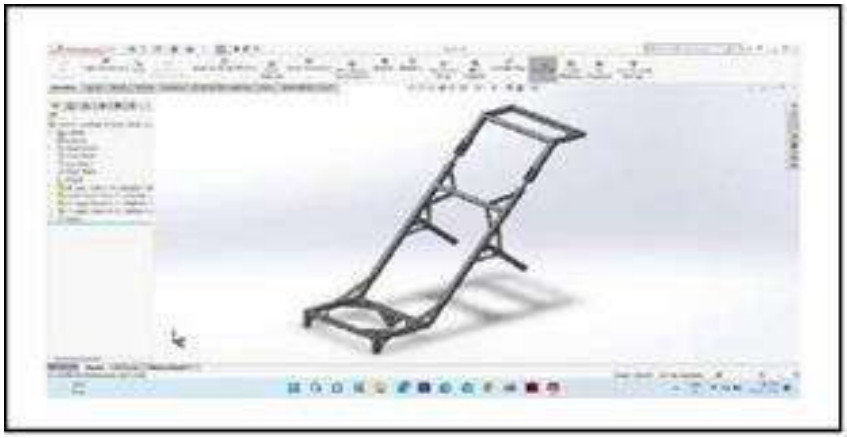

Figure 13: Assembly for Cultivator, Weeder, Furrower and Plainer

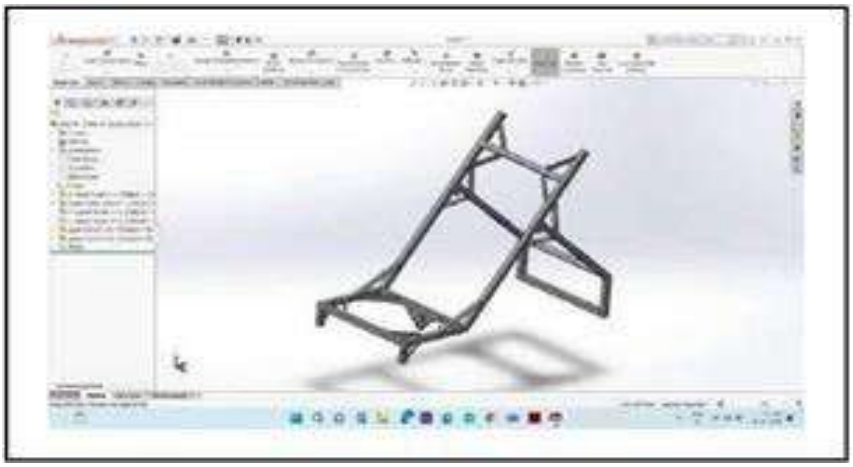

Figure 14: Assembly for Harvester

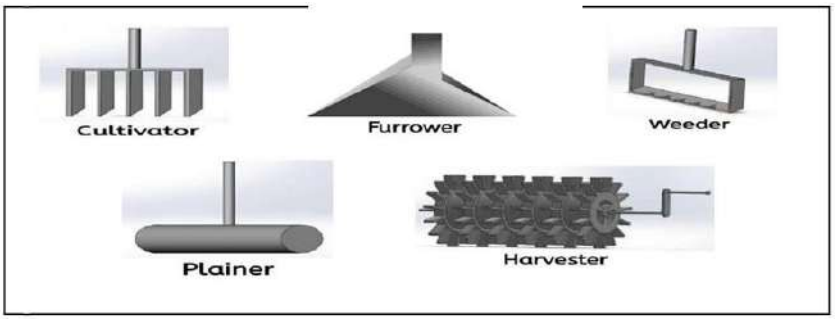

Figure 15: Attachments

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VII. CONCLUSION

Multipurpose Wheel Hoe was found useful in terms of saving time, human effort, increasing work capacity and productivity. It was found to be compatible, easy to handle and applicable in field situation as well as most efficient in vegetable fields. It was observed that use of Multipurpose Wheel Hoe improved posture and efficiency of worker. The body discomfort reduced with use of Multipurpose Wheel Hoe because it employed standing posture eliminating muscular fatigue and excessive loading of inter- vertebral discs of backbone. This proved that Multipurpose Wheel Hoe is ergonomically sound, women friendly, drudgery reducing and improves efficiency of farmers.

VIII. FUTURE SCOPE

A. Since, the machine is totally man-powered working efficiency is less. So, to increase it motor or engine is required for the enhancement.

B. Various mechanisms should be used to improve maneuverability.

C. More attachments should be designed to attach on this machine to benefit consumers.

D. Design of the product should be made more simple to reduce product cost, maintainance cost and durability.

REFERENCES

[1] S.O. Nkakini and A. Husseni. Development and Evaluation of Wheeled Long-Handle Weeder

[2] Verma, Shilpi, Gupta, Shobhana and Pachauri, C.P. (2013). An ergonomic study on evaluation of single wheel hoe in reducing drudgery. Agric. Update, 8(4): 665-669.

[3] O Hildayani1, R E Putri2, Andasuryani2. Development of "Wheel Hoe" Appropriate Tool for Supporting Organic Farming.

[4] Shubham Bhavsar, SanjayPargi, and Chirag Jadav. Development of an improved twin wheel weeder

[5] K. Sudha Rani1, G. Narayana Swamy2, G.T. Madhavi3 and G. Prasad Babu4. Performance Of Three-Pronged Wheel Hoe On The Drudgery Reduction Of Farm Women Against Traditional Practices

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DUAL- AXIS SOLAR PANEL

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ABSTRACT
This paper contains a detailed description of the solar tracking and efficiency this provides. Energy needs are continuously increasing in this rapidly growing world. Most of our energy needs are met by burning fossil fuels which is harmful for the environment. Due to climate change and pollution, there is an increasing need of renewable sources of energy that are not harmful to the environment. The sun is a source of renewable energy. This energy is abundant and can be harnessed by using photovoltaic cells to produce electrical energy. The only drawback of this energy is that its conversion efficiency is low. The main reason for low conversion efficiency is because the absorption of solar energy is the most when the solar panel is perpendicular to the sun and it decreases in any other condition. Due to constant rotation of the earth the productivity is lowered. There are other drawbacks like weather conditions and harnessing is only possible during the day. Hence to overcome this problem solar trackers are used. Solar trackers help in increasing the productivity i.e., it increases the efficiency of the solar panel. Micro controller is connected to the solar trackers and with the help of starter motors the solar panel is moved to that particular direction. The micro controller is coded in such a way that it receives the input from the solar trackers and it gives the output to the starter motors which rotates the solar panel to the desired position. In this project we are going to increase the tracking efficiency which in turn will increase the efficiency of the solar tracker allowing it to produce more energy.

Keywords: Solar tracker, efficiency, energy.

I. INTRODUCTION
In photovoltaic systems, trackers help minimize the angle of incidence (the angle that a ray of light makes with a line perpendicular to the surface) between the incoming light and the panel, which increases the amount of energy the installation produces. Concentrated solar photovoltaics and concentrated solar thermal have optics that directly accepts sunlight, so solar trackers must be angled correctly to collect energy. All concentrated solar systems have trackers because the systems do not produce energy unless directed correctly toward the sun. Single-axis solar trackers rotate on one axis moving back and forth in a single direction. Different types of single-axis trackers include horizontal, vertical, tilted, and polar aligned, which rotate as the names imply. Dual-axis trackers continually face the sun because they can move in two different directions. Types include tip-tilt and azimuth-altitude. Dual-axis tracking is typically used to orient a mirror and redirect sunlight along a fixed axis towards a stationary receiver. Because these trackers follow the sun vertically and horizontally they help obtain maximum solar energy generation.

II. OBJECTIVE OF THE PROJECT
To create a solar tracker that is efficient than the one currently available in the market. Dual axis solar tracker consists of 4 sensors, 2 for each axis. When the difference between the sensors are there it will move to the direction of solar sensor that has the highest lux.

III. DESIGN AND COMPONENTS
The components of Dual Axis Solar Panel are as follows:

1. Solar panel
2. BH1750 sensors
3. Gear motor 10 rpm
4. ESP 32 microcontroller
5. L298N motor driver
6. Voltage sensor
7. Current sensor
8. LM2596 converter
9. TP4056 charging module

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IV. CALCULATIONS DC Motor Speed (N) = 10 rpm Voltage (V) = 3.3V

For Voltage from solar panel:

(Voltage reading/ 4095.00)*16.469

For current generated from solar panel:

ACS.ma/1000.00

For power

Power (WH) = voltage * current

Watts hour = 3.3 * 1

WH =3.3 Watt Hour

Charging time depends upon the solar radiation available throughout the day. If enough sunlight is available then this solar panel should charge the battery within 3 to 4 hours.

V. METHODOLOGY

Although design may vary, Dual Axis Solar Panel depends mainly on solar tracking and the motors to keep the panels perpendicular to the solar rays. Solar tracking will greatly affect on the sensors we use. Normally LDR's are the sensor that's used for this purpose, but these sensors are less reliable because of the limitations it has.

Consideration and Planning for the Complete Setup:

1. Selection of material for the frame.
2. Selection of microcontrollers, sensors, etc.
3. Calculation and programming for the microcontrollers and the motors used for the setup or frame to rotate the frame.
4. Preparation of the setup.

The whole solar panel frame will move with the help of the motors used and the sensors used for the detection of the light sensor. A UV based sensor is beneficial in this case because this is better at improving the limitations faced by the LDR's. UV tracking has a set amount of wavelength that it can detect and can cover the whole visible rays. There are 2 motors that are going to be used for the rotation of the frame to get the desired position. We will use 4 sensors which will be placed on all 4 sides to cover the panels. In these 2 sensors will mainly detect the solar motion on the daily basis and 2 sensors for the angular motion, though all 4 will also be used for the detection of solar positioning. There are possibilities of some noise or errors made by electrical components or due to the clouds or environmental conditions, these can be reduced by some Methods like EMA, etc.

SELECTION OF MATERIAL

The main purpose is to obtain the materials that can be used for the different materials and are suitable, cost effective and are available.

- Frame: The frame must be made up of such material that can hold the whole setup as well as the solar panels and can provide movability to the frame. This will depend on the cost.
- Motor: The motor will be selected as such to hold the frame and rotate the frame to the desired position with minimum time required.
- Microcontroller: The microcontroller will be selected in a manner such that it can be easily available and is easy to program and can compute the required calculations with less time.
- Sensors: The sensor used should be able to tack the sun rays on all possible conditions and keep the solar panels perpendicular to the sun rays.

Solar Panel: The panel should generate as much electricity as possible and also should be able to maintain temperature and cost effective as well.

WORKING

When the first ray of sunlight touches the UV sensor the whole mechanism will start. The 4 sensors on the frame of the will track the sunlight and will give the reading, this reading is then sent to the microcontroller. The microcontroller will take the input and then calculate the difference between the data and will send the

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command to the motors to move in accordance to the values, and will adjust itself till the difference in the reading of all 4 sensors is equal.

There are 2 motors used in this system, one will move the frame in the direction of sun's day to day path i.e., WEST – EAST, and the other motor which will rotate the frame in the direction of sun's angular path i.e., NORTH – SOUTH. This means the solar panel is perpendicular to the solar rays. When this is achieved the solar panel will generate the electricity and the generated electricity is sent to a battery to store the energy when needed. According to our theory this system will adjust itself according to the position of the sun to keep the solar panel perpendicular at all times. This will ensure the maximum generation of electricity and less wastage of solar energy.

Since the sensor used in this system is UV based this means that the limitations of LDR can be removed and thus can actively track the solar rays. The sensor will continuously track the sunlight and when there is not enough sunlight to generate the electricity, the microcontroller will shut down the device so that the energy spent to run the system will be lowered. Once there is low sunlight to generate the electricity the microcontroller will then send the signal to the motors and will set it back to the position it was on the start. This done because the solar path is EAST- WEST, this means there exists a possibility where any one or multiple sensors cannot track the solar rays for quite a long time and will result into less generation of electricity. So, this readjustment in the evening will ensure this doesn't happen. After this adjustment the system will shut down. And will reactivate itself after the sensors pick up the solar rays, this will ensure less consumption of energy. And this will run in the loop.

VI. CONCLUSION

After doing all the literature survey, we have found out that dual axis solar panel is better than single or fixed solar panel. Also it has been found out UV based sensor can improve the solar tracking than any other LDR's. From many researches it has been found that UV based solar tracking has higher efficiency followed by the LDR and then the fixed solar panel. The proposed method is cost effective and it can be further extended and utilized for various applications of solar energy. This research focus more on the tracking system and further upgrade should be made by technological optimization as well as minimal amount of operation energy should be utilized.

VII. REFERENCES

1. Priyanka Pawale , Prajakta Pawar , Tanuja Nagthane, Mohan Thakre , Nayana Jangale, Performance Enhancement of Dual Axis Solar Tracker System for Solar Panels using Proteus, Procedia Manufacturing 00 (2021) 000–000
2. Chindakham, Nachaya & Jamroen, Chaowanan & Fongkerd, Chanon & Krongpha, Wipa & Komkum, Preecha & Pirayawaraporn, Alongkorn. (2021). A novel UV sensorbased dual-axis solar tracking system: Implementation and performance analysis. AppliedEnergy. 299. 117295. 10.1016/j.apenergy.2021.117295.

4) Gómez-Uceda, F.J.; Ramirez-Faz, J.; Varo-Martinez, M.; Fernández-Ahumada, L.M. New Omnidirectional Sensor Based on Open-Source Software and Hardware for Tracking and Backtracking of Dual-Axis Solar Trackers in Photovoltaic Plants. Sensors 2021, 21, 726. https:// doi.org/ 10.3390/ s21030726

4. V Mohanapriya et al Implementation of Dual Axis Solar Tracking System 2021 IOP Conf. Ser.: Mater. Sci. Eng. 1084 012073
5. Munshi, Md. Rezwan & Hussain, Faisal & Bristi, Farzana & Karmoker, S & Mahamud, Z & Sumu, F. (2020). Design and fabrication of microcontroller-based dual axis lightsensitive rotating solar panel. Advances in Materials and Processing Technologies. 18.10.1080/2374068X.2020.1815137.
6. Nadia AL-Rousan, Nor Ashidi Mat Isa, Mohd Khairunaz Mat Desa, Efficient single and dual axis solar tracking system controllers based on adaptive neural fuzzy inference system, Journal of King Saud University – Engineering Sciences 32 (2020) 459–469.
7. Jumaat, Siti & Said, Mohamad & Jawa, Clarence. (2020). Dual axis solar tracker with IoT monitoring system using arduino. International Journal of Power Electronics and Drive Systems (IJPEDS). 11. 451. 10.11591/ijpeds.v11.i1.pp451-458.
8. Ye-Obong Udoakah and Egwuchukwu Chukwu, Design and Implementation of a Dual Axis Solar Tracker Using Arduino Microcontroller l, VOL. 17, NO. 3, 2018, 4148 www.elektrika.utm.my, ISSN 0128-442.

9. Ming-Hui Tan, Tze-Koon Wang, Chee-Woon Wong, Boon-Han Lim, Tiong-Keat Yew, Woei-Chong Tan, An-Chow Lai, Kok-Keong Chong, Optimization Study of Parasitic Energy Losses in Photovoltaic System with Dual-Axis Solar Tracker Located at Different Latitudes ,Energy Procedia ,Volume 158,2019,Pages 302308,ISSN 18766102,
10. Karpić, J., Sharma, E., Khatib, T. et al. Comparison of solar power measurements in alpine areas using a mobile dual-axis tracking system. Energy Inform 2, 23 (2019). https://doi.org/10.1186/s42162-019-0091-1
11. Laseinde, O.T. & Ramere, Dominic. (2019). Low-cost automatic multi-axis solar tracking system for performance improvement in vertical support solar panels using Arduino board. International Journal of Low-Carbon Technologies. 14. 76-82. 10.1093/ijlct/cty058.
12. Abdelilah, B & Mouna, A & KouiderM'Sirdi, N & Hossain, A. (2018). Implementation of Maximum Power Point Tracking (MPPT) Solar Charge Controller using Arduino. IOP Conference Series: Materials Science and Engineering. 353. 012024.10.1088/1757-899X/353/1/012024.
13. El Hammoumi, Aboubakr & Motahhir, Saad & Abdelaziz, el ghzizal & Chalh, Abdelilah & Derouich, Aziz. (2018). A simple and low- cost active dual- axis solar tracker. Energy Science & Engineering. 6. 10.1002/ese3.236.
14. Solar Energy Measurement Using Arduino Siti Amely Jumaat and Mohamad Hilmi Othman MATEC Web of Conferences, 150 (2018) 01007 DOI:
15. Kamrul Islam Chowdhury, Md.Iftekhar-ul-Alam, Promit Shams Bakshi , Performance comparison between fixed panel, single-axis and dual-axis sun tracking solar panel system: Department of Electrical and Electronic Engineering BRAC UNIVERSITY. 17th December, 2017
16. Chhoton, Amit Chakraborty & Chakraborty, Narayan. (2017). Dual axis solar tracking system-A comprehensive study: Bangladesh context. 421-426.10.1109/ICAEE.2017.8255393.
17. Jyoti Mishra, Ritula Thakur, Alok Deep , Arduino based dual axis smart solar tracker: National Institute of Technology, Kurukshetra. ISSN: 2454-1311 [Vol-3, Issue-5, May- 2017], Jan, 2017.
18. Heaning, Kane & Sohail, Saad & Kerbel, William & Trafford, Russell & Georgieva, Petia & Bouaynaya, Nidhal & Polikar, Robi. (2016). Dual Axis Solar Panel Control System.
19. Sharma, Brijbhushan & Sharma, Neenu. (2016). An Analysis of Automatic Dual Axis Sun Tracking Solar System. Ijireeice. 4. 10.17148/IJIREEICE.2016.41208.
20. Purnima Singh, Roop Pahuja, Meghavi Karwasra, Sunita Beniwal, Meenakshi Bansal, Anamika Dadhich, Dual axis solar tracking system for solar panel: Bulletin of Electrical Engineering and Informatics. pp. 403~411 Vol. 5, No. 4, ISSN: 2302-9285, 4th December, 2016.
21. P.Ramya, R.Ananth, (2016) The Implementation Of Solar Tracker Using Arduino With Servomotor, Volume: 03 Issue: 08, e-ISSN: 2395 0056, p-ISSN: 2395-0072.
22. Sameer Meshram, Sharad Valvi, Nilesh Raykar , A cost-effe ctive microcontrollerbased sensor for dual axis tracking: International Conference on Renewable Energies and Power Qual ity (ICREPQ'16), ISSN 2172-038 X, No.14, 14th May, 2016.
23. Bernábe, Laura & Dmytro, Zubov. (2016). Dual Axis Light (Solar) Tracker Using Arduino Uno and Energy Saving Algorithm. Page 37- 41. 10.13140/RG.2.1.1357.7365.
24. Soumya Das, Pradip Kumar Sadhu, Suprava Chakraborty, Sanchari Banerjee, Tunir Saha, Design and implementation of an intelligent dual axis automatic solar tracking system: pp. 383–387, Vol. 61, 4, 25th September, 2015
25. Soumya Das, Suprava Chakraborty, Pradip K. Sadhu & Oruganti Sankara Sastry, Design and experimental execution of a microcontroller (μC)-based smart dual-axis automatic solar tracking system, Energy Science and Engineering 2015; 3(6):558– 564
26. Kalyani Bhole, Designing of dual-axis tracking system with remote monitoring: Department of Instrumentation and Control Engineering. International Conference on Industrial Instrumentation and Control (ICIC), July, 2015.

27. Al Dahoud, Ali & Fezari, Mohamed & Alrawashdeh, Thamer & Jannoud, Ismael. (2015). Improving Monitoring and Fault Detection of Solar Panels Using Arduino Mega in WSN page 1072- 1078.
28. Muhammad Mazhar Abbas, Mohamed A. Tawhid, Khalid Saleem, Zia Muhammad, Nazar Abbas Saqib, Hafiz Malik, Hasan Mahmood, Solar energy harvesting and management in wireless sensor networks: Department of Electronics, Quaid-i-Azam University, 45320 Islamabad, Pakistan. Hindawi Publishing Corporation International Journal of Distributed Sensor Networks Volume 2014, Article ID 436107, 8 pages. 20th July, 2014.
29. K P J Pradeep, K Sai Prasad Reddy, Chandra Mouli, K Nagabhushan Raju, Development of Dual-Axis Solar Tracking us ing Arduino with Lab VIEW, International Journal of Engineering Trends and Technology (IJETT) – Volume17 Number7–Nov2014
30. Kumar v, Sundara. (2014). Automatic Dual Axis Sun Tracking System using LDR Sensor. International Journal of Current Engineering and Technology E-ISSN 2277 – 4106, P-ISSN 2347 - 5161. 4. 3214-3217. 10.14741/Ijcet/4/5/2014/22.
31. González, A.; Aquino, R.; Mata, W.; Ochoa, A.; Saldaña, P.; Edwards, A. OpenWiSe: A Solar Powered Wireless Sensor Network Platform. Sensors 2012, 12, 82048217. https:// doi.org/ 10.3390/ s120608204
32. Singthong Pattan Sethanon, The Solar Tracking System by Using Digital Solar Position Sensor, American J. of Engineering and Applied Sciences 3 (4): 678-682, 2010 ISSN 1941-7020 © 2010 Science Publications
33. Nelson A. Kelly, Thomas L. Gibson, Increasing the solar photovoltaic energy capture on sunny and cloudy days, Solar Energy, Volume 85, Issue 1, 2011, Pages 111-125, ISSN 0038-092X, https:// doi.org/ 10.1016/j.solener.2010.10.015.
34. Denis Dondi,Alessandro Bertacchini, Davide Brunelli, Luca Larcher, and Luca Benini, Fellow, Modeling and Optimization of a Solar Energy Harvester System for SelfPoweredWireless Sensor Networks, IEEE Transactions On Industrial Electronics, Vol. 55, NO. 7, JULY 2008
35. J. Taneja, J. Jeong and D. Culler, "Design, Modeling, and Capacity Planning for Microsolar Power Sensor Networks," 2008 International Conference on Information Processing in Sensor Networks (ipsn 2008), 2008, pp. 407-418, doi: 10.1109/IPSN.2008.67.
36. D. Dondi, D. Brunelli, L. Benini, P. Pavan, A. Bertacchini and L. Larcher, Photovoltaic Cell Modeling for Solar∗ EnergyPowered Sensor Networks, DII, Universitá degli Studidi Modena e Reggio Emilia, Italy 1-4244-1245-5/07/$25.00 ©2007 IEEE
37. Cesare Alippi, Fellow, IEEE, and Cristian Galperti, An Adaptive System for Optimal Solar Energy Harvesting in Wireless Sensor Network Nodes, IEEE Transactions On Circuits And Systems—I: Regular Papers,Vol. 55, NO. 6, JULY 2008
38. D. Niyato, E. Hossain and A. Fallahi, "Sleep and Wakeup Strategies in Solar-Powered Wireless Sensor/Mesh Networks: Performance Analysis and Optimization," in IEEE Transactions on Mobile Computing, vol. 6, no. 2, pp. 221-236, Feb. 2007, doi: 10.1109/TMC.2007.30.
39. David L. King, Jay A. Kratochvil, William E. Boyson, Improved accuracy for lowcost solar irradiance sensors: Sandia National Laboratories Alburquerque, New Mexico, USA. SAND97-3/75C, CONF-980735, 7th July, 1998
40. David L. King, William E. Boyson, Barry R. Hansen, Measuring solar spectral and angle of incidence effects on photovoltaic modules and solar irradiance sensors: Sandia National Laboratories Alburquerque, New Mexico, USA. SAND97-1/83C, CONF970953, 5th November, 1997

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PIPE INSPECTION ROBOT

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ABSTRACT
The engineer is constantly conformed with the challenges of bringing ideas and design into reality. New machines and techniques are being developed continuously to manufacture various products at cheaper rates and high quality. The pipe inspection robot with active pipe-diameter adaptability and automatic tractive force adjusting is developed for long-distance inspection of main gas pipelines with different diameter series. Its physical design employs the scheme that three sets of parallelogram wheeled leg mechanism are circumferentially spaced out 120° apart symmetrically. This structural design makes it possible to realize the adaptation to pipe diameter and tractive force adjusting together. On the basis of analyzing the mechanical actions of the adaptation to pipe diameter and tractive force adjusting, the related mechanical models are established, and their control system structure and control strategy are discussed. To verify the pipe-diameter adaptability and tractive force adjusting of the robot, related field experiments are implemented in actual underground gas pipeline. The experimental results show that the theoretical analysis in this paper is valid and the prototype of this robot can work well in actual underground gas pipelines. Compared with other similar robots, this robot, which employs active mode for its adaptability to pipe diameter, can be adaptable to the wide range of gas pipeline diameters from Ø300 mm to Ø500 mm and automatically provide a stable and reliable tractive force with strong capacity of tractive force adjusting. As a mobile carrier for visual inspection wireless camera is mounted to see corrosion, crack, defect, and holes of main gas pipelines, spring is also mounted in middle for making it flexible to take turn.

Keywords: In pipe robot, Active pipe diameter adaptability; Tractive force adjusting; Gas pipelines inspection

INTRODUCTION
There are a wide variety of pipelines such as urban gas, sewage, chemical plant, nuclear power plant etc., which are indispensable in our life. Also, pipelines are the major tools for transportation of oils and gases and a number of countries employ pipelines as the main facilities for transportation. In our country, the urban gas pipelines currently go up to 13,000 Km long but since most of them have been constructed in 1980's, there happen a lot of troubles caused by aging, corrosion, cracks, and mechanical damages from third parties. Continuous activities for inspection, maintenance and repair should be performed from now on. However, those activities need enormous budgets that may not be easily handled by gas companies as they are mostly small and medium in size. Efficient equipment's for inspection and integrated maintenance program are required in gas industries an in-pipe inspection robot for the inspection of pipe with pipe diameter adaptability is introduced here. There were various models developed for the pipe inspection; however, this robot excludes various dis-advantages associated with them.

1.1Aim of Project
In-pipe inspection robot with automatic adaptability to various pipe diameters and to monitor the defect, cracks, corrosion, block etc.

Why this Topic is Chosen?
Often, robots are used to do jobs that could be done by humans. However, there are many reasons why robots may be better than humans in performing certain tasks.

1. Speed
Robots may be used because they are FASTER than people at carrying out tasks. This is because a robot is really a mechanism which is controlled by a computer - and we know that computers can do calculations and process data very quickly. Some robots actually MOVE more quickly than we can, so they can carry out a task, such as picking up and inserting items, more quickly than a human can.

2. Accuracy
Accuracy is all about carrying out tasks very precisely. In a factory manufacturing items, each item has to be made identically. When items are being assembled, a robot can position parts within fractions of a millimeter.

3. Hazardous (Dangerous) Environments: Robots may be used because they can work in places where a human would be in danger. For example, robots can be designed to withstand greater amounts ofHeat, Radiation, Chemical fumesthan humans could.

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4. Repetitive Tasks: Sometimes robots are not really much faster than humans, but they are good at simply doing the same job over and over again. This is easy for a robot, because once the robot has been programmed to do a job once; the same program can be run many times to carry out the job many times. And the robot will not get bored as a human would.

5. Efficiency: Efficiency is all about carrying out tasks without waste. This could mean not wasting timenot wasting materials.

1.1.1 Problem Definition

The inspection of pipes may be relevant for improving security and efficiency in industrial plants. These specific operations as inspection, maintenance, cleaning etc. are expensive, thus the application of the robots appears to be one of the most attractive solutions. The pipelines are the major tools for the transportation of drinkable water, effluent water, fuel oils and gas. A lot of troubles caused by piping networks aging, corrosion, cracks, and mechanical damages are possible. So, continuous activities for inspection, maintenance and repair are strongly demanded. The robots with a flexible (adaptable) structure may boast adaptability to the environment, especially to the pipe diameter, with enhanced dexterity, maneuverability, capability to operate under hostile conditions.

Pipe inspection robots have been studied for a long time, and many original locomotion concepts have been proposed to solve the numerous technical difficulties associated with the change in pipe diameter, curves and energy supply. Although an exhaustive review of the literature is impossible due to the limited space available, a few broad categories can be identified:

(i) For small size, many projects follow the earthworm principle consisting of a central part moving axially while the two end parts are provided with blocking devices connected temporarily to the pipe. Pneumatic versions of this concept have been proposed but they require an umbilical for power. For smaller diameter (10 mm or less), a piezoelectric actuation has been considered, according to the inchworm principle, or according to an inertial locomotion driven by a saw-tooth wave voltage, or using vibrating fins with differential friction coefficients.

(ii)For medium size piping, classical electromechanical systems have been proposed with various architectures involving wheels and tracks, with more or less complicated kinematical structures, depending on the diameter adaptability and turning capability

(iii)For large pipes, walking tube crawlers have also been proposed.

1.1.2 Scope of the Project

The main scope of our FINAL YEAR MECHANICAL project is to locate defects due to corrosion and obstacle at the inner side of the pipe line. Nevertheless, damage still occurs, which reduces the strength of the pipe. If it goes undetected and becomes severe, the pipe can leak and, in rare cases, fail catastrophically. So, extensive efforts are made to mitigate defects. So we proposed a new design in inspecting pipelines.

METHODOLOGY

2.1Main Component and it working in Project

Dc Motor: The project is powered by using three permanent magnets direct current motor, The DC motor which we are using in our project consumes 12v and 10-watt powerand in output it gives us 10 RPM. The gear box is attached with DC motor. On the shaft of DC motor nut is provided for mounting it on link. Wheel is directly nut bolt on the shaft of motor.

Wheels: The wheels used in pipe inspection robot is of 75 mm diameter and 25 mm width. This wheels made of nylon material.here we have used 6 number of wheels. The circumference of wheel a provided with rubber grip so that it should not sleep inside pipe. Three wheels are idle and other three wheels are powered by using DC gear motor. These wheels are used to grip pull and push the robot inside pipe.

Spring Arrangement: Springs are flexible machine elements used for controlled application of force (or torque) or for storing and release of mechanical energy. Flexibility (elastic deformation) is enabled due to cleverly designed geometry or by using of flexible material. The springs used in pipe inspection robot is for providing grip of robot inside pipe. By using spring compression, we can compress the robot and will put it inside variable size of pipe diameter. in our project we are using three number of spring, two spring are used for gripping the wheels at front and back of robot and middle spring is used for making the robot flexible while turning.

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Toggle Switch: The toggle switch is used to move the project in forward and reverse direction. These switches are fitted inside switch box and are connected by using wire with DC motors and battery. This is spring loaded toggle switches; it will automatic comes in its center position when you release the forward or backward button.Electric toggle switches control the current to power equipment.

Ms Flat: MS flat are used in our project for fabricating the arms of robot. the MS flat are used because they are light in weight compared to angle or square pipe and consumes less area for making mechanism. The ms flat used in our project is of 18 x 3 mm cross section. Flats is done by the Width (W) & the Thickness (T) of the Flat. The weight of flat bar is easily calculated. Simply multiply the appropriate alloy density by the length, width, and thickness of the required part

Wireless Camera: Wireless cameras are wireless transmitters carrying a camera signal. The components are shown in Fig.15. The camera is wired to a wireless transmitter and the signal travels between the camera and the receiver. This works much like radio. Wireless cameras also have a channel. The receiver has channels to tune in and then the picture is obtained. The wireless camera picture is sent by the transmitter the receiver collects this signal and outputs it to a Computer or TV Monitor depending on the receiver type.

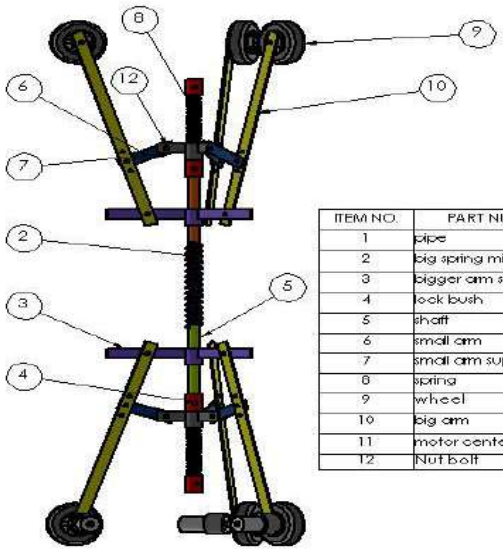
Fasteners (Nut and Bolt): The nut bolt used for making pipe inspection robot is M6 size. The M6 size is selected because they are light in weight and it can easily take the load of our mechanism. Majorlythey are used in our project for pivoting the mechanism and for tightening of Bush on shaft.

Battery: The battery is an electrochemical converting chemical energy into electrical energy. The main purpose of the battery is to provide a supply of current for operating the cranking motor and other electrical units. Its specifications are 12v and 3 amps.

Pop Rivet: The 5 mm rivets are used in our project for making the robot. Therivet is used for joining powder coated sheet with MS flat for making external pipe. A rivet is a permanent mechanical fastener. Before being installed, a rivet consists of a smooth cylindrical shaft with a head on one end. The end opposite to the head is called the tail. On installation, the rivet is placed in a punched or drilled hole, and the tail is upset, or bucked (i.e., deformed), so that it expands to about 1.5 times the original shaft diameter, holding the rivet in place. In other words, pounding creates a new "head" on the other end by smashing the "tail" material flatter, resulting in a rivet that is roughly a dumbbell shape.

Shaft: A shaft is rotating machine element which is used to transmit power from one place to another.But in pipe inspection robot shaft is used for assembling of whole mechanism here shaft is not transmitting any tangential power but it is acting as a chases for the whole project the material used for shaft is mild steel c45.

Sheet Metal: Sheet metal is metal formed by an industrial process into thin, flat pieces. Sheet metal is one of the fundamental forms used in metalworking, and it can be cut and bent into a variety of shapes. The sheet metal is used in our project for making pipe. The Powder coated sheet metal we are using here use of 26-gauge size i.e. 0.5 mm thickness, the weight of sheet is 3.9 kg per square meter.



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	pipe	Sheet metal	1
2	big spring middle	Spring steel	1
3	bigger arm support	Mild steel C-45	2
4	lock bush	Mild steel C-45	4
5	shaft	Mild steel C-45	2
6	small arm	Mild steel C-45	6
7	small arm support	Mild steel C-45	2
8	spring	Spring steel	2
9	wheel	Nylon	6
10	big arm	Mild steel C-45	6
11	motor center shaft	Galvanised iron	3
12	Nut bolt	Mild steel C-45	12

Figure 0-1 Drawing with BOM of pipe inspection robot

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RESULTS AND DISCUSSION

Pipe used for the demonstration is made of a powdered coated sheet plastic with 300 mm in diameter. The footpads are made of rubber grip just for the demonstration, but it may be need touse high friction footpads for real application. Both spring loaded arms are partially expanded at the initial position. The robot is subjected to the speed test. It is done bymeasuring time while the robot moves along the predetermined distance. It is shown that the average speed ranges 0.6~ 0.79 m/minand fifty percent decrease in speed while taking turn. By using lights and camera clear view of cracks and holes is shown on mobile and holes are visible on pipe from outside.

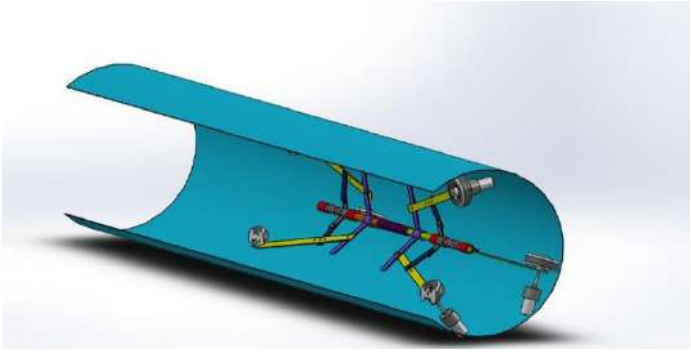

Figure 4-1 Cut sectional view

CONCLUSION

The design and assembly of a pipe inspection robot has been shown successfully. The camera for inspection purposes is functional; it provides a clear picture of cracks, obstacles, defects, rust, and holes. For non-insulated pipes, a pipe inspection robot is equipped with an LED light; if the pipe is cracked or holed in any way, a ray of light emerges from that crack, allowing us to quickly detect the damaged areas.. The robot is equipped with three springs, which perform admirably. All of the robot's six limbs are properly gripped by the two springs installed on the front and back of the robot. This robot can go through pipes ranging in diameter from 300 to 500 mm. Because of the spring, the robot has a good grip and does not slip within the pipe, while the middle spring gives the robot flexibility so that it may turn inside the pipe. The robot is controlled by a wired remote, and Robert is equipped with a wireless camera and a battery bank, allowing for a clear picture within the pipe to be displayed on the mobile device.

REFERENCES

[1] Okada, T., Sanemori, T. MOGRER-A Vehicle study and realization for in-pipe inspection tasks.-IEEE J. of Robotics and Automation, v. RA-3, No6, 1987, P.573- 582.

[2] Suzumori, K., Miyagawa, T., Kimura, M., Hasegawa,Y. Micro inspection robot for 1-in pipes. - IEEE/ASME Transactions on Mechatronics, v.4, No3, 1999, p.286-292.

[3] A small mobile robot for security and inspection operations Control Engineering Practice, Volume 10, Issue 11, November 2002, Pages 1265-1270 Nicholas S Flann, Kevin L Moore, Lili Ma

[5] H.T. Roman and B.A. Pellegrino, Pipe crawling inspection robotsan overview. IEEE Transactions on Energy Conversion, 8 3 (1993), pp. 576–583

[6] M. Beller, E. Holden and N. Uzelac, Cracks in pipelines and how to find them. Pipeand Pipelines International, 25 6 (2001), pp. 26–34.

[7] Y. Kawguchi, 1. Yochida, H. Kurumatani, and T. Kikuta, "Development of an In-pipe Inspection Robot for Iron Pipes," J. of the Robotics Society of Japan, Vol. 14, No.1, pp. 137-143, 1996.

[8] S. Hirose, H. Ohno, T. Mitsui, and K. Suyama, "Design of In-pipe Inspection Vehicles for <7'>25,<7'> 50,<7'> 150 pipes", Proc. of IEEE Int. Conf. on Robotics and Automation, pp.2309-2314, 1999.

[9] H. R. Choi, S. M. Ryew, S. W. Cho, "Development of Articulated Robot for Inspection of Underground Pipelines", Trans. of the 15th Int. Conf. on Structural Mechanics in Reactor Technology(SMiRT-15), Vol. 3 , pp.407-414, 1999.

[10] S. IvI. Ryew, S. H. Baik, S. W. Ryu, K. IvI. Jung, S. G. Roh, H. R. Choi, "Inpipe Inspection Robot System with Active Steering Mechanism" IEEE Int. Con/. on Intelligent Robot and Systems (IROS 2000), pp. 1652-1657,2000.

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MOTORIZED STAIRLIFT

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ABSTRACT
A stairlift is a mechanical device for lifting people and objects upwards and downwards on the stairs, who may find difficulty in doing so themselves. A stairlift can be used as a Material Handling System. For sufficiently wide stairs, a conveyor is mounted to the treads of the stairs. A chair or lifting platform is attached to the conveyor. Stairlifts can be mounted on the stairs without altering the civil structure. This lift runs on electric power and consists of a motor, reduction gear box, chain drive, a ladder with conveyor system.

A DC motor is used in this system to reverse the polarity of the power supply, causing the motor to run in reverse. The conveyor runs in upward or downward direction with the help of 6 pin reverse forward switches and push buttons. As guide pulleys are attached to conveyor belts, the movement of the conveyor is like a linear tracking system. Compared to conventional hydraulic lifts, there are some advantages like no civil work or alteration needed, low cost, less bulkiness, less power, less maintenance requirements, easy design, easy installation.

Keywords: Stairlifts, Conveyor, Pulley, DC motor.

INTRODUCTION
The number of patients with disabilities is on the rise according to the first official report "the global disabled persons report", there are 650 million people which are about 10% of the global population are disabled in the 1970s, and now the number has increased to 15%. Aging population who has chronic diseases is rising which makes the proportion of disabled persons expand.

The following picture (Figure 1.1) is about the proportion change of elderly people and younger people from 1950 to 2050, the percent of the young children is decreasing from 13% to 6%, in contrast to the percent of elderly population which keep increasing sharply.

BTH had a collaboration agreement with the government and the projects. of recent years had been focused on making life easier for the disabled and elderly people. The previous students in BTH had already designed some wheelchairs like "Electric wheelchair for easy access to toilet", This device can also prevent the wheelchair from overturning backward, and improve the security and comfort of the wheelchair. Locking system is added which is used to lock the wheelchair while climbing up and down stairs, making sure it can only move in one direction, and protect the wheelchair from slipping down. And combining the principle of ergonomics: a desk, shopping basket is added, and a curved seat is designed which makes the seat more comfortable and convenient. Then all parts of the wheelchair are modelled in Autodesk Inventor, and the strength of the important components of the wheelchair will be simulation analyzed.

OBJECTIVES
- To develop a lifting system which can be helpful for disabled people.
- To introduce a cost friendly solution for material handling to the upstairs.
- To design a safe lifting system which can easily be installed.
- To give a solution for the old buildings where typical lift cannot be installed.
- To determine the working efficiency and beneficial working of the stairlift.
- To determine the load carrying capacity of the stairlift.

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Design and Construction

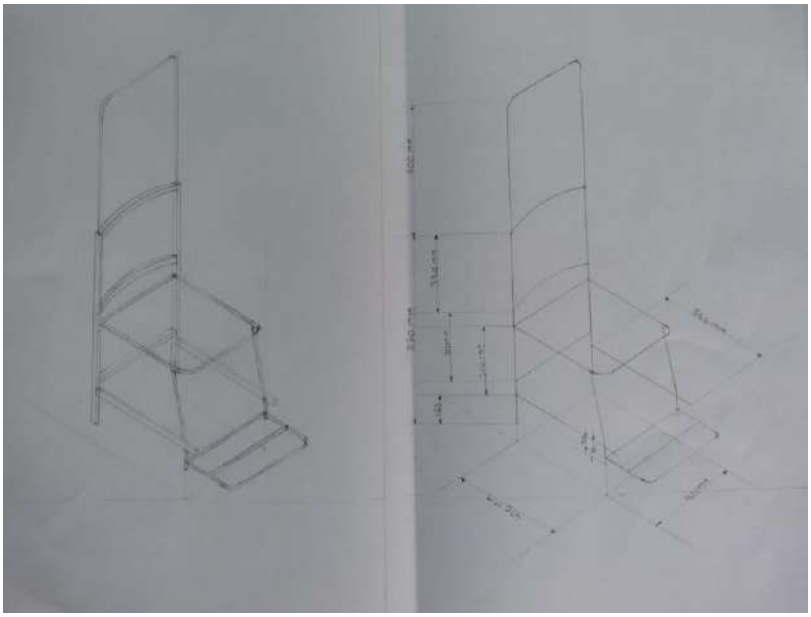

Fig: Design of Wheelchair

Wheelchair

A wheelchair is a chair with wheels, used when walking is difficult or impossible due to illness, injury, problems related to old age, or disability. These can include spinal cord injuries (paraplegia, hemiplegia, and quadriplegia), cerebral palsy, brain injury, osteogenesis imperfecta, motor neuron disease, multiple sclerosis, muscular dystrophy, spina bifida, and more.

Wheelchairs come in a wide variety of formats to meet the specific needs of their users. They may include specialized seating adaptions, individualized controls, and may be specific to particular activities, as seen with sports wheelchairs and beach wheelchairs.

Conveyor Belt

A conveyor belt is the carrying medium of a belt conveyor system, one of the many types of conveyor systems available today. Each conveyor system requires different modules in order to function properly and do the tasks required by the belts. A conveyor belt system consists of two or more pulleys (referred to as drums), with an endless loop of carrying medium – the conveyor belt – that rotates around them creating a pull effect for the goods it's carrying. One or more of the pulleys will be powered moving the belt and the material on the belt forward and along the system.

Dimension:

Length- 1750 mm belt

Width - 50 mm

Teeth – 140

Pitch – 12.7 mm

Material- PU rubber coated conveyor belt

Pulley

A pulley is a wheel on an axle or shaft that is designed to support movement and change of direction of a taut cable or belt, or transfer of power between the shaft and cable or belt. In the case of a pulley supported by a frame or shell that does not transfer power to a shaft, but is used to guide the cable or exert a force, the supporting shell is called a block, and the pulley may be called a sheave. A belt and pulley system are characterized by two or more pulleys in common to a belt. This allows for mechanical power, torque, and speed to be transmitted across axles. If the pulleys are of differing diameters, a mechanical advantage is realized.

Dimension:

Diameter: - 60 mm

Teeth -15

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Motor

A DC motor is any of a class of rotary electrical motors that converts direct current (DC) electrical energy into mechanical energy. The most common types rely on the forces produced by magnetic fields. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronic; to periodically change the direction of current in part of the motor.

Specification	BLDC Motor
Rated Output Power	60 W
Voltage	24 V
Rated Speed	2800 RPM
Actual Speed	60 RPM
Load	200KG

Sprocket

A sprocket is a toothed wheel upon which a chain ride. Contrary to popular opinion, a sprocket is not a gear. Three sprockets were used- one in motor shaft and other two were in output and input shaft of the gearbox.

Teeth	18, 9
Pitch	12.7 mm
Outer Diameter	80, 40
Thickness	8, 6

Battery

When in a battery, positive terminal of one cell is connected with the negative terminal of succeeding cell, then the cells are said to be series connected or simply series battery**.** Here, overall emf of the battery is algebraic sum of all individual cells connected in series. But overall discharged current of the battery does not exceed the discharged current of individual cells. We use two 12V battery for power supply in series. These batteries can be recharged

Chain

A chain is a series of connected links which are typically made of metal. A chain may consist of two or more links.

The Main Functions of Chain Are:

- Transmit power.
- Convey objects or materials.
- Convert rotary motion to linear motion, or linear motion to rotary motion.

Reverse Forward 6 Pin Switch

The working of this motor can be done in two ways like forward rotation and reverse rotation. Once the switch is pressed in forward direction then terminal-A is connected to terminal C whereas terminal B is connected to terminal D. Therefore, the DC motor rotates in forward direction because the battery is allied in forward connection toward the motor. Once the switch is pressed in the reverse direction, terminal-C is connected to terminal-E & also terminal-D is connected toward terminal-F. Therefore, the DC motor rotates in the reverse direction because the battery is allied in reverse connection toward the motor.

Conveyor System

Fig.2: Conveyor System

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Motorized Stairlift

Fig.3: Motorized Stairlift

WORKING PRINCIPLE

There is a motor within the base of the chair that is usually powered by a battery also within the base of the chair. The stair lift motor turns a gear that is meshed into a geared strip on the track or rail. When the gear turns the chair is moved along the geared strip. When the motor turns the gear, the chair moves one direction is reversed the chair moves to opposite way.

Call/send switches are used to move the stairlift chair without anyone being on it. This is particularly helpful if two people use the lift is opposite end of the track when a user wants to use it. The user simply calls the lift to come to them using a call/send switch. Another use of call.

CONCLUSION

Though making a cost friendly Stairlift had some limitations, it was a good and challenging project for us. Making a stairlift with conveyor is not a complicated process and all the components are widely available in market. DC motors this can be directly used in the stairlift. During the test run of this project, it was realized that it would capable of carrying heavy load without suffering any deformation or local fractures if it would go into real world production at an ideal scale. Though the initial cost of the project seemed to be a little bit higher but more accurate manufacturing would shorten this.

FUTURE SCOPE

Stairlift has distinguished advantages and benefits. In this case no one has alter the civil structure for installation thereafter shortest cost for installation procedure as compared to that of lift. So, future of such lifting system seems to be very bright. There is lot of scope for further modification in the project as follows.

- Using monorail instead of two.
- Incorporation and automation / timer unit which will ease the use of device.
- Push button ON/OFF using timer circuit can also be used.
- A swivel seating arrangement and Seatbelt for future safety can be included.
- Rack and carrier arrangement, Pulley drive, hoisting rope system can also be used for stairlift system.
- Use of work & roller reduction gear assembly.
- Folding seat arrangement

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REFERENCES

[1] Siegwart, R., Lauria, M., Mäusli, P., Winnendael, M., 1998, "Design and Implementation of an Innovative Micro-Rover," Proceedings of Robotics 98, the 3rd Conference and Exposition on Robotics in Challenging Environments, April 26-30, Albuquerque, New Mexico.

[2] Hsueh-Er, C., "Stair-climbing vehicle, 2008, "Patent No. US2008164665 (A1)", Jan 24.

[3] Mourikis, A.I., Trawny, N., Roumeliotis, S.I., Helmick, D.M., and Matthies, L., 2007, "Autonomous Stair Climbing for Tracked Vehicles," International Journal of Computer Vision & International Journal of Robotics Research - Joint Special Issue on Vision and Robotics, 26(7), 737-758.

[4] Helmick, D., Roumeliotis, S., McHenry, M., Matthies, L., 2002, "multi-sensor, high speed autonomous stair climbing", IEEE/RSJ Conference on Intelligent Robots and Systems (IROS), September.

[5] Schilling, K., Jungius, C., 1996. "Mobile Robots for Planetary Exploration," Control Engineering Practice, Vol. 4, No. 4.

[6] Burdick, J.W., Radford, J., and Chirikjian, G.S., 1993, "A 'Sidewinding' Locomotion Gait for Hyper Redundant Robots," Proc. IEEE International Conference on Robotics and Automation.

[7] Desai, R.S., Wilcox, B., Bedard, R., 1992, "JPL Robotic Vehicle Overview," in AUVS.

[8] McTamaney, L.S., Douglas, B.D., Harmon, S.Y., 1989, "Mars Rover concept development," Proc. SPIE Conf. 1007, Mobile Robots III.

[9] Spiessbach, A., Clark, B., Larimer, S., Tobey, B., Lindauer, B., Koenig, R., Lisec, T., 1987, "Issues and Options for a Mars Rover", Proc. SPIE Conf. 852, Mobile Robots II.

[10] Wilcox, B., Matthies, L., Gennery, D., Cooper, B., Nguyen, T., 1992, "Robotic Vehicles for Planetary Exploration", Proc. of the 1992 IEEE International Conf. on Robotics and Automation.

[11] Wright, D.D., Watson R.E., 1987, "Comparison of Mobility System Concepts for a Mars Rover", Proc.SPIE Conf. 852, Mobile Robots II.

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CRABY STEERING SYSTEM

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ABSTRACT
In present the car steering system is 2 wheel steering system and in conventional steering system there are only two wheels are moving while taking the turn , either forward two or the rear two wheels . While in 4 wheel steering system the rear and front both wheels are act +ive and can guide in steering. Here we using MARUTI-800 car as a reference model. We have developed a optimized 4 wheel steering system for implementation of mechanism that can give the work in changing in-phase and counter-phase steering of rear wheels depending upon the condition of turning and lane changing with respect to front wheels, thus enhancing the manoeuvrability of as edan in accordance with its speed.

Keywords: 4 Wheel steering system, octa steering, craby steering mechanism, steering system

I. INTRODUCTION

In current scenario most of the vehicles have only front wheels steering mechanism or use only front wheels for changing the direction of vehicles. But there are some limitations for this system, like less turning radios or front tyre wear due to more action of wheels, problem while get free from congested place etc. To overcome these issues we introduce CRABY MECHANISM. This mechanism will help us to reduced this kind of problems by giving our vehicle front as wheel as horizontal movement . In this mechanism vehicle will free to move at very tight corners as well as at any directions. In order to reduce the turning radius of the vehicle we need the opposite phase configuration of four wheel steering system. The main intension of this project is to reduce the turning radius of a vehicle as much as practically possible without crossing the practical limits of design and assembly of the components of the steering system. Based on these requirements, a four wheel symmetric steering system is analyzed using kinematic approach and a conclusion is drawn regarding the geometry of the optimum steering system and the effect of this on the turning radius of the vehicle. This system is seen not to cross any practical limitations of the vehicle in terms of assembly and spacing. Also the wheels are turned to the optimum extent possible and not exceeding this limit.

II. LITRATURE REVIEW

Er. Amitesh Kumar, Dr Dinesh N Kamble[1] has discussed that, Conventional Steering mechanism involves either the use of Ackerman or Davis steering systems. The disadvantage associated with these systems is the minimum turning radius that is possible for the steering action. This difficulty that is associated with the conventional methods of steering is eliminated by employing a four wheel steering system.

Saket Bhishikar, Vatsal Gudhka, Neel Dalal, Paarth Mehta, Sunil Bhil, A.C. Mehta[2] A has discussed that t, A model for 4WS system is created to test all the possible cases available in four wheel steering system. Four wheel steering system is critical and it is also popular in large farm vehicles and trucks. Some of the modern steering found it most widespread use in monster trucks, intercity buses also utilizes four wheels steering to improve road stability. The four-wheel steering mechanism is developed so that both front and rear wheel actively participate during turning, lane changing.

Ravi Shankar, Kumar Saumya, Sujeet Kumar, Saurabh Kumar, Praveen Kumar , Jitendra Kumar ,Ashis Saxena and Hitendra Bankoti [3]: The rack and pinion mechanism is commonly used to convert the rotary motion into linear motion. This mechanism contains a circular gear and teeth on a linear shaft. The circular gear is called pinion and the teeth on a linear shaft is called a rack. The rack and pinion steering mechanism are simple in construction and friendly to drive. The mechanism consists of a pinion at the end of the steering column that meshes with the rack. The pinion is fixed to the steering column at its end. As the pinion is in contact with the rack, the rotary motion given to pinion is converted to linear motion by the rack. To meet all the steering requirements the rack and pinion steering must be precise and direct under normal driving conditions. A manual rack and pinion gear suitable for a solar car. It is found that the simulation results are higher than the theoretical calculations.

X. PROBLEMDEFINITION

1. Parking Problem:-

The increase in the population and reduction in the free land for easy and wide parking is not possible now days.

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1. Reduce Turning Radius:-
Because of high turning radius we cannot make turns easily like U-turn, zero turn.

3 Reduce Skidding at Curves:-
While taking sharp turn there is high chances of skidding at conventional steering system.

4 Reduce Tire Wear:-
By enabling the front and rear wheel to Take turn it reduce the tire wear while taking u turns or zero turns.

III. THE CONCEPT

This project consist of one rack and pinion mechanism at centre, by using its motion we were able to create new steering mechanism which allows all wheel to rotate at 90^0. To create this mechanism we have used bevel gears shafts. First of all when we rotate steering wheel in clockwise direction that time pinion at the end of the steering wheel also start rotates by the help of two universal joints. This rotary motion is converted in to linear motion with the help of rack which is placed at the mid section of the frame. Over this rack we have placed one shaft which also contains one another pinion at the mid portion of the shaft. So the linear motion of the rack is transmit to the main shaft by the means of 2^{nd} pinion. Now we attached a bevel gear at both the ends of main shaft to transmit this rotary motion toward wheels we have take another small shafts and that small shafts also contains bevel gears to transmit the motion towards the wheels. By using this mechanism we were able to rotate all the wheels at 90^0.

IV. METHADOLOGY

- The literature reviews are studied completely and identified the problem statement.
- The design parameters are taken from references and design calculations are done.
- With the design calculations 3D model is designed using SOLIDWORK software.
- The model is imported to SOLIDWORK2021 SIMULATION and static analysis is carried out with a mesh size of 1mm.

[With reference to static analysis, fatigue analysis is conducted]

Solidwork Steps:

1. First of all Frame is made of size 3ft×2ft in rectangular shape as shown in figure.

2. Then Bearing supporting plates are design of size 1. Plate A=125mm×125mm, 2. Plate B=100mm×90mm, 3.Plate C=125mm×90mm.

3. Then bevel gear is design according to calculated dimensions. Bevel Gear ID=12mm, OD=36mm, L=25mm

Then pinion gears also designs according to calculations. Pinion A ID=15mm, OD=40mm Pinion B ID=12mm, OD=34mm

4. The shafts are designs which are 3 in total having different lengths 1. Shaft A-D=15mm, L=670mm, 2.Shaft B- D=20mm, L=75mm, Shaft C- D=15mm, L=200mm.

5. After that Universal joint is designed by taking standard references from research paper ID=12mm, OD=30mm, L= 60mm.

6. Wheel frame is design to attach the wheels and provide rotary motion of steering to wheels.

7. Then Bearings are design 1. Pedestal Bearing ID=20mm, OD=44mm T= 40mm and 2. DGBB ID=15mm, OD=34mm T=9mm

8. Bush is design to support the pinion gear and steering shaft with universal joint. It contains 2 DGBB in it. BUSH ID1=16mm, ID2=34mm, L=40mm

9. Then finally all parts are assembled and craby steering is ready.

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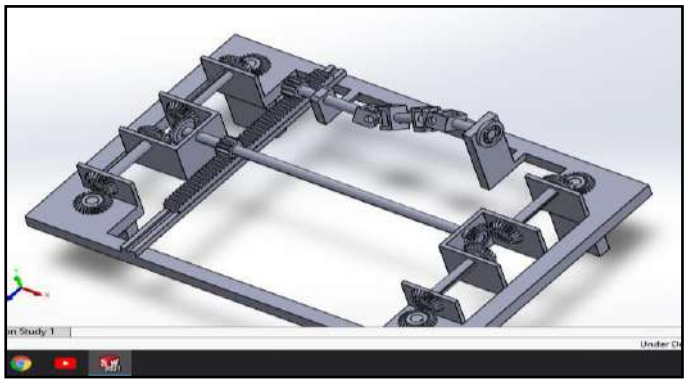
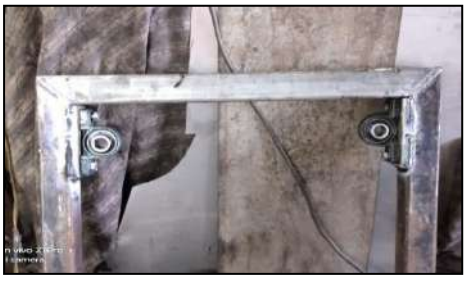


Fig: Craby steering mechanism

V. Procedure to Make this Mechanism

1. First of all M.S. square pipe of 3ft in length ,2ft in width and 50mm thickness frame has been cut by using grinding cutter machine.
2. Then they are welded together to form a frame by using **Metal arc welding** (95to 100 amp rating).

3. After frame gets welded then 4 pedestal bearing are placed to each corner and marking has been done for their fitting purpose.
4. But square pipe alone is not capable to take load of pedestal in place of that 4 plates are cut of length 125 cm, 50mm width and 10mm thickness. On this plate marking of pedestal bolts marked and drilling operation performed for bolt size M10 then tapping operation performed with tap of D=10mm &P=1.5.
5. After tapping those plates are welded on frame and pedestals bearings are bolted like shown in figure.



6. Then supporting plates are mounted on lathe machine to make bearing size hole for DGBB bearing .Total 10 Plates are drill with bearing size holes.

7. Then the DGBB bearings are fitted in those plates by slightly hammering.

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8. Then 4 shafts of 20mm diameter and 75 mm length are cut and on its one side. Gear's inner diameter of 12mm is turned on lathe machine till the length of 30mm.

9. This shaft is mounted with one bevel gear and it is fitted in pedestal bearing.
10. Then 4-M.S. shaft diameter of 16mm and length 190mm are cut on its both end bevel gear are mounted by turning it to D=12mm and L=30mm.
11. Another D=-16mm,L=660mm M.S shaft is cut and it's both ends are turned for bevel gear fitting.
12. After that supporting plates with bearing in it are welded with MAW. For supporting of this plates L-shape M.S. columns are used to give rigidity to plates.
13. Then shafts are placed through this metal plates and DGBB and gears are fitted.
14. To avoid slipping of gears on shaft gap screw are fitted by drilling and tapping the gears. 6mm drilled and tap of P=1 is used to create threaded hole for gap screw.
15. Hand drill machine is used to drill a small counters hole in each shaft to fit the bevel gears and shaft rigidity and gap screw of D=6mm , L=8mm of L.N key head is used (L.N KEY SIZE 3mm)
16. Then checks the rotation of all bevel gears, bearings and shaft then after checking middle shaft is removed for rack and pinion installation.,
17. Then pinion is mounted on middle shaft and measures the gap between pinion and frame. According to it sliding bars are selected of size 20mm*20mm square M.S. bright bar 2 pieces. Length 2ft.
18. For rack's sliding moment2 holes are drilled from 65mm from it's Centre on each side. A plate of size is width=25mm and length_185mm and thickness is 4mm is fitted.
19. Then those 20mm*20mm square bar are welded on frame and rack is mounted in it width contact with pinion fears.
20. Now steering, for steering 2 universal shafts is used. D=16mm shaft is used From rack side another pinion gear is mounted with shaft D=16mm and L=130mm On this shaft one end is attached with pinion gears and another end with universal joint. To support this shaft one bush is made of M.S. material on D=40mm and length -38mm with both side DGBB bearings are fitted. On shaft grooves are made for circlip of size D=14mm, thickness-1mm.
21. To support this bush square pipe 30mm frame is made whose dimensions are height is 65mm and width is 165mm. This frame welded on main frame.
22. Then wheel frame is made and wheel is attached on it with M10 bolt of length 75mm with 2 washers on each side. This wheel frame is attached on diameter of 20mm shaft below the pedestal bearings with the help of screw.
23. For steering on another bush of D=30mm and L=35mm is used from another end of universal joint one shaft of 16mm diameter and length 400mm is attached with gap screw and on its other end steering wheel of size od=-250MM & ID=220mm on its center bush for steering is attached.
24. Then for finishing slightly grinding is done with hand grinder and glass white spray paint work is done.

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25.Then by checking the rotation of wheels the rack is cut to suitable length and stoppers are mounted.

Final Crabby Steering Mechanism

VI. CALCULATION

1. Calculation of Pitch Diameter,

Dp = Np*Mn

2. Calculation of Torque

Mt = Ft * Dp

3.The Pitch Line Velocity can be Calculated As

$$V = \frac{2\pi nt}{60}$$

$$Nf = \frac{Np}{Cos^3\Psi}$$

4. Allowable Stress can be Calculated As

Sall=So×$(\frac{3}{3+V})$

5. CALCULATIONS of Endurance Stress

So=$\frac{Su}{3}$

6.The Calculations of Actual Induced Stress can be Done by Lewis Equation As

Sind=$\frac{2\ Mt}{M^3K\Pi^2Ypnpcos\psi}$

7.With the Above Strenght the Strenght is Checked by Using Sall and Sind

For A Good Design Sall>Sind

If Not The Module Needs To Increased Untill The Conditon Satisfies.

8.The Face Width Ccan be Calculated As

Bmin=Kred×Π×Mn

Bmax=K×Π×Mn

Kred=Kmax×$\frac{Sind}{Sall}$

Thus The Design Is Checked By Strenth Point Of View. Before Going To Analysis It Is Necessary To Check In Dynamics Point Of View. To Undergo Dynamic Calculation The Following Equations Are Used:

1.The Load Transmitted is Given By

Ft=$\frac{2Mt}{Dp}$

2.Calculation of Dynamic Load is Done by Usnig Following Equation

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$Fd=Ft+\frac{2v(BcCos^2\Psi+Ft)Cos\psi}{2v+\sqrt{(BcCos^2\Psi+Ft}}$

3.Calculations of Limiting Endurance Load is Given By

$Fo=S0bypcos\psi$

4.Limiting Wear Load can be Calculated As

$Fw=\frac{Dp\times B\times K\times Q}{Cos^2\Psi}$

$K=\frac{Ses^2\times Sin\phi n}{1.4}\times[\frac{2}{E}]$

The Dynamic Check Should Satisfy Condtion As F0, Fw>Fd

If Not Keep On Increasing The Module And Calculate Until The Condtion To Be Satisfied. After The Gear Tooth Dimensions Are Calculated:

- **In Oreder to Determine Dimensions Folowwing Equations are Used:**

1.Addendum – $Ha=0.8mn$

2.Pitch Diameter- $Dp=Np\times Mn$

3.Diametral Pitch- $Pd=\frac{Np}{Dp}$

4.Tooth Thickness- $T=\frac{1.5708}{Pd}$

5.Whole Depth - $Ht=1.8mn$

6.Clearance - $C=0.2mn$

7.Outer Diameter – $Do=Dp+2ha$

8.Dedendum - $Hd=1mn$

9.Root Diameter - $Dr=Dp-2hd$

- **In General the Intermediate Shaft are with Circular Cross Section.So,**

1.Maximum Power Used is Given By

$P=\frac{2\pi ntmax}{60}$

2.Maximum Torque Acts on Intermediate Shaft

$Tmax=\frac{60P}{2\pi nmax}$

3.Minimun Torque Acts on Intermediate Shaft

$Tmin=\frac{60P}{2\pi nmin}$

4.Mean Torque can Calculate As

$Ta=\frac{Tmax-Tmin}{2}$

5.Maximum Shear Stress is Given By

$T\ Max=\frac{S\ U}{FS}$

The FS= Factor Of Safety=15 (Consider)

6.The Inner Diameter can be Calculate As

$$T\ Max=\frac{16Tmax}{\Pi(D0^3-Di^3)}$$

7.The Mean Shear Stress Developed is Given By

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$$Tm = \frac{16Tm}{\Pi(D0^3 - Di^3)}$$

8.The Alternating Stress can Calculated As

$$Ta = \frac{16Ta}{\Pi(D0^3 - Di^3)}$$

Bevel Gear Design Results:
[Referenc From VB BHANDARI Design Of Machine Element -Fourth Edition]

VII. RESULT

Steering wheel rotation (in^0)	No. of Teeth Rotate			Linear Moment of Rack	Deg of Rotaton of Wheels	Turning Radius
	P.A	P.B	B.G			
10	2	2	1	5.5	23	1590.2
20	4	4	2	12	42	749.663
30	6	6	4	25	72	219.32
40	8	8	6	35	90	0

WHERE

P.A	PENION A
P.B	PENION B
B.G	BEWEL GEAR

VIII. CONCLUSIONS

As per the focus of the project we have created an innovative 4 wheel active steering mechanism which is feasible to manufacture, easy to install and highly efficient in achieving in-phase and counter-phase rear steering with respect to the front wheels using bevel gears arrangement. This system assists in high speed lane changing and better cornering. It combats the problems faced in sharp turning. It reduces the turning circle radius of the car and gives better manoeuvrability and control while driving at high speeds, thus attaining neutral steering. Moreover components used in this system are easy to manufacture, material used is feasible, reliable and easily available in market. The system assembly is easy to install and light in weight and can be implemented in all sections of cars efficiently. The purpose of developing this mechanism is to solve the problem of car parking. 90 degree steering mechanism helps in minimizing the space and effort required for a person to park his vehicle. The 90 degree steering mechanism made using rack and pinion and with the help of differential gears is feasible to manufacture and is easy to switch between normal mode and parallel parking mode. However, a major disadvantage here is the limitation of top speed in such mechanism due to use of differential gears. Moreover, cars can be parked very close to each other. This may save costly parking space, In congested apartment complexes where parking is limited this mechanism can be very helpful and if our vehicle got stuck to some uneven road or surface then four wheels can be engaged to power mechanism and with this we can easily come out from that surface.

IX. FUTURE SCOPE

Having studied how 4WS has an effect on the vehicle's stability and driver maneuverability, we now look at what the future will present us with. The successful implementation of 4 Wheel Steering using mechanical linkages & Electro-magnetic Clutch will result in the development of a vehicle with maximum driver maneuverability, uncompressed static stability, front and rear tracking, vehicular stability at high speed lane changing, smaller turning radius and improved parking assistance. Furthermore, the following system does not limit itself to the benchmark used in this project, but can be implemented over a wide range of automobiles, typically from hatchbacks to trucks. With concepts such as "ZERO TURN" drive as used in, Tata Pixel and "360º Turning" used in, Jeep Hurricane, when added to this system, it will further improve maneuverability and driver's ease of access.

X. REFERENCES

[1] Er. Amitesh Kumar, Dr Dinesh N Kamble " Zero Turn Four Wheel Steering System" International Journal of Scientific & Engineering Research, Volume 5, Issue 12, December-2014 ISSN 2229-5518

[2] Saket Bhishikar, Vatsal Gudhka, Neel Dalal, Paarth Mehta, Sunil Bhil, A.C. Mehta "Design and Simulation of 4 Wheel Steering system" International Journal of engineering and innovative technology (IJEIT), Volume 3, Issue 12, June 2014.

[3] Ravi Shankar, Kumar Saumya, Sujeet Kumar, Saurabh Kumar, Praveen Kumar , Jitendra Kumar , Ashis Saxena and Hitendra Bankoti "Fabrication of modified steering and drive mechanism for turning wheels through 90 degree in parallel parking "International Journal on Emerging Technologies (Special Issue NCETST-2017) 8(1): 690-694(2017) (Published by Research Trend, Website: www.researchtrend.net)

[4] V. Arvind, "Optimizing the turning radius of a vehicle using symmetric four wheel steering system",International Journal of Scientific & Engineering Research, Volume 4, Issue 12, December-2013,ISSN 2229-5518.

[5] Weblink:http://www.google.co.in/search/?

[6] SaketBhishikar, VatsalGudhka, Neel Dalal, Paarth Mehta, Sunil Bhil, A.C. Mehta, "Design and simulation of 4 wheel steering system", International Journal of Engineering and Innovative Technology (IJEIT) Volume 3, Issue 12, June 2014, ISSN: 2277-3754

[7] CREO 4.0 Software

[8] ANSYS 16.1 Software

[9] S.Nithyananth, A.Jagatheesh, K.Madan, B.Nirmalkumar "Convertable Four Wheels Steering With Three Mode Operation", International Journal of Research In Aeronautical and Mechanical Engineering, Volume 2, Issue 3, March 2014, ISSN: 2321-3051

[10] Shijin T. G. , Sooraj V. T. , Shuaib A. V. , Shirin P. R. , M. Dinesh " Four Wheels Steering Control With Three Mode Operation", International Journal of Research In Aeronautical and Mechanical Engineering, Volume 2, Issue 3, March 2014, ISSN: 2321-3051 [8] Auto suspension and steering system (Good heart willcox publication)

[11] Automotive engineering power train chassis system and vehicle body (edited by David A. Crolla and published by ELSEVIER)

[12] Automobile engineering (J. P. Hadiya, H. G. Katariya and published by BOOKS INDIA) [11] ChetanDhuri, AdityaMasur, AniketWarang&Adityasudhir "Selection, Modification and Analysis of Steering Mechanism for an All Terrain Vehicle ", International Journal on Theoretical and Applied Research In Mechanical Engineering(IJTARME), Volume 2, Issue 4, 2013, ISSN: 2319-3182.

[13] Boby George, Akhil T Benny, AlbertJohn, Aswin Jose, Denny Francis "Design and Fabrication of Steering and Bracking System for All Terrain Vehicle", International Journal of Scientific & Engineering Research, Volume 7, Issue 3, March-2016, ISSN 2229-5518.

[14] Unknown, Four wheel steering report, http://www.scribd.com/doc/34677964/FourWheel-Steering-report, Retrived on 13th Sep 2012.

[15] Unknown, Four wheel steering, http://www.wisegeek.com/what-is-four-wheelsteering.htm, Retrived on 13th Sep 2012.

[16] Unknown, Four wheel steering, http://what-whenhow.com/automobile/four-wheel-steering-4wsautomobile/, Retrived on 14th Sep 2012.

[17] "Honda Prelude Si 4WS: It Will Never Steer You Wrong," Car and Driver, Vol. 33, No. 2, pps. 40- 45, August 1987.

[18] Sano s et al, "Operational and design features of the steer angle dependent four wheel steering system." 11th International conference on Experimental safety vehicles, Washington D C 1988, 5P.

[19] Jack Erjavec., Automotive Technology, a System Approach, 5th Edition, 2010.

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MULTIPURPOSE SIEVING MACHINE

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ABSTRACT
A sieve is a device for separating wanted elements from unwanted material or for characterizing the particle size distribution of a sample, typically using a woven screen such as a mesh or net. This project focuses in design, fabrication of the mechanical part of machine and the system of the sieve machine. To achieve this project objective, this sieve machine body structure and mechanical system needs to concern some other criteria such as strength, safety and ergonomic design. Depending on their size the individual particles either pass through the sieve mesh or retained on the sieve surface. There are different machines that are being used for sand sieving processes. In our project the process will takes place automatically. Thus, the time consumed during the whole process is reduced.

Keywords: Sieving Machine, Sand Sieving Machine, Sieving Machine Fabrication, Automatic Sieving

I. INTRODUCTION
Today's world requires speed in each and every field. Hence rapidness and quick working is most important. Now a day for achieving rapidness, various machines and the equipment are being manufactured. In such a modern era of liberalization, small scale industries are contributing in a big way to the growth of our country. New machines and techniques are being developed continuously to manufacture various products at cheaper rates and high quality. This project focuses in design, fabrication of the mechanical part of machine and the system of the sieving machine. Sieving Machine mainly depends on converting rotary motion provided by AC motor. With the help of pulley attached to motor the Rotary Motion is converted into Reciprocating Motion with help of Connecting Rod and Wheels. The horizontal sieving machine is worked on the basis of crank and slider mechanism. The sieving box is placed inside the rail track and the machine is started. When the sieving box moves in the reciprocating motion the sieving process is performed. Sieving is an uncomplicated practice for sorting out the particles of different sizes. Generally, while preparing the concrete for construction purpose, the process of sieving is carried out manually. Sieving of sand is carried out using rectangular mesh which is inclined at certain angle. In the present sand sieving method, the sample is subjected to horizontal movement in accordance with the chosen method. This causes a relative motion between the particles and the sieve. Depending on their size the individual particles either pass through the sieve mesh or retained on the sieve surface. There are different machines that are being used for sand Sieving, but we demonstrate the design & fabrication of automatically driven sand sieving machine which have low cost and simple in operation. For small scale farming in rural areas the main aim of the cultivator is over domestic use. The harvest is usually a small bulk. Therefore, they are not taken in for refining in major refining factories. Here we generate an idea to solve the problem of filtering or refining the harvested crops mainly grains, cardamom etc. This project is a domestic sieving machine which can be used to separate or sieve or filter out dirt and unwanted particles from the harvested crops. The machine is compatible and requires only a limited amount of space. The machine can also sort out stones and other unwanted particles from purchased goods or stored crops.

II. LITERATURE REVIEW
A. Design and Fabrication of Domestic Sieving Machine
Alan Biju, Alwin Thomas, Akash J Kalarickal, Jeswin Jose, Rittin Abraham Kurien, Conventional practices like winnowing require highly expertise hand movements considering gravity, aerodynamics and centrifugal force. This is the major difficulty observed in the winnowing process. Nowadays people always prefer the most suitable way to save time and energy. This project proposes a domestic sieving machine which can easily remove unwanted particles from the grains, nuts and other pulses automatically.

B. Automatically Driven Sand Sieving Machine
P.R. Gajbhiye, Rupesh Khode Pratik Sukhadeve ,VickyChaple
Construction of buildings requires sand as an important ingredient Sand is used at different stages in construction right from the foundation to the finishing work i.e. plaster. This sand is needs to be screened properly for various stages in construction, i.e. size of sand for construction work is slightly coarse whereas that used for plaster work is fine These processes are carried out manually. Sieving of sand is carried out using rectangular mesh which is inclined at certain angle. This causes a relative motion between the particles and the sieve. Depending on their size the individual particles either pass through the sieve mesh or retained on the sieve surface

C. Development of NCAM Reciprocating Cassava Mash Shifter

Abiodun L.O., Oladipo N.O and Bamidele B.L.

The NCAM cassava mash sifter was developed to tackle the problems of high labor, expense associated with manual sifting, time wastage, the tedious mature of the operation, injury to the hand or palm as one rubs against the raffia sieve continuously, back ache, caused by prolonged sitting in one position during manual sifting, low productivity, and the hygienically unsafe nature of manual sifting as products are exposed to germs.

D. Stacked Siever for Natural Sand Processing

W.D. Handoko, N. Widiastuti, G.S. Budi, K. Karelius, S. Pratapa

This stacked sand sieve was intended to replace conventional sieves that had several disadvantages, including unstable speed, inefficient time in processing large amounts of sand, and relatively higher costs incurred. This stacked sieve exhibited the following characters: 1) composed of two sieves, 2) can be assembled easily to change the size of the sieve, 3) had 3 variations of the sieve slope, and 4) used a gasoline motor to pro- duce a sift speed of 25.2 cm/s and 36.4 cm/s. The sieve slopes were manually adjusted by positioning the sieves according to the available slots on the device.

E. Energy-based Indicators of Soil Structure by Automatic Dry Sieving

Dmitry Fomin, Maria Timofeeva, Olga Ovchinnikova, Ilya Valdes-Korovkin, Andrey Holub, Anna Yudina

Numerous methodological approaches and fractionation procedures contribute to the continuation of discussions about soil aggregate formation. This study aims to justify the dry sieving procedure and suggest an optimal sieving regime for automatic shakers for soil samples. For this approach to calculating total sieving energy, using oscillation frequency, vibration amplitude, and time was proposed. Retisol, Phaeozem, and Chernozem topsoil samples from agricultural and native ecosystems were analyzed using a sieving test, in which 50-kg soil samples were divided into 500–700 g subsamples and sieved with a constant oscillation frequency (50 Hz), but with varying vibrational amplitudes (0–2.5 mm), for sieving times that ranged from 1 to 5 min. We found that the optimal sieving regime is characterized by total sieving energy of 1850 J kg^{-1}, reached during 2 min of sieving with a 50 Hz frequency and a 2.5 mm amplitude. Based on results of the dry sieving test, we have proposed the indicators of mechanical stability of soil structure: index of soil structure stability (SS) which characterize the degree of change in the soil aggregates size during sieving with minimal and optimal sieving energy, and modified the soil friability index (F4), that characterizes the rate of change in the soil aggregates size under mechanical load by dry sieving. The proposed formula of total sieving energy calculation allows comparing results between soil studies. Our meta-analysis showed that most (26 of 34) studies used insufficient sieving energy, where the aggregate size distribution did not reach the equilibrium state. A detailed protocol for soil dry sieving analysis is provided.

F. Quality Attributes of Parboiled Rice Prepared with a Parboiling Process Using a Rotating Sieve System

Naruebodee Srisang, Thatchapol Chungcharoen

The aim of this study is to apply a rotating sieve system to the parboiling process for parboiled rice production. The parboiling time and rotation speed were the main production factors affecting the quality attributes of the parboiled rice, including the degree of starch gelatinization (DG), fissure percentage, head rice yield (HRY), white belly, and color. The results showed that the parboiling process with a rotating sieve can decrease the parboiling time required to provide an even quality of parboiled rice. The parboiling time for an even quality of parboiled rice was 5 min at rotation speeds of 10 and 15 rpm, while the parboiling time at a rotation speed of 5 rpm was 10 min. These times were shorter than that with a fixed sieve (15 min). Moreover, the parboiling process using a rotating sieve system provided better qualities of parboiled rice than that using the fixed sieve system, including higher DG and HRY and lower fissure and whiteness percentages. Additionally, the values of DG and HRY were increased with increasing parboiling time. In contrast, the fissure and whiteness percentages of the parboiled rice decreased. However, the quality of the parboiled rice was not dependent on the rotation speed.

III. PROBLEM STATEMENT

- Sieving of sand particles in construction, grain sorting in agriculture is done manually and human effort is required.
- After careful review of literature, it was found that no specific solution to separate different sizes of grains are not available.

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- The Speed of Motor cannot be controlled so that can be set according to preference.
- The waste which is not sorted in sieving remains in sieve after an operation it needs to
- manually cleaned and remove.
- Now days people always prefer the most suitable way to cut their cost and time. Example in a construction where they have to finish the work before the due date. His might be a problem. Since we have waiting long waiting for the good to arrive
- However, sometime in big company there are high tech machine that can do this work sieving any sub stand or mixture. But sometime in construction required a special sieve machine that are comfortable and easy to use.
- Traditional method gives low efficiency as it is operated manually but the automated sand sieving machine have higher efficiency
- Traditional method requires more labour.
- Traditional method is more time consumed during the process of preparing the
- concrete.
- The cost of highly sophisticated machine is very high which is not affordable for
- small scale foundries and low-level contractors.

IV. DESIGN CONSIDERATION

- This project focuses in design, fabrication of the mechanical part of machine and the system of the sieve machine. To achieve this project objective, this sieve machine body structure and mechanical system needs to concern some other criteria such as strength, safety and ergonomic design.
- Sieving is done automatically of sand particles in construction, grain sorting in agriculture and various operations were things need to be sieved
- As it is multipurpose so the sieve can be replaced as per the sieve size requirement in sieve bracket
- As the sieve operates on reciprocating motion the speed of the motor can be controlled by foot.
- Design and Fabricate a Sieving Machine which can filter 2-3 kg of grains at a time.
- Selection of gathering of component for the craving moment. Components like motor,

o pulleys, bearing etc.

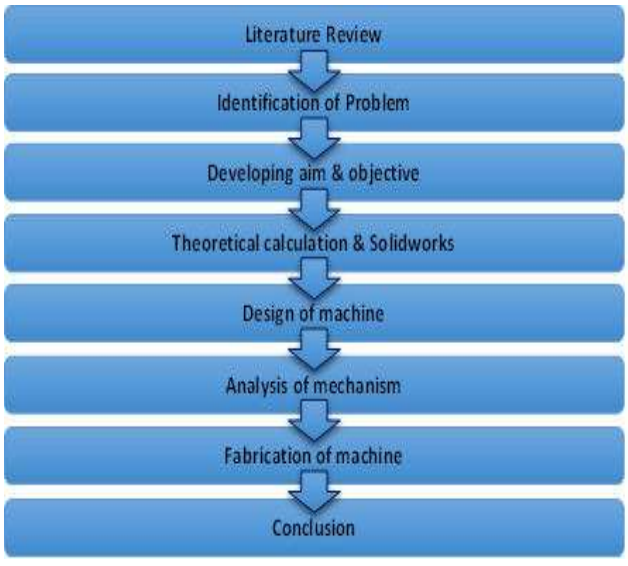
- calculation of vitality machine parts. Calculation of motor rpm, load of motor, torque

o of motor, voltage required to run motor, pulleys dimensions, bearings dimensions etc.

- And at last manufacturing or collecting and assembling machine.

V. RESEARCH AND METHODOLOGY

Although designs vary, the method followed for Project is:



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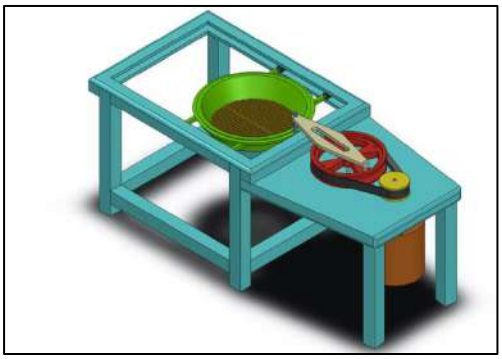
VI. WORING PRINCIPLE

The Multipurpose Sieving Machine is very easy to construct and can be operated easily. It is very economic among this kind of machines. This project is fabricated with the help of parts like a motor, crank and slider link mechanism, bearing, C.I. wheels, sieving box. The horizontal sieving machine is worked on the basis of crank and slider mechanism. Here crank is attached to the sieve box the power is given by motor through pulley belt arrangement. The rail bracket is made in which the sieving box moves in it. The sieving box fixed with the connecting rod in order to move when the wheel is rotated by means of pulley attached to the motor. The sieving box is placed inside the rail bracket and the machine is started. When the sieving box moves in the reciprocating motion the sieving process is performed for various operations by changing the inner sieve for different applications.

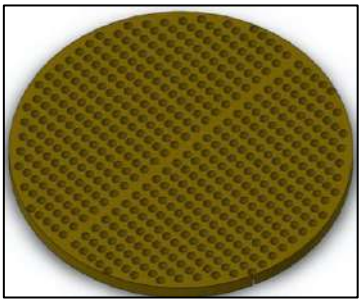
VII. CAD MODEL



VIII. COMPONENTS

A. FRAME


B. SIEVE

C. BEARING


BEARING 608 **BEARING 6204**

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D. PULLEY / WHEEL

E. BELT

F. MOTOR

3PHASE MOTOR

3HP-1410RPM

FOOT MOUNTED

CONTROLLED BY VFD

IX. WORING PROCESS

The figure shows the sieve used as separator. In this the whole work is based on the mechanism of crank and slider mechanism. The rotation of the crank transfers the motion to the movement of sieve. It consists of the pulley-wheel and belt arrangement which rotates the crank and through its slider consists of reciprocating mechanism. The power is transmitted to the crank and slider mechanism. This mechanism is used to rotate the

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crank, the wheel which is having an extended rod is connected to the sieve holder plate directly by means of a linkage. The sieve plate is passed through the guide ways by means of maintaining the reciprocating motion. The sieve moves horizontally on guided path. The crank is connected to the wheel which is transfer the motion from one to another. The pulley is connected to another wheel which is transferring motion through belt. The rotating motion of the electrical motor converts to the sliding motion using pulley and wheel by belt. The sliding crank mechanism is used in this project. The wheel which is placed at same level of pulley and is powered by motor and speed controlled through vfd. This sieving operation can be performed for multiple purposes like in sand sieving, construction sites and also in agriculture for harvested crops and sand sorting.

X. CONCLUSION

In this research study, the mild steel failure problems encountered by loads were successfully. Thus, a cost effective and simple design motor operated multipurpose sieving machine is fabricated. This machine reduces the human effort and hence we don't need multiple persons to filter/sieve at a time. Also, machine is portable as it can be de-assembled and assembled easily.

XI. SCOPE FOR FUTURE WORK

The project can be made for higher capacities by increasing the dimension and improving the design aspects. The machine can be operated using solar energy also which is economically useful.

REFRENCES

1) Alan Biju, Alwin Thomas, Akash J. Kalarickal, Jeswin Jose, Rittin. Abraham Kurien, Assistant Professor, Department of Mechanical Engineering, Saintgits College of Engineering, Kottayam, Kerala, India "Design and Fabrication of Domestic Sieving Machine" (2020 IJRAR May 2020, Volume 7, Issue 2)

2) RupeshKhode PratikSukhadeve ,VickyChaple, P.R.Gajbhiye ,Assistant professor, Department of Mechanical Engineering, K. D. K. College of Engineering, Nagpur-440009, Maharashtra, India. "Design and Fabrication of Automatically Driven Sand Sieving Machine" (2019 JEITR, Volume 6, Issue 5)

3) Abiodun L.O., Oladipo N.O and Bamidele B.L. National Centre for Agricultural Mechanization, Ilorin, Kwara State, Nigeria. "Development of NCAM Reciprocating Cassava Mash Sifter." (Vol. 5 No. 1. 2016. Pp. 10-13)

4) W.D. Handoko , N. Widiastuti , G.S. Budi, K. Karelius, S. Pratapa, Departement of Physics, Faculty of Sciences and Data Analytics, Institut Teknologi Sepuluh Nopember, Surabaya 60111, Indonesia, Departement of Chemistry, Faculty of Sciences and Data Analytics, Institut Teknologi Sepuluh Nopember, Surabaya 60111, Indonesia, Departement of Physics Education, Faculty of Teacher Training and Education, University of Palangka Raya, Palangka Raya 74874, Indonesia, Departement of Chemistry, Faculty of Mathematics and Natural Sciences, University of Palangka Raya, Palangka Raya 74874, Indonesia " Design and characterization of a stacked siever for natural sand processing" (2021 Elviser proceedings 44 3237-3240)

5) Dmitry Fomin, Maria Timofeeva, Olga Ovchinnikova, Ilya Valdes-Korovkin, Andrey Holub, Anna Yudina, Soil Science Institute, Pyzhyovskiy Lane 7 Building 2, 119017, Moscow, Russia, Institute of Mechanics, Lomonosov Moscow State University, Michurinsky Prosp. 1, 119192, Moscow, Russia "Energy-based indicators of soil structure by automatic dry sieving" (2021 Soil & Tillage Research 214) 105183)

6) Naruebodee Srisang, Thatchapol Chungcharoen, Department of Engineering, King Mongkut's Institute of Technology Ladkrabang, Prince of Chumphon Campus, Chumphon, 17/1 Moo. 6 Chumkho, Pathio, Chumphon, 86160, Thailand. "Quality attributes of parboiled rice prepared with a parboiling process using a rotating sieve system" (2019 Journal of Cereal Science 286-294)

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ACCIDENT PREVENTION SYSTEM USING EYE BLINKSENSOR

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[1, 2,3,4]Student and [5]Assistant. Professor, Department of Automobile Engineering, Theem College of Engineering, Boisar

ABSTRACT
The aim of this project is to design an Accident Prevention System which helps in preventing/avoiding accidents. Accident due to cause of drowsy is prevented and controlled when the vehicle is out of control. The accidents due to the drowsy state of the driver is prevented using automatic breaking system by using eye blink sensor and accelerometer. In recent times drowsiness is one of the major problems of highway accidents. The accidents occurred caused by drowsy and when driver wakes up he can't be ableto control the vehicle. The drowsiness is indented by the eye blink closure and blinking frequency through infrared sensor worn by driver by means of spectacles frame or IRS. If the driver is drowsy, then the system will give buzzer and the speed of the vehicle is reduced in 3 to 5 sec. Also accelerometer sensor is mounted on spectacles frame for measuring head tilting angle of driver. The advantage of this project is to less the number of accident and also save the lives of human beings and also creating a new theory of accident detecting system in this competitive world, as new technology is going to lead the globe.

Keywords: Eye Blink Sensor, Accelerometer Sensor, Accident Prevention System, Relay Circuit, Braking System.

I. INTRODUCTION

The drowsiness [a feeling of being sleepy] is one of the reasons responsible for the vehicle accidents. Around 30 percent accidents are occurs due to drowsiness of the driver. The driver drowsiness can be detected by checking driver response. One of the methods for detecting eye blinking of the driver is by making use of IR sensor. The IR sensor is used to see the blinking of eyes of thedriver. If the eyes are closed for certain period it will sense by IR sensor. The information of eye blink is send to microcontroller from IR sensor and makes the device work. Hence drowsiness of the driver is prevented and results in reduce percentage of accidents. Vehicle accidents are most common if the driving is inadequate. These happen on most factors ifthe driver is sleeping or if he is alcoholic. This Paper was focused mainly on road accidents occurring due to drowsy state of drivers in four wheelers. As the fatality rates due to growth of accidents IS increase ingday by day,the below method sareimplementedtodecrease the fatality rate. Driver drowsiness is recognized as a crucial aspect in the vehicle accidents. It was demonstrated that driving performance deteriorates with increased sleepiness with resulting vehicle accidents. But the life lost once cannot be re- winded. Advanced technology over's some hope avoid these up to some extent. This project involves measure and controls the eye blinking using IR sensor. The IR transmitter is used to transmit the infrared rays in our eye. The IR receiver is used to receive the reacted infrared rays of eye. If the eye is closed means the output ofIR receiver is high other side the IR receiver output is low. This to know the eye is closing or opening Position. This output is given to circuit to indicate the alarm. This project involves controlling accident due to unconscious through Eye blink. Here one eye blink sensor is in vehicle where if anybody looses consciousand indicate through alarm. Then eye blinking sensor transfer signals to the dc motor and it starts dc gun which apply on the break and vehicle will be stops gradually. Previously the very first method of eye blink detection was made through image processing. But this sometimes contains slow processing of image and leads to more time. It needs additional set of computer or laptop which becomes complicated arrangement.

Sometimes the shocks in the vehicle due to badconditions of the road may damage the program stored in laptop or computer. Sothe second technique installing sensors in front of eye or in long range is the possible way to detect the accurate blinking ofeyes.

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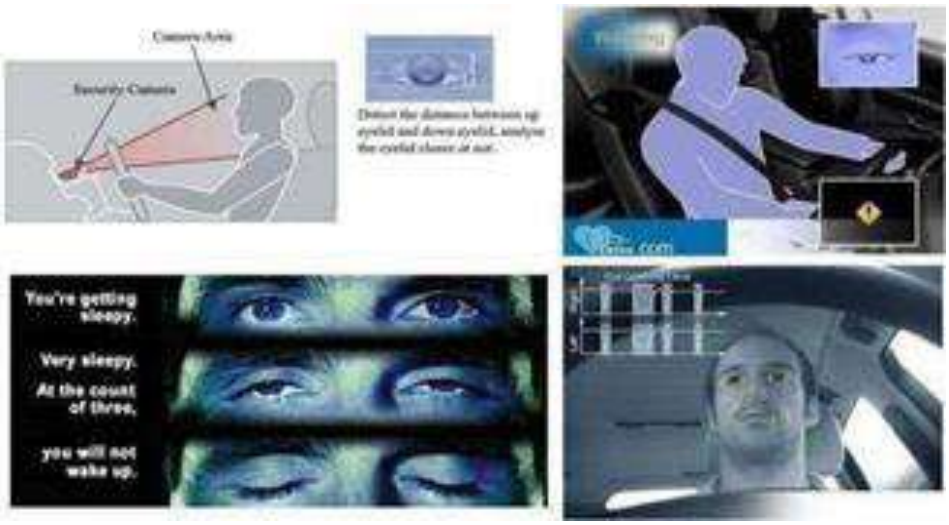
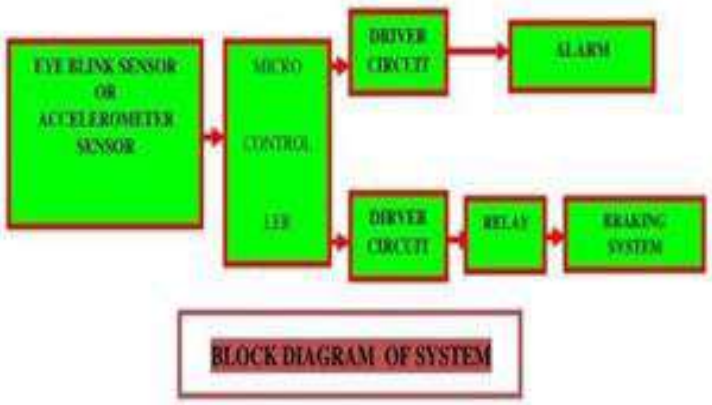


Fig 1.1: Image Processing of Drowsiness

II. METHODOLOGY

A single tire will be mounted on a frame and will be rotated by using DC gear motor. Braking system will be designed accordingly. The driver will wear goggle have sensors and will perform demo. The above results and the works shows the present design is best and the Accident alarm indicator and braking will work good according to the eye blink closing and opening of the driver and will be successful. Actually the fact that the driver is not able to control his vehicle when he is asleep and by the time he realizes it, there is an accident. The car is at a very high speed on highways due to which handling is tough and getting the vehicle to halt in such a condition is very difficult. Due to this many automobile companies are trying to research onto how an accident which cause due to driver fatigue can be prevented. In this project we will generate a model which can prevent/avoid such an incident. The Purpose of such a model is to advance a system to detect fatigue symptoms in drivers and control the speed of vehicle to prevent accidents. The main components of the system consists of an eye blink sensor for driver eye blink acquisition and an adaptive speed controller designed using stepper motor for providing accurate positioning of the throttle valve to control the speed of car or any vehicle. Advanced technology offers some hope avoid these up to some type of extent. This project involves in measure and controls through alcohol sensor and eye blink using IRsensor.If the driver is seen to be drowsy i.e. the eyes of drivers are closed for 3 seconds then the IR sensor and accelerometer sensor gives the information to the timer the sensor to the 5V and ground of the arduino and the Analog pin of sensor to the A0 circuit it activates the microcontroller and microcontroller gives information to three relays. Accordingly the buzzer will make noise and at the same time the driving motor will be disconnected by disconnecting the relay and motor used for braking will be on through relay. This is how the project works.



BLOCK DIAGRAM OF SYSTEM

III. WORKING

It is used by us is to see the blinking of eyes of a person driving the car. This will not recognize the normal flashing of eyes but will provide the time period for it, so that it will detect after the given time period. If the eyes are closed for 3sec it will sense by IR sensor and this signal is further send to microcontroller .The intensity of IR light and time for closed position of eyes can made adjustable according to the distance of sensor from the eyes. The accelerometer sensor is used to detect the head inclination angle if the head is inclined for more than 45 degree for 3 seconds it is programmed for actuate braking system and buzzer. There are three

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relays one for the disconnecting the driving motor and another for the braking circuit running purpose. If the driver is seen to be drowsy i.e. the eyes of drivers are closed for 3 seconds then the IR sensor and accelerometer sensor gives the information to the timer the sensor to the 5V and ground of the arduino and the Analog pin of sensor to the A0 circuit it activates the microcontroller and microcontroller gives information to three relays.

COMPONENTS

The Main Constitutes and Components Are:

- Microcontroller Circuit
- Relay Circuit
- Driver Circuit
- Timer Circuit
- Alarm Circuit
- Braking Mechanism
- Eye blink sensor.
- Accelerometer sensor.
- Vibrator Motor

Eye Blink Sensor

The eye blink sensor consists of an Infrared Transmitter and a Receiver. The infrared transmitter transmits the rays and the receiver receives the rays. The sensors sense our reaction of the eye [closed or opened] for 3 sec and gives information to the system that is the timer circuit. The timer circuit then precedesthe information to the microcontroller.

Figure 3.1: Eye Blink Sensor

Accelerometer Sensor

The accelerometer sensor is used to detect the head inclination angle if the head is inclined for more than 45 degree for 3 seconds it is programmed for actuate braking system and buzzer.

Figure 3.2: Micro Controller

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Buzzer

A buzzer or beeper is a signaling device usually electronic. These devices are used in automobiles, household appliances such as microwave oven. It consists of a number of switches or sensors connected to a control unit that determines if and which button pushed or a present time has lapsed, sounds a warning in the form of an intermittent buzzing or beeping sound. The infrared transmitter transmits the rays and the receiver receives the rays. The sensors sense our reaction of the eye [closed or opened] for 3 sec and gives information tothe system that is the timer circuit. The timer circuit then precedes the information to the microcontroller.

Figure 3.3: Buzzer

Vibrator

This is the vibrator kept in the circuit of the system. In real time the vibrator is set under the seat of the driver or at the back of the seat or on the steering of the vehicle. The vibrator has a separate driver circuit and a relay for its control. The vibration is controlled by the microcontroller. A vibrator is fixed in the circuit in which it will vibrate and make the driver alert about the drowsinesscondition.

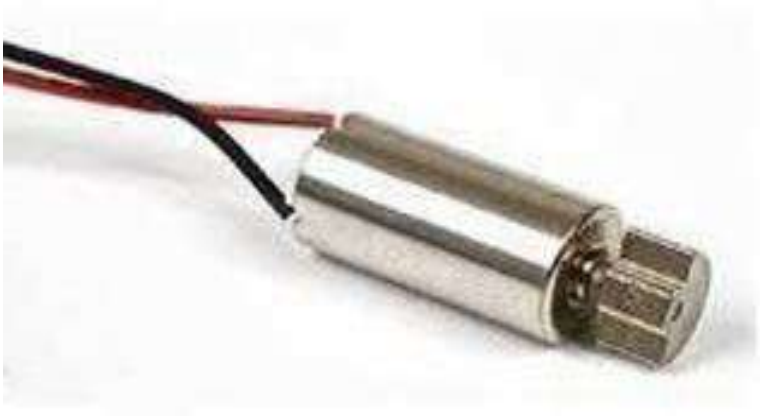

Figure 3.4: Vibrator

IV. DESIGN

Figure 4.1: Glasses with IR Sensor

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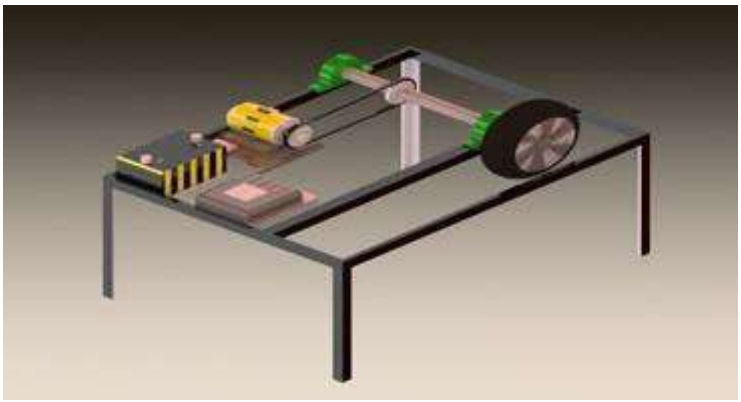

Figure 4.2: Project with Assembly in CAD

Figure 4.3: Assembled project

V. CONCLUSION

Actually the fact that the driver is not able to control his vehicle when he is asleep and by the time he realizes it, there is an accident. The car is at a very highspeed on highways due to which handling is tough and getting the vehicle to halt in such a condition is very difficult. Due to this many automobile companies are trying to research onto how an accident which cause due to driver fatigue can be prevented. In this project we will generate a modelwhich can prevent/avoid such an incident.

The Purpose of such a model is to advance a system to detect fatigue symptoms in drivers and control the speed of vehicle to prevent accidents. The main components of the system consists of an eye blink sensor for driver eye blink acquisition and an adaptive speed controller designed using stepper motor for providing accurate positioning of the throttle valve to control the speed of car or any vehicle. Advanced technology offers some hopeavoid these up to some type of extent. This project involves in measure and controls through alcohol sensor and eye blink using IR sensor.

REFERENCES

1. Hayashi K, Ishihara K, Hashimoto H, et al. Individualized Drowsiness detection during driving by pulse wave analysis With neural Network. In: 2Proceedings of the 8th International IEEE Conference on Intelligent Transportation Systems. Vienna, Austria, 2005: 901-906.
2. IJCSNS International Journal of Computer Science and Network Security, VOL.9 No.3, March 2009, A NeuroGenetic System Design for Monitoring Driver's Fatigue N.G.Narole , Research Scholar,G.H.Raisoni College of engineering, Nagpur, Dr.P.R.Bajaj, Principal, G.H.Raisoni College of Engineering, Nagpur.
3. Fatigue", IEEE Intelligent Transport System Proceedings a. [1997], pp314-319.
4. Drowsy driver detection system, Google Patents.Wu, R., et al. [2016].
5. "Drowsy driver detection system. "Engineering Design Project Thesis, Ryerson University. Parmar, N. [2002].
6. "Embedded Systems" by Raj Kamal, 2nd Edition, TMH
7. http://ntl.bts.gov/lib/16000/16600/16694/PB200010452 1.pdf

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DESIGN AND FABRICATION OF GROUNDNUT SHELLER

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ABSTRACT
In a developing countries like India groundnuts is grown on small scale, so there is a lack of lack of groundnut sheller machine which are affordable. The average price of peanut is approximately twice the price of pod. There are some groundnut sheller machines are available in market but the cost is not affordable and also they are large in size so they are not suitable for domestic applications they are suitable for mass production like industrial applications. Hence it is essential to design and fabricate a portable groundnut sheller machine for domestic applications. The performance of the machine was evaluated in terms of overall capacity, shelling and material efficiency and mechanical damage. This paper describes about the working, result and conclusion of the groundnut shelling machine.

Overall, this project involves processes like design, analysis, fabrication and assembling of different components.

I. INTRODUCTION

The process of removal of the skin and bark of the beans is a very time-consuming process and requires labor. Hence machine could fasten this process and reduce labour to one man that would be very advantageous in mass production. The need of this machine is in food processing industry and in agriculture sector for de-shelling of the beans. The bean Sheller will be very efficient for mass production. The objective of this machine is to speed up the process of de-shelling and to reduce the labour work. When the beans are de-shelled manually the bean are pressed at the edge and their shell opens. Same thing happens when we thrash the bean at a hard place it opens up its shell. The same principal is used here in our bean Sheller. The beans are hit by the wooden arms and they cause the bean's skin to rupture and the beans fall in our collect.

II. OBJECTIVES

- The main and basic objective is to make low-cost groundnut shelling machine.
- Another thing is that to shell maximum possible groundnut in shortest possible time

III. LITERATURE SURVEY

Sr no	Name Of Paper/journal	Authors Name	Year of	Findings of the Paper published
1	A Review on Design and Fabrication of Groundnut Shelling and Separating	Adwal Ravindra1, Ghadge Rohit, Awad Saurav, Prof. Khare G.N	2017	The agriculture is the basic profession of vast of population world-wide. Some modifications can be done in this machine and it will be used over long scale. The scope in agricultural field is tremendous. It will definitely be a vast sector to work on to minimise man power and improve efficiency of operation, decrease cost of operation, decrease efforts.
2	Design and Fabrication of Groundnut Pods and Shell Stripper Machine.	G. Karthik , D. Balashankar	2018	This work presents the design of an electrically powered groundnut pods stripper and shelling machine. It can be used for both domestic and industrial purposes. The advantage to be derived from the use of this machine far outweighs its shortcomings. It was also observed that groundnut with one seed per pod and those with two small seeds in their pods were the ones that came out unshelled or partially shelled
3	Groundnut Peeling Shelling Machine	A.Mani1 P.Manishkumar, M.Krishna U.Karthick	2021	The main importance of this project is as this machine is battery operated it can be directly transported to the groundnut farms and can be operated without an external electric supply which is not available at most of the farms. Proper evaluation of the design will be performed and

				created something even better instead of simply manually operated operations. Finally, we conclude that atomizing machines is a better option to use farmer instead of manually operated.
4	Design & Fabrication of Groundnut Sheller Machine	Tushar Walke1, Praful Gadge, Ganesh Gohate, Ritesh Banpurkar	2017	The cost of the machine is less and if the farmer buys this machine, farmer can recover the invested money back. By using this machine problem of the labour crises can be reduced. Comparing with manual harvesting only one labour is required. It makes the process faster hence reduces most of the shelling time and labour cost.
5	Design and Fabrication of Pedal Operated Groundnut Decorticator Machine	Kulbhushan M.Shejole1, Nitin B. Borkar , Abhijit M. Bobade	2017	Based on it is concluded that, the pedal operated groundnut decorticator machine is better option to use farmer instead of hand operated. The machine is pedal operated so that there is no energy consumption which wills helps to reduce the cost of productions. This machine also saves time and manpower. If we go on continuous work we got a higher output in very short time. The operating procedure of this system is very simple, so there is no skill labour required to operate a machine.

IV. DESIGN METHODOLOGY

V. RESULTS AND CALCULATION

The sample of a readings are recorded. Five tests are conducted each of them consists of one Kg of groundnuts. Each of test conducted at a same speed. Approximately 78% groundnuts are shelled. The shelled groundnuts are collected in a drawer among with some small size pods. In shelled groundnuts damaged and undamaged peanuts are separated for calculating efficiencies.

Sr. No.	Total wt. of groundnut in Kg. (Qt)	Wt. of shelled groundnut in Kg (Qs)	Wt. of undamaged groundnut in Kg (Qu)	Wt. of amaged groundnut in Kg (Qd)	Time for shelling operation in seconds (Tm)
1	1	0.80	0.59	0.186	30
2	1	0.76	0.55	0.180	30
3	1	0.78	0.58	0.183	30
4	1	0.77	0.57	0.181	30
5	1	0.79	0.54	0.188	30
Total	5	3.90	2.83	0.918	150
Average	1	0.78	0.566	0.1836	30

Shelling Efficiency (%) = $\frac{Qs}{Qt} x100 = \frac{0.78}{1} x100 = 78\%$

Material Efficiency (%) = $\frac{Qu}{(Qu+Qd)} x100 = \frac{0.566}{(0.566+0.1836)} x100 = 75.5\%$

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Mechanical Damage (%) = $\frac{Qd}{(Qu+Qd)} x100 = \frac{0.1836}{(0.566+0.1836)} x100 = 24.4\%$

Overall Capacity (Kg/h) = $\frac{Qs}{Tm} = \frac{0.78}{0.0083} = 93Kg/h$

DESIGN MODEL

VI.CONCLUSION

Reduction in Size:
The overall size of the unit fabricated is smaller than the one which are commercially available in the market. The dimensions this of the machine are 1117.6x762 mm (44" x 30"). Upon calculating the area occupied by the machine it comes out as 851611.2mm^2. The dimensions of the machine available in the market is about 1150x762 mm. The machine can be made even more compact by reducing the free space in the body and drum. However, reduction in the free space will make the maintenance and cleaning of the machine harder. Also adding of the accessories like a gear box, shaker or blower and changing the mesh (drum net) will be harder.

Reduction in Weight:
The project is light in weight as it is built from wood. Using high quality steel would have increased the weight as well as the cost of the machine. Also the mechanism which includes the drum and the planks are made from wood which not only reduces the weight, but it also reduced the direct forced and centrifugal forced acting on the shaft which also helps in the reduction of vibrations.

Reduction in Cost:
The overall cost of the fabricated project is around Rs. 13000 whereas the average cost of the machines available in the market ranges from Rs. 15,000 to Rs. 50,000. The lower power motor, the wooden body and drum are some of the factors which help in major cost cutting of the overall cost of the project both in terms of material cost and machining cost.

Power Saving:
The motor used in the project is a 0.5 hp (0.37 KW) 1440 rpm motor where as most of the machines in the market uses around 1.1 to 2.2KW. It reduces the power consumption. The motor is able to drive the mechanism as it is light in weight. Also higher power motors are costly and bulky that is it adds in more weight to the machine. Using a higher RPM motor would lead to the mechanism rotating at much higher RPM producing un-necessary sound and vibration.

VII. FUTURE SCOPE

The groundnut sheller can be modified with various attachments and changes in the components to increase the efficiency and for maximum output conveniently. These changes would increase the cost of the machine but also increasing the efficiency and can avail new features to the machine a few of the attachments/modifications are as follows:

1. Blower:
A process for removing the skins from the bean comprises:

Loading the beans in the de-shelling chamber

Rotating the de-shelling chamber and the arms inside on the shaft that will hitthe beans and the beans will fall down and if some of the skins fall down, it will get collected in the draw.

To avoid the skins of the beans to get collected in the drawer a blower should be installed sothat the peeled skins of the beans are blown away and would be expelled from the rear side ofthe machine.

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2. Automatic Pouch Packing:
This machine can be attached to the Bean Sheller and the beans could be packed and sealed directly which will increase the productivity and the time will be saved. This machine should be installed just before the unloading drawer where the beans would fall after passing the mesh. The beans would be packed and sealed in plastic bags and can be sent straight for sales in the market or it can even be frozen to increase its life.

3. Solar Driven Motor:
Motor installed on the machine could be driven by solar panels increasing the efficiency much and would eliminate the wastage of electricity but these installments could be expensive causing high initial costs. The solar panels would be installed and would set on the open field which would simply generate electricity giving power to the motor.

REFERENCES

1. Ashish S. Raghtate and Dr. C. C. (anda, DzDesign Consideration of Groundnut Sheller machinedz. Department Of Mechanical Engineering, KDK College of Engineering, Nagpur. International Journal of Innovative Research in Science and Technology// Vol.01 Issue 1//September 2014//ISSN (online) 2349-6010.
2. Ikechukwu Celestine Ugwuoke, Olawale James Okegbile and) bukun Blessing) kechukwu, DzDesign and Fabrication of Groundnut Shelling and Separating Machinedz.) nternational Journal of Enigeneering Science Invention//ISSN (online):2319-6734//ISSN (Print):2319-6726// www.ijesi.org// Vol. 03// Issue 04// April 2014//PP.60-66.
3. Santosh Mangave and Bhagyesh Deshmukh, DzDesign of Portable Groundnut Sheller Machinedz. Department of mechanical engineering, WIT, Solapur. International Journal of Mechanical Engineering and Information Technology// Vol.03 Issue 04// April//Page No: 1125-1129//ISSN-2348-196x
4. Oladeji Akanni Ogunwole "Design, Fabrication and Testing of A (Manually and Electrically Operated) Roasted Groundnut Decorticating Machine" Food Science and Quality Management www.iiste.org ISSN 2224-6088 (Paper) ISSN 2225-0557 (Online) Vol.14, 2013
5. Engr Aminu ,Ezekiel Usman Jabba, "Design Construction And Evaluation Of Groundnut Shelling Machine Pedal Operated" EPRA International Journal of Research and Development (IJRD) Volume: 5 | Issue: 9 | September 2021
6. Tushar Walke1, Praful Gadge2, Ganesh Gohate3, Ritesh Banpurkar4, "Design & Fabrication of Groundnut Sheller Machine" International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395 - 0056 Volume: 04 Issue: 03 | Mar -2017
7. Z Iqbal1, G Jowowasito1, Darmanto1, M Lutfi1, F I Wardani1, R A Lubis1, L B Siahaan1 and I Hidayah1, Published under licence by IOP Publishing Ltd "Designing small-medium scale groundnut" IOP Conference Series: Earth and Environmental Science, Volume 230, International Conference on Green Agro-industry and Bioeconomy 18–20 September 2018, Universitas Brawijaya, East Java IndonesiaCitation Z Iqbal et al 2019 IOP Conf. Ser.: Earth Environ. Sci. 230 012013
8. Ikechukwu Celestine Ugwuoke , 2,Olawale James Okegbile 3,Ibukun Blessing Ikechukwu, "Design and Fabrication of Groundnut Shelling and Separating Machine" International Journal of Engineering Science Invention ISSN (Online): 2319 – 6734, ISSN (Print): 2319 – 6726 www.ijesi.org Volume 3 Issue 4‖ April 2014‖ PP.60-66
9. R. Bhalavignesh1, L. Arjunan1, B. S. Arunkumarrao1, G.Arun1, S.P.Vinayagam Mohanavel "Modelling and Fabrication of Groundnut Separating Machine" International Research Journal of Automotive Technology (IRJAT) http:// www. Mapletreejournals. com/ index.php/ IRJAT Received 15July2019 ISSN 2581- 5865 Accepted 20August 2019 2019; 2(5); 1-7Published online 25 September2019
10. E. Gu¨zel a,*, _ I.D. Akc¸ali b , H. Mutlu c , A. _ Ince a "Research on the fatigue behavior for peanut shelling" Journal of Food Engineering 67 (2005) 373–378 Received 20 October 2003; accepted 26 April 2004

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EFFECT OF COMMUNICATION SKILLS ON STUDENTS LIFE

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ABSTRACT
The purpose of the paper is to study about the problems faced by young adults in communication skills and provide them guidance to success in personal and professional life by developing communication skills. It educates them the importance of good communication skills in teaching-learning process and in technical sector. It also emphasizes that the teacher should provide hands-on practice in soft skills and in technical sectors so that students can do communication effectively both in business and social life. The study also highlights Communication skills is an incorporating skills that can be taught by facilitating Training with Personality Development which could ensure a healthier and stronger working life after their graduation. It presents a brief of Definition of Communication, Process of Communication, Method of Communication, Barriers to Communication and Reason for Lack of Communication Skills and its Remedies. The conclusion of the study is presented with explanation of Advantage of Communication and Benefits and its results.

I) INTRODUCTION
The aim of this study is to overcome the communicational problems of young adults, especially engineering students and guide them to gain good communication skills to success in their personal and professional life. As communication is being a major part of teaching-learning process as well as a huge importance in the technical sectors, development of this skill starts when an individual has motivation and opportunity to express his/her thoughts and transfer of information through a medium to people.

In general, students develop their skills in terms of knowledge and communication in a socialize environment but not in the environment of continuously attending the class. So, in the terms of developing communication skills, the role of a teacher is very important. They have to organize number of hands-on practice activities to facilitate training in both soft skills and technical sciences. This allows students to effectively communicate with business team members and other members of social life.

II) LITERATURE REVIEW
To add weightage to the research, we referred some books, internet and research papers which had given us a lot of points to improve our views and thoughts to fulfil this activity. Recognizing these contexts, communication is regarded as one of the fundamental areas in which the function of human communication is clearly understood. However, in the literature survey, the cases of “adult education” and “communication in adult education” were ignored in Japan, and educational events planned for adults still had an educational character. For this reason, Andragogy-based communication skills training organized for young adults that was considered to serve as a guide for further research. We also examined whether the communication skills training for university students affects the level of ability to express emotions and empathy tendencies that play important roles in the communication skills of young adults.

III) IMPORTANCE OF COMMUNICATION SKILLS
The rapidly developing world, changing environment, technological advancement and the regular use of communication technology in the lives of people convince the young adults for the importance of communication skills. In the recent years, there has been frequent research on the importance of communication skills where people learnt that the communication is a multifaceted concept in many areas of interest mainly centred on people such as the healthcare field, services at the hospital, etc., which required a proper and effective communication and quality of care for all reasons.

For example, medical professionals spend most of their time in contact with patients and their families and due to their sensitive situation; communication with patients and relatives requires a gentler and friendlier approach. Therefore, it is expected that the communication skills of healthcare professionals will be effective.

Developing communication skills for health science students will enable them to communicate effectively with their patients. Communication skills are not just personal talents, they are very important in incorporating skills that can be taught. In addition, this study is believed that the Communication Skills Training and Personality Development can be prepared for college students to ensure a healthier and stronger working life after their graduation.

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IV) DEFINITION OF COMMUNICATION

Communication is a two-way process in which messages in the form of ideas, thoughts, feelings, and opinions are passed between two or more people to create a common understanding. Simply put, the act of conveying intended information and understanding to the other party is called communication. Communication is a two-way process in which messages in the form of ideas, thoughts, feelings, and opinions are passed between two or more people to create a common understanding. Simply put, the act of conveying intended information and understanding to the other party is called communication. Effective communication is when the message conveyed by the sender is precisely understood by the recipient as intended. Effective communication is when the message conveyed by the sender is precisely understood by the recipient as intended.

V) PROCESS OF COMMUNICATION

Communication is a dynamic process in which the sender conceptualizes an idea, delivers a message to the receiver, and the receiver provides feedback in the form of a message or signal over a given period of time. Therefore, there are 7 main elements in the communication process. Sender: A caller or communicator is someone who starts a conversation and comes up with an idea that they want to share with others. Encoding: The sender begins with the encoding process using specific words or non-verbal methods such as signs, symbols, gestures, etc. to translate information into a message. Your knowledge, skills, awareness of the sender, your background, and your competencies will greatly influence the success of your message.

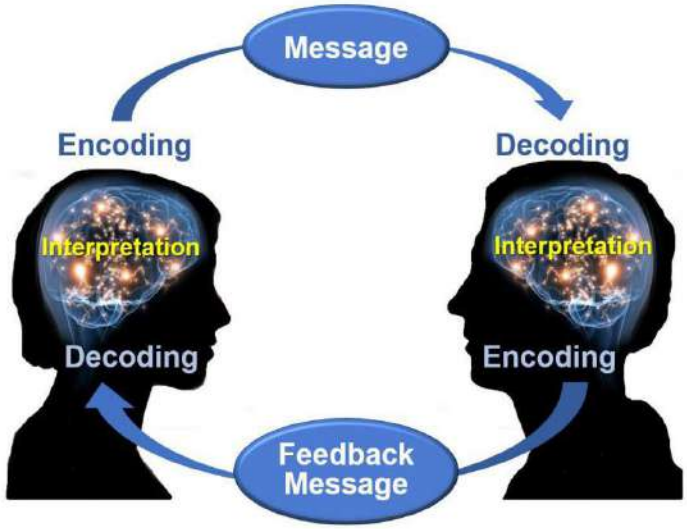

Fig.1: Process of Communication

Message: After encoding is complete, the sender receives the message it was about to send. Messages can be written, spoken, symbolic or non-verbal, such as gestures, silences, sighs, sounds, etc. or any other signal that elicits a response from the receiver.

Communication Channel: The sender chooses the medium through which he wants to send his message to the receiver. You must choose carefully so that the recipient of your message can interpret it effectively and accurately. The choice of means depends on the interpersonal relationship between the sender and the recipient and the urgency of the message being sent. Oral, virtual, written, audio, and sign language are the most commonly used means of communication.

Recipient: The recipient is the intended or intended person of the message. He tries to best understand him in order to achieve the goal of communication. The degree to which a receiver can decode a message depends on the subject's knowledge, experience, trust, and relationship with the sender. Decoding: Here, the receiver interprets the message from the sender and tries to understand it in the best possible way. Effective communication is only possible when the recipient understands the message exactly as the sender intended.

Feedback: Feedback is the final step in the process for a recipient to receive a message and interpret the message exactly as the sender intended. This makes communication more efficient because the sender is aware of the impact of the message. The recipient's response can be linguistic or non-verbal.

VI) METHODS OF COMMUNICATION

Basically, in communication skills, the most important thing is effective dialogue that involves both verbal and non-verbal elements. These two elements are considered as method of communication. Here, we present the details of Verbal Communication and Non-verbal Communication.

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Verbal Communication: In this type of communication spoken or written words are used which can be divided into two parts as Oral and Written Communication.

1. **Oral Communication:** In this type of Communication, face to face interaction happens between a sender and a receiver.

Fig.2: Process of Communication

2. **Written Communication:** In this type of communication, written or typed words are used for communication. Written type of Communication is widely used to deal with distanced people for professional works.

Fig.3: Process of Communication

Non-Verbal Communication: In this type, communication is done without uttering words. This type of communication plays a very important role in professional communication because it requires non-verbal cues to transmit and receive information. These non-verbal cues are classified into: Body language, facial expression, eye contact, tone of voice, gesture, posture, etc.

Fig.4: Process of Communication

VII) Barriers to Communication: Many times communication fails especially interpersonal communication. It happens because the message which the sender wants to send is not exactly received by the receiver as sender intends for that reason the sender seeks for feedback from the receiver to verify the message given by him is clearly understood.

A) Major Barriers to Communication: It is sender's responsibility to clear it by making a sound knowledge on language which he/she using to communicate.

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1. **Wrong Channel:** There are different types of channels from which we present you a few examples for how wrong channel can affect the communication and make a person misunderstand the importance and nature of a sentence/message. The message "how are you" is most suitable in oral channel but it will be less effective or inappropriate in written on book or paper. On the other hand, if someone is saying different items name then you must be write it in paper or sender should write the items name in paper. If a sender say that "The Kashmir is so beautiful place", it will not have much effect. If a video is used to show the beauty of the Kashmir, it will have a great effect and then the receiver will wish to go the Kashmir. Simple rules for choice of a channel cause a lot of issues than they solve. In selection of a channel, the sender must be sensitive to such things because the quality of the message (good morning versus a construction contract); the results of a misunderstanding (medication for a sick animal versus a guess concerning tomorrow's weather); data, skills and talent of the action from the message (order for this morning's work versus a thought of labour for 1994). To overcame it you should learn about different type of channel and which one to be used and where. If someone use some channel and you are not understand why it is use then ask about it, clear your doubts.
2. **Language:** Words are not absolute and not reality because it is the sender understands them, are combined with the perception of those words by the receiver. A language represents only a fraction of part, remaining part is filled by the receiver's perception. When you try to understand a foreign language, it's easy to see that the language isn't real. Being a "foreigner", it is not limited to the language of another country. It could be the language of another form, the house of Gerkens where Brown lives. Green goose can be coloured red long after it has been given the name green goose. A busy day has to do with temperature and a little bit of colour. Each apprentice must learn the language of the form. Until they learn the language of the form, this can be as problematic for communication as with other languages.
3. **No Feedback:** Feedback is very important. When the sender receives the feedback, it sends another message accordingly. Without or not enough feedback, the sender may hit a communication barrier or the communication is one-way. Feedback can be of any type, such as question-and-answer, repetition, embarrassment, etc. So, try to get good feedback and give correct feedback.
4. **Lack of Listening Skills:** Listening is not easy. The average speaker speaks about 125 words per minute, and the average listener can read 400-600 words per minute. So, about 25% of the time is listening time and the rest of the time is free time that allows listeners to draw attention to other things or to think about things other than the topic.Sketching or summarizing key point's memorial can be very helpful. Do not disturb the speakers. "Shut up" is a useful recommendation for listeners. "Shut up a little bit more" is a useful addition to this rule. Let someone else finish your message, and then offer your judgment, rating or opinion. An impatient impression, a shake of the head and a bored look on the listener's face can easily convince the speaker that there is no attempt or boasting to convey his/her brilliant idea. To handle this situation and the provide feedback, ask the speaker a question, agree and nod. Be an active listener. Look into the speaker's eyes and lean forward. Focus on what the other person is intends to say and repeat the point.
5. **Physical Distraction:** Physical distraction is a physical thing that causes communication problems. For example, noisy places and uncomfortable meeting places and the phone ringing. These physical distractions are common on forms. When the phone rings, that person cannot refuse to answer, even if it interrupts your very important conversation. Supervisors can give instructions from the driver's seat of the pickup truck. A person sitting next to a table, especially a large chair, having a conversation across a table is a conversation caused by a physical barrier. The personal sense of communication become much open when there is conversation between people facing each other without a truck-door or a desk. A place on the farm that is too hot or too cold makes the meeting places uncomfortable. The meeting also can be uncomfortable chair that makes people to want to stand or leave even if it means cutting short the discussion. The common physical distraction is noise; it is hard to focus on conversation if hearing is difficult because it is physical. You can overcome it easily, for example, ask the person to came across the desk, ask the management to provide comfortable chairs, use washroom before important meeting, etc.
6. **Interruption:** The long period of calm and quiet rarely interrupt the usual frantic pace. In this conversation, meeting, environment, instructions and casual talk about last night dinner can be interrupted. This interruption causes due to something more pressing, lack of privacy for conversation, rudeness, drop-in visitor, even curiosity of someone who wants to know what is your discussion or emergency. For example, when you and your friend discussing about assignment and that time your classmate jump in interrupt your discussion and says share that assignment with me, then you cannot overcome it, just can take precautions.

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B) Common Barriers to Communication: The common issues faced in communication are as follows:

1. Lack of attention, interaction, distraction, cause irrelevances to the receiver.
2. Difference in perception and viewpoints.
3. Physical disabilities.
4. Physical barriers.
5. Language difference, unfamiliar accent.
6. Psychological barriers.
7. Physiological barriers.
8. Attitudinal barriers.

C) Factors Affecting Students' Communication Skills: There are many researches have been done to find out whether the poor performances of students in communication skills is influenced by teaching methods or lack of interest, curiosity in students. If they are useful in their studies or not, during presentation, students thinks presenting means only giving information and such a skill would not be effective or useful in students life.

VIII) What is Lack of Communication?

The lack of communication is a discrepancy between sender and receiver on what message is given and what message is received. It could be possible by many reasons like barriers to communication and others.

A) Remedy for Lack of Communication

1. **Ensure you Want to Learn More:** Most of the students hesitate to ask questions because of their fear and lack of confidence. As communicating helps them to listen for better understanding in day-to-day life, the students can ask questions freely which will boost their confidence and eventually give them more information to improve their skills.

1. **Be Friendly:** Clear communication about skills, information, objective vocabulary in words while doing communication will give you confidence and you will be lack of nervousness. For example, many students face difficulties during the job interviews. They become nervous and give bad postures and gestures which will directly affect their performances.
2. **Engage With New People:** Being socially active is one of the most important things in communication skills. While communicating, we should respect each other because good communication will make you trustworthy and will impact students' life positively.
3. **Have Collaborative Attitude:** As earlier said that the good communication skills will make you trustworthy, it is important in teamwork and will be very effective while presenting your point of views. After doing graduation, you will enter the corporate world where this skill will be most important as it is sign of good leadership quality.
4. **Improving Presence of Mind and Memory:** Every student should have sharp brain and presence of mind for effective communication and being productive to become successful. These will help them improve vocabulary, communication skills in every difficult situation. As good communication indicates you well-educated person, you should start communicating with everyone with proper manner without disrespecting anyone.

IX) Advantages of Communication Skills

1. **Communication Build Relation Stronger:** Personal correspondence moreover depends on effective communication in many ways. Good communication improves relation, trust, love, and strengthens the bond and also reduces the dispute. Talking can reduce stress and make awareness of love, hope, and care. If you don't take communication seriously in your relation then it may take you to important points like disagreement, cheat, etc. If you don't do it right, you can lose it. So, the choice is yours.
2. **Understanding:** Other advantages of the communication skills are that effective communication removes estimate/guess from any message. When information is successfully transmitted to your audience, your audience does not question or ask you a reason. Even a physician make sure that he does his best to make the sufferer understands what he is facing. When you communicate properly, your piece of information becomes easy to understand by all. For example, if you are expressing your suggestion in a meeting, so it is compulsory to give your speech clearly so that everyone can understand your perspective and rely on you.

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3. **Read Emotional Signs:** The human beings are stressed all the time so, paying attention to signs and conveying desires or needs may occur not unexpectedly. These skills can be exercise with improved self-awareness and understanding of emotional signs. It can be a big advantage if you have the expertness of reading others' emotions in agreement and finding solutions. It makes it easier to adjust your communication according to the situation to hit the target listeners. Pay attention to their body language and adjust your words corresponding. For example, if you are giving a speech on stage and your listeners seems to be bored, you can add little funniness or take a break to grab their attention back.
4. **Easy Presentation:** The whole conversation will be improved if we attach non-verbal communication. The whole meaning of conversation will be converting if there is no non-verbal communication. Non-verbal is body moments like nodding of the head, sign like waving of a hand, a facial expression like a smile. It is also one of the trump cards of communication skills. Without execute justly, these forms of communication can result in a change in message. For Example, if you are at a social gathering and everyone is enjoying, a man with an angry face ask you stop dance, WILL YOU? The whole sequence of events will be changed if it is not executed well.
5. **Substituting:** You can replace your words with non-verbal forms of communication for easy and better understanding to others, without using a single word.
6. **Expressive:** Communication helps human beings to be more expressive about their suggestions and to be further creative. It allows us to understand others' emotions, their way of thinking, their goals and line of thinking of others. As a result, we develop our thoughts for others and develop affection or bad feeling for them or making positive and negative relationships.

To Overcome the Lacks of Communication Skills Here are Some More Solutions and Tip:

- Always try to communicate with other, don't hold back because of any anxiety
- Make positive attitude toward communication
- Avoid defensiveness that interferes with communication
- Work on your weakness and make it your power. It takes knowledge and hard work
- Try to learn about barriers to communication because it will provide you the necessary knowledge and will help you to know your weakness
- Consider communication as a skill, evaluate along with other skills
- Try to help other people to improve in their weakness in communication skill; it will help you to understand the communication problem
- Try to make good understanding and relationship, it will free you from any fear and anxiety and make your communication much better.
- Try to know the point of interest of receiver and speak on it, it will help you to make long discussion.
- If you do any miscommunication, accept it. By doing this, it will minimize its negative impacts.

Fig.5: Process of Communication

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CONCLUSION: The study concludes its research points as follows:

- Communication skills are incorporating skills that can be taught by facilitating Training with Personality Development.
- It defines that the teachers are responsible to provide this facility through student-centred education process that ensures a healthier and stronger working life after students' graduation.
- Students must know the importance of effective communication skills in teaching-learning process and in technical sector for building good and life-long relationships.
- If students strictly follows the guidance and remedies of lack of communication, they can understand others' emotions, their way of thinking, their goals and line of thinking of others which will lead them to have success in personal and professional life.

REFERENCES

1) Abena Abokoma Asemanyi (2015), An Assessment of Students' Performance in Communication.
2) Bernard L. Erven, Overcoming Barriers to Communicaions. Skills. A Case Study of the University of Education Winneba.
3) Dr. Amitabh Kishor Dwivedi (2019), Communicational Skills For Professional & Students: An Occupational Therapist's Perspective.
4) Owen Hargie. (Ed). (2019) the Handbook of Communication Skills Fourth Edition.
5) Sultan Guclu (2016), an Experimental Study towards Young Adults. Journal name Eurasian Journal of Educational Research,
6) 63, 279-292, http://dx.doi.org/10.14689/ejer.2016.63.16.
7) Amy C. Evans (2021), what is Communication? - Definition & Importance. Updated 10/20/2021. https://study.com/academy/lesson/what-is-communication-definition- importance.html
8) Business Jargons (2017), Communication Process.
9) https://businessjargons.com/communication-process.html
10) Indies Education (2005), 5 Advantages and Disadvantages of Communication Skills. Retrieved May 20, 2020, https://indieseducation.com/advantages-of-communication-skills/
11) Yemeh, N. (2007), improving the writing skills of Community Based Rehabilitation (CBR) students at the University of Education, Winneba. Retrieved November 18, 2010, from Yin, R. (2009).

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HYDRAULIC BRAKING SYSTEM

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ABSTRACT
Now days the no. of accident are so high and uncertainly. Accident occurs frequently and causes worse damage, serious injury and even death. Most accident takes place due to driver error in recognition, judgments or vehicle operation. This report is about a system known as 'Hydraulic Braking System' whichhas been use around on most car models since the early 1930s, with combination brake systems added to cars in the mid-1960s. Combination systems combine drum brakes with hydraulic brakes to offer backup braking support in case the vehicle's hydraulic system fails. Many modern vehicles feature solely hydraulic disc brakes because of their proven effectiveness in safety testing.

A hydraulic brake system has advantages over traditional brakes. Hydraulic brakes are more efficient than most brakes when coming to a complete stop. Hydraulics also offer better cost economically and space compared to other types of brakes.

Keywords: master cylinder, brake pedal, hydraulic lines, brake caliper, disc brake

INTRODUCTION

1.1HYDRAULIC
Hydraulics is the use of a liquid under pressure to transfer force or motion, orto increase an applied force. The pressure on a liquid is called hydraulic pressure andthe brakes which are operated by means of hydraulic pressure are called HYDRAULIC BRAKES. In 11118, Malcolm Lougheed developed a hydraulic brakesystem. The hydraulic brake is an arrangement of braking mechanism which usesbrake fluid, typically containing ethylene glycol, to transfer pressure from thecontrolling mechanism to the braking mechanism. Hydraulic Brake is arrangementwhich uses brake fluid under certain pressure to actuate the brakes. Thus, brakes areapplied to stop the rotating wheel.

1.2 BRAKE
A brake is a mechanical device that inhibits motion by absorbing energy from a moving system. It is used for slowing or stopping a moving vehicle, wheel, axle, or to prevent its motion, most often accomplished by means of friction.

Most brakes commonly use friction between two surfaces pressed together to convert the kinetic energy of the moving object into heat, though other methods of energy conversion may be employed. For example, regenerative braking converts much of the energy to electrical energy, which may be stored for later use. Other methods convert kinetic energy into potential energy in such stored forms as pressurized air or pressurized oil. Eddy current brakes use magnetic fields to convert kinetic energy into electric current in the brake disc, fin, or rail, which is converted into heat. Still other braking methods even transform kinetic energy into different forms, for example by transferring the energy to a rotating flywheel.

Brakes are generally applied to rotating axles or wheels, but may also take other forms such as the surface of a moving fluid (flaps deployed into water or air). Some vehicles use a combination of braking mechanisms, such as drag racing cars with both wheel brakes and a parachute, or airplanes with both wheel brakes and drag flaps raised into the air during landing.

Since kinetic energy increases quadratically with velocity ({\displaystyle K=mv^{2}/2}K=mv^{2}/2), an object moving at 10 m/s has 100 times as much energy as one of the same mass moving at 1 m/s, and consequently the theoretical braking distance, when braking at the traction limit, is up to 100 times as long. In practice, fast vehicles usually have significant air drag, and energy lost to air drag rises quickly with speed.

Almost all wheeled vehicles have a brake of some sort. Even baggage carts and shopping carts may have them for use on a moving ramp. Most fixed-wing aircraft are fitted with wheel brakes on the undercarriage. Some aircraft also feature air brakes designed to reduce their speed in flight. Notable examples include gliders and some World War II-era aircraft, primarily some fighter aircraft and many dive bombers of the era. These allow the aircraft to maintain a safe speed in a steep descent.

Friction brakes on automobiles store braking heat in the drum brake or disc brake while braking then conduct it to the air gradually. When traveling downhill some vehicles can use their engines to brake.

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When the brake pedal of a modern vehicle with hydraulic brakes is pushed against the master cylinder, ultimately a piston pushes the brake pad against the brake disc which slows the wheel down. On the brake drum it is similar as the cylinder pushes the brake shoes against the drum which also slows the wheel down.

LITERATURE SURVEY

In the 1800's, the first mechanisms to slow a vehicles momentum and prevent motion were tested. Today, over 100 years later, the braking system has evolved into a complex device designed to adapt to different road conditions. From the early drum brakes to modern day discs, brake system evolutionhas improved safety and reduced the risk of car crashes. In 1918, the concept of a four-wheel brake system using hydraulics was first proposed by Malcolm Loughead. Brake system evolution has seen interesting advances in technology since the introduction of the wooden block brake. Such innovations have led to an increase in safety on the road and fewer accidents.The system used fluids to transfer force to the brake shoe when a pedal was pressed. This braking system was adopted in nearly every vehicle by the late 1920's.The disc brake was invented long before becoming popular. William Lanchester patented the disc brake in 1902; the system was not popular until the auto industry began to boom in the mid-20th century. The rise of disc brakes as a popular option is attributed to the increasing weight and speed capabilities of vehicles, which caused hydraulic brakes to become less efficient in distributing heat. The first system to use disc brakes integrated both disc and hydraulic functions and was introduced in the Chrysler Imperial. In our project we are using Hydraulic Brake with Hydraulic Disc which Help to reducedspeed of the vehicle.

HDRAULIC BRAKING WOKING

Construction

Hydraulic braking system is mainly confined with "brake fluid" this fluid consist of Alcohol, castor oil & glycerin, Hydraulic braking system has following components.

Master cylinder, brake pedal, wheel cylinder, brake drum, retracting spring, brake shoe etc.

The disc brake is a lot like the brakes on a bicycle. Bicycle brakes have a caliper,which squeezes the brake pads against the wheel. In a disc brake, the brake pads squeeze the rotor instead of the wheel, and the force is transmitted hydraulically instead of through a cable. Friction between the pads and the disc slows the disc down. A moving car has a certain amount of kinetic energy, and the brakes have to remove this energy from the car in order to stop it. How do the brakes do this? Each time you stop your car, your brakes convert the kinetic energy to heat generated by the friction between the pads and the disc.

Working

The brake pedal is connected to the master cylinder by means of piston for application of brake driver presses the brake pedal, which moves the master cylinder. In master cylinder pressure is instantly transferred to all four wheels. In a disc brake, the fluid from the master cylinder is forced into a caliper where it presses against a piston. The piston in turn squeezes two brake pads against the disc (rotor), which is attached to wheel, forcing it 1o slow down or stop. When driver releases the brake pedal, the master cylinder piston returns to its original position duc to return springs, dropping fluid pressure.

Fluid Properties

Fluid is the medium in which energy is transmitted through in a hydraulic systeand the type of fluid used will have an impact on a number of different system properties. The fluid itself might be synthetic or non-synthetic and important properties and issues that need to be considered when selecting a hydraulic fluid are lubricity, Viscosity, protection against corrosion, tendency to foam, fire resistance and environmental impact. The properties of a fluid medium are apart from the type of fluid used also dependent on temperature, pressure and entrained air. Understanding how these various parameters affect the behavior and control of a hydraulic system constitutes the fundamentals of hydraulic system theory and is therefore presented in the following.

Fluid Mass Density

The density of a homogeneous fluid is defined as its mass per unit volume, denoted with the symbol p

$$\rho = \lim_{\Delta V \to 0} \frac{\Delta m}{\Delta V} = \frac{m}{V},$$

Where m, V, P and 7 correspond to fluid mass, volume, pressure and temperature respectively. The definition above assumes an isothermal and isobaric condition, where the Latin prefix iso used in these terms translates into equal or similar, ie. a condition where the fluid pressure and temperature are held constant such that P = PO

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and 7 = 70. The mass density of a fluid is dependent on temperature and pressure, both causing volumetric change to a fluid under varying conditions.

The relation between fluid density, temperature and pressure may be formulated through the equation of state that describes the state of a matter under a given set of physical conditions. An example of an equation of state is the ideal gas law

PV = nRT

Where P is the absolute pressure, Vis the gas volume n is the amount Substance (number of moles), R is the universal

Fabrication
Fabrication is the building of metal structures by cutting, bending, drilling, machining, and welding etc. or assembling process. It is a value added process that involves the creation of machines , part, and structure from various raw material.

Cutting:
We used angle grinder for Cutting the raw material with cutting disc of yuri green. We cut the square tubes for frames, breaking system for mounting.

Fig 5.1: Cutting

Drilling:
We also done drilling operation on the wheel for brake mountingand to mount the motor on frame using C clamp, also to angle for mounting

Turning:
To mount/insert the shaft in the place of axle that is preinstalled, wedecrease the diameter of shaft at the one end.

Boring:
To mount the chain sprocket on the shaft be enlarges the inner dia ofthe chain sprocket to 30mm.

Welding:
To make the frame, mount the wheel, install the bearing supportwe did welding at current of 100amperes. And to join the brake with frameused stainless steel welding rods.

MODEL CONSTRUCTION AND DESIGN

Engine
An engine or motor is a machine designed to convert one or more forms of energy into mechanical energy. Available energy sources include potential energy (e.g. energy of the Earth's gravitational field as exploited in hydroelectric power generation), heat energy (e.g. geothermal), chemical energy, electric potential and nuclear energy (from nuclear fission or nuclear fusion). Many of these processes generate heat as an intermediate energy form, so heat engines have special importance. Some natural processes, such as atmospheric convection cells convert environmental heat into motion (e.g. in the form of rising air currents). Mechanical energy is of particular importance in transportation, but also plays a role in many industrial processes such as cutting, grinding, crushing, and mixing. Mechanical heat engines convert heat into work via various thermodynamic processes. The internal combustion engine is perhaps the most common example of a chemical heat engine, in which heat from the combustion of a fuel causes rapid pressurisation of the gaseous combustion products in the combustion chamber, causing them to expand and drive a piston, which turns a crankshaft. Unlike internal combustion engines, a reaction engine (such as a jet engine) produces thrust by expelling reaction mass, in accordance with Newton's third law of motion.

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Fig 6.1: Engine

- **Specifications of the Engine Used**

Specification	Honda CBZ
Engine Type	Air cooled, 4 stroke
Number Of Cylinders	1
Valves Per Cylinder	2
Engine Displacement	150 CC
Max Power	14.4 PS @8500 rpm
Max Torque	12.8 Nm @6500 rpm
Bore x Stroke	57.3 x 57.8 mm
Fuel Type	Petrol

Table 6.1: Engine Specification

2) Chassis

Chassis is the vehicle's main support structure, also known as the 'Frame.' It bears all the stresses on the vehicle in both static and dynamic conditions. In a vehicle, it is analogous to the skeleton of a living organism. The origin of the word Chassis lies in the French language. Whether it is a two-wheeler or a car, or a truck, every vehicle has a chassis-frame. However, its form, obviously, varies with the vehicle type. It consists of all the parts which are required to function the automobile.

Fig 6.2: Chassis

3) Steering Mechanisms

Steering is a system of components, linkages, and many other parts that allows a vehicle to follow a desired course. An exception is the case of rail transport, by which rail tracks combined with railroad switches provide the steering function. The primary purpose of the steering system is to allow the driver to guide the vehicle.

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Fig 6.3: Turning Mechanisms

4) Battery

An electric battery is a source of electric power consisting of one or more electrochemical cells with external connections for powering electrical devices. When a battery is supplying power, its positive terminal is the cathode and its negative terminal is the anode. In This Project we use battery for the starter switch to start.

- **Specifications of the Battery Used**

Specification	Honda Activa
Size	11.3 x 7 x 8.5 Centimeters
Voltage	12 Volts
Item Weight	1.5 Kilograms

Table 6.2: Specification of battery

5) Wheels:

Tires or Wheels are designed to support the weight of the vehicle, absorb road shocks, transmit traction, torque and braking forces to the road surface and maintain and change the direction of travel. To fulfill these four basic functions tires are made of resilient rubber and filled with compressed air.

Fig 6.4: Wheels

6) Chain

A chain is a series of connected links which are typically made of metal. A chain may consist of two or more links. The main functions of the chain to Transmit power to the engine to the rear wheel.

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Fig 6.5: Chain

7) Brake

Brake systems have been widely used in automobiles, motorcycles, rail trains, and aircrafts. In brake systems, friction is both a principal performance factor and a potential cause of undesirable noise and vibration. The structures and principles of the brake systems of different kinds of vehicles are analogous and similar. Friction dynamics has been one of the most challenging problems in the brake.

Fig 6.6: Brake Disc

RESULT

After doing all the activites we make this model of hydraulic braking system.

Fig 7.1: Final result

CONCLUSION

With this project we achieved a safe, drable and viable design for a rotor component in a disc brake system taking in consideration the forces exerted for all the components in the brake system. In our fracture analysis for the static and the dynamic approach we found that our safety factor numbers are elevated. With this we demonstrate that disc brakes do not fracture. That is because the force exerted in the disc is a compressive force. That's why the materials used for the manufacturing of brake disc are brittle.

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FUTURE SCOPE

Our future course of action is to assemble a system on vehicle & perform various experimentations by varying different parameters. Those parameters are as follows:

1. Vehicle Speed
2. Obstacle distance
3. Sensor Position
4. Varying deceleration rate

ACKNOWLEDGMENT

It's our pleasure to take this opportunity to thank with deep sense of gratitude to our guide, staff members of Mechanical Department & everyone who have directly or indirectly contributed to our project as a success. With immense pleasure we express our deep sense of gratitude & vote of thanks to our project guide **Prof. Nitin Galwade** for his constant interest, motivation & valuable guidance during work & completion of this project report.

We are very thankful to **Prof. Nitin Galwade** and the whole staff of the **Mechanical Department** for giving us the opportunity to work on this project and for his extensive co-operation and guidance. We offer sincere thanks to **Principal Prof. Sayyad Layak and Prof. Nitin Galwade (Head of Department)** for their inspiration and providing full administrative support and departmental infrastructure facilities for this report.

We are also very thankful to all those who supported us without which project would not have been completed successfully.

REFERENCES

[1] Bhandari, V.B. (2010). Design of machine elements. Tata McGraw-Hill. p. 472. ISBN 9780070681798. Retrieved 9 February 2016.

[2] Nice, Karim (2000-08-22). "How Power Brakes Work". Howstuffworks.com. Retrieved 2011-03-12.

[3] David Hench (May 8, 2014). "Train-sparked fires cause explosions, destroy trailers, force evacuations". Portland Press Herald.

[4] Elissa, "Title of paper if known," unpublished.

[5] "Mercedes explains Hamilton brake fire on Mugello F1 grid". www.motorsport.com. Retrieved 2020-11-21.

[6] Roll Stability Control system (RSC) Archived 2011-07-16 at the Wayback Machine

[7] https://www.unece.org/fileadmin/DAM/trans/main/wp29/wp29regs/2020/ECE-TRANS-WP.29-343-Rev.

[8] 28-Add.1.pdf[bare URL PDF]

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PERFORMANCE ON SHELL AND TUBE HEATEXCHANGER

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ABSTRACT
Heat transfer is one of the most important processes inside the industry so increasing heat exchanger efficiency has a great use and major beneficial effect to the heat transfer. The project objective is to design an experimental system of shell and tube heat exchanger. Shell And Tube heat exchanger are widely used in industries due to their versatility. Different types of shell and tube exchangers can be easily configured by changing the shell and tube arrangement. In this project design and fabrication of a simple shell and tube heat exchanger is done. In this project different calculations are done in order to find the optimum heat transfer using limited option of materials. This heat exchanger consists of a MS shell and tubes which pass inside the shell and are supported with the help of baffle plates and there are two inlet and outlet ports for the water to flow inside of shell and tube. In present day shell and tube heat exchanger is the most common type heat exchanger widely used in oil refinery and other large chemical process, because it suits high pressure application.

1. INTRODUCTION
A heat exchanger is a system used to transfer heat between two or more fluids. Heat exchangers are used in both cooling and heating processes. The fluids maybe separated by a solid wall to prevent mixing or they may be in direct contact. The classic example of a heat exchanger is found in an internal combustion engine in which a circulating fluid known as engine coolant flows through radiator coils and air flows past the coils, which cools the coolant and heats the incoming air. Heat exchangers are one of the mostly used equipment in the process industries. Heat exchangers are used to transfer heat between two process streams. One can realize their usage that any process which involve cooling, heating, condensation, boiling or evaporation will require a heat exchanger for these purpose. Process fluids, usually are heated or cooled before the process or undergo a phase change. There are different types of heat exchanger

- Double Tube Heat Exchangers
- Shell and Tube Heat Exchangers
- Tube in Tube Heat Exchangers
- Plate Heat Exchangers
- Finned heat exchanger
- Plate fin heat exchanger
- Compact heat exchanger
- Plate shell heat exchanger

Different heat exchangers are named according to their application. For example, heat exchangers being used to condense are known as condensers, similarly heat exchanger for boiling purposes are called boilers. Performance and efficiency of heat exchangers are measured through the amount of heat transfer using least area of heat transfer and pressure drop. A typical heat exchanger, usually for higher pressure applications up to 552 bars, is the shell and tube heat exchanger. Shell and tube type heat exchanger, indirect [6] contact type heat exchanger. It consists of a series of tubes, through which one of the fluids runs. The shell is the container for the shell fluid. Generally, it is cylindrical in shape with a circular cross section, although shells of different shape are used in specific applications. For this particular study shell is considered, which is generally a one pass shell. A shell is the most commonly used due to its low cost and simplicity, and has the highest log-mean temperature-difference (LMTD) correction factor. Although the tubes may have single or multiple passes, there is one pass on the shell side, while the other fluid flows within the shell over the tubes to be heated or cooled. The tube side and shell side fluids are separated by a tube sheet. Baffles are used to support the tubes for structural rigidity, preventing tube vibration and sagging and to divert the flow across the bundle to obtain a higher heat transfer coefficient.

2. PROBLEM DEFINATION
Shell and tube heat exchanger is the most common type of heat exchanger used in industries. In this project, the design of a shell and tube heat exchanger unit has been carried out. The task at hand was to design and fabricate

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a heat exchanger with minimum cost and a good heat transfer rate. The tests for the heat exchanger are done by experimental method. The shell of the heat exchanger is made from Mild Steel material and the pipes used are made of copper

3. LITERATURE REVIEW

[1] Pranita Bichkar: - In the paper "Study of shell and tube Heat exchanger with effect of types of baffles" it is shown that how design ofbaffle plates can affect the thermal efficiency of the heat exchanger. . Increasing the number of baffles beyond certain number gives serious effects on pressure drop. So by changing the types of baffles without hampering the other dimensions suggested that single segmental baffles show the maximum pressure drop while it reduced when helical baffles are used. Single segmental baffles show the formation of dead zones where heat transfer cannot take place effectively. This problem is solved by usage of double segmental baffles. It also reduces the vibrational damage as compared to single segmental baffles.

[2] Moses Petinrin: - In the paper "Performance of shell and tube type heat exchanger with varying tube layouts" In this paper it is shown that how different tube layouts affect the pressure drop of fluid flowing through shell. n this study, numerical investigation has been carried out for predicting the performance of shell and tube heat exchangers with three different tube layout patterns. The results showed that much of the heat transfer and pressure drop occur during the crossflow of shell-fluid through the tube bundles. the STHE_T is moredesirable follow by the STHE_C as they exhibit higher heat transfer coefficient than the STHE_RT for the same pressure drop in the shell-side. [8] (a) triangular(STHE-T) (b) rotated triangular(STHE-RT) (c) combined (STHE-C)

[3] Raj Rajat, Piyush Verma:- In the paper "Performance Analysis of shell and tube type heat exchanger under the effect of varied operating conditions" In this paper it is shown that how different load conditions and different ambient temperature affect the working of the heat exchanger. a lot of factors affect the performance of the heat exchanger and the effectiveness obtained by the formulas depicts the cumulative effect of all the factors over the performance of the heat exchanger. It may be said that the insulation is a good tool to increase the rate of heat transfer if used properly well below the level of critical thickness. Amongst the used materials the cotton wool and the tape have given the best values of effectiveness. Moreover the effectiveness of the heat exchanger also depends upon the value of turbulence provided. However it is also seen that there does not exists direct relation between the turbulence and effectiveness and effectiveness attains its peak at some intermediate value. The ambient conditions for which the heat exchanger was tested do not show any significant effect over the heat exchanger's performance.

[4] Saurabh Sharma:- Ritesh Kumar Dewangan:- In the paper "Shell and Tube heat exchanger using various angle of baffle" this paper provides a review about major work done on design of Baffle plates and its different orientations to improve overall performance of shell and tube heat exchanger. From CFD simulation results, for fixed tube wall and shell inlet temperatures, shell side heat transfer coefficient, pressure drop and heat transfer rate values are obtained. So, overall we can say that using heat exchanger with 25% baffle cut percentage with 45° inclination angle will give best result compared to all other design models [9] under study. This results in higher heat transfer rate, greater heat transfer coefficient value and lesser pressure drop of that shell side fluid.

[5] Sandeep. K. Patel: - In the paper "Shell and Tube design with optimization of mass flow rate and baffle spacing". This paper shows that how to design with optimization of mass flow rate and spacing of baffle. From literature review it can be concluded that, there is increase in pressure drop with increase in fluid flow rate in shell and tube heat exchanger which increases pumping power. Tube pitch ratio, tube length, tube layout as well as baffle spacing ratio were found to be important design parameters which has a direct effect on pressure drop and causes a conflict between the effectiveness and total cost. It is necessary to evaluate optimal thermal design for shell and tube heat exchanger to run at minimal cost in industries**.**

[6] Uday C. Kapale: - Satish Chand:- In the paper "Modeling for shell-side pressure drop for liquid flow in shell-and-tube heat exchanger". This paper shows the effect of pressure drop at the shell side of shell and tube heat exchanger. The present model is developed based on estimated actual flow pattern of the liquid in the shell. The model is simple and based on geometrical and operating parameters of the heat exchanger and covers the Reynolds numbers ranging from 103 to 105. The present model results can be used by designers confidently.

[7] Majid Amidpour: - In the paper "Economic optimization of shell and tube heat exchanger based on constructal theory" It is shown that how the total construction cost for the manufacturing can be reduced by using constructal theory. Shell and tube heat exchangers have been optimized using a new useful method called the constructal theory. The results of design using the constructal theory are heat exchangers with in-series

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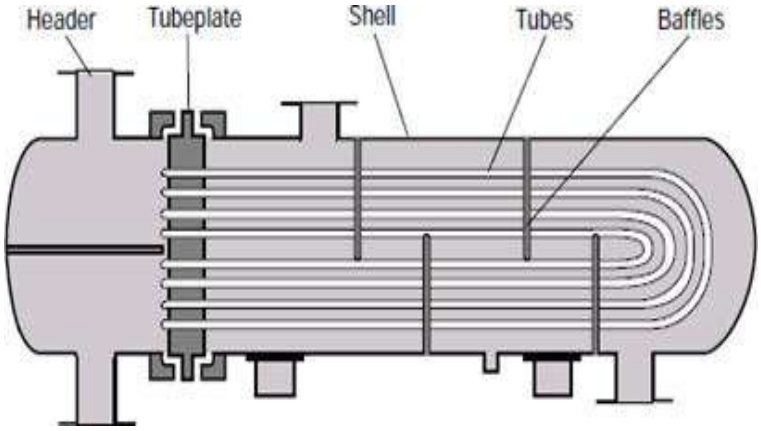
sections which we call constructal shell and tube heat exchangers. In sections of the heat exchanger, optimal values of diameter and length are found by trade-off between operational and capital costs. The series structure of sections of constructal heat exchangers facilitates reparation, maintenance and deposit removal throughout their operation. The case study used in this paper for validation which was taken from one of the renowned reference texts on heat exchanger design represented more than 50% reduction in [10] total cost compared to the usual method of design. Consequently, designing heat exchangers by the use of constructal theory is proposed as a useful method for designers, engineers and researchers.

[8]P.S.Gowthaman, S.Sathish:- In the paper "Analysis of Segmental and Helical Baffle in Shell and tube Heat Exchanger" the analyse of two different baffle in a Shell and Tube Heat Exchanger done by ANSYS FLUENT. Baffle is an shell side Component of shell and tube heat exchanger. The segmental baffle forces the liquid in a Zigzag flow and improving heat transfer and a high pressure drop and increase the fouling resistance and Helical Baffle have a Effective Performance of increasing heat transfer performance. From the Numerical Experimentation Results it is Confirmed that the Performance of a can be improved by Helical Baffles instead of Segmental Baffles. Use of Helical Baffles in Heat Exchanger Reduces Shell side Pressure drop, pumping cost, weight, fouling etc as compare to Segmental Baffle for a new installation. The Pressure Drop in Helical Baffle is Appreciably lesser as Compared to Segmental Baffle heatexchanger

4. DESIGN METHODOLOGY

Several designs constrain have been implicated in the project they are as follows.



This study is an attempt to address the performance and efficiency of shelland tube heat exchanger using the fluids i.e (hotwater and cold water).

- Design of an experiment setup to perform study.
- Perform the experiment to investigate the heat transfer between the two fluids.
- Optimise the results by comparing the experimental outcome with the therotical result.
- Provide recommendation to enhance the performance of shell and tube heatexchanger.

Shell and Tube Heat Exchanger

The shell and tube heat exchanger consists of two cycles which are cold water and hot water. The exchanger has two inlets and two outlets for the hot and coldflow. There are two ways to do the experiment in the heat exchanger, which are the parallel and the counter flow. However using the counter flow will give a betterefficiency than the parallel one.

Safety

Safety is an important factor to be considered during work and experimentimplementation.

Hot Water Tank and Cold Water Tank

The water temperature for the hot tank reaches around 50^0 C so, to avoid touchingthe hot tank we put stamp mark on the hot surfaceof the hot water tank. The cold water is kept in a separate tank at low temperature as it has to exchangethe heat with the hot fluid through the partition of tube walls.

Thermometer

As we all know that thermometer is used for the measuring of temperatures. We are going to measure the temperatures of both the fluids that is temperature of inletand outlet of both hot and cold fluid.

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Baffle Plates
Baffle plates are nothing but a thin steel plate with number of holes which is equal to the number of tubes. It is mainly used to create the turbulence flow into the shell, as the turbulence flow helps in very high heat transfer rate. They are alsoused to supportthe tubes and to hold them in position until they are dismantle.

Pumps
A pump is a device that moves the fluid by mechanical action, typically convertedfrom electrical energy into hydraulic energy. Pumps are operated by the mechanism that is reciprocating or rotary and consumes energy to perform mechanical work of moving the fluid.

Measuring Beaker
Beaker is generally a cylindrical container with a flat bottom and have a readingsin vertical direction. It is mostly used to holdthe liquids.

Tubes
Tube is a long, hollow and cylindrical object use for the passage of fluids or as container made up of several materials like metal, glass and plastic. In this projectwe are going to use both types of tubes that is metal as well as plastic.

Types of Shell and Tube Heat Exchanger According to flow Arrangement:
Parallel Flow: In this type the inlets for the hot fluid and cooler fluid are kept at the same end of the heat exchanger and the workingmedium are allowed to move in the same direction towards the outlet.

Counter Flow: On the same end of the heat exchanger inlet of one pipe and outlet of another pipe is made. Hence by this configurationfluids will be travelling in vice versa direction to each other.

Cross Flow: If fluids are made to move perpendicular to each other this is called cross flow.

Material Selection for Tube: Among the two fluids one is made to pass through the tubes so it becomes necessary to choose a tube whichis capable of facing every possible condition. For this the tubes must be having a good thermal conductivity. As the temperature along width of the tube varies thermal stresses are observed by the tubes. So the tubes must be designed in such a way that it can hold the thermal stresses. And the tube material must becompatible with the pH of the fluid. In addition to all this tube must be corrosion resistant. Commonly used tube materials are, aluminum, copper alloy, stainlesssteel, Carbon steel and titanium. Fluoropolymers arealso used viz, Perfluoroalkoxy alkane (PFA) andFluorinated ethylene propylene (FEP).

Applications of Shell and Tube Heat Exchanger
These are highly used to make heat transfer possible between two fluids or mediums. These are used in industrial sectors for heating orcooling purpose. The main applications are:

- Space heating
- Refrigeration
- Air conditioning
- Power plants
- Chemical plants
- HVAC
- Air processing

ADVANTAGES
1. They can be designed and manufactured to bear very high pressures.
2. They have extremely flexible and steady design.
3. They have no dimension limit.
4. Pressure loss is at a minimum and can be maintained at a minimum in line with the process purpose.
5. They can easily be disassembled and assembled back for maintenance, repair and cleaning.
6. Easy maintenance and repair.

LIMITATIONS
1. Heat exchange effectiveness is less

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2. Requires more space
3. Capacity of tube cooler can't be expanded.

5. RESULT

1. Inlet of hot water (t1)= 50^0C (323K)
2. outlet of hot water (t2)= 33^0C (306K)
3. Inlet of hot water (t3)= 30^0C (303K)
4. outlet of hot water (t4)= 34^0C (307K)
5. Mass flow rate of hot water (m_h) = 2.6l/min (43.3kg/sec), Mass flow rate of hot water (m_h) = 5/min (kg/sec)

6. CALCULATIONS

1. Length of copper pipe = 762mm
2. Cp of water = 4.182 KJ/KgK 3. $(T_h) = t1 - t2 = 323 - 306 = 17$k4. $(T_c) = t4 - t3 = 323 - 306 = 3$k
5. LMTD = T_h-T_c / ln (T_h/T_c)= 8.07K6. Q= mcp (t1 – t2) = 3.078W
7. A= 3.14.r^2h = 1.11m^2
8. Q = U.A.LMTD

3.078 = U. 1.11. 283.45U=9.78*10^{-3} W/M^2K

9. Efficiency = Q/ Q_{MAX} = $m_h$cp(t1 – t2)/ C_{min}(t1 – t3) = 85%

7. CONCLUSION

After finding wide applications in industrial sector shell and tube heat exchangers were taken as key topic by many researchers to work on. In order to increase performance of these heat exchangers the numerical andexperimental simulations were carried out by changing different parameters. As according to its use there is still some work neededto make shell and tube heat exchangers less economic and more efficient. Shell and tube heat exchangers do have many parameters on which some more work can be done.Compact heat exchangers are available in a wide variety of configuration to suit most processes heat transfer requirements.Shell and tube heat exchanger are preferred as they have no dimension limit. They are used for variety of applications.

8. FUTURE SCOPE

- STHXs are widely used and if designedproperly with better efficiencies it can give a promising feedback.
- STHXs are used for many works i.e. they are multi-purpose and will definitely give a vast field to research on.
- STHXs have various parameters which can be configured in different ways and better experimental results could be found out. Theseresults could prove fruitful to many industries.

9. REFERENCES

[1] Arjun Kumar Parasad, Mr. Kaushik Anand, Design and Analysis of Shell and Tube Heat Exchanger, Vol. 9 Issue 01, January-2020 Article ID: ISSN: 2278-0181, International Journal of Engineering Research & Technology (IJERT) January 2020

[2] Ram Kishan, Devendra Singh, Ajay Kumar Sharma, CFD Analysis of Heat Exchanger Models Design Using Ansys Fluent, Volume11, Issue 2, February 2020 Article ID: IJMET_11_02_001.

[3] P.Mathiyalagan, A Research Paper On Heat Exchanger, Journal of Emerging Technologies and Innovative Research (JETIR) Volume6- Issue 5, Article ID: ISSN-2349-5162, May 2019.

[4] Pranita Bichkar, Ojas Dandgaval, Pranita Dalvi, Rushabh Godase, Tapobatra Dey, Study of shell and tube heat exchanger with effect of type of baffle, Procedia Manufacturing 20 (2018) 195–200, Volume 20, February 2018

[5] Saurabh Sharm, Ritesh Kumar Dewangan, Performance analysis of shell and tube heat exchanger having different baffle cut and inclination angle, International Journal of Latest Engineering and Management Research (IJLEMR) ISSN: 2455- 4847, Volume 03 – Issue 05, May 2018.

ISSN 2394 - 7780

[6] Kaushik Parmar, Osama Gora, Kashyap Desai, Nirajkumar C Media, A Practical Attempt to Improve Performance of Heat Exchanger, International Journal Of Advance Research And Innovative Ideas In Education, Volume 3- Issue 1, Article ID: ISSN(O)- 2395-4396 March 2017.

[7] Sandeep.K.Patel, Professor Alkesh M. Mavani, Shell and tube heat exchanger Thermal design with optimization of mass flow rate and baffle spacing, International Journal of Advanced Engineering Research and Studies EISSN2249–8974, 2016

[8] Moses Omolayo, Petinrin, Ademola Dare, Performance of shell and tube heat exchanger with varying tube layout, British Journal ofApplied Science & Technology, 12(2): 1-8, 2016, Article no.BJAST.20021, ISSN: 2231-0843, NLM ID: 101664541. 2016

[9] Raj Rajat Verma, Vindhya Parasd Dubey, Piyush Shanker Verma, A.K.Srivastava, Performance analysis of shell and tube type heat exchanger under the effect of varied operating conditions, ISOR journal of Civil and Mechanical Engineering, Volume 11, Issue 3 ArticleID:ISSN: 2278-1684 June 2014.

[10] P.S..Gowthaman, S.Sathish, Analysis of Segmental and Helical Baffle in Shell and tube Heat Exchanger, International Journal of Current Engineering and Technology E-ISSN 2277 – 4106, P-ISSN 2347 - 5161Special Issue-2, February 2014

[11] Abazar Vahdat Azad, Majid Amidpour, Economic optimization of shell and tube heat exchanger based on constructal theory, Department of Mechanical Engineering, 3 January 2011.

[12] Uday C. Kapale, Satish Chand, Modelling for shell-side pressure drop for liquid flow in shell-and-tube heat exchanger, InternationalJournal of Heat and Mass Transfer 49 (2006) 601-610. 2 November 2005

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LITERATURE REVIEW ON: DEVELOPMENT OF FLOATER MATERIAL

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ABSTRACT
Solar Energy is one of the most abundant renewable sources of energy and free on planet earth. For water mounted solar photovoltaic systems, HDPE material is found to be best suited for the manufacturing of floating bed structure. The major limitation in this regard is the effect of UV radiations present in the natural environment that leads to the degradation of plastic materials. In the present study, the Carbon nanotube is used as a additive which is mixed with the base HDPE material under different concentration. The behavior of the HDPE/ Carbon nanotube composite floats so formed is observed before and after U.V exposure. The change in properties of material will be observed from several test that is Tensile, Impact, Flexural and Hardness Test.

INTRODUCTION
Floatovoltaics is a solar power structure that floats on a body of water it may be artificial basin or a lake. This technology has had a rapid growth on the renewable energy market since 2016. The first 20 plants, of a few dozen of kWp have been built between 2008 and 2014 as reported in the MIRARCO paper that analyzed the birth of this technology.[1] The installed power reached 1.1 GW in 2018.The costs for a floating system are 20-25% higher than for ground-mounted systems.[2] Solar energy appears to be heading toward a global growth spurt, due to a combination of new technology and expanding reach to consumers as it becomes more competitive with the cost of traditional energy sources.[3] “Floating solar allows for power generation to be sited much closer to areas where demand for electricity is high," the World Bank report, published in October 2018, predicted. “This makes the technology an attractive option for countries with high population density and competing uses for available land.”[3] While solar floaters are slightly more expensive than arrays built on land, they are more efficient producers of electricity because their nearness to the water allows their solar panels to run cooler.[4] Floaters are generally made up of HDPE material used in current market and from blow moulding process. This is the most crucial component of FSPV; it supports all necessary components like solar PV during the project time. Hence selection of appropriate materials for the floating platform becomes imperative. HDPE is the most popular material being used in a majority of the FSPV power plants across the globe. Other materials like FRP, medium density polyethylene (MDPE), and Ferro-cement are also been utilized as materials for the floating platform. Various designs of a floating platform are described below.[5] HDPE is preferred by the pyrotechnics trade for mortars over steel or PVC tubes, being more durable and safer: HDPE tends to rip or tear in a malfunction instead of shattering and becoming shrapnel like the other materials. Milk bottles, jugs, and other hollow goods manufactured through blow molding are the most important application area for HDPE, accounting for one-third of worldwide production, or more than 8 million tones. [38] A carbon nanotube (CNT) is a tube made of carbon with diameters typically measured in nanometres. Single-wall carbon nanotubes (SWCNTs) Single-wall carbon nanotubes are one of the allotropes of carbon, intermediate between fullerene cages and flat graphene, with diameters in the range of a nanometre. Although not made this way, single-wall carbon nanotubes can be idealized as cutouts from a two-dimensional hexagonal lattice of carbon atoms rolled up along one of the Bravais lattice vectors of the hexagonal lattice to form a hollow cylinder. In this construction, periodic boundary conditions are imposed over the length of this roll-up vector to yield a helical lattice of seamlessly bonded carbon atoms on the cylinder surface. Multi-wall carbon nanotubes (MWCNTs) consisting of nested single-wall carbon nanotubes weakly bound together by van der Waals interactions in a tree ring-like structure. If not identical, these tubes are very similar to Oberlin, Endo, and Koyama's long straight and parallel carbon layers cylindrically arranged around a hollow tube. Multi-wall carbon nanotubes are also sometimes used to refer to double- and triple-wall carbon nanotubes. Carbon nanotubes can also refer to tubes with an undetermined carbon-wall structure and diameters less than 100 nanometres. Such tubes were discovered in 1952 by Radushkevich and Lukyanovich. The length of a carbon nanotube produced by common production methods is often not reported, but is typically much larger than its diameter. Thus, for many purposes, end effects are neglected and the length of carbon nanotubes is assumed infinite. Carbon nanotubes can exhibit remarkable electrical conductivity, while others are semiconductors. They also have exceptional tensile strength and thermal conductivity because of their nanostructure and strength of the bonds between carbon atoms. In addition, they can be chemically modified. These properties are expected to be valuable in many areas of technology, such as electronics, optics, composite materials (replacing or complementing carbon fibers), nanotechnology, and other applications of materials science. Rolling up a hexagonal lattice along different directions to form

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different infinitely long single-wall carbon nanotubes shows that all of these tubes not only have helical but also translational symmetry along the tube axis and many also have nontrivial rotational symmetry about this axis. In addition, most are chiral, meaning the tube and its mirror image cannot be superimposed. This construction also allows single-wall carbon nanotubes to be labeled by a pair of integers.[38]

LITERATURE REVIEW

Raneiro Cazzaniga: From beginning there were three distant options. Class 1: Hdpe pipes + steel or aluminum components for building rafts of large dimensions. Class 2: Full hdpe rafts of small dimension typically mono modules connected together by suitable hooks. Class 3: Floating pontoon structures connected together and able to support photovoltaic modules.Class 1: is robust system. Its assembly and launching is simple. The system is walkable and has large buoyancy and last but not the least the contact surfaces between plastic pipes and water is roughly only 20% of the plant surface Class 2: solution was proposed by Ceil El Terre. The floaters in class 2 very thin and water plastic contact is very large at least 50% with possible problems in terms of long term plastic defoliation.[7]

Sade K. Cromratie Clemons et al: They are made mostly from silicon, a non-toxic material. They are covered with glass and plastic and the framework is usually made from aluminum. The panels are held in place by mounting structures and create the angle at which the panels will absorb energy. The mounting members are generally made from galvanized steel or aluminum. The structures are fixed to pontoons made of high-density polyethylene (HDPE) to provide buoyancy. The material's lightweight and durable properties make it suitable for pontoon creation. The floats are made with either rotational or blow molding. HDPE has a lifetime of about 50 years. The pontoons support the modules and the cables, and additional floats are used to support the inverters.[8]

Carlos Ferrer-Gisbert et al: The pontoon is the key element of the system. It has to ensure the stability and buoyancy of the system and it is the basis of the photovoltaic plant. The platform must resist several design loads, such as dead and live loads and wind uplift and drifting, so that it must be stiffer. The top side of the module consists of several rectangular gutters. These elements divide the platform into smaller units that improve the stiffness and the load bearing capacity of the system. The floating module's geometry should be designed taking into account two main issues. First, the dimensions of the module must be adapted to commercial photovoltaic panels. Second, the modules must cover the maximum possible water surface to prevent water evaporation. The solar issues under analysis were: photovoltaic panel dimensions and tilt angle, number of units to be installed, distance between panel rows to prevent shade effects and access ways to ease operational maintenance.[6]

Giles Exley et al: To resolve the effects of FPV on lake physical properties, we simulated lake variables by adapting an existing MATLAB model. Increases in surface water temperatures occurred only in scenarios when wind speed was reduced considerably more than solar radiation. Cooler water temperatures and greatly reduced wind speeds permitted the formation of ice. In water bodies where FPV deployment could induce ice-cover, consideration would need to be given to the FPV design in order to mitigate the possibilities of compression forces and the restriction of array movement due to ice cover. FPV deployments may have impacts that are as, or more, influential than catastrophic climate change, therefore providing an opportunity to manage the effects of climate change on lake systems actively[16]

C.J. Ho et al: Since the efficiency of PV module decreases as the solar cell temperature increases. Therefore, it is necessary to enhance the heat dissipation of the PV module. The panel was placed on the lake surface and a pump was used to draw water on the PV surface because of this the PV system was 20 0C lower as compared to ground. So on lake the power output was 61.4 KW h and on ground based system was 54.6 KW h. Because of this the efficiency of panel was increased by 38%, water flow rate was 92 mL/min and air flow rate was 2.69 m/s. After that PCM (phase change material) was used. This material can release or stores large amount of heat so it is a very promising material for controlling the thermal environment. The MPCM (microencapsulated phase change material) are attached to the back of PV panel to form MPCM-PV module which floats on the water surface.[17]

Maria Ikhennicheu et al: The revolution in green energy is growing faster in recent trends around the whole world, the solar panels are in great demand, we can shift from land space to water reservoir, as water will give cooling as well it will not occupy much space on land, it also increases efficiency of solar floater if we fix in reservoirs, lakes or water basins. Aspects need to improved in Solar industry design cases dedicated to floating solar environments: a typical small lake, a typical large lake, and an offshore site, present a generic, analytical and industry-used method to determine the loads due to waves, current and wind on the floating island, discuss the main design challenge for each cases.[18]

Giles Exley et al: Increased energy demand and urgently need to be decarbonizes. One such technology , solar photovoltaic (PV) has experienced exponentially growth over the past 25 years. Conservative estimation of suggest that FPV has global potential of 400 GW peak. , demonstrating the likely widespread uptake of this renewable energy technology.FPV will both reduce the amount of solar radiation reaching the Water and shelter the water from the effects of wind mixing modifying water body temperature and stratification. When reductions to the forcing variables were 1:1 and did not exceed 45%, stratification duration was similar (±three days) to that of Wind-Ermere without FPV. Water temperature changes were minor for small coverage's of FPV, while more extensive FPV coverage's drove major decreases.FPV deployments may have impacts that are as, or more, influential than catastrophic climate change, therefore providing an opportunity to manage the effects of climate change on lake systems actively.[19]

Tara Hooper et al: Offshore energy infrastructure provides new substrate for species to settle on, and so functions as an artificial reef (Kogan et al., 2006; Sherwood et al., 2016). These small organisms that attach to structures form the base of food webs, which, together with the shelter offered by energy infrastructure, create environments attractive to larger and more mobile species such as crab, lobster and fish (Hooper et al., 2018). Species use the offshore structures as stepping stones to colonize larger areas or as nursery grounds, which create spill-over effects to the surrounding areas. Most studies to date have focussed on artificial reefs created by the foundations and scour protection around offshore wind farms and oil and gas platforms (and hence on species that live close to the seabed).[29]

Ayat Bozeya et al (2021): In this paper author has worked on thermal and structural properties of HDPE & CNT nanocomposite. The author have used a material in this study is HDPE & CNT. The CNTs type used are P-SWCNT, O-SWCNT, A-SWCNT, P-MWCNT, O-MWCNT, A-MWCNT. Addition of 1%pristine increases the crystallinity of polymer from 53.6% to 56.6%. Addition of 5% functionalized MWCNT with steric acid to HDPE increases crystallization temperature and crystallinity by 28.9deg & 1.8%. Addition of 1% MWCNT to HDPE increased the temperature by 2% O-MWCNT shows the best enhancement of thermal properties without affecting the crystallinity.[32]

Junjin Che et al (April 2017) : The author in this paper has researched about the Improved thermal conductivity of HDPE/Expanded Graphite/Carbon Nanotubes ternary composites via filler network network Synery. The material used in this research was HDPE/Expanded Graphite and Carbon Nanotubes in different propotion in different crieteria. This research has concluded that the mechanism increases the thermal conductivity and also optimizes the mechanical properties.[33]

Wenzhong Tang et al (2003): The authors have worked on melt processing & mechanical property characterization of MWCNT & HDPE composite films in this paper. HDPE was used as the matrix material for carbon nanotube (CNT) polymer composites. MWCNT & HDPE composite films were fabricated using the melt processing method. The nanotube in this was used in 0, 1, 3, & 5%of weight proportion. The mechanical properties of the films were measured by small punch test. The small punch test results show that the stiffness, the yield strength and the fracture toughness of MWCNT/HDPE composite films all increase with increasing percentage of MWCNTs.[34]

Filipe V. Ferreira et al (July 2016): The authors have worked on the effect that take place on the mechanical properties of (HDPE/CNT) in this paper. CNTs were treated with HCL & then with H2SO4 / HNO3. CNTs are used in proportion of (0.2) % wt. the research has concluded that the mechanical properties are improved and the surface treatment of CNT with acid did not decrease the mechanical properties of composites.[35]

Brian B. Johnson et al (April 2009): Wear behavior of carbon nanotubes & HDPE composites were tested by author in this paper. The HDPE material is used with CNT to make composite by author. The material was made in varying weight % e.i (1%, 3% & 5%) through mixing & extruding. The material was test by small punch test to measure the mechanical properties. The mechanical properties and wear resistance of the composite materials increased with increasing nanotube content in the range studied.[36]

Alen Oseli et al (May 2020) : The authors in this paper have used the material named HDPE mixed with SWCNT. In first step 6g of HDPE to 1 of wt% was mixed at 220 deg cel for 10 min in the twin screw extruder same processed was performed with 0.5 of wt% at same temp. The addition of SWCNTs increased the viscosity of nanocomposite profoundly. The mechanical properties profoundly improved.[41]

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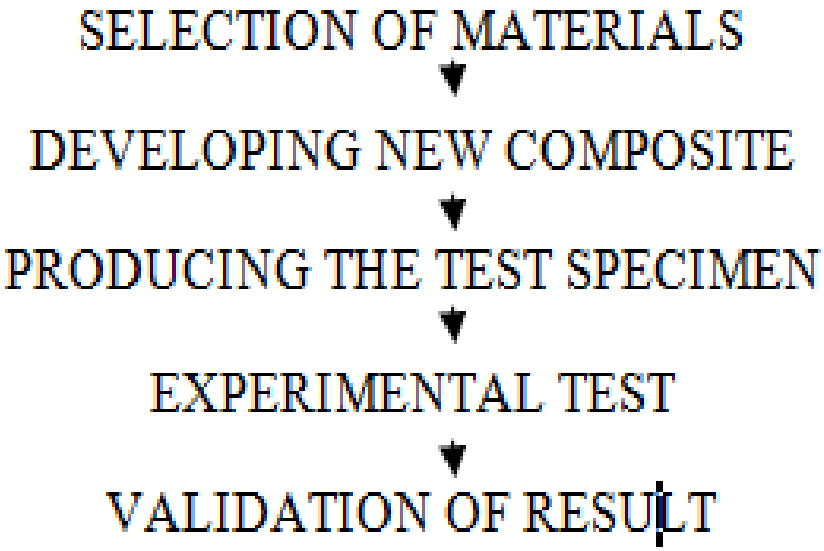
METHODOLOGY



As per the proposed methodology the first step is selection of material where after reading and taking help of many research papers we got to know that as per the properties required HDPE is suitable material. So selecting it as a base material & Carbon Nanotube can be used with HDPE to enhance the properties of HDPE. Using these two material new composite will be developed by using twin screw extruder machine in form of small pellets and composite will be made in certain batches according to different weight proportions of CNT & HDPE. Using this composite, will we make specimens for different test that is Tensile, Impact, Flexural test. This several test are going to be done but before that this sample for going to be kept in wet and dry conditions under sunlight for required hours. After this process in once done the test will be performed and validate the result.

CONCLUSION

With the help of this research paper we got to learn about floaters used in floating solar system. What should be their properties and physical properties should carry. The kind of extreme high and low condition they go through for that what thermal properties a material should and many more thing about it. We learnt about the material like HDPE and many different processes and different test that are performed. We concluded that HDPE withstand in every conditions like in water, in extreme conditions, it has good tensile strength and many more characteristics. With this does not degrade in water and has flexibility. Till date in current market only pure HDPE is used for making floaters and learnt about carbon nanotubes and what the properties and purpose of using it and in what proportion it should be used.

REFERENCES

1. https://en.wikipedia.org/wiki/Floating_solar
2. IRENA Future of Solar PV 2019
3. https://www.scientificamerican.com/article/floating-panels-buoy-predictions-of-global-solar-growth-spurt/
4. https://www.scientificamerican.com/article/floating-panels-buoy-predictions-of-global-solar-growth-spurt/
5. https://www.teriin.org/sites/default/files/2020-01/floating-solar-PV-report.pdf
6. Carlos Ferrer-Gisbert, José J. Ferrán-Gozálvez, Miguel Redón-Santafé, Pablo Ferrer-Gisbert b, Francisco J. Sánchez-Romero , Juan Bautista Torregrosa-Soler ," A new photovoltaic floating cover system for water reservoirs", RENEWABLE ENERGY, PP 63 to 70.
7. Raneiro Cazzaniga "FLOATING PV STRUCTURES" CTD R&D.
8. Sade K. Cromratie Clemons , Coleman R. Salloum, Kyle G. Herdegen ,Richard M. Kamens , Shabbir H. Gheewala "Life cycle assessment of a floating photovoltaic system and feasibility for application in Thailand", RENEWABLE ENERGY, PP 448 to 462
9. Where Sun Meets Water Floating Solar Handbook for Practitioners.

10. https://www.rechargenews.com/transition/fire-hits-bp-ventures-flagship-floating-solar-plant-in-uk/2-1-877293
11. https://www.rechargenews.com/transition/fire-hits-bp-ventures-flagship-floating-solar-plant-in-uk/2-1-877293
12. https://documents1.worldbank.org/curated/en/418961572293438109/pdf/Where-Sun-Meets-Water-Floating-Solar-Handbook-for-Practitioners.pdf
13. https://www.offshore-energy.biz/weather-likely-the-culprit-for-ocean-suns-floating-solar-unit-failure-in-albania/
14. https://solar-media.s3.amazonaws.com
15. https://azsolarcenter.org/japan-s-largest-floating-pv-plant-catches-fire
16. Giles Exley, Alona Armstrong, Trevor Page, Ian D. Jones,"Floating photovoltaics could mitigate climate change impacts on water body temperature and stratification", Solar Energy, PP 24-33.
17. C.J. Ho, Wei-Len Chou, Chi-Ming Lai, "Thermal and electrical performance of a water-surface floating PV Integrated with a water-saturated MEPCM layer", Energy Conversion and Management, PP 862-872.
18. Maria Ikhennicheu, Benoat Danglade, Remy Pascal, Valentin Arramounet, Quentin Tr´ebaol, F´elix Gorintin "Analytical method for loads determination on floating solar farms in three typical environment, Solar Energy, pp 34-41
19. Giles Exley , Alona Armstrong, Trevor Page, Ian D. Jones "Floating photovoltaics could mitigate climate change impacts on water Body temperature and stratification", Solar Energy, pp 24-33
20. https://www.teriin.org/sites/default/files/2020-01/floating-solar-PV-report.pdf
21. https://www.greenpowerhybrid.com/floating-solar-system/
22. https://www.yanglinxm.com/floating-solar-mounting-system_p61.html
23. https://www.grengysolar.com/floating-solar/solar-floating-system.html
24. https://varipontoons.com/floating-solar-panel-manufacturers-in-india.html
25. https://www.bosch-solar.com/floating-solar-system.html
26. https://www.enfsolar.com/pv/mounting-system datasheet/6969?utm_source=ENF&utm_medium=component_profile&utm_campaign=enquiry_company_directory&utm_content=116428
27. Javier Farfan*, Christian Breyer , "Combining Floating Solar Photovoltaic Power Plants and Hydropower Reservoirs", A Virtual Battery of Great Global Potential, 404 to409
28. Young-Kwan Choi, "A Study on Power Generation Analysis of Floating PV System Considering Environmental Impact."
29. Tara Hooper, Alona Armstrong, Brigitte Vlaswinkel, "Environmental impacts and benefits of marine floating solar", Solar Energy.
30. Huzaifa Rauf, Muhammad Shuzub Gull, Naveed Arshad, "Complementing hydroelectric power with floating solar PV for daytime peak electricity demand", Renewable Energy (2020), 1241
31. Samer Sulaeman, Erik Brown, Raul Quispe-Abad, Norbert Müller, "Floating PV system as an alternative pathway to the Amazon dam underproduction", Renewable and Sustainable Energy Reviews. Pg.1
32. Ayat Bozeya, Yahia F. Makableh, Rund Abu-Zurayk, Aya Khalaf and Abeer Al Bawab," Thermal and Structural Properties of High Density Polyethylene/Carbon Nanotube Nanocomposites: A Comparison Study" chemosensors
33. Junjin Che, Kai Wu, Yunjie Lin, Ke Wang, Qiang Fu," Largely improved thermal conductivity of HDPE/expanded graphite/carbon nanotubes ternary composites via filler network-network synergy" Composites: Part A,PP 32-40.

ISSN 2394 - 7780

34. Wenzhong Tang, Michael H. Santare, Suresh G. Advani," M elt processing and mechanical property characterization of multi-walled carbon nanotube/high density polyethylene (MWNT/HDPE) composite films.
35. Filipe V. Ferreira Wesley Francisco Beatriz R.C. Menezes Felipe S. Brito Andre S. Coutinho Luciana S. Cividanes Aparecido R. Coutinho Gilmar P. Thim," : Correlation of surface treatment, dispersion and mechanical properties of HDPE/CNT nanocomposites.
36. Brian B. Johnson , Michael H. Santare *, John E. Novotny , Suresh G. Advani," Wear behavior of Carbon Nanotube/High Density Polyethylene composites" Mechanics of Materials.
37. Alen Oselia , Alenka Veselb , Miran Mozetičb , Ema Žagarc , Miroslav Huskićc , Lidija Slemenik Peršea," Nano-mesh superstructure in single-walled carbon nanotube/polyethylene nanocomposites, and its impact on rheological, thermal and mechanical properties" Composites Part A
38. https://en.wikipedia.org/wiki/High-density_polyethylene https://en.wikipedia.org/wiki/Carbon_nanotube

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LITERATURE REVIEW ON: DEVELOPMENT OF COMPOSITE MATERIAL

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ABSTRACT
Floating solar power plant is an innovative approach of using photovoltaic modules on water infrastructures to conserve the land along with increase in efficiency of the module. Additionally, the water is also conserved due to reduction in evaporation of water from the water body. The plant can be installed on a pond, lake, reservoir, or on any other water body. This paper focuses on the floating PV technology, describing the types of floating PV plant along with studies carried out on some floating solar plants. India, In this project we are about to study, The material used in floater is mainly HDPE (high-density polyethylene). We are also going to study about different types of material used in floater and its properties. There are also different types of test in floaters and different type of designs in floater. The report also covers the best practice guidelines for installing FSPV projects.

Keywords: HDPE, floater, graphene

INTRODUCTION
FSPV also known as floatovoltaics is a solar PV application in which PV panels are designed and installed to float on waterbodies such as reservoirs, hydroelectric dams, industrial ponds, water treatment ponds, mining ponds, lakes, and lagoons. In this, solar panels are usually mounted upon a pontoon- based floating structure and to keep its location fixed, floating structure is anchored and moored. Recently there has been an interest in FSPV globally as well as in India. Further, it is also seen that if the capacity of FSPV deployment is scaled up, the tariff may also come down closer to the tariff discovered for ground-mounted solar PV. Recently, environmental problems associated with the excessive use of fossil fuel have become social issues. As an alternative energy resource, the importance of renewable energy is continuously rising. Moreover, the demands for facilities to generate renewable energy are also ever increasing. In Japan, after the Fukushima Daiichi nuclear power plant disaster, a law was enacted for the development of the solar industry, wind power industry, etc. In Korea, the renewable portfolio standard (RPS), which requires electricity providers to gradually increase the amount of renewable energy sources such as wind, solar, bioenergy, and geothermal, was enacted to ensure the growth of the renewable energy market. floating photovoltaic (FPV*) installations are forecast to increase 143% from 2019 to reach over 900 MW in 2020 according to IHS Markit's 'Floating PV Report - 2020'. The total installed capacity at the end of 2019 was estimated to have reached 1.5 GW. When combined with other demonstrated benefits—such as higher energy yield, reduced evaporation, and in certain cases improved water quality—FPV is likely to be an attractive option for many countries. Several countries with high population density are looking at large-scale floating solar deployment in order to avoid using their scarce land resources for solar power generation. It is estimated that the annual capacity addition may rise from the current installed of 1.314 GWp in 2018 to 4.6 GWp by 2022. Presently, China is the leading international market followed by Japan and South Korea. India also has very bright prospects to develop FSPV projects due to availability of large water bodies. FSPV market appears to inch forward to make its presence felt in India and the tariffs discovered through bids have already shown rapid reductions. So far large-to-medium size man-made inland waterbodies seems to have attracted initial interest to install FSPV based power plants, but all these 4waterbodies were created to serve various purposes like irrigation, water supply, fishing, hydroelectric, navigation etc., and this warrants great deal of diligence to balance out various usages of these waterbodies on the basis of accurate information. The Energy and Resources Institute (TERI), New Delhi, India with support from the Energy Transitions Commission (ETC), India, has undertaken a study to analyses data on country's medium and large reservoirs to estimate the potential of FSPV in the country. It is observed that about 18,000 km2 water surface area spreading across various states and UTs is suitable for the installation of FSPV plants. The overall potential is a strong indication of the extent of the surface area than can be made available for setting up these projects, and even a capacity of about 280 GW is possible. The various factors determining the overall potential include percentage of water surface area coverage, water level variations, the purpose of the water body, and proposed plant location. A majority of the installations utilized a floating pontoon constructed either from fiber-reinforced plastic (FRP), Medium Density Polyethylene (MDPE) or Forcemeat, High-Density

Polyethylene (HDPE). The solar PV modules were supported on these pontoons through the use of metal structures and were inclined in a majority of cases to maximize the solar incidence.

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LITERATURE REVIEW

Xian Jiang (2011) In this paper High Density Polyethylene (HDPE) based nanocomposites are reinforced by exfoliated graphene nanoplatelets, GNP, and multi-wall carbon nanotubes, MWCNT, through melt extrusion and injection molding. They are coating the low molecular weight paraffin waq on the surface of GNP and MWCNT to improve their dispersion in HDPE. After coating they fabricated by mixing wax with GNP and MWCNT in hot xylene and followed with solvent evaporation and vacuum drying. they found that wax coated GNP and MWCNT are much more efficient than the uncoated. Because coated GNP and MWCNT improving the electrical conductivity and the flexural properties of HDPE nanocomposites[4]

Zhengping Fang (2013) Graphene nanoplatelets (GNPs) are the stacks of multi-layered graphene sheets which can be incorporated with different polymers in order to gain outstanding performance in mechanical, thermal, electrical, optical and barrier properties. However, the strong van der Waals interactions between graphene sheets make GNPs tend to agglomerate in polymer matrix, resulting in the concentration of stresses. In this paper, GNPs were compounded with high density polyethylene (HDPE) and chlorinated polyethylene(CPE) in the presence of a Lewis acid catalyst (AlCl3). The macrocarbocations in polymer chains, initiated by Friedel–Crafts reaction, formed strong interaction with delocalized conjugated p electrons of graphene sheets, which benefited to unfolding the aggregations of GNPs and improving its dispersion in the composites.[6]

Wei-Len Chou et al. (2014) Solar Cell temperature is associated with the generation efficiency of the solar irradiation energy that is converted to electricity. The efficiencies is photovoltaic (PV) module decrease as the solar cell temperature increase. It is necessary to enhance the heat dissipation of the PV module. This paper is mainly focused on solar cell efficiencies in photovoltaic module.[1]

Nader Javani et al. (2018) Floating solar (FPV) is not used to produces electricity at night time or cloudy seasons. At the day time the extra energy which is produced is used to produce hydrogen through an electrolyzer and the hydrogen is Stord in hydrogen tank. At the night time or cloudy season the stored hydrogen is used by fuel cell to generate required electricity. The study of electricity generation at night time or cloudy season by hydrogen fuel cells is done.[11]

Zhengping Fang (2016) In this paper, Fullerene (C60) decorated graphene oxide (GO),and they denoted as GO-d-C60, they are synthesized through a threestep chemical process, including acylating chlorination of GO, amino-functionalization of GO and additional reaction of fullerene molecules with amino groups, with the purpose of promoting the dispersion of GO in high density polyethylene (HDPE) and further improving thermal stability and flame retardancy of HDPE/ GO composite. Infrared spectroscopy (IR), transmission electron micrographs (TEM) and X-ray photoelectron spectroscopy (XPS) proved that about 2.3 wt.% of C60 molecules, with the size of about 40 e70 nm, were bonded onto the surface of GO and mainly located on the edge of GO sheets. The chemical decoration made GO-d-C60 to give better dispersion in HDPE than GO, favoring the formation of compact and integrated char barriers when heated or ignited. Consequently, it is improved the thermal stability and flame retardancy of HDPE more effectively than pristine GO, due to the assembly of the barrier effect of GO and the radical-trapping effect of fullerene.[30]

Tuba Evgin (2020) High-density polyethylene (HDPE)-based nanocomposites incorporating three different types of graphene nanoplatelets (GnPs)were fabricated to investigate the size effects of GnPs in terms of both lateral size and thickness. And they found the inclusion of GnPs enhance the thermal, electrical, and mechanical properties of HDPE-based nanocomposites regardless of GnP size. and the most significant enhancement of the thermal and electrical conductivities and the lowest electrical percolation threshold were achieved with GnPs of a larger lateral size. There results show that the lateral size of GnPs was a more regulating factor for the above-mentioned nanocomposite properties compared to their thickness. For a given lateral size, thinner GnPs showed significantly higher electrical conductivity and a lower percolation threshold than thicker ones. On the other hand, in terms of thermal conductivity, they aobserved remarkable amount of enhancement only above a certain filler concentration. They found the size of the GnPs had no considerable effect on the melting and crystallization properties of the HDPE/GnP nanocomposites.[20]

Guiyin Fang (2016) In this paper, formable phase change materials (FSPCMs) consisting of palmitic acid (PA) and high-density polyethylene (HDPE) were modified with graphene nanoplatelets (GNPs). The thermal properties and shape stability of composites vary with their different mixing ratios. According to the results of Fourier Transform Infrared Spectroscopy (FTIR) and X-ray diffractometer (XRD), the composites have advantages such as chemical structure and crystalline phase stability. The differential scanning calorimeter (DSC) shows that the FSPCM has a constant melting point of about 62°C and a high latent heat of at least 155.8 J/g. Using scanning electron microscopy (SEM), the layered structure and uniform dispersion of PAs were

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observed in the modified FSPCM. Thermal gravimetric analyzer (TGA) and cycle test results show that the modified FSPCM has good thermal reliability and the leakage of PA is greatly reduced with the help of PNB. Thermal conductivity The quality of the FSPCM was measured with a thermal conductivity meter and it increased to 0.8219 W (m K), which is close to 2.5 times higher than pure FSPCM, when the mass percent of GNP is 4%. The revised FSPCM is expected to have potential applications in solar energy and building heating systems. [21]

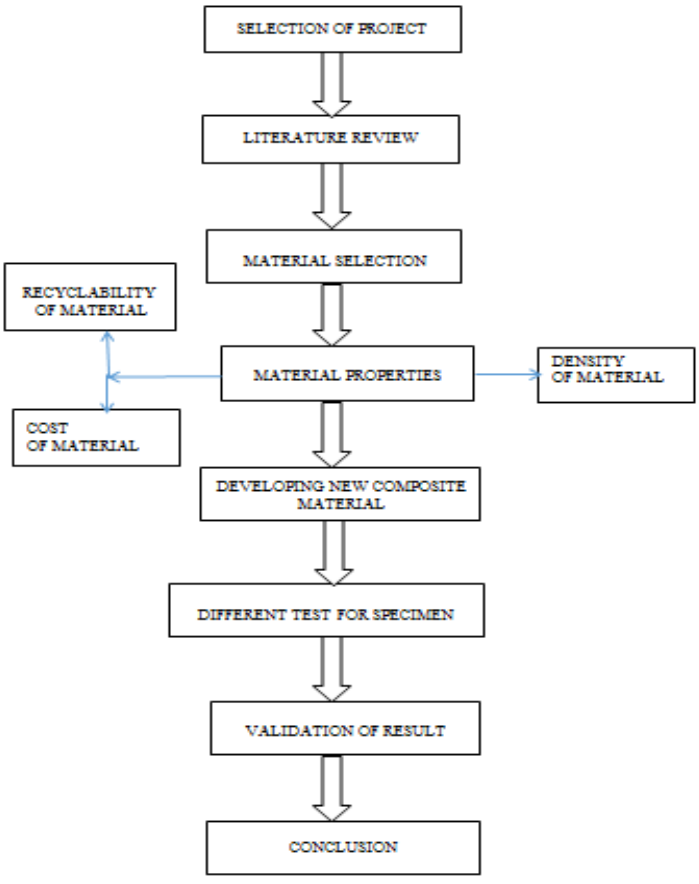
K. **Honaker (2016)** Graphene nanoplatelets (GnP) of different sizes were investigated for their ability to modify high density polyethylene (HDPE) for potential fuel system applications, focusing on compounding via melt mixing in a twin-screw extruder. Mechanical properties, crystallinity of the polymer, and permeation to oxygen and fuel were assessed as a function of GnP concentration. The surface of GnP acted as a nucleation site for the generation of HDPE crystallites, increasing the crystallinity. The flexural properties were improved, clearly influenced by platelet size and quality of dispersion. A sharp, 46% decrease of the impact resistance was observed, even at low GnP concentration (0.2 wt.%). With a 15 wt.% GnP-M-15 (platelets with a 15 lm diameter), a 73% reduction in oxygen permeation was observed and a 74% reduction in fuel vapor transmission. This correlation was similar throughout the GnP concentration range. The smaller diameter platelets had a lesser effect on the properties.[25]

Miguel Redón-Santafé et al. (2013) The system consists of polyethylene floating modules which, with the use of tension producing elements and elastic fasteners, are able to adapt to varying reservoir water levels. A full-scale plant located near Alicante (Spain) was built in an agriculture reservoir to study the behavior of the system. The top of the reservoir has a surface area of 4700 m2 but only 7% of such area has been covered with the fixed solar system. The system also minimizes evaporation losses from water reservoirs. The primary purpose of the PFCS is to improve water and power efficiency of agricultural irrigation reservoirs as illustrated in.The water surface is covered with a number of floating modules which are joined together by means of pins. The floating module's geometry was designed taking into account two main issues.

1} The dimensions of the module must be adapted to commercial photovoltaic panels.

2} The modules must cover the maximum possible water surface to preventwater evaporation.[12]

METHODOLOGY



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As per proposed methodology first we find some research paper and reading than we got to know that the properties we required for material that is High Density Polythelene (HDPE). So we selected HDPE as a base material and graphene can be used to enhance the properties of HDPE.After these material we develop a new composite material by using twin screw extruder machine in the form of small granlues. After this we made batches of composite material with different weight.

Using this composite material we produce the specimens through vertical injection moulding machine. After producing our specimen we keep them for wet and dry condition under the sunlight for required hours. Than we applied a different test and the test are Tensile test, Flexural test, Impact test. After this all process will be done we get result of composite material velidation.

CONCLUSION

The preparation of multifunctional nanocomposites by combination of HDPE and graphene has been described. The adequate combination of both components produces nanocomposites with better thermal and mechanical properties incorporating gas barrier and electrical conductivity. The importance of an appropriate selection of the type of filler and the mixing method for the preparation of HDPE/graphene nanocomposites has been highlighted. Consistent results demonstrate a clear influence of both parameters on the final properties of the nanocomposites. While thermal and mechanical properties are slightly affected, gas barrier and electrical conductivity are strongly dependent on the type of filler as well as on the mixing approach. While melt-compounding produces better membranes for gas barrier due to some orientation along the extrusion direction, this is disadvantageous for electrical conductivity at the graphene contents tested. Furthermore, the mechanical and barrier properties of the materials prepared here make them good candidates for food packaging, although in this particular case, issues related to reduced transparency must be addressed.

REFERENCES

1. C.J. Ho , Wei-Len Chou a , Chi-Ming Lai b,⇑ aDepartment of Mechanical Engineering, National Cheng
2. Kung University, Tainan, Taiwan Department of Civil Engineering, National Cheng Kung University, Tainan, Taiwan.
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5. Gachon University, Seongnam 13120, Korea; 2 Departments of Civil Engineering, Hongik University, Seoul 04066, Korea.
6. Zhenghong Guo , Runfeng Ye , Liping Zhao , Shiya Ran , Zhengping Fang a, *, Juan Li a Laboratory of Polymer Materials and Engineering, Ningbo Institute of Technology, Zhejiang University, Ningbo, 315100, ChinaShanghai PRET Composites Co., Ltd., Shanghai, 201707, China.
7. Siliang Chen a,b , Panpan Zhao a,b , Guo Xie a,* , Yuanke Wei a,c , Yijing Lyu a,d , Yingjing Zhang a , Tiantong
8. Yan a , Tingting Zhang e a State Key Laboratory of Hydraulics and Mountain River Engineering,
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10. Shanghai Jiaotong University, Shanghai 200240, China c Key Laboratory of Thermo-Fluid Science and Engineering of Ministry of Education, School of Energy and Power Engineering, Xi'an Jiaotong University, Shaanxi 710049, China.
11. Mert Temiz* , Nader Javani Faculty of Mechanical Engineering, Yildiz Technical University, Besiktas
12. Carlos Ferrer-Gisbert a , José J. Ferrán-Gozálvez a , Miguel Redón- Santafé a,*, Pablo Ferrer-Gisbert b , Francisco J. Sánchez
13. -Romero a, Juan Bautista Torregrosa-Soler a aUniversidad Politécnica de Valencia,
14. Epartamento de Ingeniería Rural y Agroalimentaria, Camino de Vera s/n, 46022 Valencia, Spain.
15. https://www.offshore-energy.biz/incidentseverely-damages- floating-solar-plant-inalbania/
16. https://www.pv-magazine.com/2020/02/22/ the-weekend-read- dont-throw-caution-to-the-wind/

ISSN 2394 - 7780

17. Mark Osborne, Sungrow Targets Leading Role in Supply of Floating Solar Systems to Booming Market | Pv Tech, Aug 2019.
18. https://www.pv-tech.org/news/sungrow-targetsleading-role-in-supply-of-floating-solar-systems-to-booming
19. http://www.matweb.com/search/datasheet.aspx?MatGUID=557b 96c10 e0843 dbb1e830 ceedeb 35b0&ckck=1
20. https://www.materialshub.com/material/polymethylpentene/
21. Tuba Evgin*, Alpaslan Turgut, Georges Hamaoui, Zdenko Spitalsky, Nicolas Horny Matej Micusik, Mihai Chirtoc, Mehmet Sarikanat and Maria Omastova Dokuz Eylul University, The Graduate School of Natural and Applied Sciences, Mechanical Engineering Department, Tinaztepe Campus,35397, Buca, Izmir, Turkey,
22. Yaojie Tang, Yuting Jia, Guruprasad Alva, Xiang Huang, Guiyin Fang School of Physics, Nanjing University, Nanjing 210093, China
23. https://www.emcoplastics.com/pp-copolymer/
24. https://www.azom.com/article.aspx?ArticleID=855
25. http://www.scotra.co.kr/en/sub/introduction/introduction.asp
26. K. Honaker ⇑, F. Vautard, L.T. Drzal Composite Materials and Structures Center, Michigan State University, 2100 Engineering Building, East Lansing, MI 48824, United States
27. Kangsheng Liu , Efren Andablo-Reyes , Nilesh Patil , Daniel Hermida Merino ,Sara Ronca , **, Sanjay Rastogi Department of Materials, School of Aeronautical, Automotive, Chemical and Materials Engineering, Loughborough University, Loughborough, LE11 3TU,England, UK
28. https://en.sungrowpower.com/
29. https://www.indiamart.com/proddetail/uv-stabilized-floats-for-floating-solar-power-plant 17061282212 .html
30. Zhenghong Guo, Shiya Ran, Zhengping Fang ⇑Laboratory of Polymer Materials and Engineering, Ningbo Institute of Technology, Zhejiang University, Ningbo 315100, China

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TWO WHEELER AIR BAG SYSTEM

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ABSTRACT
The Airbag system is first introduced in 4-wheeler vehicles, this paper gives an information about the introduction of the airbag system can be used in the two wheelers(bikes) this paper shows the working, construction, installation and what will be problems can occurs are discussed.Theconceptofthisairbagsystem is "Toreducetheinjuries to a rider when impacting with an opposing vehicle and/or opposing object in frontal collisions by absorbing rider kinetic energy and by reducing rider separation velocity from motorcycle in the forward direction."With the help of the ANGLE sensor with an angle indicator and sense of the collision and the large frequency vibration for to open the air bag.

Keywords: Typical VRF System, castor wheel, Lathe, Relay circuit, Angle sensor, Airbag.

I. INTRODUCTION

Nowadays the increment in the death rate of India is 20% because of the accidents on the highways hence this invention can help us to reduce the death rate by 7% to 10% since this can be used in the pedestrian and safety department. In 4 wheeler vehicle the operation is based on the collision of two vehicles or collision with any object. This system is installed in dashboard and the battery power is consumed for working of this system.

In the 2-wheeler system there is installation of the airbag system in between and at both sides of the bike. There is usage of the battery of bike for working of system. There are two cases when system runs by both the angle difference calculation and collision of the 2 bikes or by the any accident of bike with any object. The concept of this airbag system is "To reduce the injuries to a rider while affecting with an opposing vehicle as well as restricting object in frontal crashes by absorbing rider kinetic energy and by decreasing rider detachment speed from motorcycle the forward way." With the help of the ANGLE sensor with an angle indicator and feeling of the impact and the vast large vibration for to open the air bag. The Airbag system was first introduced in 4-wheelers. This paper gives information about the introduction of the airbag system can be used in the two wheelers(bikes). This paper shows the working, construction, installation of this system and problems that can occur in this system. Accident involving two wheeler are assuming a significant social cost and there dynamics is really more complex and diversified than accident involving only bike and there occupant .since the kinematics of biker body can influenced by a wide range of variable ,so motorcycle air bag must be compliant with far more specification than an automotive one and need a more bikeeful and accurate design often also totally different design approach is required there are two different kind of air bag for motorcyclist mounted on vehicle or fitted in bikers garment. The inflation of the device mounted on the motorbike is activated by one or more accelerometer put on the vehicle or even the wheel mount, to get earlier information when a frontal impact occurs. the bag itself is generally quite big (150liter) and to obtain acceptable inflation time a pyrotechnic inflator is used.

II. DESIGN WITH REQUIRED ISTRUMENTS

The following instruments are utilized for the 2 wheeler Airbag system –

1. Air bag (leather material with grasp innovation)
2. Chemical chambers for discharging the air or gas
3. Sensors (angle sensor)
4. Inflator

Air Bag (Leather Material with Grip Technology)

Airbags are stretchable fabrics or other materials that are tightly packed in various locations throughout your vehicle. These bags are compressed and kept in a small area. When there is an accident, the airbags fill up with air very quickly to provide a cushioning system for the people on the motorcycle so that they are not thrown around in the event of a crash. While this does not necessarily prevent total injury or death, it can be very helpful in cushioning the passengers in many cases.

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Design of Strong Leather Grip Technology Air Bag:

- Strong leather with grips is used to construct the air bags.
- Especially as the lower surface of the air bags take the friction caused due to the road surface.
- The grip is used to avoid slipping or skidding of the bike on the oily or wet surface areas The shape of the air bag is semi-circular "D" shape on both sides of the bike.

Chemical Reaction behind Opening of Airbag

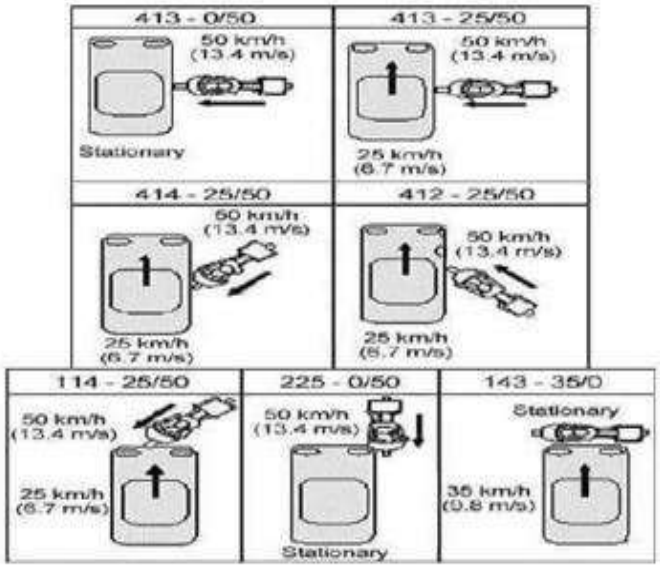
Actual opening of air bag is due to the chemical reaction occurred in between two chemical cylinders which are fitted at the bottom of bike. When an external force or collision of two objects with bike occur then those two chemical cylinders' mixes with each other and the chemical reaction takes place inside the cylinder. At the outlet of the cylinder, the high-pressure exhaust gas (air) is expanded from exit valve. The pressure can be controlled by pressure valve in between air bag and chemical cylinder. This exhaust air or gas is used to fill the air bag and hence an air bag will open.

The signals from the various sensors are fed into the Airbag control unit, which determines from them the angle of impact, the severity, or force of the crash, along with other variables. Each restraint device is typically activated with one or more pyrotechnic devices, commonly called an initiator or electric match. The electric match, which consists of an electrical conductor wrapped in a combustible material, activates with a current pulse between 1 to 3 amperes in less than 2 milliseconds. When the conductor becomes hot enough, it ignites the combustible material, which initiates the gas generator. In a seat belt pre-pensioner, this hot gas is used to drive a piston that pulls the slack out of the seat belt.

Angle Sensor

The TLE5012B is a 360° angle sensor that detects the orientation of a magnetic field. This is achieved by measuring sine and cosine angle components with monolithic integrated Giant Magneto Resistance (iGMR) elements. High precision angle values are achieved over temperature and lifetime using internal auto calibration algorithm.

Data communications are accomplished with a bi-directional SSC Interface that is SPI compatible. The absolute angle value and other values are transmitted via SSC or via a Pulse-Width- Modulation (PWM) Protocol. Also the sine and cosine raw values can be read out. These raw signals are digitally processed internally to calculate the angle orientation of the magnetic field (magnet). The TLE5012B is a pre calibrated sensor. The calibration parameters are stored in laser fuses. At start-up the values of the fuses are written into Flip-Flops, where these values can be changed by the application specific parameters.



Inflator

Once the control unit determines there is an accident, it sends a signal to the inflator system. The inflator sets off a chemical charge, producing an explosion of nitrogen gas, filling up the airbag. As the airbag fills up, it bursts through the paneling that contains it and order to protect you. This all happens in an instant, usually within 25 or 50 milliseconds. That translates to almost 200 miles per hour. The airbag then will deflate itself on its own once it deploys.

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III. How Air Bag System Protects the Human Body Parts?

The provision of air bags on motorcycles is more complex than installation in cars, because the dynamics of a motorcycle crash are more difficult to predict. But we discussed the following points on accident.These characteristics leads to act with very short reaction time and fast inflation but only if the motorcycle is involved in the accident . Limitation of this system is that they work properly only under particular conditions , especially the rider must remain on the motorcycle during the accident and the impact dynamics must lead him to hit exactly the part of his vehicle protected by airbags.[2] Normally, following kinds of bodily harms occur in the accident -Hand/leg Cracks or fractures -Head injury - Bleeding from body parts -Getting thrown from bike.

IV. WORKING METHODOLOGY

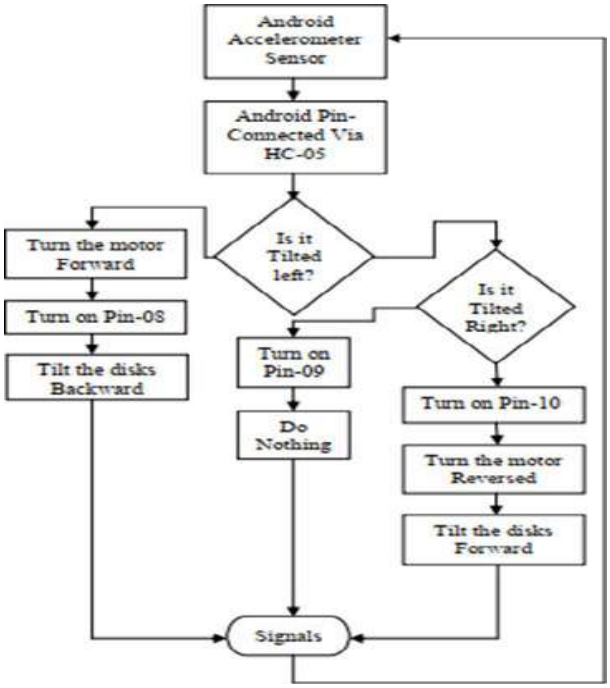

Figure 1: Flow chart of total working procedures

Figure 4.3: Assembled project

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V. CONCLUSION

By providing the total safety to the motorcycle rider by implanting the airbags in both sides of the motorcycle as mention in this paper we will reduce the fatality rate by 20% to 30%.by using this technology there is not only reduce the death rate but also we give the total protection to the rider as well as motorcycle. The experimental research will show the how this system is useful and It may be published as soon as possible. The passenger can be protected from the above-mentioned bodily harms as described as, the air bag system opens from the bottom to the left or right side of bike; hence we can avoid hand/leg cracks or fractures. The diameter of the air bag when opened is more than height of the bike and that of the rider, hence head injury is avoided as the material used in the air bag construction is light weight strong leather the chances of bike skidding or slipping is diminished and external injuries like scratches are avoided. The chances of the rider being thrown from the bike are avoided as the leather belts are provided on both sides of the bike to secure the legs of the rider. The material used for manufacturing these belts is similar to those used for manufacturing seat belts of bikes.

VI. REFERENCES

1. Bayerische Motoren Werke Aktiengesellschaft, “Everything you need to know about the airbag”Service Product Support, D-80788 Munich, Germany Editorial office: HörnerWieland, Gewerbepark13, D-83052 Bruckmühl, Germany,

a. Takeshi Kuroe Hideo Namiki Satoshi Iijima, “Exploratory study of an airbag concept for a largetouring motorcycle further research second report” Honda R&D Co., Ltd. Asaka R&D Center JapanPaper Number 05-0316

b. International Journal Of Research In Aeronautical And Mechanical Engineering Vol.2 Issue.2, February

c. Rishikesh H. Tike, Prof. Mukesh C. Chaudhari Published by Infineon Technologies AG 81726 Munich, Germany © 2011 Infineon Technologies AGAll Rights Reserved.Edition 2011-06

d. Joseph S. Merola, a chemistry professor and associate dean of the College of Arts and Sciences atVirginia Tech, offers this explanation

2. Happian-Smith, J. and Chinn, B. P., “Motorcycle Airbag

3. Systems” Ref: European Road SafetyObservatory BP5: PTW Design and Protective Equipment by (1990) Simulation of airbag restraintsystems in forward impacts of motorcycles, International Congress and Exposition, Detroit (SAE9000752)

a. Honda Develops, “World’s First Production Motorcycle Airbag System” September 8, 2005 - HondaMotor Co., Ltd.

4. S. Mukherjee, A.Chawla, Jayant Jangra, “Studies for Motorcycle Airbags” Transportation researchand Injury prevention program. Indian Institute of Technology New Delhi110016 India.

5. R. Capitani and S.S Pellari, R Lavezzi, Brembo “Design and numerical evaluation of an airbag jacketfor motorcycle”, 25, 24035(BG) Italy

6. Anonymous 1996 Motorcycles - test and analysis procedures for research evaluation of rider crashprotective devices fitted to motorcycle ISO 13232, Geneva

7. Bothwell P W, Petersen H C 1971 Dynamics of motorcycle impact Vol. I, DOT HS 800 586Bothwell P W, Knight R E, Petersen H C 1973 Dynamics of motorcycle impact 1971–1973, Vol. I,DOT HS 800 906

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POWER GENERATOR THROUGH EXHAUST

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ABSTRACT
In this project, we modify a stationary diesel engine for producing power using turbine. Nowadays in automobile field many new innovating concepts are being developed. We are using the power from vehicle exhaust to generate the electricity which can be stored in battery for the later consumption. In this project, we are demonstrating a concept of generating power in a stationary multiple cylinder diesel engine by the usage of turbines. Here we are placing a turbine in the path of exhaust in the silencer. The turbine is connected to a dynamo, which is used to generate power. Depending upon the airflow the turbine will start rotating, and then the dynamo will also start to rotate. A dynamo is a device which is used to convert the kinetic energy into electrical energy. The generated power is stored to the battery. It can be stored in the battery after rectification. The rectified voltage can be inverted and can be used in various forms of utilities.

Keywords: Power generation, turbine, nozzle, dynamo, ecofriendly.

• INTRODUCTION
In recent the years the scientific and public awareness on environmental and energy issues has brought in major interests to the research of advanced technologies particularly in highly efficient internal combustion engines. Viewing from the socio-economic perspective, as the level of energy consumption is directly proportional to the economic development and total number of populations in a country, the growing rate of population in the world today indicates that the energy demand is likely to increase. A heat engine is a system that performs the conversion of heat or thermal energy to mechanical work. Examples of everyday heat engines include the steam engine, the diesel engine, and the gasoline (petrol) engine in an automobile. Heat engines are designed to produce useful work only. The efficiency of a modern internal combustion engine is about 37% in a normal spark ignition engine. The energy in the form of heat is rejected by means of exhaust, circulating cooling water, lubrication oil & radiation.

Substantial thermal energy is available from the exhaust gas in modern automotive engines. Two-thirds of the energy from combustion in a vehicle is lost as waste heat, of which 40% is in the form of hot exhaust gas. There are many developments and technologies on waste heat recovery of exhaust gas from internal combustion engines (ICE).

If our idea is implemented effectively, the potential for energy conservation is massive. The report deals into the Working, Hardware requirements, and the advances made so far in implementing the idea. It also hints at future modifications intended.

Figure 1: Model

• LITERATURE REVIEW
Generation of Electricity by Using Exhaust from Bike by S.Vijaya Kumar, Amit Kumar Singh, Athul Sabu and Mohamed Farhan.P[1]: - According to their study, it has been identified that there are large potentials of energy savings through the use of waste heat recovery technologies. Waste heat recovery entails capturing and reusing the waste heat from internal combustion engine and using it for heating or generating mechanical or electrical work.

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Study and performance analysis of charging vehicle battery using bike exhaust gas by K. Kumaravel, P. Bala Shanmugam, and G. Balasubramanian [2], They had done different studies according to their practical inputs. They had approached the problem with different engine RPM. Practically for different engine speeds for different turbine power output were observed.

Power Generation by Exhaust Gases on Diesel Engine by Kranthi Kumar Guduru, Yakoob Kol ipak, Shanker. B and N. Suresh [3]: -. Waste heat recovery entails capturing and reusing the waste heat from internal combustion engine and using it for heating or generating mechanical or electrical work. It would also help to recognize the improvement in performance and emissions of the engine if these technologies were adopted by the automotive manufacturers.

Main Components of Model -

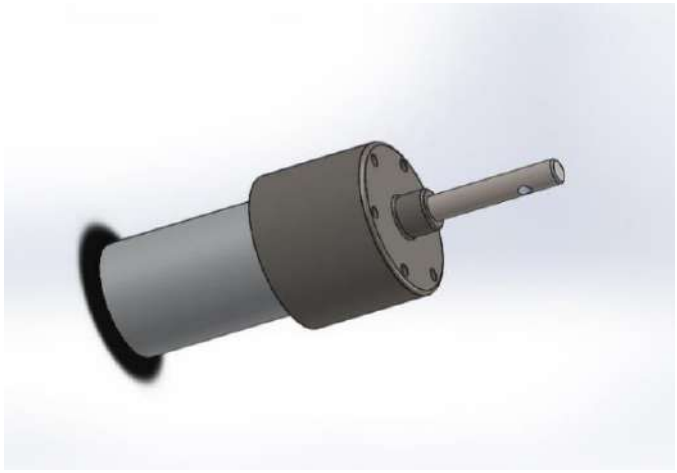

Fig. 1: PMDC Motor

Fig.2: Shaft

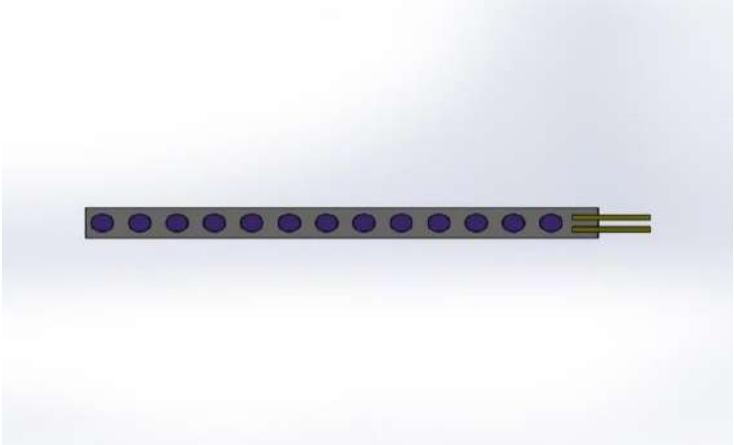

Fig 3: LED Strip

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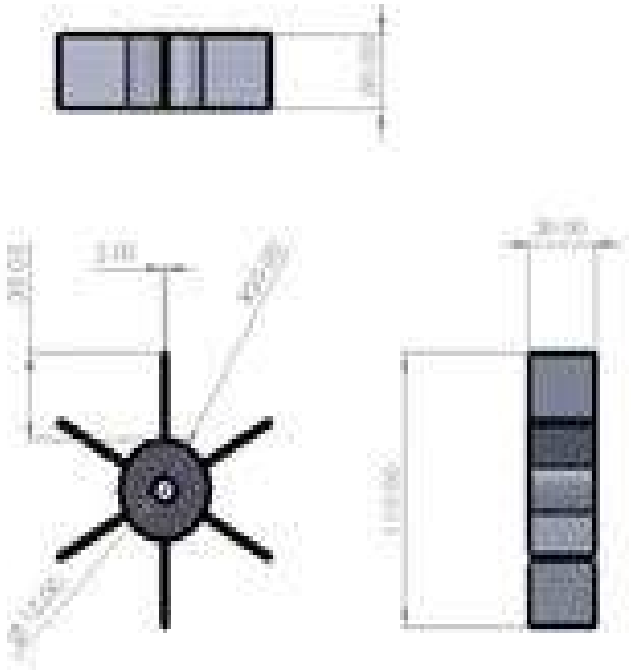

Fig.4: Turbine

- **METHODOLOGY**

The turbine is fixed to the shaft of the generator. It will be a mechanism of axial high-pressure turbine and backward curved fan blades with an electrical generator. The air will strike on high pressure reaction turbine and the pressure energy will convert into mechanical energy. This shaft will also be rotate fan blade that will increase the discharge rate. The improvement in discharge rate will increase the engine power because high pressure discharge means low-pressure drop-in exhaust system. If the pressure drop will be low the power will increase of the engine. The electrical generator will have rotated by the same shaft and the electricity will be produced by generator. This generator converts the mechanical work into electrical energy This generator is also a DC motor of 12 volts 0.5 MA current This DC motor will give maximum output on 1000 rpm

COMPONENTS

- Nozzle
- Turbine
- Dynamo
- A LED Strip
- Mild steel for constructing frames
- Connecting wires
- Sheet metal
- Bearing to mount turbine
- Shaft

Turbine

A steam turbine is a mechanical device that extracts thermal energy from pressurized steam, and converts it into rotary motion. It has almost completely replaced the reciprocating piston steam engine primarily because of its greater thermal efficiency and higher power-to-weight ratio. Because the turbine generates rotary motion, it is particularly suited to be used to drive an electrical generator – about 90% of all electricity generation in the United States is by use of steam turbines. The steam turbine is a form of heat engine that derives much of its improvement in thermodynamic efficiency through the use of multiple stages in the expansion of the steam, which results in a closer approach to the ideal reversible process.

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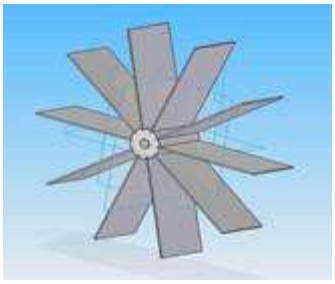
Diesel Engine



The diesel engine is an internal combustion engine in which ignition of the fuel that has been injected into the combustion chamber is caused by the high temperature which a gas achieves (i.e., the air) when greatly compressed.

Diesel engines work by compressing only the air. This increases the air temperature inside the cylinder to such a high degree that it ignites atomized diesel fuel that is injected into the combustion chamber.

Specifications of Diesel Engine Used

Model	Tata 407
Type	Water cooled, naturally aspirated
No. Of cylinders	4 in line
Displacement	2956 cc
Maximum engine output	72 bhp
Maximum operating speed	3500 rpm
Idling speed	600 rpm
Firing order	1-3-4-2
Compression ratio	17:1

Dynamo

Dynamo is an electrical generator. This dynamo produces direct current with the use of a commutator. Dynamo was the first generator capable of the power industries. The dynamo uses rotating coils of wire and magnetic fields to convert mechanical rotation into a pulsing direct electric current. A dynamo machine consists of a stationary structure, called the stator, which provides a constant magnetic field, and a set of rotating windings called the armature which turn within that field. On small machines the constant magnetic field may be provided by one or more permanent magnets, larger machines have the constant magnetic field provided by one or more electromagnets, which are usually called field coils.

Nozzle

Jet nozzles are also use in large rooms where the distribution of air via ceiling diffusers is not possible or not practical. When the temperature difference between the supply air and the room air changes, the supply air stream is deflected upwards to supply warm air or downwards to supply cold air. Nozzles can be described as convergent or divergent (expanding from a smaller diameter to a larger one). A de Laval nozzle has a convergent section followed by a divergent section and is often called a convergent divergent nozzle.

Battery

It is a device user to store the power. The power is stored in the form of DC current only. There are many types of batteries are used Lead acid, lithium fluoride and in this work 8Amp current and 12 voltage specification is used.

Shaft

A shaft is a rotating machine element, usually circular in cross section, which is used to transmit power from one part to another, or from a machine which produces power to a machine which absorbs power.

Bearing

A bearing is a machine element that constrains relative motion to only the desired motion, and reduces friction between moving parts. The design of the bearing may, for example, provide for free linear movement of the moving part or for free rotation around a fixed axis or, it may prevent a motion by controlling the vectors of normal forces that bear on the moving parts. Most bearings facilitate the desired motion by minimizing friction. Bearings are classified broadly according to the type of operation, the motions allowed, or to the directions of the loads (forces) applied to the parts.

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Rotary bearings hold rotating components such as shafts or axles within mechanical systems, and transfer axial and radial loads from the source of the load to the structure supporting it. The simplest form of bearing, the plain bearing, consists of a shaft rotating in a hole. Lubrication is often used to reduce friction. In the ball bearing and roller bearing, to prevent sliding friction, rolling elements such as rollers or balls with a circular cross-section are located between the races or journals of the bearing assembly

- **CALCULATIONS**

4.1 Exhaust Gas Flow Rate

To Determine Theoretical Nozzle Outlet Velocity:

Continuity equation,

$Q=A_1V_1=A_2V_2$

Velocity at nozzle outlet,

$V_2=A_1V_1/A_2$ $V_2=D^2V/D^2$

Where A_1 is the cross-sectional area at section 1 A_2 is the cross-sectional area at section 2

V_1 is the velocity of exhaust gases from silencer

Trial No	Speed of engine (rpm)	Velocity of exhaust gas at silencer end (m/s)	Expected velocity of exhaust at nozzle end (m/s)
1	960	12.9	51.6
2	1125	16.1	64.4
3	1230	18.1	72.4

Table 4.1: Exhaust gas Velocity test

Flow Rate,

Q=A*V

Where A is c/s area of outlet in m^2 V is velocity in m/s

$A=\pi*d^2/4 = \pi*(2.5*10^{-2})^2/4 = 4.9087*10^{-4}m^2$

Therefore,

Q= 4.9087*10-4*51.6 (At an engine speed of 960 rpm) Q=0.0253 m3/s

At an engine speed of 1120 rpm, Q=0.0316 m3/s

At an engine speed of 1230 rpm, Q=0.0355 m3/s

Area Swept,

A= (22/7) x radius of turbine2 Velocity of the Turbine, V= ((22/7) * D x N)/60

Where D=diameter of turbine

N=number of revolutions per minute Power available at the turbine, P= (1/2) * Density * (Velocity)3*Cp*Area swept

4.2 Model Calculation

Swept area by the turbine, A = (22/7) x radius2

A=3.14 x (0.115) 2

A=0.04152 m2

Velocity of the turbine, V= ((22/7) x D x N)/60 V=3.14*0.115*60/60

V=0.3611 m/s

Power of the flowing exhaust gas =1/2*ρ* area x (velocity)3 * Cp

=1/2 x1.23 x 0.04152x (0.3611)3*0.4

=4.8*10-4 Watts

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4.3 Impulse force Acting on the turbine

Mass flow rate, m=ρ*Q

Where ρ is the density in kg/m3

Q is the volume flow rate in m3/s Impulse force, F=m*V

Where V is the velocity of flow of exhaust gases in m/s

At engine speed of 960rpm, Mass flow rate, m=1.23*0.02503

m=0.03079kg/s Impulse force, F=0.03079*51.6 F =1.588 N

At an engine speed of 1125rpm, Mass flow rate, m=1.23*0.0316

m=0.03886 kg/s Impulse force, F=0.03886*64.4

F =2.503 N

At an engine speed of 1230rpm, Mass flow rate, m=1.23*0.0353

m=0.04347 kg/s Impulse force, F=0.04347*72 F =3.129 N

4.4 Power Generated by Turbine

Torque, T=F*R

Where F is impulse force in Newton

R is distance from center of shaft to the point where exhaust gas hit the blades in meter Power generated, P=2πNT/60 watts

Where N is speed of turbine in RPM T is torque in Nm

At engine speed of 960rpm, Torque, T=1.588*0.09 T=0.1492 Nm

Power generated, P=2π*70*0.1492/60

P =1.0936 Watts

At engine speed of 1125rpm, Torque, T=2.503*0.09 T=0.225 Nm

Power generated, P=2π*125*0.225/60

P=2.945 Watts

At engine speed of 1230rpm, Torque, T=3.129*0.09 T=0.2816Nm

Power generated, P=2π*171*0.2816/60

P =5.04 Watts

4.1 Graphs

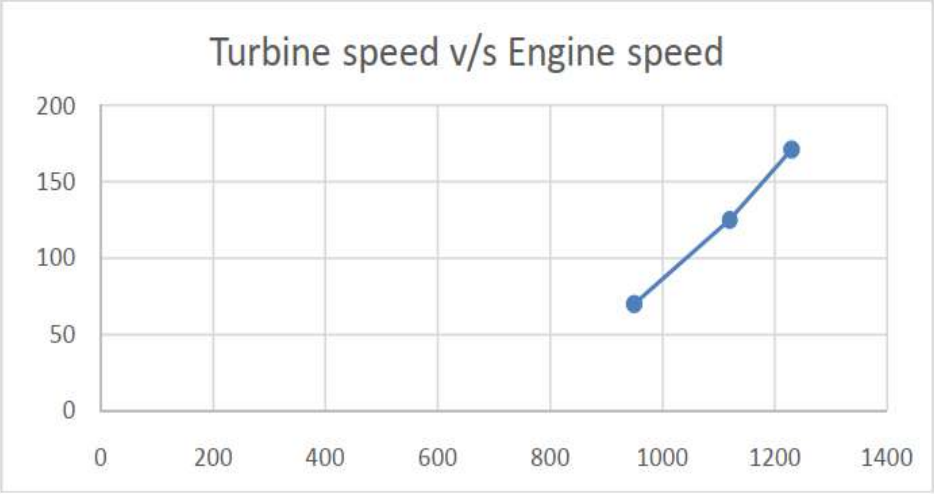

Fig. 4.1: Turbine speed (rpm) v/s engine speed (rpm)

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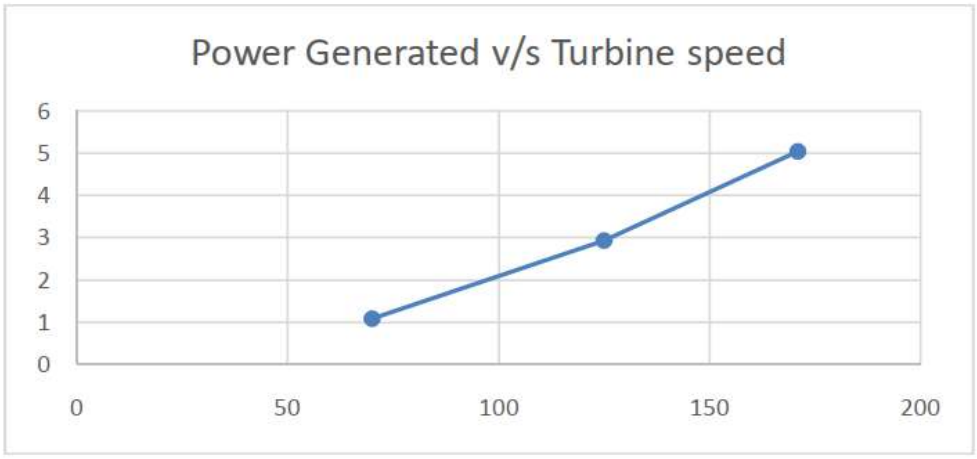

Fig. 4.2: Power generated (Watts) v/s Turbine speed (rpm)

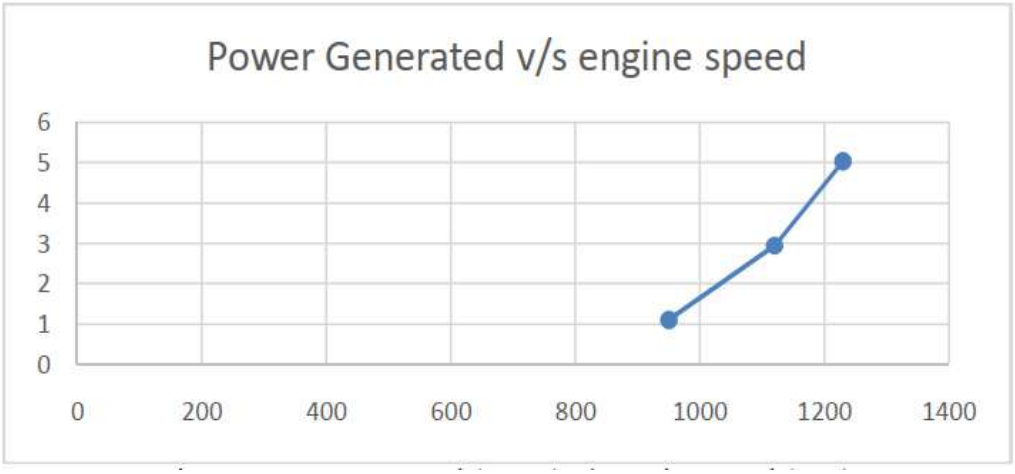

Fig. 4.3: Power generated (Watts) v/s Engine speed (rpm)

- **CONCLUSIONS**

From this project, it has been identified that there are large potentials of energy savings through the use of waste heat recovery technologies. Waste heat recovery entails capturing and reusing the waste heat from internal combustion engine and using it for heating or generating mechanical or electrical work. It would also help to recognize the improvement in performance and emissions of the engine if these technologies were adopted by the automotive manufacturers.

The study also identified the potentials of the technologies when incorporated with other devices to maximize potential energy efficiency of the vehicles. The project carried out by us made an attempt to generate electricity in engine exhaust unit. This project has also reduced the cost involved in the concern.

REFERENCES

1) International Journal of Innovative Research in Science, engineering and technology.Vol.4, Special issue 6, May 2015. Generation of electricity by using exhaust gases from bike.

2) Kranthi Kumar Guduru, Yakkob KolIpak Power generation by exhaust gases on diesel engine.ISSN: 0975-5662. Vol.7, Issue 5, December 2015

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SOLAR POWERED PORTABLE PELTIER REFRIGERATOR

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ABSTRACT
The fruits, vegetables and medicines require to store in refrigerator the continuous provision of electrical energy is require so that their efficacy is not affected. This represents an important problem for rural areas where there is no continuous electrical energy. In this work, we design a solar energy system for refrigeration of cold storage medicines to be used in rural towns without giving continuous electrical. The system uses a thermoelectric refrigerator based on the Peltier effect, which produces a temperature difference when electrical power is provided to it. It will be shown that for a typical application for food refrigeration, the required solar panel is about 100W peak connected to batteries with a storage capacity of 20Ah. The designed refrigeration system have 18 litre volume capacity of vaccines at temperatures in the range between 8° to 10°C using a Peltier cell (TEC) that consumes 30 W at 12V.

Keywords: Refrigeration, Thermoelectric, Solar energy, Peltier.

INTRODUCTION
There are Several types of Refrigeration in market that are designed to produce cooling. Thermoelectric is one of them. It is also known as Peltier Effect The main objective of our project is to produce cooling effect by using the Peltier Module. By using the vapour compression refrigeration system we neglect the harmful refrigerant and usage of green-house gases and CFC's. For protecting our environment thermoelectric refrigeration is used. The Peltier effect is the reverse phenomenon of Seebeck effect. The Peltier effect is created a temperature difference by transferring heat between two electrical junction when a circuit of two dissimilar metal and two junction is formed a current will flow between the junction or the circuit this phenomenon is known as Seebeck effect. Peltier effect is discovered by French physicist Jean-charles-Athanase -Peltier.

Due to increasing refrigeration in various field led to production of more electricity and henceforth more release of harmful gas like CO2 all over the world which is contributing factor of global warming on climate change. Thermoelectric refrigeration is a new method the thermoelectric modules are made of many P-type and N-type semiconductor couples which are electrically connected series configuration of thermally in parallel to create cold and hot surface. Many researchers reported that the Peltier thermoelectric refrigeration system have small size, less weight, no refrigerant and no moving part such as compressor and it can be operated using DC power supply the TEC are used in like consumer product, Industrial, Science and imaging, military, aerospace thermoelectric can be used to heat and cool, depending on the direction of current In an application requiring both heating and cooling mode

Throughout the world refrigeration is a critical means for storing medicine and essential item whose require low temperature in Rural areas. Because of expensive and require high watt power electricity so rural areas people facing problem for storing medicine and food. our objective is to brought the refrigeration in rural areas for people in low cost, solar powered and portable to use everywhere so people are not deprived for essential medicine and food.

LITERATURE REVIEW
- Awasti, M., & Mali, K. (2012). Design and Development of Thermoelectric Refrigerator. International Journal of Mechanical Engineering and Robotics Research(Volume No. 3). The retention time achieved was 52 min with the designed module in this project. In order to achieve the higher retention time, another alternative was incorporate. This consists the additional heater on heat sink.
- Chetan Jangonda, K. P. (2016). Review of various Apllication of Thermoelectric Module. Thermoelectric cooling added a new dimension to cooling. It has major impact over conventional cooling system. It is compact in size, no frictional elements are present, no coolant is required and weight of the system is low.
- D. SUMAN, P. H. (2020). Design And Fabrication Of Thermoelectric Refrigerator Using Peltier Module. The efficiency and life of the Peltier refrigerator are maximized by using these water pockets and the temperature was controllable by changing the input voltage and current so we can maintain the things in the required temperature. Finally, it has been recorded the minimum temperature i.e., 2°c

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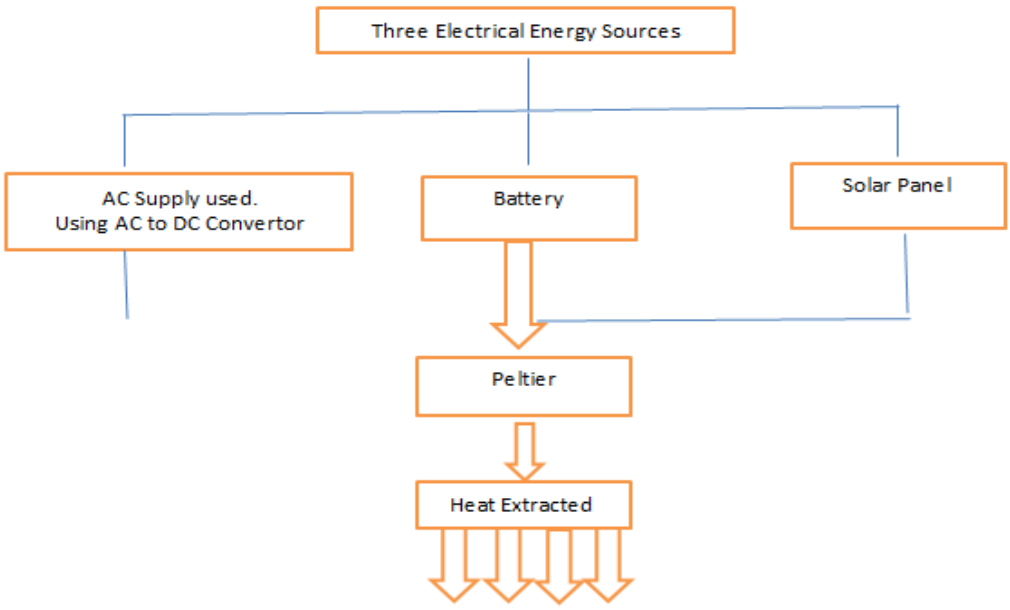
- Jatin Patel, M. P. (2016). Improvement in the COP of Thermoelectric Cooler. This study experimentally investigates the performance of the single stage and multistage TEC air-cooling module. It is quite easy to achieve the significant temperature difference in the single stage TE module, but, the COP of the single stage module is very less for the domestic use. In the multistage TE module, It is possible to get the require COP as well as better thermal performance
- Kshitij Rokde.Mitali Patle, T. k. (2017). Peltier Based Eco-Friendly Smart Refrigerator for Rural Areas.The efficiency of the refrigerator can be increased by increasing the number of peltier plate module which will eventually help in decreasing the temperature in less time. Number of peltier plate modules used can be calculated using the heat transfer formula.
- V.Rajangam, M. (2015). Design and CFD Analysis of Thermoelectric Cooling System.The design parameters involved with thermoelectric cooling system. An experimental work is carried out to obtain a temperature up to 5 degree Celsius. An attempt made in validating the experimental work with the CFD analysis by giving sufficient boundary conditions. Further this work could be enhanced with different thermoelectric materials to attain high performance.

RESEARCH METHODOLOGY

The proposed refrigeration has three source of Electrical energy if we have electricity of 240 v Ac Supply then we directly connect to refrigeration by using SMPS (switch mode power supply) to convert 240v to 12v and if we do not have electricity we can use battery give power to peltier module or we also use solar panel to charge the battey and peltier module is a device that after giving current in two terminal one side it gave hot temperature and another side cold temperature we require cold side temperature to keep for cooling in cabin box we used aluminium cabin box. and for hot side temperature Heat Extracted by heat sink fan. we use Armaflex for insulation to decrease transfer of heat from ambient to cabin box. and to see the temperature we can use the temperature controller which can also control the temperature, and power will cut off after reaching required temperature.

Below Diagram Shows Process of Energy Supply



Calculation and Material Selection

With the above constraint imposed by objective we selected rectangular wooden box with an insulation is sandwich between the aluminium wall and its dimension of box length*breadth*height = 30*25*25 cm Volume of a box is 18 cubic-meter. In this we calculate two types of load Heat absorbing load in cabin and Heat rejection load through outside Heat sink fan. First we have to calculate how much amount of power required to absorb heat of 18 cubic meter size of volume box at 35°c outside Temperature. So there heat absorbing load formula Q = m*Cp*(Th- Tc). so we have to have calculate Mass.

Mass = Density * volume = 1000*0.018 = 18 kg. Q = m*Cp*(Tamb -Tc) = 18*4.187*(35 -10) =261 watt-h

So we required total 261 watt heat absorbing load in 18 cubic meter volume box to reach 10°c. In 261 watt we select 8 peltier that each peltier would take 32 watt of load to cool up 10°c

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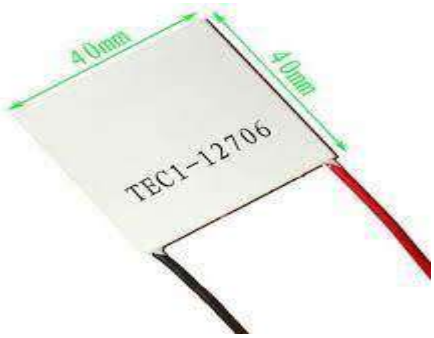
SELECTION OF MATERIAL

Peltier

Above calculation of cabin load for per peltier we required 32 watt and 12v dc supply 2.6 ampere current for this amount of power we select TEC1-12706 Module Peltier that characteristic is

Hot Side Temperature (°c)	25	50
Qmax (watts)	50	57
Delta Tmax (°c)	66	75
Imax (Amps)	6.4	6.4
Vmax (Volts)	14.4	16.4
Module Resistance (Ohms)	1.98	2.30



Heat Sink Fan:

Heat rejection Load = Q = h*A (Th-Tc) = 15 * 5.1*(50-35) = 0.31 = 0.31 watt-h per Heat sink Fan

Total we require watt-h for Heat rejection Load that's why we select 0.6 ampere 12v heat sink fan

Total Max power take to reject heat is 7.2 watt per peltier Total 8 peltier max power to reject heat 57.6 = 58watt

Total watt required = heat absorb load + heat reject load = 261+58 = 319 watt-h

319 watt Total power required to remove the heat in 18 cubic meter volume box heat till 10°c

Selection of Battery

For 261 watt amount of load we required a battery to run this load hence we calculate capacity of battery:

Power calculation = Voltage Load * Current Load = 12*3 (∴ 3 = 2.6+0.6) = 36 watt

Battery capacity = total load / battery voltage = 319/24 = 13.29 Ah We select 20 Ah battery to run this refrigerator

For charge battery we select solar panel We need a Charge the battery in 4hr so, 20Ah/4H = 5A 5A*12V = 60 60watt then 100 watt Solar Panel Require Charge Battery in require time

Output power of solar panel = 60W

Total power generated by solar panel = 100W

Total time required to charge the battery = Watt-hour of Battery / output power of solar panel= 240/60 = 4hr

Aluminium : Aluminium material is used for inside cabin box and its thermal conductivity is 239 (w m-1 k-1) it is corrosion resistance and aluminium is superb heat sink as compared to other material that heat can be drained away rapidly that why used in many application.

Insulation: we used 10mm Armaflex to resist heat from outside temperature to inside temperature and Armaflex is best material because it service temperature is -50 to +80° thermal conductivity is 0.003 (w/m.k) control condensation reduced energy loss and protect against frost on aluminium wall, light weight and flexible it is closed cell structure it means no additional vapour barrier is required

We want to calculate how much thickness insulation we required :

X = k {[(Th-ta)/qmax]-(1/f)} = 0.035*{[42-35)/249]-(1/5.7)} =0.008m = 8mm Insulation thickness required

Wooden Box: wood is low thermal conductivity of material compared to other material and is best sustainable for portable

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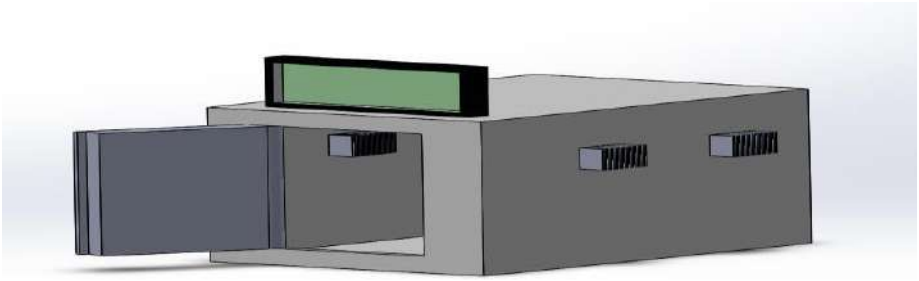
Temperature Controller: we used W1209 is an incredibly low cost yet highly functional thermostat controller. With this module you can intelligently control power to most types of electrical device based on the temperature sensed by the included high accuracy NTC temperature sensor.

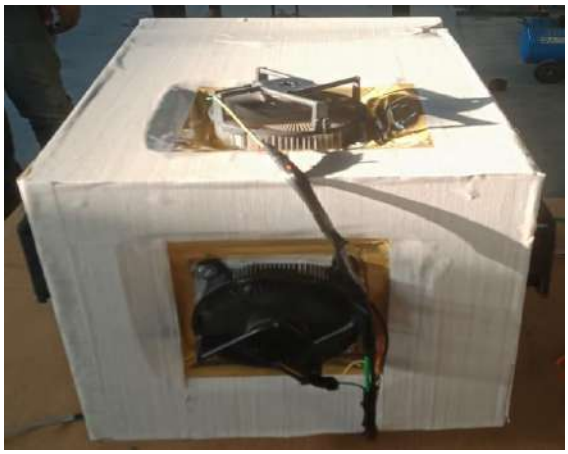
Design:

Cad Model View

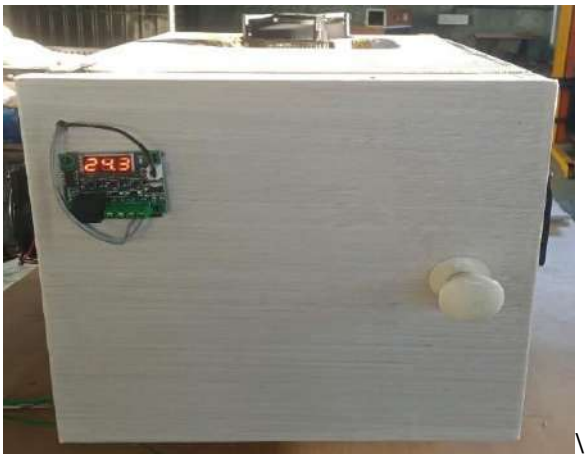


Actual Design Model

Top View



Back View



Front View

Side View

RESULTS AND DISCUSSION

To verify the above system design analysis, we designed and built a prototype thermoelectric refrigerator and perform an experiment.

For above calculation we got theoretical data of how much current required to run this system. For finding practical data test was conducted at ambient temperature 37°c. In 2 hr we get 10°c we have done this test in empty box. so In empty box total 156 watt-h load we required Per heat sink fan we get total 52 watt-h. Per peltier we require 30 watt-h and 3 ampere current. In theoretical data we calculate in full volume capacity load.

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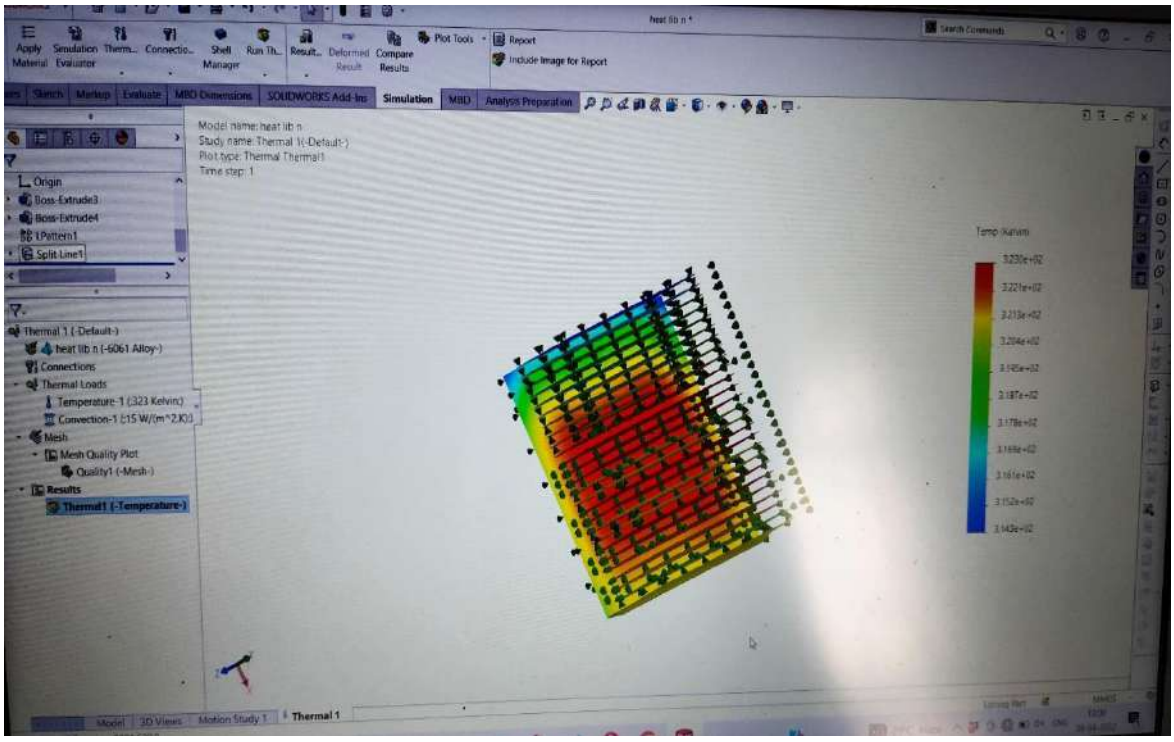
Temperature	Cooling Time (in PM)	Retention Time(in PM)
37	03:00	05:22
34	03:01	05:20
31	03:03	05:18
28	03:06	05:16
25	03:09	05:14
22	03:14	05:12
19	03:22	05:10
17	03:36	05:08
15	04:00	05:06
12	04:22	05:04
10	04:40	05:02
8	05:00	05:00

We simulate the heat rejection convection coefficient to calculate heat rejection load In simulation we find out we require 15 w/m^2.k to reject hat till ambient temperature.



The above figure shown that hot side peltier there is 50°c temperature. Cooled the peltier with heat sink fan at 35°c we require 15 w/m2.k heat transfer coefficient.

CONCLUSION

The objective project is to achieve the long term cooling in case of power failure for refrigerator. A Peltier Cooling system is has been designed and developed to provide active cooling with help of single stage 12 V and 3A TEC module is used to provide adequate cooling. First the cooling load calculations for this TER compartment considered under study were presented. Simulation test have validated the theoretical design parameters and established the feasibility of providing cooling with single stage thermoelectric cooler was tested in the environmental chamber. The total Power required to run TEC Refrigerator in empty box is 156 watt-h. The retention time achieved was 22 min with the designed module in this project. In order to achieve the higher retention time and more cooling temperature another alternative was incorporate.

FUTURE SCOPE

We have to develop a little further in Peltier Module Which can reduce the temperature difference from hot side to cold, In hot side we must have to reduce temperature till ambient or below ambient it will increase efficiency and temperature will cool down in cold side in very less time. To increase the retention time first reduced cooling loss using best insulation and needs to be explored with quick switching mechanism from thermoelectric cell off state of heater to on state, so that temperature drop in thermoelectric cell can be reduced.

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REFERENCES

[1] DiSalvo F. Thermoelectric cooling and power generation. Science 1999; 285(5428):703–6.

[2] Xi H, Luo L, Fraisse G. Development and applications of solar-based thermoelectric technologies. Renew Sustain Energy Rev 2007;11:923–36.

[3] Mei VC, Chen FC, Mathiprakasam B, Heenan P. Study of solar-assisted thermoelectric technology for automobile air conditioning. J Sol Energy Eng, Trans ASME 1993;115(4):200–5.

[4] Riffat SB, Xiaoli MA. Thermoelectric: a review of present and potential applications. Appl Therm Eng 2003;23:913–35.

[5] Tritt TM, Kanatzidis MG, Lyon HB, Mahan GD. Thermoelectric materials-new directions and approaches. Warrendale, PA: Materials Research Society; 1997.

[6] Riffat SB, Guoquan Q. Comparative investigation of thermoelectric airconditioners versus vapour compression and adsorption air-conditioners. Appl Therm Eng 2004;24:1979–93.

[7] Bansal PK, Martin A. Comparative study of vapour compression, thermoelectric and absorption refrigerators. Int J Energy Res 2000;24(2):93–107.

[8] Dai YJ, Wang RZ, Ni L. Experimental investigation and analysis on a thermoelectric refrigerator driven by solar cells. Sol Energy Mater Sol Cells 2003;77: 377–91.

[9] Field RL. Photovoltaic/thermoelectric refrigerator for medicine storage for developing countries. Sol Energy 1980;25(5):445–7.

[10] Sofrata H. Heat rejection alternatives for thermoelectric refrigerators. Energy Convers Manag 1999;37(3):269–80.

[11] Hara T, Azuma H, Shimizu H, Obora H, Sato S. Cooling performance of solar cell driven: thermoelectric cooling prototype headgear. Appl Therm Eng 1998;18: 1159–69.

[12] Chen K, Bwilliam SB. An analysis of the heat transfer rate and efficiency of thermoelectric cooling systems. Int J Energy Res 1996;20:399–417

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BRIQUETTING MACHINE

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ABSTRACT
The objective of this study explores technology, implementation, and possible commercialization of charcoal briquettes derived from organic waste through thermal treatments in emerging markets. Given the lack of formal and centralized waste management system in emerging markets, we present a low-cost thermal treatment system to produce charcoal briquettes derived from organic waste. Bio digestion, composting, and other waste-to-energy technologies represent possible solutions to this problem, however due to technological, infrastructural, and logistical reasons these technologies have not hit the required scale to tackle the significant volume of organic waste generated in urban areas. With lack of infrastructure or technology for proper composting or recycling, organic waste represents little to no monetary value for waste picker cooperatives who operate and serve as de-facto waste collectors from urban households. The briquetting technology available is mostly for the upscale business for mass production and which is not feasible for the macro organizations or an individual we have also proposed a solution to it in this project, which is economical and feasible for such organizations or an individual.

Keyword: Briquettes, Renewable energy, Biomass, Agricultural residue

INTRODUCTION
Sequel to the increasing adverse environmental impacts related to the use of conventional fossil fuels, there is strong interest worldwide in the development of technologies that exploit renewable energy sources; and new measures to limit greenhouse gas emissions are continuously sought. Biomass, a naturally abundant domestic energy source is seen as the most promising energy alternative to mitigate greenhouse gas emissions Waste agricultural biomass is often under- utilized, more also there is rapid increase in volume and types of waste agricultural biomass produced worldwide due to intensive agricultural activities in the wake of population growth and improved living standards. In Nigeria particularly, with a population of over 170 million people, agriculture is the mainstay of the economy contributing more than 40% of the gross domestic product (GDP). In addition, agricultural sector employs more than two-thirds of the total country's work force and provides livelihood for more than 90% of the rural population The varying categories of these agricultural wastes is becoming a burgeoning problem as rotten waste agricultural biomass emits methane and leach ate while open burning by the farmers to clear the lands (a practice very widely practiced in Nigeria) generates CO2 and other local pollutants. Generally, the agricultural wastes in Nigeria could be grouped in to two major classifications; namely the crop residues and the agricultural industrial residues. The major crop residues in Nigeria are the sugarcane trash; straws of millet, corn, wheat, sorghum; maize stalks and cobs; cotton stalks; leaves; roots; barks; branches different types of fibrous materials. The common agricultural industrial residues include timbering residues; oilseeds shells such as groundnut, palm kernel and coconuts; rise husks; cotton wastes; cassava peels; sugarcane bagasse etc. The aim of this work is to use one of the ubiquitous agro- waste: the corncobs to produce and characterize briquette charcoal, and to draw comparisons with the properties of a selected biofuel.

LITERATURE REVIEW
1) Harshita Jain, Y.Vijayalaxmi, T.Neeraja, has studied in their paper named "Preparation Of Briquettes using biomass combinations and estimation of its calorific value" An experimental research design was adopted to conduct the present investigation. For the present study six biomass materials namely Charcoal Dust, Saw dust Rice Husk, Dry Leaves, Wood Chips, Groundnut Shells and two binders namely Cow dung and Starch were identified. The commercially available briquetting machine of five horsepower motor was selected for making the briquettes. Subjective evaluation of physical properties of briquette i. e. texture, cohesiveness, moisture, shape, evenness of surface and appearance of surface was conducted by a panel of six judges comprising of staff and PhD graduate students of College of Home Science. The data obtained from the experimental tests was compiled, tabulated and statistically analysed by mean and standard deviation. The data obtained from subjective evaluation was consolidated by averages, standard deviation. The calorific value of all prepared briquettes was measured by using bomb calorimeter. The results indicate that briquettes made from charcoal dust and other biomass materials with starch combinations were found to be best in physical characteristics with highest scores whereas briquettes made from charcoal dust other biomass materials with cow dung combinations were found to be highest in calorific value. The results show that when cow dung is used as

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binder with charcoal dust and other biomass materials, it was giving higher calorific value. The use of starch as binder with charcoal dust and other biomass materials was making briquettes smooth in texture, compact, dry, uniform, even without cracks and shiny.

2) J.T. Oladeji, has studied in their paper named "Comparative Briquetting of residues from corn cub, groundnut shell and their mixture" have shown that, the briquettes produced from rice husk and corncob would make good biomass fuels. However, from the study, it can be concluded that, briquette from corncob has more positive attributes of biomass fuel than rice husk briquette. Finally, the study also concluded that, both briquettes would not crumble during transportation and storage because six the values obtain

Ned for their relaxed densities are closed to the maximum densities of the briquettes from the two residues.

3) S. H. Sengar , A. G. Mohod , Y. P. Khandetod , S. S. Patil , A. D. Chendake has studied in their paper named "Performance of Briquetting Machine for Briquette fuel" have observed that the Cashew nut shell, grass and rice husk were used as major biomass in the form of raw biomass, hydrolysed biomass and carbonized biomass. Carbonized biomass was found suitable as compared to raw (as such) and hydrolysed biomass for briquetted fuel. The briquettes were prepared on screw press extruder briquetting machine for different combinations of major biomass. The prepared briquettes after sun drying were subjected to various tests for assessing the quality of fuel. Better results in cashew shell briquettes related to calorific value, shattering indices test, tumbling test, degree of densification, energy density ratio, resistance to water penetration and water boiling test as compared to grass and rice husk briquettes were observed.

4) Idah, P. A , Mopah, E. J. has studied in their paper named "Assessment of energy values of briquettes from some agricultural by-product with different binders" that the effect on environment by agricultural and other industrial wastes is on the increase and is causing a lot of problem. Adequate means of disposing these wastes are lacking, hence, converting them to other useful products such as briquettes for domestic fuel is desirable. In this work, the energy values of briquettes made from some of these agricultural by-products using two binders were assessed. The effective utilization of the agricultural by-products as high grade solid fuel can reduce environmental pollution resulting from the wastes and also help in minimizing the energy crisis resulting from non- renewable energy sources like petroleum products as domestic fuel.

PROBLEM STATEMENT

Most of the coal deposits occur in the northeaster part of the Indian peninsula. Other parts of the country have either no coal deposits or limited reserves of poor-quality coal. Coal distribution is highly uneven throughout India. Coal has to bear very high cost of transportation from the mines to the consuming centres. Thus, the coal-consuming industries have to pay a high price for coal. Much of the Indian coal is non-coking grade. This is unsuitable for metallurgical industries. The Godwin coal has high ash content, while the Tertiary coal has high Sulphur content. Railways transport more than 90 per cent of the coal. The problem in transportation arises due to lack of railway facilities, variation in gauges, shortage of wagons, slow movement of trains, pilferage, etc. There are severe health effects caused by burning coal. According to a report by the World Health Organization in 2008, coal particulates pollution are estimated to shorten approximately 1,000,000 lives annually worldwide. the list of historical coal mining disasters is a long one, although it should be noted work related coal deaths has declined substantially as safety measures have been enacted and underground mining has given up market share to surface mining. Underground mining hazards include suffocation, gas poisoning, roof collapse and gas explosions. Open cut hazards are principally mine wall failures and vehicle collisions. The briquetting technology available at present is mostly for the mass production for the big organizations, which is not economical and feasible for the small organizations or an individual and in rural area

OBJECTIVES

The study aims to evaluate the fuel properties of charcoal briquettes made from combinations of coconut shell, corn cob and sugarcane bagasse at specified ratios. In the study, single (100%) double (50%-50percentage) and triple (33%-33%-33percentage, 50%-25%-25percentage, and 50%-37.5%-12.5percentage) Constituent briquettes were produced with compaction pressures of 2.2MPa, 4.4 MPa and 6.6 MPa.

- To design and manufacture a briquetting machine that is economical and feasible for
- Small organization or an individual. With a production rate of 40kg/hr – 60kg/hr.
- To produce biomass briquettes with a calorific value of around 3700 - 4600 kcal/kg.
- To utilize the labor to produce biomass briquettes.
- To produce biomass briquettes with a lower ash content of around 0.7 – 18 % as

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- Compared to that of coal, which is around 20- 40 %.
- To produce biomass briquettes of density 1000 – 1200 kg/m3 depending upon the raw
- Materials fed into the system.
- To produce solid briquettes which would burn for longer period of time as compared to
- That classical densified biomass.

DESIGN OF THE PROJECT

Fabrication of Briquetting Machine is consists of the Following components to full fill the requirements of Complete operation of the machine.

1. Motor
2. Worm and worm gear
3. Feed Screw
4. Feed Screw Casing
5. Hopper
6. Die
7. Klin

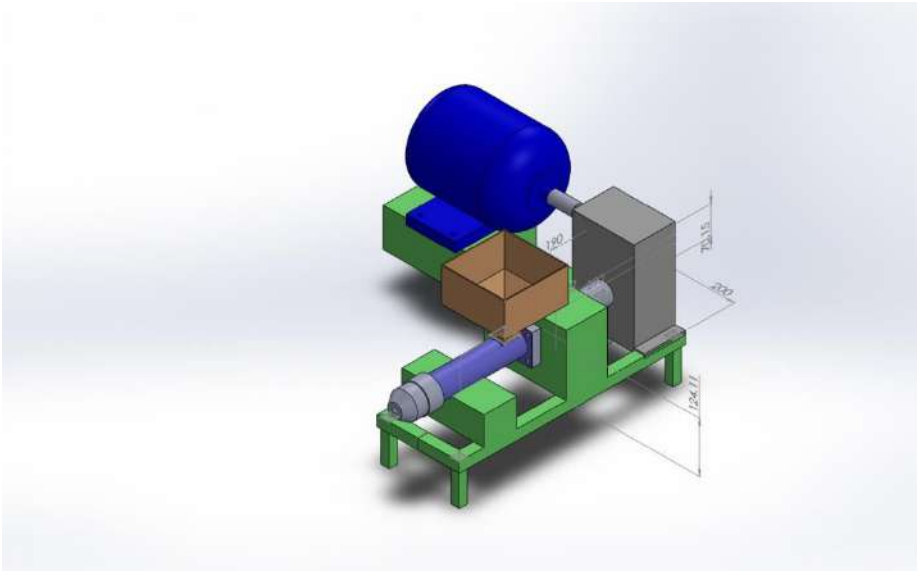

Fig: Solidworks Design

WORKING PRINCIPLE

Carbonization Process-

- For the purpose of manufacturing the charcoal briquettes we had collected dry waste such
- As sugarcane bagasse and dry leaves & branches.
- For the first batch we fed the sugarcane bagasse waste in the kiln for the carbonization
- In addition, for the second batch dry leaves & branches were fed.
- It took half hour for sugarcane bagasse to complete the process and 15 minutes for the dry
- leaves & branches, after that some water was sprinkled on the carbonized char as it was
- Hot to work with.
- After the carbonized char had been cooled, some unburnt waste was sorted from the char.
- Now the char was crushed into fine particles and the starch binder was mixed with the
- Char to give the briquettes shape.

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Briquetting Process-

The Briquetting Machine is of screw type which is driven by a belt drive transmitting the power from the 1HP electric motor.

- The char mixed with the binder is then fed into the hopper of the briquetting machine.
- From there it is then carried forward by the screw which applies a force on the mixture
- along the housing which is slightly tapered towards the die end which further compress
- The mixture.
- The compressed mixture further reaches the die plate, which has two holes of 19 mm.
- Two pipes of 19 mm I.D and 40 mm in length has been welded on the die plate.
- Now as the compressed char passes through these pipes it takes the shape as the
- Cylindrical briquettes.
- These cylindrical briquettes are kept in air to dry up to two days.
- The first batch is of sugarcane bagasse, second batch is of dry leaves & branches and the
- Third batch is the mixture of sugarcane bagasse and dry leaves – branches.

CONCLUSION

A large volume of agricultural by products being generated in India and which constitute environmental hazards. Call for effective utilisation of those high grade biomass material for solid fuel called briquette. Hence it can be concluded that the waste material like dry leaves, wheat straw, saw dust, etc are feed stocks for the biomass briquette . Generally dry leaves and wheat straw are burnt to reduce waste, which causes several pollution to environment, but if wisely handled these wastes can then could be a better option for briquetting. Hence for an agricultural country like India that produces huge amount of agricultural waste every year, use of these waste as a briquette can be economically viable, sustainable and environment friendly solution. And also as machine concerned, it can be concluded that by using simple mechanism with widely available machine element the machine cost could be lowered and makes fabrication economical and portable.

FUTURE SCOPE

The machine fabricated require some human effort for compressing the raw material. The requirement of human effort can be eliminated by using a less capacity motor to actuate the telescopic jack gradually for compressing the feed stock. This increases the compression pressure which helps in obtaining the good quality briquettes. And also this high pressure causes raw material to bind stiffly and this may also lead to elimination of using binder. By some minor changes in the compressing unit, the cylinder piston arrangement and inverted position of jack will allow the operator to apply maximum pressure as much as possible. And by using this mechanism fabrication cost can be reduced. Any type of feed stock can be used apart from the saw dust, coffee husk, dry leaves and other biological and non-biological waste can be compacted toreduce waste management cost and facilitates the easy transportation of the same.

REFRENCES

- A.D.Karve, “Biomass as energy source (appropriate rural technology)”, India, August 27, 2000.
- Idah, P. A1, Mopah, E. J2 1,2Department of Agricultural Bioresources Engineering, Federal University of Technology, P.M. B. Minna, Niger State, Nigeria.
- Oladeji, J.T.2010. “Fuel Characterization of Briquettes Produced from Corncoband Rice Husk Resides”.Pacific Journal of Science and Technology. 11(1):101106.
- S. H. Sengar , A. G. Mohod , Y. P. Khandetod , S. S.Patil , A. D. Chendake "Performance of Briquetting Machine for Briquette Fuel", International Journal of Energy Engineering,Vol.2 No.1, 2012, pp. 28-34.doi: 10.5923/j.ijee.20120201.05.
- William s. gate: Proc. The 12th ISIJ-VDEh, ISIJ, Tokyo, (2005), 15.

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IOT BASED AIR POLLUTION MONITORING SYSTEM

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ABSTRACT

The increased level of air pollution in big cities has become a major concern for several organizations and authorities because of the risk it represents to human health. In this context, the technology has become a very useful tool in the contamination monitoring and the possible mitigation of its impact. Particularly, there are different proposals using the internet of things (IoT) paradigm that use interconnected sensors in order to measure different pollutants. In this paper, we develop a systematic mapping study defined by a five-step methodology to identify and analyze the research status in terms of IoT-based air pollution monitoring systems for cities. The study includes implementation in a real environment. We analyze and compare these proposals in terms of different parameters defined and highlight some challenges for air quality monitoring systems implementation into the city context. The system uses MQ135, MQ6 AND MQ7 and MQ6 sensor for monitoring Air Quality as it detects most harmful gases and can measure their amount accurately.

Keywords: IOT, new technology, air quality monitoring.

I. INTRODUCTION

The Air Excellence Guide (AEG) may be a common indicator of air quality. The Air Quality Indicator (AQI) is calculated and supported on air pollutants like CO and NO2 compounds that consume opposing possessions happening the atmosphere and human health. The Air Quality Indicator may be a range that represents the very finest meditation of a specific air unused matter at a particular time. WE propose an air quality as well as air pollution monitoring system that allows us to monitor and check live air quality as well as air pollution in an area through Internet of Things (IoT). It uses air sensors (Gas Sensor MQ135, MQ6 AND MQ7 , MQ6, MQ7), DTH11 and LDR based PM sensor to sense presence of harmful gases/compounds in the air and constantly transmit this data. In addition, system keeps measuring air level and reports it. The sensors interact with Arduino Uno (Microcontroller) which processes this data and transmits it over the application. This allows authorities to monitor air pollution in different areas and act against it [1]. In addition, authorities can keep a watch on the air pollution near schools, and hospitals areas. Normally, little concentrations area unit measured exploitation ppb (parts per billion), that represents units of mass of a material per one billion units of total mass. Parts per million (ppm) may be similar and unremarkable used unit to measure concentrations of pollutants. It determines the requirements of a new system and analyze on product and resource requirement, which is required for the successful system. The product requirement contains input and output requirements it gives the wants in term of input to produce the required productivity. The resource requirements define in brief about the hardware that are needed to achieve the required functionality. In this project WE am going to make an IoT based Air Pollution Detection Monitoring System in which WE monitor the Air Quality over a web server using NodeMCU Wi-fi device and a trigger alarm when the air quality goes down a certain level means when there is amount of harmful gases is present in the air like CO2. It shows the air quality in PPM (Parts Per Million) on APP and webpage so that WE monitor it very easily.

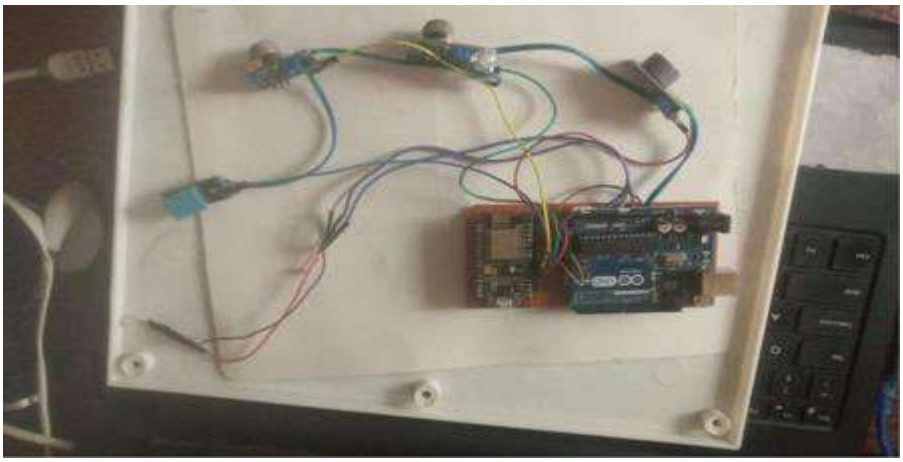

Figure 1: Model

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II. METHODOLOGY

Sensing Node

The Sensing Node consist of the **PM sensor**, **DHT11 sensor** for Humidity and Temperature, **MQ72** for Carbon Monoxide, **MQ06** for detecting the gas concentration, **LM 35** for detecting ambient air temperature, **MQ135** which detects the Harmful gases and Smoke.

The Sensors read values of Temperature & Humidity, concentration of various gases and Particulate Matter in real time.

Data Acquisition

The ESP8266 MCU acquires and compute the data from sensors interfaced with it.

The programming sketch written in Arduino UNO helps ESP8266 in successful operations.

Data Transmission

The acquired data from all the sensors is transmitted to the cloud storage of IoT platforms through Wi-Fi protocol.

The acquired data is collected and stored at the cloud and managed for the further processing and analysis.

Data Visualization & Sharing

The collected, stored and well managed data is further shared on the mobile application.

The mobile application helps us to monitoring the measured real time concentration of the all pollutants along with temperature and humidity in real time through IoT.

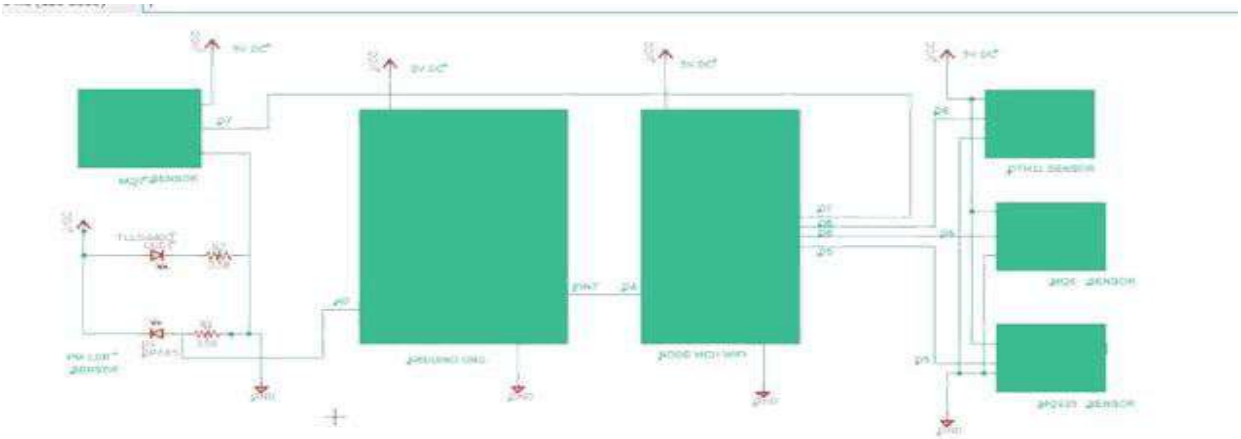

Figure 1: Circuit Diagram

III. MODELING AND ANALYSIS

Model and Material which are used is presented in this section.

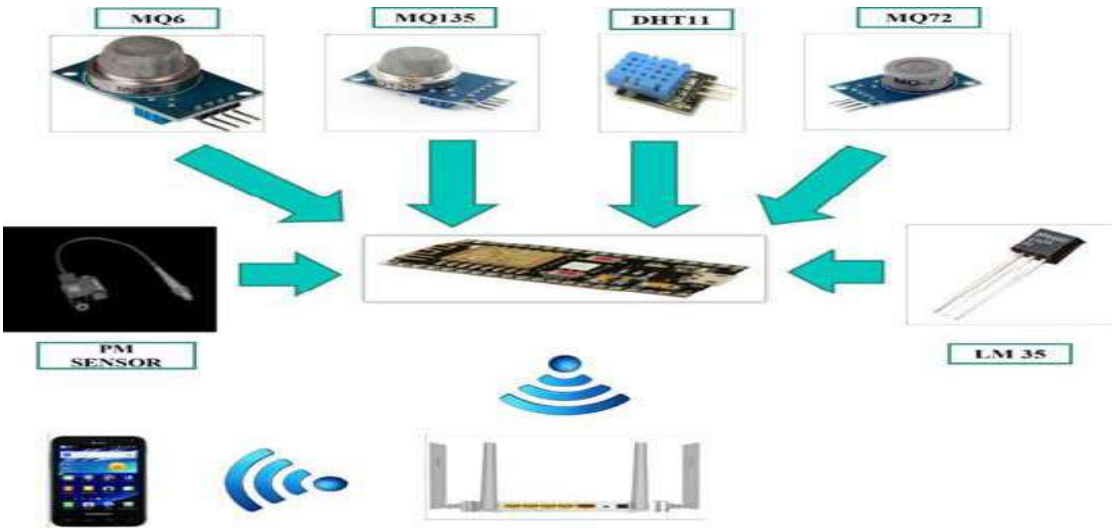

Fig (a): Proposed System

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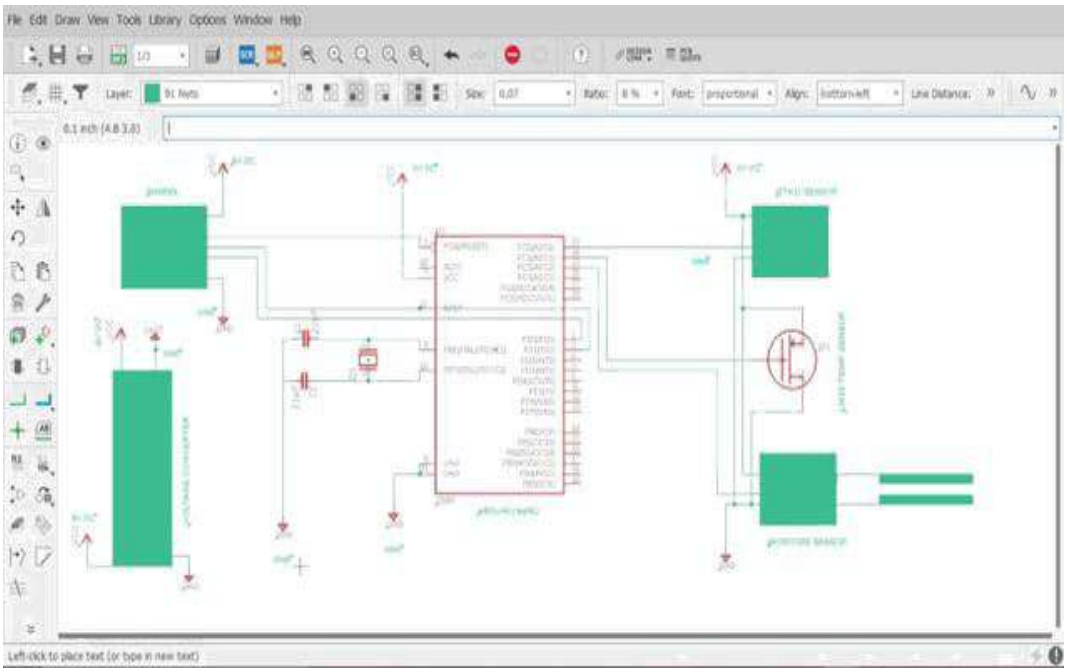

Fig (b): Drafting

Fig(c): Working Model

IV. RESULTS AND DISCUSSION

This table shows that the air quality health and its risk through a 0.1-1.0 base scale. It is divided into three parts like as Fresh Air, Poor Air & Danger Air. It detects the air pollution level and indicates the risk through this scale. When the updated data compared to the base data then it shows the result accordingly to this scale [18]. The compared data is between 0.1-0.5 it shows that health risk is low and indicate open window, when it rises up to 0.6-1.0 it shows that the pollution in the air is considered dangerous for human being and WE take some steps quickly.

Table 1: AQWE levels and Connected Health Impacts

Air Quality Indicator		
Range (PPM)	**Result**	**Health Impacts**
0-0.5	Fresh Air	Minimal impact
		May cause minor breathing discomfort to sensitive people.
0.6-0.9	Poor Air	
		May cause breathing discomfort to people with lung disease such as
		asthma, and discomfort to people with heart disease, children and
1 to above	Danger Air	Older adults.

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V. CONCLUSION

The system is going to be an important tool for the real monitoring of quality of ambient air. Monitoring the environment parameters especially with respect to air plays very important role to ensure healthy environment for living beings. We have seen various hazards being caused at various places due to air pollution.

There are many reasons for causing air pollution but knowing their concentration at various location helps to take decision on prevention measures. The proposed application works on the principle of IoT, data read from sensor are processed by the processor then uploaded to databased, these data are analysed and displayed to users, and user could fetch this information over phone and take proper action to prevent pollution.

The system to monitor the air of environment using Arduino microcontroller, IoT Technology is proposed to improve quality of air. With the use of IoT technology enhances the process of monitoring various aspects of environment such as air quality monitoring issue proposed in this paper. Here, using the MQ135, MQ6 AND MQ7, DHT11 gives the sense of different type of dangerous gas and Arduino is the heart of this project. Which control the entire process, Arduino module connects the whole process to APP and serial monitor is used for the visual Output.

VI. REFERENCES

[1] Ch.V.Saikumar, M.Reji, P.C.Kishoreraja, “IOT Based Air Quality Monitoring System”, International Journal on Information Theory (IJIT), Vol-117, No.-9, 2017;

[2] Riteeka Nayak, Malaya Ranjan Panigrahy , Vivek Kumar RaWe and T Appa Rao “IOT based air pollution monitoring system”, International Journal on Information Theory (IJIT) Vol-3, Issue-4, 2017;

[3] Poonam Pal, Ritik Gupta, Sanjana Tiwari, Ashutosh Sharma, “Air Pollution System Using Arduino”, International Journal on Information Theory (IJIT), Vol-04, Issue-10, 2017;

[4] D.Arunkumar, K.Ajaykanth, M.Ajithkannan, M.Sivasubramanian, “Smart Air Pollution Detection And Monitoring Using IoT”, International Journal on Information Theory (IJIT) Vol-119, No.-15, 2018;

[5] ShanzhWe Chen, HuWe Xu, Dake Liu, Bo Hu, and Hucheng Wang, “A Vision of IoT: Applications, Challenges, and Opportunities with China Perspective”, IEEE Internet Of Things Journal, Vol.-1, No.-4, August 2014;

[6] S. Chen, H. Xu, D. Liu, B. Hu and H. Wang, "A Vision of IoT: Applications, Challenges, and Opportunities with China Perspective," in IEEE Internet of Things Journal, Vol-1, No.-4, 2014;

[7] Ms. Sarika Deshmukh, Mr.Saurabh surendran and Prof.M.P. Sardey, “Air and Sound Pollution Monitoring System using IoT” International Journal on Information Theory (IJIT), Vol-5, Issue-6, 2017;.

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DEVELOPING THE RAT REPELLENT STRIPS TO MITIGATE THE PROBLEM ARISING DUE TO RAT BITING IN AUTOMOTIVE WIRING HARNESS IN ECONOMICAL AND EFFECTIVE WAY

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ABSTRACT
The objective of the study is to find a cost-effective and environmentally friendly approach to address the problem of rat biting. The idea behind the creating strips is that it is readily removable and may be stuck in any desired location, increasing the product's adaptability. We are using two types of materials in our project: chemical and organic. We'll employ peppermint and Citronella in our organic material, and paradichlorobenzene in our chemical stuff. These materials include strong odorant components that irritate mice's nasal cavities, preventing them from approaching the strips. The exterior coating of the strips is made of PVC for safety reasons. PVC is a naturally fire-resistant substance.

Keywords: Automotive wiring harness, harness Damage, Rat biting, Rat Repellent, Removable Strips.

INTRODUCTION
As everyone knows, the auto business is booming, and new models are being introduced on a regular basis. Every day, new technology that is cutting-edge and comfy is introduced into automobiles to improve their visual and ergonomic appeal. As the number of cars on the road grows, so do the challenges associated with vehicle maintenance. The most common problem that owners overlook is rat biting/gnawing. These small rodents do considerable damage to automobile wiring harness, causing major problems at critical times.

People prefer to greet visitors in their cars the same manner they do in their homes, especially if the vehicle is new. Friends and relatives are constantly there in one's car. Whether it's for a road trip, a romantic night drive, or a group of friends visiting their favorite cuisine restaurant, cars are commonly the mode of transportation of choice. However, not everyone is welcome in the car. Rats, mice, and other rodents can cause a lot of damage, so no one wants them in their car. It's unclean, and if things go worse, it might be dangerous.

In today's world, a car is an essential method of transportation that allows us to get to work, hospitals, road trips, outings, and other destinations on time. But what if your automobile can't move an inch because of damaged or incorrect wires? Rats wreak havoc on people's automobiles as well as their bank accounts. Electrical systems in automobiles are among the most delicate components, and even minor damage to them can cause the vehicle to fail. We've seen numerous situations when a rodent or rat bite has caused damage to a car's electrical system, necessitating repairs. A rodent or rat may eat the wires in the car's electrical system, causing t he vehicle to malfunction and the electrical system to be damaged.

Rats prefer dark, warm environments, so your automobile engine becomes their favorite hangout. Rats usually build a nest in the engine and stay there. They clog up your engine and cause damage to it by chewing through wiring, which may be expensive. Rats like to nibble on wire insulation, which can cause problems with the car's electrical system. Another big issue is that rats can use the automobile as a food storage facility, resulting in strewn food all over the engine, as well as damage to the car interior from food, droppings, and other debris, making it an unsanitary environment [1].

Although no one keeps track of rat damage to automobiles, there are indicators that it is becoming more of an is sue as a result of a statewide rat population increase, which scientists believe is being exacerbated by a warming climate [1].

In the fall, rodents set fire to a vehicle in Manhattan.College students' automobiles have been mutilated in Florid a. A half-dozen class action lawsuits have been brought again auto manufacturers in recent years, all eging that today's environmentally friendly wiring is tempting to mice. Rats have a "smorgasbord of delights" in modern cars, according to AAA [1].

LITERATURE SURVEY
Because our concept is so fresh and unique, no study has been done regarding it, however, there have been some studies done on certain oils and chemicals to see how effective they are at repelling rats. Peppermint oil, citronella oil, and paradichlorobenzene are all utilized individually, and their work is done separately, employing the same chemical and organic substances but without combining them. Organic oils of peppermint and citronella are known insect and rodent repellents, while paradichlorobenzene is a registered pesticide. Various research publications say that this assertion is true based on extensive laboratory testing on rats.

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A. Peppermint and Peppermint Oil Profile

The culinary and medicinal plant peppermint (Mentha piperita) is extensively grown and utilized in a variety of cuisines. The main source of menthol is its essential oil. Menthone and pulegone are two further active ingredients in peppermint and peppermint essential oil. The main active component, menthol, has biocidal characteristics and is effective against mites, mosquito larvae, and other pests when used as a pesticide. Insects, dogs, and cats are all repelled by it. Antimicrobial properties of peppermint oil Peppermint and peppermint oil are regarded safe when used correctly due to its history as a flavoring ingredient [2]. In comparison to a no-treatment control and four different combinations of natural plant repellents under inks, including chili, geranium oil, and bergamot oil, cardboard treated with a combination of peppermint and wintergreen oils with ink repelled numerous rats in field conditions (Kalandakanond-Thongsong et al. 2011) [3].

B. Aversion to Food is A Measure of Citronella Oil's Potential as a Rodent Repellent

Repellents work by causing the meal to be rejected by triggering the primary or secondary defense mechanisms. Rattus, mature and healthy house rats of both sexes, were given the option of being exposed to 5, 10, or 20% citronella oil sprayed as paint in laboratory pens, or no oil. Each concentration was applied using three distinct methods (daily, once and alternatively in a week). The repellent effect of oil was determined by comparing food consumption on the treated and untreated sides. Food consumption was tracked over a four-day period. Overall, food consumption was considerably (p 0.05) lower on the treatment side than on the control side, demonstrating that the oil had a considerable repelling effect. The repellent effect of oil, on the other hand, was not significantly different across the sexes. When oil was administered daily in both female and male rats, a significant difference in average percent repellent effect was detected between 5 and 10% concentrations, with treatment at 10% having a greater effect. The experiments demonstrated that daily application of citronella oil as a paint had a greater capability for repelling rats of both sexes [4].

C. Two-Year Inhalation Exposure to Para-Dichlorobenzene Caused Carcinogenicity and Chronic Toxicity in Mice and Rats–

The carcinogenicity and chronic toxicity of para-dichlorobenzene (p-DCB) were investigated by inhaling p-DCB vapor at a target concentration of 0 (control), 20, 75, or 300 ppm for 6 hours per day, 5 days per week, and for two years in 50 BDF1 mice and 50 F344 rats of both sexes. In the 300 ppm-exposed male mice, the incidence of hepatocellular carcinomas, hepatoblastomas, and hepatic histiocytic sarcomas increased, while the incidence of hepatocellular adenomas and carcinomas, as well as hepatoblastomas, increased in the 300 ppm-exposed female mice. Most of those liver tumors had a dose-related rise in their occurrence. In any p-DCB-exposed rat of either sex, no increase in tumor incidence was seen. The 300 ppm-exposed male rats showed hepatocyte centrilobular enlargement, papillary mineralization, and kidney pelvic urothelial hyperplasia. Incidences of eosinophilic globules of the respiratory and olfactory epithelia in female rats, as well as respiratory metaplasia of the nasal gland epithelium in mice and rats, and the olfactory epithelium in mice, were shown to be treatment- and age-related. The most sensitive endpoint of prolonged inhalation toxicity was the nasal lesion. The present study's findings of induction of mouse hepato-carcinogenicity and lack of rat nephron-carcinogenicity were compared to the mouse liver tumors and rat renal tumors reported in the NTP gavage study and discussed considering the estimated p-DCB uptake into the body via inhalation and oral administration [5].

Car Mechanics Use Market-Available Solutions to Get Rid of Rats in Automobiles. (Models Implemented) –

The methods listed below can be used to eliminate rats from automobiles to safeguard electrical harnesses and maintain a pleasant atmosphere in the vehicle.

A] Ultrasonic Rodent Repellent Devices –

Rats despise ultrasonic sounds because they can hear them, and they bring them extreme auditory stress. Humans and other pets are oblivious to the ultrasonic frequency. The electric auto repellent makes your car uninhabitable for rodents by creating a hostile atmosphere for them.

B] Rat Repellent Sprays –

Nowadays, you may buy rat repellent spray. Mechanics advise squirting it beneath the hood, particularly on the wires. It has a two-week impact before needing to be reapplied.

C] Rat Repelent Compounds –

Rat repellents come in a variety of forms, including cake, granules, and gels. Some of them are poisonous, but the majority aren't. They primarily target the mucous membrane of the rat. As a result of this long-term exposure, rats gradually develop a phobia of this odor and migrate away from the area where Rat Repellent is placed.

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D] Rat Glue Pads –
The glue pads are square-shaped pads with a strong sticky coating. Rats become trapped on it when they walk across it.

E] Rodent-Repellent Tape from Honda Company –
Honda Cars sells rat repellent. This is a fiery Capsaicin-infused electrical tape (Chilly substance extracted from capsicum). The Capsain causes rodents to become irritated. The part number for this anti-rodent tape is 4019-2317. (Available in US Honda dealerships).

PROPOSED METHODOLOGY
The major purpose of developing these strips, is to solve the problem of rat bites in automobile wiring harnesses in a cost-effective and efficient manner. Also, rodents should not be allowed to create shelters in standing, irregularly moving automobile. These strips can also be used to maintain the cosmetics of both high-end and low-end vehicles. The goal of this research is to keep the non-moving car in a pleasant state despite the presence of filthy rats. to keep rats from gnawing into the car's primary harnesses and electrical circuits Strips can be used in home settings such as kitchens, cupboards, food storage warehouses, and a variety of other places where rats can cause major damage.

A. SIZE OF STRIPS –

Fig. 1: Trapezoidal design of strip

To maintain optimum inclination while opening and shutting the bonnet, we contemplate a trapezoidal shape from the start of our project. The reasoning behind this is that because our perforated holes were on the front side of our strips, the chemical ingredient should not come out in an unpleasant circumstance. However, to ensure a cost-effective manufacturing process, we chose a rectangular form because it will be easier to build in bulk and will require fewer complex machinery. It will become versatile to use and attach to any surface if you use double sided foam tape.

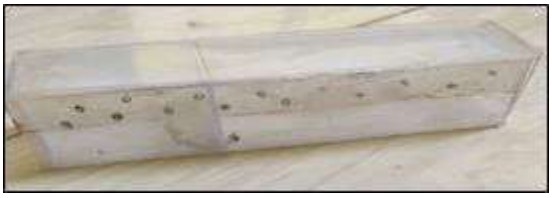

Fig. 2: Rectangular design of strips

Volume of rectangle = 10 cm x 3 cm x 3 cm

Volume of rectangle = 90 cm^3

Density of PARADICHLOROBENZENE = 1250 kg/m^3

Density of Peppermint oil= 900 Kg/ml

For PARADICHLOROBENZENE:

Mass=Density x volume

30 gm= 1250 kg/m^3 x v_1

Actual volume covering = 24 cm^3

For Oil:

Mass = Density x volume

15 ml = 900kg/ml x v_2

Actual volume covering = 16.67 cm^3

total volume covered by chemical = 40.73 cm^3

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clearance area for chemicals to sublimate= volume of rectangle – total volume covered by chemical

90cm³-40.73cm³ = 49.27 cm ³

The rationale for the huge clearance area is to account for the bending moment that occurs owing to the weight of the chemicals. The strips should not lose its adhesive over time and should provide solid, correct sticking and robust adhesion. For the strip's adhesiveness, we gave a huge sticking surface.

B. Odour Intesity of Paradichlorobenzene –

1,4-Dichlorobenzene is a colorless substance with a strong odor and a sweet flavor [6]. For 1,4-dichlorobenzene, the odor threshold is 0.18 parts per million (ppm) [7]. The molecular weight of 1,4-dichlorobenzene is 147.02 g/mol [6]. The solid crystal of paradichlorobenzene is colorless to white and has a strong unpleasant odor[8,9]. 2,3 At room temperature, it will sublimate, converting from a solid to a gas [9].3 The average sublimation rate was 1.6-4.6 x 10-3 g/minute during 19 days at 21-24 °C [10]. 4 Humans can detect paradichlorobenzene at concentrations of 15 parts per million in the air [11].

Pressure of vapor 3: 4 x 10-1 mmHg at 20 degrees Celsius [9].

Partition Coefficient of Octanol and Water (log K ow) (unitless) 3.52 [11].

1.74 x 10-3 to 2.63 x 10-3 Henry's constant (atmm3/mol) 2, 6: 1.74 x 10-3 to 2.63 x 10-3[8,12].

C6H4Cl2 = 147.0 g/mol molecular weight [12].

At 25 °C, solubility (water) 6 is 0.08 g/L (80 mg/L) [12].

275 to 833 (unitless) Soil Sorption Coefficient (K oc)[8].

Factors that affect conversion:

To convert ppm to mg/m3 concentrations in air (at 25°C)

Mg/m 3 = (ppm) × (molecular weight of the compound)/ (24.45).

For 1, 4-dichlorobenzene: 1 ppm = 6 mg/m 3.

Ppm value for 30gm mass and 90 cm³ volume is:

Ppm=(mg/m³) x (24/molecular Weight)

=(30000/0.0001)x (24/147.01ppm = 48976260.12

1 ppm = $1.225083X10^{-7}$ mg/m³

C. Odour Intensity of Menthol –

Crystals or granules, depending on their physical state. The molecular weight of this substance is 156.27.

Factors that affect conversion 6.4 mg/m3 = 1 ppm.

0.16 ppm = 1 mg/m3

Melting Point: 41-43 degrees Celsius (106-109 degrees Fahrenheit) There is no information about the isomer. Menthol is found in two polymorphs, one of which melts at 28 degrees Celsius and the other at 38 degrees Celsius.

Freezing point: 27 to 28 degrees Celsius, rising to 30 to 32 degrees Celsius with continuous stirring. Not specified isomer.

212°C (414°F) is the boiling point. Not specified isomer

0.890 g/cm3 density/specific gravity There is no information about the isomer.

CAS# 1490-04-6 (0.895 g/cm3 at 20 °C).

At 25 °C, vapor pressure is 8.5 Pa (0.064 mm Hg) (L-menthol, Isomer not specified); at 55 °C, vapor pressure is 30 Pa (0.975 mm Hg) (D/L menthol).

84 ppm (538 mg/m3) Saturated Vapor Concentration at 22-25°C (calculated; = Vapor Pressure X 1315); 132 ppm (845 mg/m3) Saturated Vapor Concentration at 55°C (calculated; = Vapor Pressure X 1315)

Partition Coefficient of Octanol/Water: log K ow = 3.2–3.4 CAS No. 1490-04-6, 2216-51-5, 15356-70-4, Isomer not defined.

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Description and Threshold of Odor: Aroma of peppermint.

0.14–0.26 ppm detection threshold odor concentration, 0.9–1.7 mg/m3

0.002–11.6 mg/ m3 is the threshold odor concentration.

Recognition threshold odor concentration 0.33 ppm, 2.1 mg/m3 Peppermint flavor

Limits on flammability: None available

(Closed cup; isomer not stated; purity > 99.7%) Flash Point: > 100°C

Temperature of autoignition is unavailable.

Other features include: +49.2 degree/D specific optical rotation (alcohol, 5 percent, D menthol)

635 UV (Sadtler Research Laboratories Spectral Collection) 410 NMR [13,14,15,16,17,18,19,20,21,22,23,24,25].

D. Odour Intensity of Citronella Oil –

Properties:
Clear liquid, pale yellow to dark yellow in color (Est)

No specific food chemicals are included in the Codex. @ 25.00 °C, gravity ranges from 0.85000 to 0.92000.

7.073 to 7.655 pounds per gallon (estimated)

At 20.00 °C, the refractive index ranges from 1.43000 to 1.52000.

Optical Rotation: -7.00 to +7.00 Optical Rotation: -7.00 to +7.00

@ 760.00 mm Hg, boiling point: 215.00 °C

At 25.00 °C, the vapor pressure is 0.100000 mm/Hg.

TCC (79.00 °C.) Flash Point: 175.00 °F.

Shelf Life: 24.00 month(s) or more if properly stored.

Store in tightly sealed containers in a cool, dry area away from heat and light.

38.94 mg/L @ 25 °C soluble in paraffin oil, murky water, and very weakly water (Est)

Propylene glycol is insoluble. In most media alkali, it is non-discoloring.

Medium odor strength; advised smelling in a 10% solution or less.

28 hour(s) at 100 percent fresh sweet citrus powdered rose weedy green dewy tomato woody at a concentration of ten percent in Di propylene glycol, the odor is described as follows: weedy green dewy tomato woody geraniol fresh sweet citrus powdery geraniol.

William tgsc Luebke (1985) CA Aromatics Company Inc. odor sample [26].

E. Damaged Cause by Rats as Well as Possible Entry Points for Rats Inside Automobile –
The vehicles were severely damaged by rats. Electrical equipment in the engine area is mostly damaged by rats. Rats devour the blowing motor plastic and the PVC plastic coating on the wiring harness with ease.

Damaged Area


Fig.3: Viper tray


Fig.4: Blowing Motor


Fig.5: Rear side harness

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Potential Entry Point in Car


Fig.6: Under viper Tray


Fig.7: Behind Covering Cap


Fig.8: Behind Glovebox in Car

EXPERIMENTAL RESULTS

After speaking with a garage mechanic, we discovered that most irregular and motionless cars are found in garages because of catastrophic car breakdowns, engine malfunctions, unpaid vehicle owner bills, and a lack of spare parts. With 30gm of PARADICHLOROBENZENE and 15ml of citronella oil, we conducted our experiment on FIAT LINEA and DATUS GO PLUS cars. We ran the experiment for 6 days and recorded the results using a SQ8 tiny DV camera in the engine compartment. We weight the chemicals before and after they are placed, and we take a reading before and after 12 hours. We physically documented garage employees' statements regarding the presence of rats in the proximity of the car. We chose a garage that has a lot of rodents. In the six days that our camera has been recording around the engine area compound, there has been no evidence of rat presence.

Conducted first experiment on 1st vehicle for 3 days of duration.

	No of Days	Chemical Combination (Citronella Oil + PDCB)	Study Length	Position	Visible Effect by Owner	Weight Of Chemical before		Weight Of Chemical After	
FIAT LINEA	Day 1	C	12 HR	On ECM	Rats didn't appear in Strips vicinity area	30	15	30	15
	Day 2	C	12 HR			30	15	30	15
	Day 3	C	12 HR			30	15	29	15


Fig.9: Strips on ECM of Fiat Linea


Fig.10: Fiat Linea in Open Garage Area

Conducted second experiment on 2nd vehicle for next 3 days in same garage with different location of car.

	No of Days	Chemical Combination (Citronella Oil + PDCB)	Study Length	Position	Visible Effect by Owner	Weight Of Chemical before		Weight Of Chemical After	
DATSUN GO PLUS	Day 4	C	12 HR	On Car Battery	Rats didn't appear in Strips vicinity area	29	15	28	15
	Day 5	C	12 HR			29	15	28	15
	Day 6	C	12 HR			28	14	27	14

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Fig.11: Strips on Car Battery of Datsun Go Plus


Fig.12: Datsun Go Plus in open garage area

MODEL DEPLOYMENT

After completing proper experiments on rats legally in government-certified laboratories, we will release our product to the market. Because we conducted our research in an open environment, the possibility of rats entering in vicinity of strips and testing the strips repellency impact was highly unpredictable. Based on previous several literature studies conducted by professional research scholars, we are using these chemicals and organic oils.

CONCLUSIONS

Due to heavy traffic, most drivers prefer two-wheeler rides to four-wheeler rides, hence rat biting is a prevalent problem in city areas. Our strips are inexpensive, so anyone can afford them, and they can also be used to maintain the beauty of high-end cars from placing sachets and poring mothballs in the garage. Our strips are removable, allowing the owner to apply and remove them as needed. Natural oils create a fresh atmosphere in odor-prone areas. It can also safeguard your car from rat bites due to the long life of the strips.

REFERENCES

[1] https://www.washingtonpost.com/science/2020/02/13/rats-will-devour-your-car/

[2] Brian P. Baker, Jennifer A. Grant, and Raksha Malakar-Kuenen, “Peppermint & Peppermint Oil Profile”, New York State Integrated Pest Management, Cornell University, Geneva NY, 8006-90-4 (Peppermint oil); 2216- 51-5 and 89-78-1 (Menthol),2018.

[3] Kalandakanond-Thongsong, Sarinee, Suwaporn Daendee, Boonrit Thongsong, and Vivat Chavananikul. 2011. “Evaluation of Cardboard Coated with Natural Substances in Combination with Ink on Rat Repellency.” The Thai Journal of Veterinary Medicine 41 (2): 205.

[4] Parv Nayak, Tankesh Kumar, AK Gupta and NU Joshi, “Peppermint a medicinal herb and treasure of health: A review ”Journal of pharmacognosy and phytochemistry, India, 9(3): 1519-1528,2020.

[5] Neena Singla and Ramandeep Kaur, “Potential of citronella oil as rodent repellent measured as aversion to food, Department of Zoology”, Punjab Agricultural University, Ludhiana 141004, Punjab., Applied Biological Research 16 (2): 191-198,2014.

[6] Agency for Toxic Substances and Disease Registry (ATSDR). Toxicological Profile for 1,4-Dichlorobenzene (Update). Public Health Service, U.S. Department of Health and Human Services, Atlanta, GA. 1998.

[7] U.S. Environmental Protection Agency. Health Effects Assessment Summary Tables. FY 1997 Update. Solid Waste and Emergency Response, Office of Emergency and Remedial Response, Cincinnati, OH. EPA/540/R-97-036. 1997.

[8] Toxicological profile for dichlorobenzenes; U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry: Atlanta, GA, 2006.

[9] Para-Dichlorobenzene: HED chapter of the Reregistration Eligibility Decision Document (RED); U.S. Environmental Protection Agency, Office of Prevention, Pesticides, and Toxic Substances, Office of Pesticide Programs, U.S. Government Printing Office: Washington, DC, 2007.

[10] Scuderi, R. Determination of para-dichlorobenzene releases from selected consumer products. Unpublished report, 1986, submitted to U.S Department of Health and Human Services prepared by Midwest Research Institute, Kansas City, MO. Toxicological profile for dichlorobenzenes; U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry: Atlanta, GA, 2006.

ISSN 2394 - 7780

[11]Hollingsworth, R. L.; Rowe, V. K.; Hoyle, H. R.; Spencer, H. C. Toxicity of paradichlorobenzene. AMA Arch. Ind. Health 1956, 14 (2), 138-147.

[12] Lide, D. CRC Handbook of Chemistry and Physics; CRC Press Inc.: Boca Raton, FL, 1994; p 16-25.

[13] Budavari, S. The Merck Index- An Encyclopedia of Chemicals, Drugs, and Biologicals; Merck and Co., Inc.: Whitehouse Station, NJ, 1996.

[14] OECD SIDS Program. Menthols. 2003.

[15] Osol, A.; Robertson, P. The United States Dispensatory; JP Lippincott Company: Philadelphia, 1973.

[16] Blacow, N. W. Martindale: The Extra Pharmacopoeia; Blacow, N. W., Ed.; Pharmaceutical Press, 1972.

[17]Chem ADVISOR. Chem ADVISOR, Inc. – Chem ADVISOR Online Login https:// www. chemadvisor. com/ lolionline/LOLI/LOLI_ LOLIQUERY.aspx ?SRCHVAL=221.

[18] Perry, R. H.; Green, G. D. Perry's Chemical Engineers' Handbook: Physical and Chemical Data; McGraw-Hill: New York, 1984.

[19] IUCLD. 1490-04-6. DL-Menthol Datasheet. 2000.

[20] Yalkowsky, S. H.; Dannenfelser, R. M. Aquasol Database of Aqueous Solubility. Coll. Pharm. Univ. Ariz. Tucson AZ 1992.

[21] Weast, R. C. CRC Handbook of Chemistry and Physics; Weast, R. C., Ed.; 60th ed.; CRC Press: Boca Raton (FL), 1979.

[22] Murphy, C. Age-Related Effects on the Threshold, Psychophysical Function, and Pleasantness of Menthol. J. Gerontol. 1983, 38, 217–222.

[23] Nagata, H.; Dalton, P.; Doolittle, N.; Breslin, P. A. S. Psychophysical Isolation of the Modality Responsible for Detecting Multimodal Stimuli: A Chemosensory Example. J. Exp. Psychol. Hum. Percept. Perform. 2005, 31, 101–109.

[24] Johnson, L. F.; Jankowski, W. C. Carbon-13 NMR Spectra; Wiley-Interscience, New York, 1972.

[18] Weast, R. C. CRC Handbook of Data on Organic Compounds; Weast, R. C., Ed.; CRC Press: Boca Raton (FL), 1985; Vol. 1 & 2.

[25] Lewis, R. J.; Sax, N. I. Dangerous Properties of Industrial Materials; 9th ed.; Van Nostrand Reinhold: New York, 1996; Vol. 1-3

[26] Canada Domestic Sub. List: 4000-29-1 PubChem (Sid): 135289152

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DRAG REDUCTION SYSTEM ANALYSIS ON TATA NEXON

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ABSTRACT
Aerodynamic styling of the vehicle is one of the promising technologies which can not only improve the fuel efficiency, but also ensure better stability and good handling characteristics of vehicles at higher speed especially on highways. The paper includes assessment of drag force (Fd) and drag coefficient (Cd) by the conventional wind tunnel method. The experimental calculations were performed using subsonic wind tunnel having a test section of 100cm x 30cm x 30 cm. An exact replica of a model of Sports Utility Vehicle (SUV) on reduced scale 1:32 was used to conduct and perform the experiment for calculating Fd and Cd. Three-dimensional (3D) computational analysis was carried out using Gambit as the preprocessing software and Fluent as the solver and post-processor. The comparison of computational approaches with experiment shows that the computed Fd agrees well with the experimental values over the entire range of air velocities. The design and development of an active Drag Reduction System (DRS) for multielement wings in a race car application is described. Such systems are currently allowed within certain racing categories, including Formula 1, and provide the opportunity to run increased down force levels for cornering and braking events, whilst minimizing drag during straight line acceleration. Switching from the high down force to the low drag mode is achieved by individual rotation of the trailing edge flaps. This aerodynamically decouples the multielement configuration and converts it to a staggered multi-plane assembly, reducing the liftinduced drag produced by the wing. In the present example, DRS is applied to both the front and rear wings of the car in an effort to retain an acceptable aerodynamic balance when the system is deployed, thereby retaining aerodynamic stability and allowing DRS to be used in partial cornering situations. Numerical models are developed to predict the quasi-static aerodynamic performance of the wings in isolation as the flaps are progressively rotated. These results are correlated with full scale wind tunnel tests. Maximum drag reductions of 70% and 83% are predicted for the front and rear wings respectively. Down force was found to be reduced by 37% for the front and 67% for the rear wing, with the large difference attributed to the fact that the front wing is operating in ground effect. A numerical simulation of the full car with front and rear wings, driver and underbody diffuser predicted that the application of DRS resulted in a maximum full car drag reduction of 62%. However, this mode was found to produce an unacceptably large forward shift in the aero balance, which would make the car extremely unstable and prone to over steer. By reducing the magnitude of DRS applied to the rear wing a configuration was found which slightly improved the aerodynamic balance and stability of the car at high speeds whilst still delivering a total drag reduction of 54%. In fluid mechanics, drag related problems aim to reduce fuel consumption. This paper is intended to provide guidance for drag reduction applications on cars. The review covers papers from the beginning of 2000 to April 2020 related to drag reduction research for ground vehicles. Research Papers were collected from the library of Science Direct, Web of Science, and Multidisciplinary Digital Publishing Institute (MDPI). Achieved drag reductions of each research paper was collected and evaluated. The assessed research papers attained their results by virtual wind tunnel measurements or calculating validated numerical models. The study mainly focuses on hatchback and notchback Shaped ground vehicle drag reduction methods, such as active and passive systems. Quantitative Analysis was made for the drag reduction methods where relative and absolute drag changes were used for evaluations.

INTRODUCTION
Recently automobile fuel economy, emissions, and recycling have become an important social concern. At the meantime, automotive industry competition has become more brutal and automotive companies began to put more effort on advanced vehicle design. Engineers believe that the automobile should be affordable, yet appealing, safe, and inexpensive to drive. The well-designed aerodynamic vehicle consumes not only less fuel in overcoming the drag exerted by air while running at higher speeds, but also offers good stability and handling. Aerodynamic styling of a car is one of the most crucial aspects of car design-a highly complex Phenomenon, encompassing the task of an artful integration of advanced engineering and stylish aesthetics. A lot of emphasizing is laid on the aerodynamics in car design as an aerodynamically well-designed car spends the least power in overcoming the drag exerted by air and hence exhibits higher performance- cruises faster and longer, that too less fuel.

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There are different types of forces acting on a vehicle when it is in motion such as drag force and lift force. Drag force being the more prominent one is more responsible for increased fuel consumption and lower top speed of a vehicle. There are various types of drag forces acting on a vehicle namely: Parasitic drag, lift, induced drag and wave drag. Parasitic drag is further sub divided into form, skin friction and interference drag. These individual drags are very difficult to calculate and hence most people are concerned in finding the overall drag coefficient of a vehicle. This can be found out in wind tunnels by making numerous scaled models of vehicles to be tested or in nowadays we prefer by calculating coefficient of drag force on any analysis software.

The advantage over wind tunnel with scale model is that we can also save money and time. The fuel prices are rapidly increasing and the regulation of greenhouse gasses to control global warming gives tremendous pressure on the design engineers to enhance the current designs of the automobile using minimal changes in the shapes. To fulfill the above requirements, design engineers have been using the concepts of aerodynamics to enhance the efficiency of automobiles, and it was found that drag causes many problems in the performance of SUV models like instability, noise and fuel consumption.

In 2011, in a bid to increase the opportunities for passing, Formula 1 re-introduced actively controlled aerodynamics in the form of a Drag Reduction System (DRS) for the rear wing. This system was essentially a moveable flap on the rear wing which could be turned out to reduce drag along the straights. Unlike a typical commercial aircraft wing which uses a multi-element configuration that retracts into a single element configuration, race cars have adopted a different approach. As most race car wings are simply supported between endplates and skin friction is of little consequence, a reduced drag (and down force) configuration can be achieved more easily by rotating and aerodynamically decoupling each element within an existing multi-element configuration. When each element is rotated to ~0° angle of attack, the assembly becomes multi-plane with both vertical spacing and stagger of the order of the flap chord lengths. The effectiveness of these systems has inspired various road car manufacturers and after- market suppliers to re-examine and develop actively controlled wings.

There is also growing interest in actively controlled aero amongst Formula SAE and Formula Student competitions, which have always allowed such devices. In 2011 at the FSAE-WEST competition the Oklahoma Formula SAE team (Sooner Racing) debuted the first actively controlled wings seen in Formula SAE history, with front and rear wing flaps dynamically actuated by micro-servos.

“We are planning to increase speed by reducing drag of Passenger vehicle by applying addition body parts on it. The main body part will be a Spoiler or Rear wing. The idea came in our mind from Formula 1 Race car, they are using **DRS** (Drag Reduction System) under certain parameters to overtake front vehicle by converting their turbulent air flow into streamline airflow.”

For testing aerodynamics on the vehicle in virtual wind tunnel we’re using **ANSYS workbench**. In that by the help of **FLUENT** module we will achieve our result.

AIMS AND OBJECTIVES

The aim of this project is to implement the DRS System (Drag Reduction System) in Public Cars. As the DRS system has many different advantages from improved Aerodynamics to improved vehicle performance. This system allows the vehicle to induce a down force on the vehicle and will increase the top speed by 10% - 20%. It increases the traction also while running at top speed.

We are trying to implement this on SUV, sedan or hatchback cars and will analyse the result we get accordingly at various speeds. We have selected TATA Nexon for this analysis. This an SUV type of car. We will implement the DRS and will try to improve the down force of the vehicle at top speed. This in result will also improve the efficiency of Engine will running at top speed on highways. As now a days it is important to make the vehicle as efficient as it can be by making a perfect body design which can resist the turbulence of the wind.

While analysing this on the Sedan, SUV vehicles there will be some kind of complications which have to face. As the vehicle design is stream lined. Finding out the flow separation will be very difficult. Whenever there is relative movement between a fluid and a solid surface, whether externally round a body, or internally in an enclosed passage, a boundary layer exists with viscous forces present in the layer of fluid close to the surface. Boundary layers can be either laminar or turbulent.

So, we have to calculate the boundary layer separation at different regions of the vehicle and have analyse it very closely. This will also help us to understand the low-pressure points at the vehicle body.

The objective is to convert a passenger car into a super-efficient vehicle with the help of aerodynamics.

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METHODOLOGY

- **Problem Identification**

High fuel consumption due to poor aerodynamic design in commercial vehicle

- **Previous History**

In 2011, in a bid to increase the opportunities for passing, Formula 1 re-introduced actively controlled aerodynamics in the form of a Drag Reduction System (DRS) for the rear wing [5]. This system was essentially a moveable flap on the rear wing which could be turned out to reduce drag along the straights [6].

- **Brain-storming Ideas**

Implement of movable spoiler at rear end, with diffuser and fins if needed. Create model of car and run simulation to check existing aerodynamic result, and after that design suitable rear wing and improve existing aerodynamic result. To test it import car model into Ansys 15.0 Fluent, by analyzing CDF check comparison between drag and lift force.

- **Basic Calculations**

Check necessary calculation data from other research papers. Drag Force predominantly depends upon the velocity, frontal area, and coefficient of drag of the body

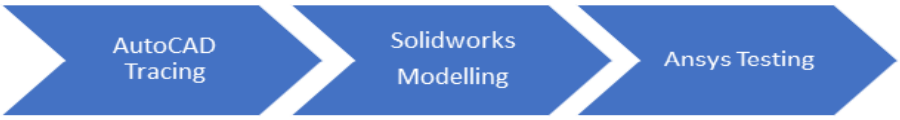
- **3D Modeling**

Our aim is to prove existing cars up gradation so we are not actually making car 3D model because it is time consuming, we will download the existing design from internet and import it into SOLIDWORKS 2016 to check surface quality. We will design an aerofoil for particular commercial car because we cannot use F1 rear wing into commercial vehicle.

- **Analysis Study**

The three-dimensional car model was imported to ANSYS™ workbench. If necessary, we will repair car surface to gain good meshing quality. Computational Fluid Dynamics (CFD) was carried out in the FLUENT module. In Design Modeler, an enclosure is developed to form a virtual wind tunnel.

- **Design and Analysis Methodology**



- **Research and Developments**

After analysis there might be some error or not as expectation so we will learn from mistakes by modify some data, design etc. and will develop to get expected as well as revolutionary results.

- Model Modification.
- Meshing.
- Inflation Layer.

RESULTS

Analysis on Tata Nexon XE

Contour of Velocity Magnitude

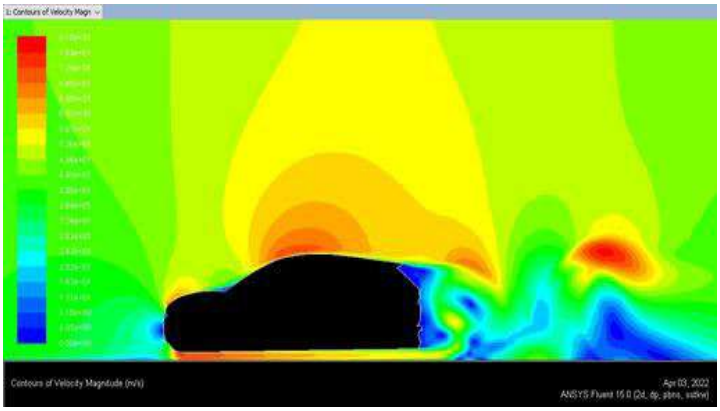


Figure 10: Existing Model

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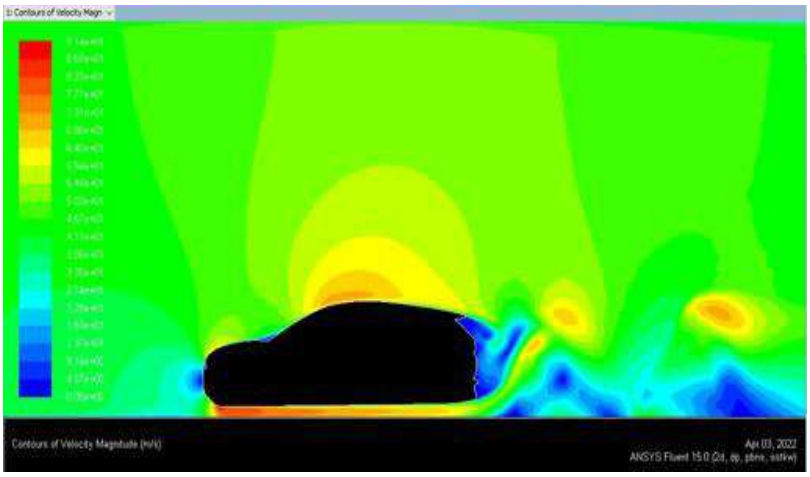

Figure 11: Upgraded Model

- Above results are found at 150 kmph speed.
- The figure 4a shows existing design of TATA Nexon XE.
- In other hand figure 4b shows upgraded design of TATA Nexon XE.
- We can easily observe the flow at afterbody, In figure 4a the velocity of air is much more disturbed than that of figure 4b.
- Basically we ignore the effect of wheels, but the Thumb rule which is accepted by aerodynamic researchers, i.e. if you get drag value Cd = X (without wheels) then the value of Cd is equal to 1.5 X (with wheels).

Drag Force on Existing Model

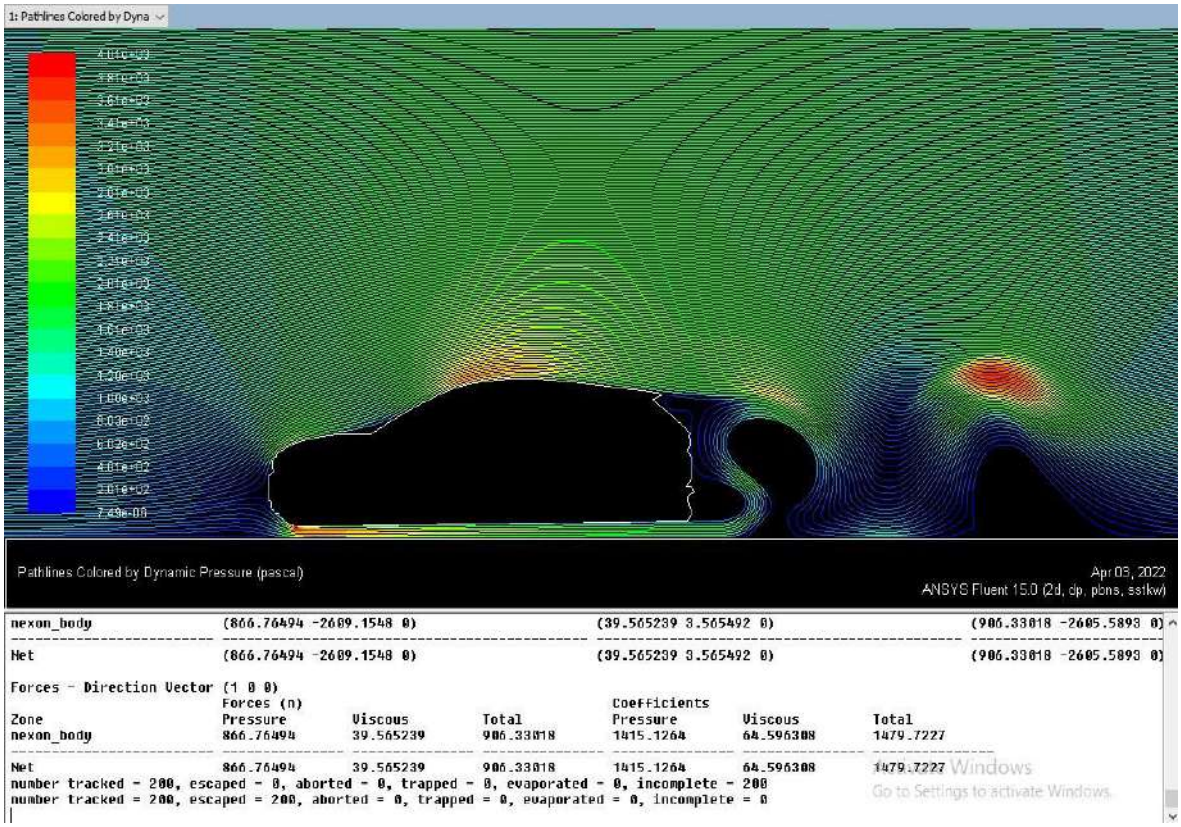

Figure 12: Drag Force on existing Model, Showing Pathline.

- The total drag value on exiting model is 906.3 N.
- The flow coming from underneath the body is get disturbed and we can see the eddies formation after body.
- Our target is to delay the boundary layer separation meaning the low-pressure loop is created just at the after body, resulting increases the drag value.

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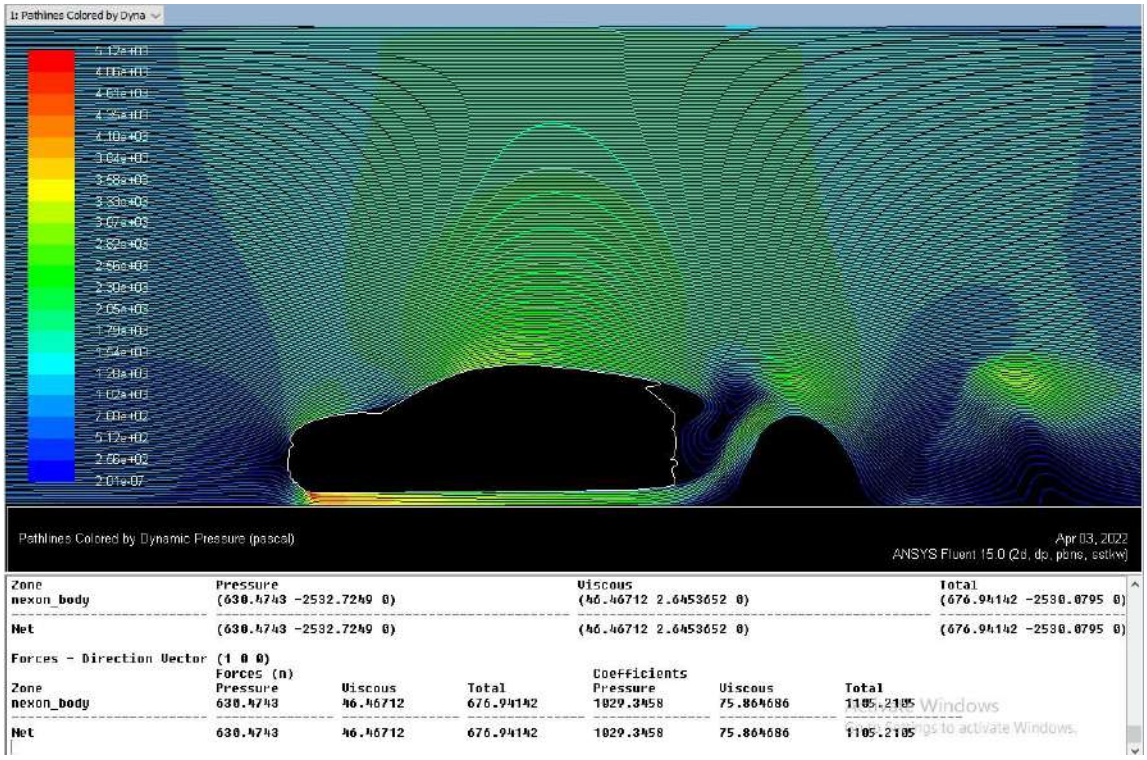
- There will be more fuel consumption to achieve the speed of 150kmph.

Drag Force on Upgraded Model



Zone	Pressure	Viscous	Total
nexon_body	(630.4743 -2532.7249 0)	(46.46712 2.6453652 0)	(676.94142 -2530.0795 0)
Net	(630.4743 -2532.7249 0)	(46.46712 2.6453652 0)	(676.94142 -2530.0795 0)

Forces - Direction Vector (1 0 0)

	Forces (n)			Coefficients		
Zone	Pressure	Viscous	Total	Pressure	Viscous	Total
nexon_body	630.4743	46.46712	676.94142	1029.3458	75.864686	1105.2105
Net	630.4743	46.46712	676.94142	1029.3458	75.864686	1105.2105

Figure 13: Drag Force on Upgraded Model, Showing Pathline

- The total drag value reduced on upgraded model is 677 N. It almost reduced by 25% than previous one.
- The flow coming from under body is smoothly transferred and we can see the formation of eddies have been decreased.
- The boundary layer separation has been delayed successfully at rear end spoiler and diffuser.

Boundary Layers at Rear Bottom End

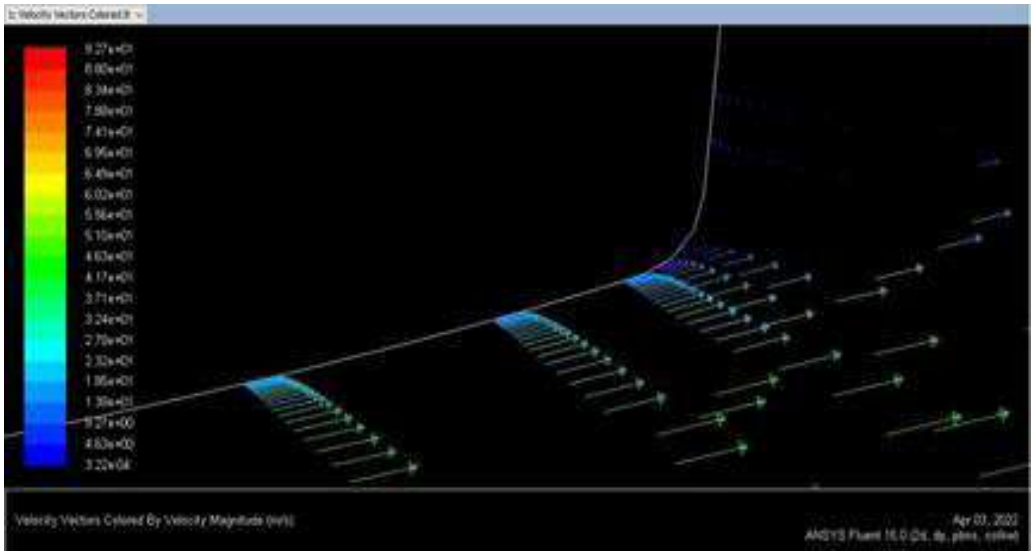


Figure 15: Boundary Layer Separation at Rear End Bottom

- The diffuser acts as an expansion chamber to manage the air as it exits from underneath the car and reintegrates it with higher-pressure ambient air. Smoothing this transition reduces turbulence and drag in the car's wake and improves airflow under the car.
- As we observed previous results after introducing a diffuser the flow is smoothly passing with minimum boundary layer separation.

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- In figure 6b we can see how the boundary layers are created without separation on the curvature of diffuser. To know more about diffuser check figure 6a.

Boundary Layer at Spoiler End

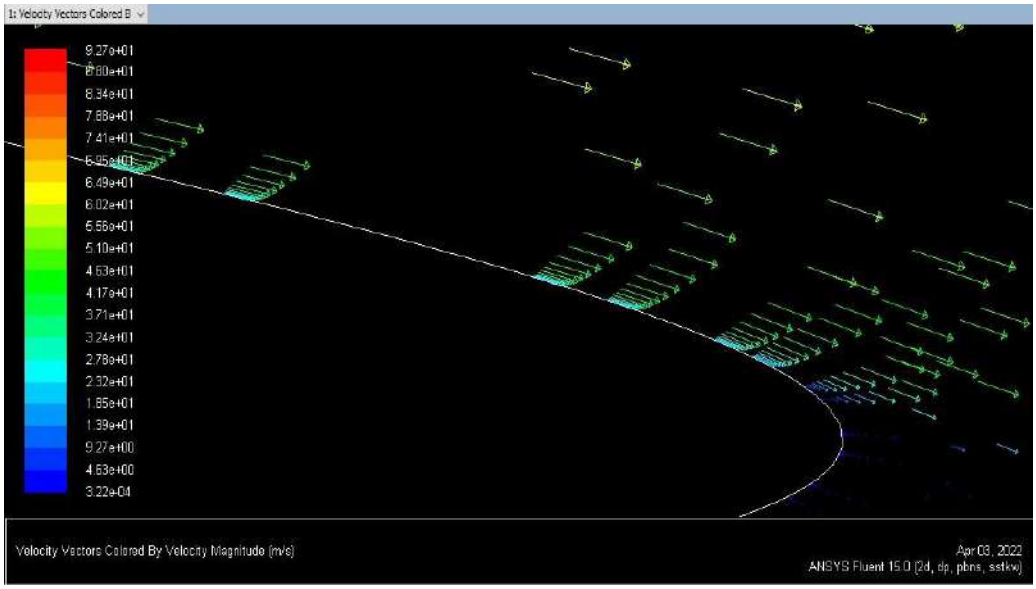

Figure 16: Boundary Layer Separation at Spoiler End

- As we observed previous results after enlarging the spoiler flow is smoothly passing with minimum boundary layer separation.
- In figure 7 we can see how the boundary layers are created without separation on the curvature of spoiler.

Area Consideration for Coefficient of Drag

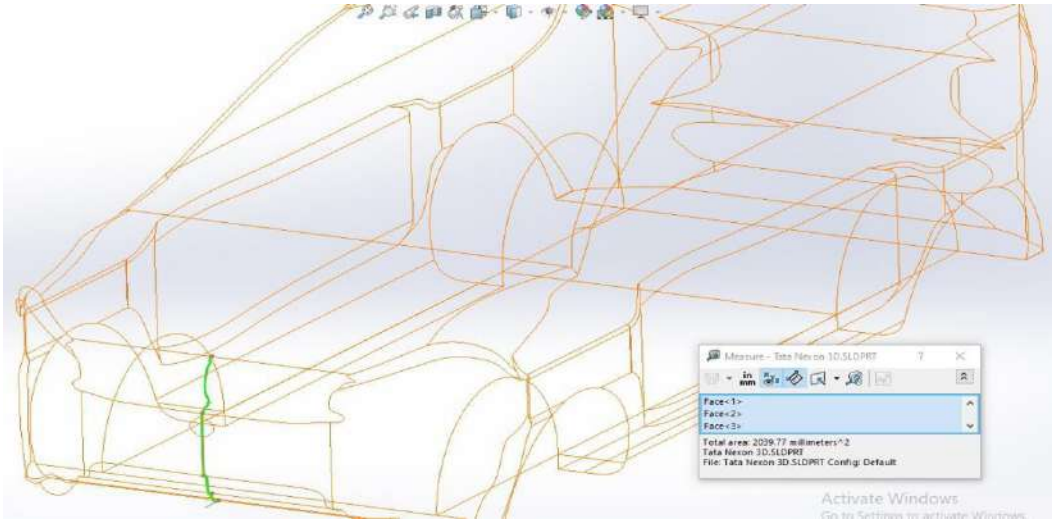

Figure 17: Figure Showing the Area Consideration.

- Due to 2D analysis we can not consider whole frontal area, we have considered an elemental strip on frontal area.
- In figure 8 we can observe the area we have got for elemental strip is about 2 m^2. This is the area we have consider for calculating drag coefficient value.

CALCULATION

Coefficient of drag Cd = 2D / (ρ * v2 * A)

Were,

D = Drag (N)

ρ = Density of fluid (kg/ m3)

v = Velocity of fluid (m/s)

A = Contact area (m2)

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Given
D before = 906.3 N
D after = 677.0 N
ρ = 1.225 kg/ m3
v = 42 m/s
A = 2 m2
Note: All units are in Metric.
Coefficient of drag for Existing TATA Nexon XE
Cd before = 2 * 906.3 / (1.225 * 422 * 2)
Cd before = 0.41
Coefficient of drag for Upgraded TATA Nexon XE
Cd before = 2 * 677 / (1.225 * 422 * 2)

Cd after = 0.31

CONCLUSION

The constant evolution in the history of vehicle aerodynamics has led to the development of certain devices which led to the enhancement of the overall aerodynamics characteristics of the vehicles. Not only it improves the efficiency of the vehicle but also reduces fuel consumption. The drag has been reduced by 25%. This equates to a 25% reduction in fuel consumption. It will provide a speed advantage of 10-12 kmph while overtaking at high speeds. While turning, the traction and stability will be excellent.

The drag on the rear wing can be decreased by utilizing a drag reduction system (DRS) as observed from the results. Further investigation of computational fluid dynamics and aerodynamics is recommended to compliment the result. There is uncertainties in the results due to inadequacy in the mesh and design of the rear wing. By addressing these uncertainties better results can be achieved.

This is a 2D Analysis so we didn't examine elements like varied mechanical losses, spoiler and diffuser orientation, effect on wheels, environmental conditions, etc. In conclusion, it may be regarded as proper optimization can lead to better aerodynamics of the vehicle in different scenarios.

REFERENCES

[01] Christoph Strangfeld, Dirk Wieser, Hanns-Joachim Schmidt, Rene Woszidlo, Christian Nayeri And Christian Paschereit :- Experimental Study of Baseline 2013-01-0037leristics for the Realistic Car Model Driver, SAE International, Doi:10.4271/2013-01-1251.

[02] Katz, J., 1985, Calculation of the Aerodynamic Forces on Automotive Lifting Surfaces.

[03] K.BurginJ.P.Beatham, Wind tunnel tests on road vehicle models using a moving belt simulation of ground effect.

[04] K. R. Cooper:- Bluff-Body Aerodynamics As Applied To Vehicles, Journal Of Wind Engineering And Industrial Aerodynamics.

[05] Felix Regin A. and Manoraj Manimanoharan, and, Akepati Bhaskar Reddy and Prakash Nigam:- Aerodynamic Analysis of Cabriolet Passenger Car: A Design Approach, SAE International, doi:10.4271/2013-01-0037.

[06] S. Watkins*, J.W. Saunders, P.H. Hoffmann, Turbulence experienced by moving vehicles. Part I. Introduction and turbulence intensity.

[07] Kevin P.Garry, Some effects of ground clearance and ground plane boundary layer thickness on the mean base pressure of a bluff vehicle type body.

[08] Antonello Cogotti ,Industrie Pininfarina s.p.a., has studied in their paper named, A Parametric Study on the Ground Effect.

[09] Arvin R Savkoor, CT Chou, Application of aerodynamic actuators to improve vehicle handling, Vehicle System Dynamics 32 (4-5), 345-374, 1999.

[10] Mark E. Gleason: - Detailed Analysis of the Bluff Body Blockage Phenomenon in Closed Wall Wind Tunnels Utilizing CFD, SAE International.

[11] Andrea E. Senior, Ph.D student, Xin Zhang, The Force and Pressure of a Diffuser-Equipped Bluff Body in Ground Effect.

[12] Basudev Datta, Vaibhav Goel, Shivam Garg, and Inderpreet Singh;- Study of Various Passive Drag Reduction Techniques on External Vehicle Aerodynamics Performance: CFD Based Approach International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056 Volume: 06 Issue: 05 | May 2019

[13] D M Bushnell:- Aircraft drag reduction - a review Proc. Instn Mech. Engrs Vol. 217 Part G: J. Aerospace Engineering

[14] Xin Zhang, Willem Toet, Jonathan Zerihan, Ground Effect Aerodynamics of Race Cars.

[15] Steven De Groote on 02 Jan 2007, Aerodynamic study of the CDG concept.

[16] K. S. Song, S. O. Kang, S. O. Jun, H. I. Park, J. D. Kee, K. H. Kim, And D. H. Lee, Aerodynamic Design Optimization Of Rear Body Shapes Of A Sedan For Drag Reduction.

[17] Manan Desai, S.A.Channiwala, H.J. Nagarsheth, "Experimental and Computational Aerodynamic Investigation of a Car," Wseas Transactions on Fluid Mechanics, vol.3, pp 359-368, Oct. 2008.

[18] Variation in Aerodynamic Drag and Lift by addition of a Rear Spoiler in a Passenger Car 1Kunj Thummar, 2Neel Shah, 3Vishal Vaghrecha, 4Subhasis Sarkar Babaria Institute of Technology, Vadodara, India

[19] Jeffrey William Saunders and Rached Ben Mansour:- On-Road and Wind Tunnel Turbulence And its Measurement Using a Four-Hole Dynamic Probe Ahead of Several Cars, Society of Automotive Engineers, Inc.

[20] S. Kirubakaran, Numerical Model Using The Computational Fluid Dynamics (CFD)

[21] Angelina I. Heft, Thomas Indinger and Nikolaus A. Adams:- Introduction of a New Realistic Generic Car Model For Aerodynamic Investigations, SAE International, Doi:10.4271/2012-01-0168

[22] S.M. Rakibul Hassan*, Toukir Islam, Mohammad Ali, Md. Quamrul Islam, Numerical Study on Aerodynamic Drag Reduction of Racing Cars, Procedia Engineering 90 (2014) 308 – 313

[23] Chung Sun Lee*, Abdulkareem Sh. Mahdi Al-Obaidi :- Calculation and Optimization of the Aerodynamic Drag of An Open-Wheel Race Car, EURECA 2013.

[24] Fereydoon Diba, Ahmad Barari, Ebrahim Esmailzadeh, Handling and safety enhancement of race cars using active aerodynamic systems, Vehicle system dynamics 52 (9), 1171-1190, 2014.

[25] Jangdeog-dong, Hwaseong-si, Gyeonggi, Actively Translating A Rear Diffuser Device For The Aerodynamic Drag Reduction Of A Passenger Car.

[26] Numerical Study on Aerodynamics Drag Reduction on a Rear Wing of a Formula Student Car, by MAHIM AHSAN.

[27] Jianfeng Wang, Hao Li, Yiqun Liu, Tao Liu, and Haibo Gao: - Aerodynamic research of a racing car based on wind tunnel test and Computational fluid dynamics, MATEC Web of Conferences 153, 04011 (2018), ICMME 2017.

[28] Investigation of Aerodynamic Forces on Vehicle using CFD Technique Deepak B. Kushwaha1, Vikas V. Chaurasiya2, Mohd. Raees3 March 2017 | IJIRT | Volume 3 Issue 10 | ISSN: 2349-6002

[29] Ashok Misra:- Simulation of Aerodynamic Flow Parametersovera Simplified Sedan Car, International Journal of Engineering, Science and Mathematics Vol.6Issue 8, December2017, ISSN: 2320-0294, Impact Factor: 6.765.

[30] N.A.Siddiqui, Nature-inspired solutions to bluff body aerodynamic problems.

[31] S N Singh, L Rai, P Puri, and A Bhatnagar, Effect of moving surface on the aerodynamic drag of road vehicles.

[32] Dinesh Dhande, Manoj Bauskar, :- Analysis of Aerodynamic Aspects of SUV by Analytical and Experimental Method, International Journal of Emerging Technology and Advanced Engineering Website: www.ijetae.com (ISSN 2250-2459, ISO 9001:2008 Certified Journal, Volume 3, Issue 7, July 2013)

[33] A. Cogotti: - Evolution of performance of an automotive Wind tunnel Journal of Wind Engineering and Industrial Aerodynamics 96 (2008) 667–700

ISSN 2394 - 7780

[34] Gu Yunqing, Liu Tao, Mu Jiegang, Shi Zhengzan, and Zhou Peijian :- Analysis of Drag Reduction Methods and Mechanisms of Turbulent Hindawi Applied Bionics and Biomechanics Volume 2017

[35] S N Singh, L Rai, P Puri, and A Bhatnagar, Effect of moving surface on the aerodynamic drag of road vehicles.

[36] BALLA VENUKUMAR and KPJ REDDY:- Experimental investigation of drag reduction by forward Facing high speed gas jet for a large angle blunt cone at Mach 8, Sadhan ¯ a¯ Vol. 32, Parts 1 & 2, February–April 2007, pp. 123–131. © Printed in India

[37] Yang X, Cai Z, Ye Q (2019) Aerodynamics analysis of several typical cars. J EngThermophys 28(2):269–275.

[38] XZhangARuhrmann, Vortices behind a bluff body with an upswept aft section in ground effect.

[39] K.Suhit Reddy, Jayakrishnan, Drag Reduction in Automotive Vehicles, International Journal of Scientific & Engineering Research Volume 10, Issue 9, September-2019, ISSN 2229-5518

[40] 1 Darshan M. Desai, 2 Imran Molvi:- Effect Of Various Aerodynamic Drag Reduction Methods On Vehicle- A Review, International Journal Of Advance Engineering And Research Development Volume 4, Issue 6, June -2017

[41] Nath et al. Advances in Aerodynamics (2021) 3:4

[42] M. Hariharan, E. Harish Babu, S. Kirubakaran, S. Gopalakrishnan, :- Drag Reduction on Passenger Car, Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 6, 2021, Received 25 April 2021; Accepted 08 May 2021.

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DESIGN AND FABRICATION OF ADAPTIVE HEADLIGHT SYSTEM USING LDR AND ARDUINO NANO

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ABSTRACT
Bright lights coming from the upcoming vehicles on a night highway road give rise to fatal glare and dazzling effects. These effects have always been discomforting to the drivers. Also, the lack of illumination by the headlights leads the blind spots on a steep curvy road. To overcome these phenomena, many measures have been taken place in Asian as well as American countries. The concept of the Adaptive Headlight System is one of the effective solutions built by many car brands to tackle the problem. The system works by actively monitoring upcoming traffic and giving outputs accordingly to enhance the driving experience as well as reduce the high accident rates due to bright lights. The future scope of this system can include adaptive headlights being controlled by vehicle speed. High speed can correspond to the headlights being more divergent, and at low speed, headlights can be made to converge to get a better lit area while driving. In this paper, the fabrication of an Adaptive Headlight System using Light Dependent Resistor(LDR) and microcontroller Arduino NANO has been discussed.

Keywords: Blind Spots, Dazzling effect, Glare effect, Headlight Movement, Intensity Control.

INTRODUCTION
The bright lights from the upcoming vehicle directly fall on the driver's eyes. This results in temporary vision loss, which is undesirable while driving at a high speed at night. As per the Royal Automotive Club (RAC) in Western Australia, almost 70% of the drivers feel that these dazzling and glare effects are very risky and 300 collisions occur every year due to dazzling bright headlights. As per the surveys conducted by the Ministry of Road Transport and Highways (MoRTH), more than 700 blind spots have been identified on Indian highways. According to Fortune India, 74% of cars use high beam lights which can lead to catastrophic accidents. In the current scenario, many cars brand have developed their unique Adaptive Headlight Systems. Some of the Adaptive Headlight Systems which currently exist in the automobile industry are Mercedes Benz Intelligent Lighting Systems (ILS), Mazda Adaptive LED Headlights (ALH), and Porsche Dynamic Lighting System (DLS), etc.

In this project, we have developed an Adaptive Headlight System that works on two aspects, movement of the headlights by the steering wheel input and simultaneous intensity control of headlights by active monitoring of upcoming traffic through Light Dependent Resistor (LDR). The existing Adaptive Headlight Systems are very expensive and complex. These systems cannot be implemented on low-end car versions. Thus, a convenient and budget-friendly Adaptive Headlight System, which can be easily installed in normal mid-range cars is essential. After thorough research in the past work on the topic, we designed an Adaptive Headlight System which is extremely simple yet an effective working model. It needs no manual operation for switching ON and OFF. When the LDR detects the light from an oncoming vehicle, it automatically dims the light and when the vehicle passes by, it automatically switches back to the normal or bright headlight. The main objective of this project is to reduce the accidents caused by headlight glare and dazzling effects, as well as blind spots. It is also aimed to ensure high safety along steep curves and sharp turns.

LITERATURE REVIEW
Li. Y. et al., (2011) proposed a model using two machine learning-based approaches, Servo Vector Machine (SVM) and AdaBoost. Frame-level beam decision making with temporal smoothing was incorporated. The system has been extensively tested both online and offline to validate the robustness and effectiveness of the two proposed approaches. They compared model with Mobil-eye and Mercedes Benz night-view headlight system. They trained both SVM and AdaBoost models with the same set of data.

Mohite H., et al., (2015) proposed an Electronic Control Power Steering (ECPS) was used which turns the headlights as per the steering wheel rotation along with various light sensors. They built a mechatronic system by using microcontroller, relay, sensor and motor. The light sensor senses the intensity of light and turns on the headlight whenever the intensity of light falls below a certain value.

Wu Y. and He. L. (2019) proposed multi-sensor fusion technology in which the NCV78663 chip is used as the main chip of the LED headlamp driving unit. They measured data by changing the number of lamp beads or the

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current setting. They developed a relationship between illuminance and headlamp turn-on ratio at different times. They also compared the model with Audi A8L and BMW Q series.

Omkar P. et al., (2017) presented a hardware in the loop simulation of an Adaptive Headlight System (AHS) for motor vehicles, which is an active safety system where the headlamp orientation control system rotates the right and left low beam headlights independently and keeps the beam as parallel to the curved road as possible to provide better visibility at night.

Aishwarya J. et al., (2020) proposed an automation system that illuminates the headlight beam towards the concerned area when taking a steep turn. They developed an automated headlight system using Arduino Uno which automatically detects traffic from the opposite direction and switches the light to low beam. This helps for a better and safer driving experience.

Priyanka D. and Dr. Alam S. (2018) emphasized on the Adaptive Front Lighting System (AFLS) which detects the information about the corners in advance with help of sensors and sends information to the motor to adjust headlamps to get the lighting beam suitable for the corners, thus avoiding blind spots.

Ashiq K. A. and Ranganathan A., (2015) proposed controlling the brightness of headlights using vehicle speed by varying the current flowing from the battery to the headlights. The voltage and current obtained from the alternator was varied with speed. This varying power from the alternators according to speed is directly supplied to the headlights so that brightness changes according to speed.

EQUIPMENT

The steering rack and steering wheel needed for this setup have been taken from a Maruti Suzuki Wagon R model. Mild Steel (MS) is used to build the main-frame on which the steering system is to be assembled. Two separate frames have been built to fix headlights to the main-frame. The battery needed to power the electronic circuitry of the system has a 12 Volt output and is fitted on the main-frame. The electronic circuitry of the Arduino NANO has been elevated via a rod on the main-frame to give better exposure to the LDR which is meant to capture the light from the oncoming vehicle. The headlights are taken from the Royal Enfield Classic 350 X model. The description of all the equipment is given below.

Steering Rack: The steering rack looks like a long metal tube that is located near the front of the vehicle. As the pinion gear rotates, the steering rack moves left or right between the two front wheels. This transfers the steering wheel input into the energy that moves the vehicle's front wheels to steer.

Steering Wheel: A steering wheel and the system it connects to primarily controls the direction of a vehicle. It converts the rotational commands of the driver into swivelling movements of the vehicle's front wheels.

Main-Frame: The function of the main-frame in this system is to support the mechanical components and other accessories and deal with the loads without undue deflection or distortion.

- Material: Mild Steel
- Dimensions: 900 x 500 x 300 mm
- Frame rod cross section: 40 x 40 mm

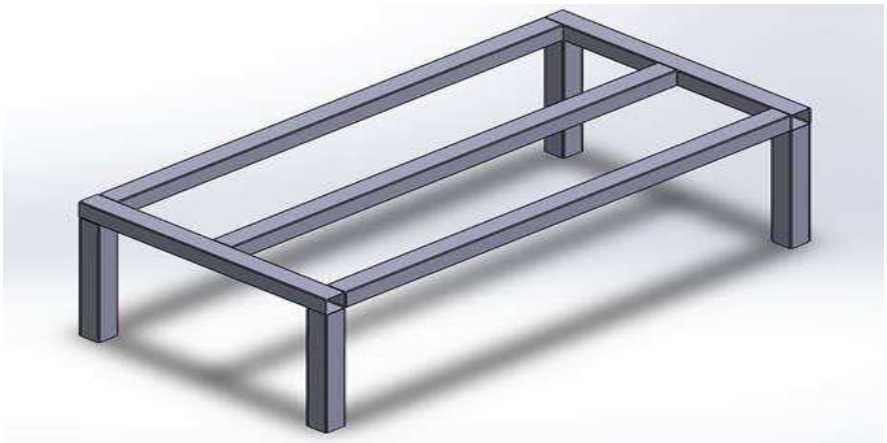

Figure 1: Proposed main-frame CAD model

Headlights: A headlight is attached to the front of a vehicle to illuminate the road ahead. The primary task of headlights on cars is to illuminate the roadway and facilitate fatigue-free and safe driving.

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Headlight Frames: Two square frames were built for holding the headlights. These frames were fixed on the main-frame and connected to the linkages via fasteners.

Linkages: Two linkages have been used to connect the headlight frames to the steering system. The length of the linkages is 300 mm and the material used to make them is mild steel.

Battery: A 12 Volt battery has been used as a DC power supply source to run the Arduino NANO. The charging current of the battery is 3.5 Amps and it is fitted on the main frame.

Microcontroller: The Arduino NANO is a small, complete, and breadboard-friendly board based on the. It offers the same connectivity and specs as the Arduino Uno board in a smaller form factor.

- Microcontroller: Arduino NANO
- Operating voltage: 5 volts
- Input voltage: 7-12V
- Digital I/O pins: 22 (6 optional PWM outputs)
- Analog input pins: 8
- Power consumption:19 mA

LDR: Light Dependent Resistor (LDR) is a type of semiconductor and its conductivity changes with a proportional change in the intensity of light. It is a resistor whose resistance decreases with increasing incident light intensity; thus, it exhibits photoconductivity.

Resistors: A resistor is a passive two-terminal electrical component that implements electrical resistance as a circuit element. In electronic circuits, resistors are used to reduce current flow, adjust signal levels, divide voltages, bias active elements, and terminate transmission lines, among other uses. In this system, the resistors used in the electronic circuitry are specified as R1, R2, R3 and R4. All resistors are 0.25 W.

PCB: It is a non-conductive material with conductive lines printed or etched. Electronic components are mounted on the board and the traces connect the components to form a working circuit or assembly.

METHODOLOGY

The main-frame was built using mild steel on which all the components are welded to bear a high amount of load by the steering system. Then the steering rack was fixed on the main frame using U-clamps, screws and bolts. The linkages were set at both the ends of the steering rack which connects the headlights to the steering rack. These linkages were bolted to the headlight frames fixed at a symmetric distance from the main-frame centre. Thus, on steering wheel rotation, the mechanical linkages cause the headlights to rotate as well. This was followed by the fitting of the battery on the main frame. A plate of size bigger than the battery base was cut and drilled with two holes. This plate was then fitted on the main-frame with the help of screws and bolts and the battery was placed on it. The battery was given plugs with red and black colour codes on both terminals. The plate for holding the circuit of Arduino NANO was welded on a rod and elevated on the main-frame. The circuit was then glued to the plate on the rod. Finally, the wire connections from the battery to the electronic circuitry and the headlights were provided.

Figure 2: Final Assembly Model of the Adaptive Headlight System

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Coding of Arduino NANO:

Step 1: int LED = 10; [LED with 220 Ohm resistor on Pin 10]
Step 2: int PIN = 0; [LDR on Analog pin 0]
Step 3: int VALUE; [variable to store inputted analog voltage values]
Step 4: void setup () {} [No setup needed]
Step 5: void loop ()
Step 6: { [Open this special bracket]
Step 7: VALUE = analogRead (PIN); [Read analog value at "PIN"]
Step 8: VALUE /= 4; [Converts 0-1023 to 0 – 255]
Step 9: analog Write (LED, VALUE); [Outputs PWM signal to LED]
Step 10 :} [Close this special bracket]

Electronic Circuitry and Explanation of the Code

The LDR is connected to the analog pin zero of the Arduino NANO module via a pull-up resistor of 10 kilo Ohms. The voltage at analog pin zero varies with ambient light conditions i.e., more intense light falling on LDR will lower the voltage at analog pin zero of Arduino NANO module, while no light or less light determines the voltage accordingly at analog pin zero. No light on LDR will produce closer to 5-Volt at analog pin 0 of the Arduino NANO module. The voltage at analog pin zero varies inversely.

To read the Analog voltage value available at analog pin zero of the Arduino NANO module, the command used is “analogRead(pin)”, where pin is the integer declared globally in the code as “PIN” and the syntax used to declare it is “int PIN = 0;”. The next process is to store inputted analog voltage values in the variable declared as “VALUE” in the Arduino NANO module.

The Arduino NANO module has an internal Analog to Digital Converter (ADC) of 1024 bits i.e., 0 to 1023 bits. Though Arduino NANO module’s internal ADC register is 1024 bits wide, but internal Pulse Width Modulation (PWM) register of Arduino NANO module is 8 bits wide, which can accept a maximum value of 255. Hence ADC value requires dividing it by 4 to shrink the entire span of 0 to 1023 bits in 0 to 255 range for digital write at output. Dividing the “VALUE” by 4 and storing the new 8-bit value in the same register name “VALUE” is executed by issuing the command “VALUE /= 4.

Final step is to reflect PWM signal concerning the new 8-bit value stored in the register declared as “VALUE” in the form of PWM, we issue a command “analogWrite(LED, VALUE);”, where LED is declared as an integer globally at pin D10 by issuing a command “int LED = 10;”. The code is executed in loop function “void loop()”. It goes on executing forever. Hence no code is required in setup function called “void setup() {}”. As mentioned, D10 pin of Arduino NANO is the output pin where LED is connected via series resistor which gives output in terms of brightness according to light intensity falling on the LDR. The same output is extended via an NPN power switching transistor to drive higher watts of LED load. The inputted voltage applied to Arduino NANO Module via diode D1, D2, D3 each are forward bias and have a voltage drop of 0.7 Volt, so total voltage drop achieved comes out to be

0.7V x 3 = 2.1V. The appearing voltage at the Arduino module is 12V - 2.1V = 9.9V DC.

In addition to this, a 3mm green LED at 12-Volt input shows the status of power of the circuit.

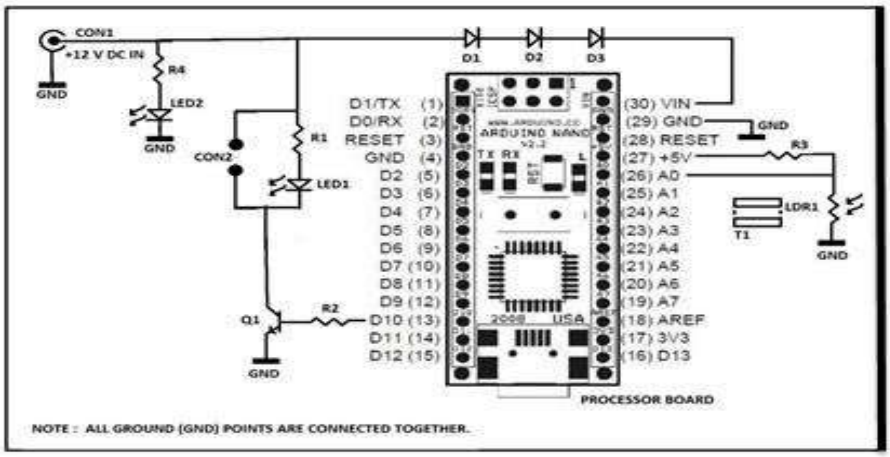

Figure 3: Circuitry of Arduino NANO

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Testing of the Model

- Plug-in the terminal wires of the battery.
- Plug-in the other end of the terminal wires to the electronic circuitry of the Arduino NANO.
- Connect both the LEDs to the three-phase wires which goes inside the electronic circuit via screw tightening connections.
- The LED will start glowing depending on the light falling on the LDR.
- When you fully cover the LDR, this complete lack of light will give the output of the LED glowing at its maximum luminosity.
- When an external light falls on the LDR, it dims according to the luminosity of light falling on it.

Thus, when a vehicle's light coming from the opposite direction falls on the LDR of our car, the proposed Adaptive Headlight System will automatically activate and make our headlights glow dim according to the amount of light falling on the LDR and will remain dim till the opposite vehicle's light is being appeared on LDR. When the opposite vehicle passes away, LDR will experience zero light falling on it on the road at night, thus LDR will glow brightly.

The system works best at night and also on highways where lighting on the road is an issue. The system was tested at different times of the day and the output of the LED was noted. It was found out that the system also catches the sunlight and dims accordingly, hence it is not suitable to opt for this system in daylight. The model glows dim enough to light the area near own vehicles vicinity and at the same time reduces glare and dazzling effect from being experienced by the driver of the oncoming vehicle. Thus, giving a perfect output as desired at night.

CONCLUSION

The system works best at night and also on highways where lighting on the road is an issue. The system will be efficient at night when drivers feel the dazzling and glare effects from upcoming vehicles. The model glows dim enough to lit the area near own vehicles vicinity and at the same time reduces glare and dazzling effect from being experienced by the oncoming vehicles driver. Thus, giving a perfect output as desired at night. It was found out that the system also catches the sunlight and dims accordingly, hence it is not suitable to opt for this system in daylight. The counter product of this system is the advanced camera dependent adaptive headlights which gives much faster results as they capture satellite information of the roads and upcoming vehicles. As the fancy and extreme bright LEDs are coming in market, the significance of this project will be visible in the near future. The upcoming versions of Adaptive Headlights System can be built depending on the traffic and lighting system of the roads and specific highways and also taking into consideration the new LEDs that have potential effects on drivers while driving.

REFERENCES

Li, Y., Haas, N., & Pankanti, S. (2011). Intelligent headlight control using learning-based approaches. In IEEE intelligent vehicles symposium (IV) (pp. 722-727). IEEE.

Mohite, H., Mahangade, B., Gholase, M., Kattgihalimath, S., & Kumbhar, S. (2015). Intelligent and Adaptive Headlight with Electronic Controlled Power Steering System (IAEPS). In Proceedings of the IEEE Workshop on International Journal of Current Engineering and Technology (IJCET), Burbank, CA, USA (Vol. 5, pp. 1026-1029).

Wu, Y., & L. He. (2019). Research on Intelligent LED Headlamp System Based on Multi-Sensor Fusion. In IOP Conference Series: Materials Science and Engineering (Vol. 677, No. 3, p. 032055). IOP Publishing.

Pawar O., Ajay R., & Shivraj S. Salekar. (2016). Design and Fabrication of Movable Headlight System. International Journal of Advance Engineering and Research Development Vol. 4-5.

Aishwarya J, Amrutha R., Dhanalakshmi M.S., N. Rakshitha, & Yashonidhi Yajman. (2017). Adaptive Headlight System for Automobiles. International Research Journal of Engineering and Technology (IRJET)., Vol. 2, Vol no. 5.

Dubal P., & Nanaware, J. D. (2015). Design of adaptive headlights for automobiles. International Journal on Recent and Innovation Trends in Computing and Communication, 3(3), 1599-1603.

K.Ashiq A., & A.Ranganathan. (2015). Automatic dimming of Headlights using vehicle speed. International Conference on Energy Efficient Technologies for Automobiles (EETA).

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KIDNEY STONE DETECTION USING DEEP LEARNING

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ABSTRACT
Ultrasound scanning is that the foremost often used tool to appear at the patient for abnormalities, especially the presence of stone, within the kidney. Kidney abnormalities are a bit like the formation of stones, cysts, blockage of urine, congenital anomalies, and cancerous cells. Kidney stone ailment (nephrolithiasis) is a not unusual trouble among the western population. Most kidney stones are small and skip spontaneously. These sufferers often need no treatment. However, a few nephrolithiasis sufferers expand big stones, which could reason enormous morbidity with inside the shape of acute signs and continual headaches if they're now no longer treated. Convolutional Neural Networks (CNN or ConvNet) are complex feed forward neural networks. CNNs are used for image classification and recognition because of its high accuracy. The CNN follows a hierarchical model which works on building a network, like a funnel, and finally gives out a fully connected layer where all the neurons are connected to each other, and the output is processed.

Keywords: Kidney Stone Detection, Convolutional Neural Networks (CNN or ConvNet)

I. INTRODUCTION
Kidney stone disease is one of the major life threatening ailments persisting worldwide. The stone diseases remain unnoticed in the initial stage, which in turn damages the kidney as they develop. A majority of people are affected by 11 kidney failure due to diabetes mellitus, hypertension, glomerulonephritis, and so forth. Since kidney malfunctioning can be menacing, diagnosis of the problem in the initial stages is advisable. Kidney stone also called as nephrolithiasis is a small, hard deposit that forms in the kidneys and is often painful when passed. Kidney stones are hard deposits of minerals and acid salts that stick together in concentrated urine. They can be painful when passing through the urinary tract, but usually don't cause permanent damage. The most common symptom is severe pain, usually in the side of the abdomen, that's often associated with nausea. Treatment includes pain relievers and drinking lots of water to help pass the stone. Kidney stone is formed when salts and certain minerals such as calcium and uric acid are accumulated in urine. It is caused because of inadequate intake of water. It mainly occurs when our body lacks fluid and accumulates a lot of waste. Medical procedures may be required to remove or break up larger stones. There are various methods for the diagnosis of kidney stone such as urine test, blood test, CT scan, MRI scan etc. By human inspection and operators, it is impossible to produce result for large amount of data. During surgical processes, it's vital to acknowledge the truth and precise location of kidney stones. Ultrasound imaging is one of the available imaging techniques used for diagnosis of kidney abnormalities. Nowadays a discipline of automation got here into lifestyles which additionally getting used with inside the clinical discipline. Rather many not unusual place issues rose because of automated analysis along with the usage of correct and accurate outcomes and additionally the usage of right 12 algorithms. The clinical analysis manner is complicated and fuzzy through nature. Convolutional Neural Networks are complex feed forward neural networks. Among all strategies, the smooth computing approach referred to as a neural community proves blessings because it will analyze the ailment through first gaining knowledge of after which detecting on a partial i.e., Feature extraction.

II. METHODOLOGY
CNN is a type of neural network model which allows us to extract higher representations for the image content. It is a Deep Learning algorithm which can take in an input image, assign importance (learnable weights and biases) to various aspects/objects in the image 16 and be able to differentiate one from the other. The pre-processing required in a ConvNet is much lower as compared to other classification algorithms. While in primitive methods filters are hand-engineered, with enough training, ConvNets have the ability to learn these filters/characteristics. The architecture of a ConvNet is analogous to that of the connectivity pattern of Neurons in the Human Brain and was inspired by the organization of the Visual Cortex. Individual neurons respond to stimuli only in a restricted region of the visual field known as the Receptive Field. A collection of such fields overlap to cover the entire visual area. Unlike the classical image recognition where you define the image features yourself, CNN takes the image's raw pixel data, trains the model, then extracts the features automatically for better classification.

The First Block makes the particularity of this type of neural network since it functions as a feature extractor.

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The Second Block is not characteristic of a CNN: it is in fact at the end of all the neural networks used for classification.

The Convolutional Layers are the major building blocks used in convolutional neural networks. The convolutional layer is the key component of convolutional neural networks and is always at least their first layer.

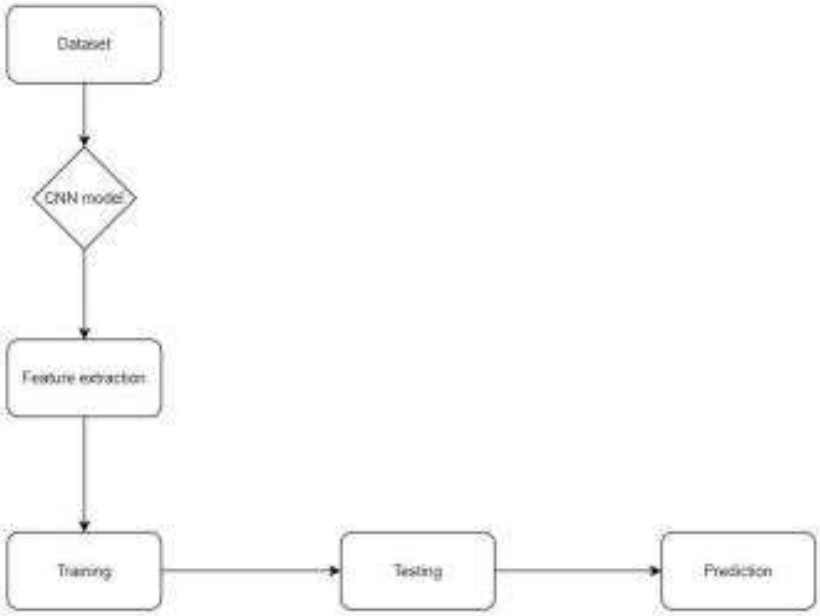
The pooling layer is often placed between two layers of convolution: it receives several feature maps and applies the pooling operation to each of them.

The Relu Correction Layer (Rectified Linear Units) refers to the real non-linear function defined by ReLU(x)=max(0,x). The ReLU correction layer replaces all 19 negative values received as inputs by zeros. It acts as an activation function.

The Fully-Connected Layer is always the last layer of a neural network, convolutional or not — so it is not characteristic of a CNN. This type of layer receives an input vector and produces a new output vector.

III. IMPLEMENTATION

CNN architectures are designed and proposed for classification tasks using publicly available data sets. The first of these architectures is used to decide whether a given CT image of a patient has stone or not. The proposed CNN architecture consists of weighted layers, in which there are two convolutional layers and one fully connected layer, as shown in Fig. 4.1. The convolutional layer is the most important CNN layer and is also known as the transformation layer. This transformation is performed by moving a particular filter over the whole input image (64, 64). The convolutional layers are followed by the rectified linear units' layer (ReLU layer) and maxpooling layers. The ReLU layer follows the convolution layers and is used as a rectifier unit. The RELU layer's effect on the input data is that it takes negative values to zero. In all architectures, ReLU is used as an activation function, since it is already a standard activation function in image classification tasks. A pooling layer is generally placed after the ReLU layer, and its main task is to decrease input size (width × height) for the subsequent convolution layer. In the CNN architecture, the consecutive convolution, ReLU, and pooling layers are followed by a fully connected layer (64, 64). This layer is connected to all neurons of the previous layer. The fully connected layer, resulting in a two-dimensional feature vector, is fed as an input to Softmax classifier, which makes the 29 final prediction whether there is the novel coronavirus or not. There are two neurons in the output layer, as this model tries to classify an image into two classes: Stone present or No Stone.



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IV. CONCLUSION

Prevention of kidney stone formation and recurrence is still a significant problem for human health. Impairment of kidney function due to the formation of kidney stones endangers human life. Therefore, early diagnosis of kidney stones is critical. In recent years, machine learning and deep learning approaches have been widely adopted to diagnose diseases thanks to the development of technology. These methods provide a reliable tool for making definitive diagnostic decisions that require long and complex 34 processes, as they shorten the diagnosis time and increase the diagnostic accuracy. Region of interest detection within the ultrasound image could even be a challenging task due to the heterogeneous texture than the presence of speckle noise. Ultrasound scanning is that the foremost often used tool to appear at the patient for abnormalities, especially the presence of stone, within the kidney. The CNN follows a hierarchical model which works on building a network, like a funnel, and finally gives out a fully connected layer where all the neurons are connected to each other, and the output is processed.

V. FUTURE SCOPE

In future work, the proposed technique is probably designed for real-time implementation through interfacing it with the scanning machines. Training deep learning neural network models on more data can result in more skilful models. The captured kidney image can be subjected to the proposed set of policies to end up aware about the affected location and for correct class of kidney stone. For undertaking higher accuracy, we're capable of evaluate the outcomes of different neural networks.

VI. REFERENCES

1. Mrs. Monica Jenifer, A Roopa, C R Sarvasri, G Sharmila, A Yamuna – “Design And Implementation Of Kidney Stone Detection Using Image Processing Technique”
2. Annameti Rohith; S. Premkumar – “Detection of Kidney Stones in Ultrasound Images Using Median Filter Compared with Rank Filter”
3. Malathy Chidambaranathan, Gayathri Mani – “Kidney Stone Detection with CT Images Using Neural Network”
4. T. Vineela, R. V. G. L. Akhila, T. Anusha, Y. Nandini, S. Bindu – “Kidney Stone Analysis Using Digital Image Processing”
5. Vinayagam.P, Sreemathi.M, Jeevitha K, Sandhya S – “Kidney Stone Detection Using Neural Network”
6. W. G. Robertson, “Methods for diagnosing the risk factors of stone formation,” Arab Journal of Urology, vol. 10, no. 3, pp
7. K. Kumar, “Artificial neural network for diagnosis of kidney stone disease,” International Journal of Information Technology and Computer Science, vol. 7, pp.
8. P. R. Tamilselvi and P. Thangaraj, “Computer aided diagnosis system for stone detection and early detection of kidney stones,” Journal of Computer Science, vol. 7, no. 2, pp. 250–254, 2011.
9. D. H. Bagley, K. A. Healy, and N. Kleinmann, “Ureteroscopic treatment of larger renal calculi (>2 cm),” Arab Journal of Urology, vol. 10, no. 3, pp. 296–300, 2012.
10. K. Viswanath and R. Gunasundari, “Design and analysis performance of kidney stone detection from ultrasound image by level set segmentation and ANN classification,” 40
11. S. Hu et al., "Towards quantification of kidney stones using X-ray dark-field tomography,"
12. International Symposium on Biomedical Imaging (ISBI 2017), Melbourne, VIC, 2017,
13. Differentiation from segmented ultrasound kidney images," IEEE 2016 3rd International Conference on
14. N. Thein, H. A. Nugroho, T. B. Adji and K. Hamamoto, "An image preprocessing method for kidney stone

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DESIGN AND FABRICATION OF PORTABLE PPE KIT STERILIZATION

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ABSTRACT
Medical demands during the COVID-19 pandemic have triggered a grave shortage of medical-grade personal protective equipment (PPE), especially, N95 respirators. N95 respirators are critical for the personal protection of medical providers and others when being exposed to individuals with infections caused by the SARS- CoV-2 coronavirus. To address the shortage of PPE Kit & N95 respirators, innovative methods are needed to decontaminate coronaviruses from N95 respirators & PPE Kit, allowing them to be safely reused by healthcare workers.

Keywords: UV, UV-C LED, Sterilize, Ultraviolet-C; decontamination; N95 respirator; peracetic acid; SARS-CoV-2, ozone

1. INTRODUCTION
Personal protective equipment (PPE) is essential for protection of personnel and patients in healthcare settings. The pandemic of coronavirus disease 2019 (COVID-19) caused by severe asucute respiratory syndrome coronavirus 2 (SARS- CoV-2) has resulted in shortages of critical supplies, including PPE. These shortages have led many facilities to consider strategies to extend or reuse PPE, particularly N95 filtering facepiece respirators. The Centres for Disease Control and Prevention and the National Institute for Occupational Safety and Health (NIOSH) have provided guidance the acceptability of extended use or limited reuse of N95 respirators & PPE Kit. The guidance document includes a discussion of potential concerns regarding these practices, particularly the risk for contact transmission from touching a contaminated respirator. There is an urgent need for evidence regarding the effectiveness of decontamination strategies for PPE. The goal of the current study was to examine the effectiveness of UV-C light and a high-level disinfection cabinet for decontamination of PPE Kit & N95 respirators.

2. LITERATURE REVIEW
A. Effectiveness of an Ozone Disinfecting and Sanitizing Cabinet to Decontaminate a Surrogate Virus for SARS-CoV-2 on N-95 Masks | Megan S. Beaudry (4 April 2020)

Author Writes, Effectiveness of an Ozone Disinfecting and Sanitizing Cabinet to Decontaminate a Surrogate Virus for SARS-CoV-2 on N-95 Masks that the COVID-19 pandemic has dramatically reduced the availability of PPE. During this global emergency, decontamination and reuse of FFRs may be necessary when access to PPE is limited. We have demonstrated that ozone sterilization is an effective method for the decontamination of N95 mask materials.

B. Ultraviolet-c and other methods of decontamination of 2 filtering facepiece n-95 respirators during the covid-19 pandemic | Henry W. Lim (24 April 2020)

Author Writes, The current COVID-19 pandemic, extreme measures are needed to keep those on the front line protected. UVC, hydrogen peroxide, microwave, and dry heat systems are all viable options to kill microorganisms on N95 FFRs to enable their reuse. These options are cost-effective, quick to employ, and have the potential to save many lives and valuable resources. These methods have demonstrated good biocidal activity against many viruses including influenza, SARS-CoV and MERS-CoV however, their efficacy against the novel coronavirus SARS-CoV-2 specifically has not been tested.

3. METHODOLOGY AND UVC RADIATION APPLICATION
Ultraviolet Radiation is an electromagnetic wave with low wavelength and high energy lying between X-ray and Visible Light spectrum. The wavelength of UV rays is 400 nanometers to 100 nanometers. This spectrum is dividedinto UV-A, UV-B and UV-C bands. The wave length of UV-A is from 400nm to 315nm, UV-B is from 315nm to 280nm. UV-C radiation covers wavelength spectrum from 280 nm to 200 nm. The UV radiation below 200nm does not propagate in air andcan only pass-through vacuum, so this band is called Vacuum-UV. Ultraviolet germicidal irradiation (UVGI) with wavelength of 254 nm can kill or destroy the DNA of bacteria or virus like SARS-CoV-2 more efficiently, but this particular wavelength radiation can penetrate into human skin and eye and causes damage to both. But the farUV-C with wavelength between 222nm to 207nm, have almost similar germicidal properties and very less impact on human body. So, the disinfectant UV-C radiators are designed to operate in this spectrum.

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4. OZONE PRODUCTION

When oxygen comes in the contact with UVC Lamp it slips into single molecule of ozone, that single molecule combine with O_2 and forms ozone.

5. CHOICE OF UVGI EXPOSURE DOSE

We chose 1.0 J/cm2 as a minimum UV-C dose formask decontamination, which is also consistent with recently released guidance from governmental and non-governmental agencies. The UV-C unit used at the VA Portland Health Care System delivers 1.0 - 2.0 J /cm2 to each PPE Kit.

6. DESIGN AND CONSTRUCTION

First of all, wooden cabinet of (lxbxh)=(50x50x80) with one side door opening with hinges and door opening and locking with the help of door magnetic catcher and one more wooden box of (lxbxh)=(14x14x50) for circuitry and dc fan. Now cover the edges with the help of sealing rubber and add 4 wheels on the cabinet and place hook on under the top of the cabinet drill the cabinet with suitable holes for circuitry and now place UVC lamp with adapter and attach to the cabinet with the help of UVC light holder in left right and middle of the cabinet attach a wiring to the adapter to connect to the circuitry also make a drill for a bulb holder make a connection up to the circuitry.

Now add ozone sensor to the cabinet for sensing the ozone level now at the second wooden box add circuitry and the wires of the cabinet and attach lcd display to it with ozone sensor once the circuitry complete and aluminum foil inner surface of the cabinet and from outer add wall paper for better design.

And now hang the PPE Kit and start the process of sterilization wait for 240 seconds to sterilize and now PPE kit is free from all types of viruses and bacteria.

Fig: Testing with PPE Kit

7. COMPONENTS

1. UVC Lamp

UVC lamps used for disinfection purposes may pose potential health and safety risks depending on the UVC wavelength, dose, and duration of radiation exposure.

Fig: UVC Lamp

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2. LCD Display
An electronic device that is used to display data and the message is known as LCD 16×2.

Fig: LCD Display

3. Ozone Sensor
MQ131 **ozone gas sensor** has high sensitivity to ozone, and also has sensitivity to strong oxide such as Cl2, NO2 &etc. Use for sensing ozone in the cabinet.

Fig: Ozone Sensor

4. W1209 Digital Temperature Controller Thermostat Module
The **W1209 Digital Temperature Controller Thermostat Module** W1209 thermostat module has a temperature sensor, keys, LED display, relay and requires DC 12V power supply. It is an affordable, good quality thermostat controller.

Fig: W1209 Digital Temperature Controller Thermostat Module

5. Arduino UNO
Arduino UNO is a low-cost, flexible, and easy-to-use programmable open-source microcontroller board that can be integrated into a variety of electronic projects.

This board contains a USB interface i.e., USB cable is used to connect the board with the computer and Arduino IDE (Integrated Development Environment) software is used to program the board.

Fig: Arduino UNO

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8. WORKING

Main function of our project is sterilization of PPE kit for instant use in 240 seconds. And to meet this condition, we have designed a cabinet who is capable to sterile it in 240 seconds. In our cabinet a process take place. Process of ozone formation air inside the cabinet will interact with the UVC light and form ozone as we all know that ozone is disinfectant than ozone formed in cabinet will disinfect the PPE and make it ready for instant use. Ozone is a gas that can reach all areas of the PPE kit so that it is sterilized inside out. Ozone is a proven disinfection and has the ability to disinfect surfaces of bacteria and viruses. The system can generate ozone out of air and no need for water or chemicals or any other inputs. The system makes use of a UV based ozone generator. UV or ultraviolet light (185 to 200nm) can generate ozone gas from air.

When air comes in contact with this UV frequency, the oxygen in air is converted to Ozone. The ozone is then reverse passed through UV chamber this time with a different light frequency to convert it back to oxygen. The system uses ozone sensorsin sterilization chamber to check for ozone levels ozone is a harmful gas if inhaled in certain quantity.

9. MAINTENANCE

1. Clean the inner and outer surface of sterilizer cabinet with the help of lint free cloth soaked in disinfectant solution. Once in a month check the intensity of UV lamb by using LUX meter.

2. Replace UV lamp of the sterilizer cabinet after 2000 hours of burning.

10. ADVANTAGES AND LIMITATIONS OF DECONTAMINATION METHODS

Advantages:

- Good germicidal activity
- Short treatment duration
- Has activity against coronaviruses

Disadvantages:

- Not readily available
- Degrades polymers

11. DISCUSSION

Shortages of PPE are a grave concern for many healthcare facilities in the setting of the global COVID-19 pandemic. Our findings have important implications for facilities that are considering decontamination of PPE as a potential strategy to maintain adequate supplies. Using a rigorous test method, we found that UV-C reduced contamination of PPE Kit with E.Coli and MS2 bacteriophages and MRSA. However, there was considerable variability in reductions achieved on different respirator brands and on different locations on the respirators. The efficacy on the interior surface of the respirator was reduced in comparison to the outer surface, possibly due to the permeability of the inner surfaces to the liquid suspensions resulting in reduced access by UV-C. Our results suggest that facilities might consider use of the UV-C box or room decontamination devices to reduce contamination on respirators that will be reused by individuals. However, the levels of reduction did not meet our pre-established criteria for decontamination (i.e., >3-log10 reduction on inoculated respirators), and more over would not have met a >2-log10 reduction requirement for decontamination. Thus, the level of reduction would not be adequate to allow shared use of respirators by different individuals.

The high-level disinfection cabinet was more effective than UV-C and provided 2.1 orgreater log10 reductions in bacteriophage MS2 on both outer and inner surfaces of the respirator with a single cycle. It is not able that this level of reduction is substantially lower than the 6-log10 reductions in bacteriophage MS2 achieved on solid carriers in previous studies with this technology. Moreover, the single cycle resulted in >6-log10 reductions in MRSA and C. difficile spores inoculated on the respirator, despite greaterUV-C resistance of these organisms on solid surfaces. Taken together, these data suggest that reduction in viral pathogens on PPE Kit might be challenging, in part because the small size of viral particles allows them to penetrate beneath the respiratorsurface to a greater extent than bacteria resulting in partial protection from technologiessuch as UV-C and aerosolized peracetic acid. These data also highlight the importance of including viruses in the testing of technologies proposed for PPE Kit decontamination. With 3 consecutive cycles or an extended cycle, the high-level disinfection cabinet met criteria for disinfection, achieving >6-log10 reductions on PPEKit.

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12. RESULTS

S.No.	Test Organism	Duration of Exposure to UV radiation		
		120 sec	180 sec	240 sec
1	E.coli MTCC 68 (bacterium)	99.99996	Not Applicable	Not Applicable
2	MS2 phage ATCC1559781 Surrogate Virus – MS2 phage	99.91 % Reduction	99.975 %	≥99.9883

Table: Microbial Reduction with Different Exposure Timing to UV Treatment

A Report was taken up to assess the efficacy Sample of PPE Kit's using E.coli MTCC 68 (Bacterium) and MS2 phage ATCC15597B1 (Surrogate Virus - bacteriophage). Different time of exposures were given in separate trials with reference to MS2 phage viz. 120 sec, 180 sec, 240 sec and only 120 seconds in case of E.coli organism. Tested Sample was found to be effective.

13. OBSERVATION

Observed that UvC light is effective towards the viruses and bacteria's E.coli MTCC 68 (Bacterium) and MS2 phage ATCC15597B1 (Surrogate Virus - bacteriophage).

14. CONCLUSION

After sterilization found that the its effectively sterilize the PPE kit and kill all type of viruses and bacteria with the help of ozone and UVC light.

REFERENCES

[1] Ultraviolet-C And Other Methods Of Decontamination Of Filtering Facepiece N-95 Respirators During The Covid-19 Pandemic (Photochemical & Photobiological Sciences) Published on 24 April 2020.

[2] UV Sterilization of Personal Protective Equipment with Idle Laboratory Biosafety Cabinets During the COVID-19 Pandemic. †authors in alphabetical order: Kyle J. Card, Dena Crozier, Andrew Dhawan, Mina Dinh, Emily Dolson, Nathan Farrokhian, Vishhvaan Gopalakrishnan, Emily Ho, Eshan S. King, Nikhil Krishnan, Gleb Kuzmin, Jeff Maltas, Julia Pelesko, Jessica A. Scarborough, Jacob G. Scott, Geoff Sedor, Davis T. Weaver. This version posted March 27, 2020. The copyright holder for this preprint (which was not certified by peer review) is the author/funder, who has granted medRxiv a license to display the preprint in perpetuity. It is made available under a CC-BY-NC 4.0 International license .

[3] Effectiveness of an Ozone Disinfecting and Sanitizing Cabinet to Decontaminate a Surrogate Virus for SARS-CoV-2 on N-95 Masks | Megan S. Beaudry*1 , Julia C. Frederick*1 , Megan E. J. Lott*1 , William A. Norfolk*1, Travis C. Glenn$1, Erin K. Lipp$1

[4] Filtering Facepiece Respirator (N95 Respirator) Reprocessing A Systematic Review | Max A. Schumm, MD; Joseph E. Hadaya, MD; Nisha Mody, MLIS, MA, CCC-SLP; Bethany A. Myers, MS; Melinda Maggard-Gibbons, MD, MSHS

[5] Monitoring Ultraviolet Lamps in Biological Safety Cabinets with Cultures of Standard Bacterial Strains on TSA Blood Agar | Brian J. Harrington, PhD, MPH,1 Michael Valigosky, MS, CIH, CSP, CHMM2 (Departments of 1Public Health and Homeland Security and Environmental and 2Health and Safety, University of Toledo Health Science Campus, Toledo, OH)

[6] Use of UV-C radiation to disinfect non-critical patient care items: a laboratory assessment of the Nanoclave Cabinet | Ginny Moore1,4*, Shanom Ali1,4, Elaine A Cloutman-Green2 , Christina R Bradley3 , Martyn AC Wilkinson3 , John C Hartley2 , Adam P Fraise3 and A Peter R Wilson1

[7] Homegrown Ultraviolet Germicidal Irradiation for Hospital-Based N95 Decontamination during the COVID-19 Pandemic Eric Schnell1,2,*, Melanie J. Harriff3,4, Jane E. Yates3 , Elham Karamooz4,5, Christopher D. Pfeiffer6,7 , James F. McCarthy8 , Christopher L. Trapp8 , Sara K. Frazier9 , John E. Dodier8 , Stephen M. Smith4,5

[8] Preliminary Indications For The Use Of Ozone As Air And Surface Disinfectant In The Conjuncture Of Covid-19 | Elena Grignani1 , Antonella Mansi2 , Renato Cabella2 , Paola Castellano2 , Angelo Tirabasso2 , Renata Sisto2 , Mariangela Spagnoli2 , Giovanni Fabrizi2 , Francesco Frigerio1 , Giovanna Tranfo2

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[9] Effectiveness of Ultraviolet-C Light and a High-Level Disinfection Cabinet for Decontamination of N95 Respirators | Jennifer L. Cadnum1 , Daniel F. Li1 , Sarah N. Redmond2 , Amrita R. John3 , Basya Pearlmutter1 , Curtis J. Donskey2,4

[10] Inactivation of Human Coronavirus by FATHHOME's Dry Sanitizer Device: Rapid and Eco-Friendly Ozone-Based Disinfection of SARS-CoV-2 Timsy Uppal 1 , Amir Khazaieli 2 , Antoine M. Snijders 3 and Subhash C. Verma 1,*

WEBSITES

1) https://doi.org/10.1039/d0pp00131g
2) https://doi.org/10.1101/2020.03.25.20043489
3) https://doi.org/10.1101/2020.11.04.20226233
4) https://jamanetwork.com/journals/jama/fullarticle/10.1001/jama.2021.2531?utm_campaign=articlePDF%26utm_medium=articlePDFlink%26utm_source=articlePDF%26utm_content=jama.2021.2531
5) https://academic.oup.com/labmed/article/38/3/165/2504576

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SHOP NOW ECOMMERCE WEBSITE

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ABSTRACT
Ecommerce, also known as electronic commerce or internet commerce, refers to the buying and selling of goods or services using the internet, and the transfer of money and data to execute these transactions. Ecommerce is often used to refer to the sale of physical products online, but it can also describe any kind of commercial transaction that is facilitated through the internet. These business transactions occur either as business-to-business (B2B), business-to-consumer (B2C), consumer-to-consumer or consumer-to-business. Ecommerce provides several benefits to sellers over traditional retailing. Some key benefits include: overcoming geographical limitations, lower costs, 24 X 7 availability of products, gaining new customers through better search engine visibility, create targeted information, enable comparisons while shopping and eliminating travel time and costs for customers.

Ecommerce is becoming increasingly popular in Arab countries due to its various advantages over traditional brick and mortar retailing. Sultanate of Oman is one of the important economies in this region and is a key emerging market. Oman has witnessed a boom in Ecommerce activities including B2B and B2C activities. Attaining customer satisfaction is one of the keys to success in today's crowded and competitive online market. This study attempts to find and analyse the important factors affecting customer satisfaction with Ecommerce websites and online purchasing in Oman. The study shows that Price and Ease of Use and availability of multiple payment options are the important factors that positively influence customer satisfaction.

Keywords: Ecommerce, Customer Satisfaction

I. INTRODUCTION
Ecommerce, also known as electronic commerce or internet commerce, refers to the buying and selling of goods or services using the internet, and the transfer of money and data to execute these transactions. Ecommerce is often used to refer to the sale of physical products online, but it can also describe any kind of commercial transaction that is facilitated through the internet. These business transactions occur either as business-to-business (B2B), business-to- consumer (B2C), consumer-to-consumer or consumer-to- business. The terms e-commerce and e-business are often used interchangeably. The term e-tail is also sometimes used in reference to the transactional processes for online shopping .Electronic commerce draws on technologies such as mobile commerce, electronic funds transfer, supply chain management, Internet marketing, online transaction processing, electronic data interchange (EDI), inventory management systems, and automated data collection systems.(www.wikipedia.org).

Modern electronic commerce typically uses the World Wide Web for at least one part of the transaction's life cycle although it may also use other technologies such as e-mail. There are three areas of e-commerce: online retailing, electronic markets, and online auctions. Whereas e-business refers to all aspects of operating an online business, ecommerce refers specifically to the transaction of goods and services.

A. Benefits of E-Commerce
Ecommerce provides several benefits to sellers over traditional retailing. Some key benefits include : overcoming geographical limitations, lower costs , 24 X 7 availability of products, gaining new customers through better search engine visibility, create targeted information, enable comparisons while shopping and eliminating travel time and costs for customers. However, some customers prefer purchasing physical products as it enables them to touch, feel and try them out prior to buying.

B.Customer Satisfaction with Ecommerce Services
At a global level, customer satisfaction leading to loyalty (e.g. customer retention) is generally very strongly related to the profitability and long-term growth of a firm [Reichheld ,1995]. Small increases in customer retention rates can dramatically increase profit [Huffmire, 2001]. Loyal customers visit their favorite websites twice as often as non- loyal customers, and loyal customers spend more money [Dialscore.com 2000].According to analysts, 35 to 40%of e-commerce website sales revenue comes from repeat visitors [Rosen , 2001]. As such, it is not surprising that customer loyalty has been found to be a critical asset fore-retailers. Reichheld and Schefter [2000]found that the high cost of acquiring new online customers could lead to unprofitable customer relationships for up to three years. Consequently, it is very useful to determine the key antecedents or factors that influence customer satisfaction with ecommerce websites.

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Previous research found that e-retailers experience difficulty maintaining customer satisfaction despite the recent rapid growth in B2Ce-commerce[Hoffman and Novak , 2000]. Although there are certainly challenges shared by both traditional retailers and e-retailers, e- retailers face greater competition due to the fact that on the Internet a competitor is only a click away[Mithas, Ramasubbu, Krishnan, and Fornell ,2007] . Due to the ease of surfing websites, etailers face an uphill task in attracting, satisfying and retaining customers. This study looks some of the key factors affecting customer satisfaction with regards to Ecommerce websites in Sultanate of Oman.

Though numerous studies have been conducted to determine the factors affecting customer satisfaction with Ecommerce in several countries, the number of such studies in Arab countries is quite limited. A the same time, the number of people buying products online has seen a steady increase in the Sultanate of Oman, with websites like Namshi, Roumaan and Souq becoming increasingly popular among people, especially the youth, who are internet savvy. Thus the motivation of this study is to determine the key factors affecting the satisfaction and loyalty of customers of online services in the Sultanate of Oman. In addition it aims to determine whether access, ease of ease of use of website and online payments , safety and security and pricing of products are direct antecedents of customer satisfaction. Theresearch questions addressed in this study are as follows:

1. What are the key factors affecting customersatisfaction with ecommerce websites in Sultanate ofOman?
2. Do access and quality of interface, ease of use and payments, safety and security and pricing of products affect the satisfaction of customers with ecommerce websites?

As there are very few studies on the key factors affectingcustomer satisfaction with ecommerce websites in the gulf region in general and Oman in particular, this study willplay a role in addressing this gap in the extant literature. Also, the managers of ecommerce companies can utilize the findings to identify the gaps and shortcomings in their service offerings in order to improve customer satisfaction levels and customer loyalty. From an academic perspective, this study provides insights that will improve our understanding of the impact of various factors related toe- commerce customer loyalty in the context of Sultanate of Oman as one major developing country in the Middle East. The study will add value to the literature of e-commerce in terms of improving our understanding of the impact of ease of access, website user interface design, e-payments, e-security and price on e- satisfaction.

II. LITERATURE REVIEW

Firdaus Khan and Noura Al Jahwari (2018) in their study on in their study on factors affecting customer satisfaction of online shopping in Oman concluded that the perceptions of the youth confirming the product quality & service guarantee influenced comfort and satisfaction to the online customers. The study also revealed that the service tangibility concerning the guaranteed package and delivery process along with the lowest price motivated them to go for online shopping repeatedly. The study illustrates through Quality Safety Assurance (QSA) model, the factors viz. Product Quality, Application Safety, Delivery Guarantee, and Offers should be focused to improve the online customer satisfaction, and the best-buy offers are the factors which need more attention to increase the Omani clientele.

Zatalini and Pamungkas (2016) pointed out that the factors leading to customer loyalty and the successful implementation of online retailing are the privacy of customer information and security and the speed of service. According to Suh and Han (2003), security is the biggest issue, the online shopping customers worried about and so higher the system security; higher will be the customer

Satisfaction security and the speed of service. According to Suh and Han (2003), security is the biggest issue, the online shopping customers worried about and so higher the system security; higher will be the customer satisfaction.

Oxley and Yeung (2001) confirmed that online shoppingis widely preferred because it provides easy access to a large amount of information at reduced costs. AlGhamdi, Nguyen, Nguyen, and Drew (2012) claimed that the factors encouraging companies to engage in online retailing are the Government action in the form of reliable and secure online payment option, e-commerce support, strong ICT infrastructure, and educational e-commerce awareness programs in the country.

Christian & France (2005) proves that customers satisfied the most were privacy (Technology factor), Merchandising (Product factor), and convenience (Shopping factor); also followed by trust, delivery, usability, product customization, product quality and security. Surprisingly, security was chosen as the last choice comparing to others. Thus customers assume that security is a standard attribute present in all websites and other factors take precedence over it. David J. Reibstein (2002) did a study on the role of price in attracting

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customers to the site and retaining them. However, it was found that price alone is not a decisive factor as customers tend to shop at other sites unless the vendors provide them good customer service and on-time delivery. Interestingly, e-shopping site using low prices or price promotions to attract customers do mostly tend todraw price-sensitive customers who are well known as having low loyalty and are prone to switching.

Jarvenpaa & Todd (1997) in their study found that convenient and dependable shopping and ease of use of website are the most significant factors to satisfy online customers since the shoppers make their purchase decision depending on the process of delivery starting from accurate information of merchandise availability, anticipated deliverydate, and confirmation e-mail for specific order. Hence it is necessary to explain all policies including returns and refunds clearly and this will increase the trust of the customers

III. METHODOLOGY

A. Conceptual Framework and Hypotheses

I. Conceptual framework

This study aims to investigate the impact of the antecedent factors on customer satisfaction with ecommerce sites with variables shown in Fig. 1.

Fig 1: Conceptual Framework

i. HYPOTHESES

1. Easy access to the website has positive effect on Customers' satisfaction with Ecommerce websites.
2. Ease of use of site and availability of multiple payment options has a positive effect on Customers' satisfaction with Ecommerce websites.
3. Safety and security of online transactions has apositive effect on Customers' satisfaction with Ecommerce websites.
4. Prices of products and offers have a positive effect on Customers' satisfaction with Ecommerce websites.

B. Population and Sampling

The population of the study are citizens and residents in the Sultanate of Oman who have at least a onetime experience in shopping online. The sample size of this research is 150 and descriptive research design has been utilized in this study as it is found to be most appropriate forthe research problem. Convenience sampling has been used to collect the data for analysis.

C. Research Instrument

The data collection instrument used in this study is structured questionnaire. This questionnaire consists of 20 questions to measure the customers perceptions about the variables used in the study. A 5 point Likert scale has been used to measure the responses.

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D. Reliability and Validity

The most popular test of reliability used by numerous researches is Cronbach's coefficient alpha (Cronbach's alpha) which will test the consistency of respondent's answers to all the items in the measurement. The Cronbach alpha of all the variables exceed 0.7 which makes them acceptable for the study.

Table 1: Kmo Measures

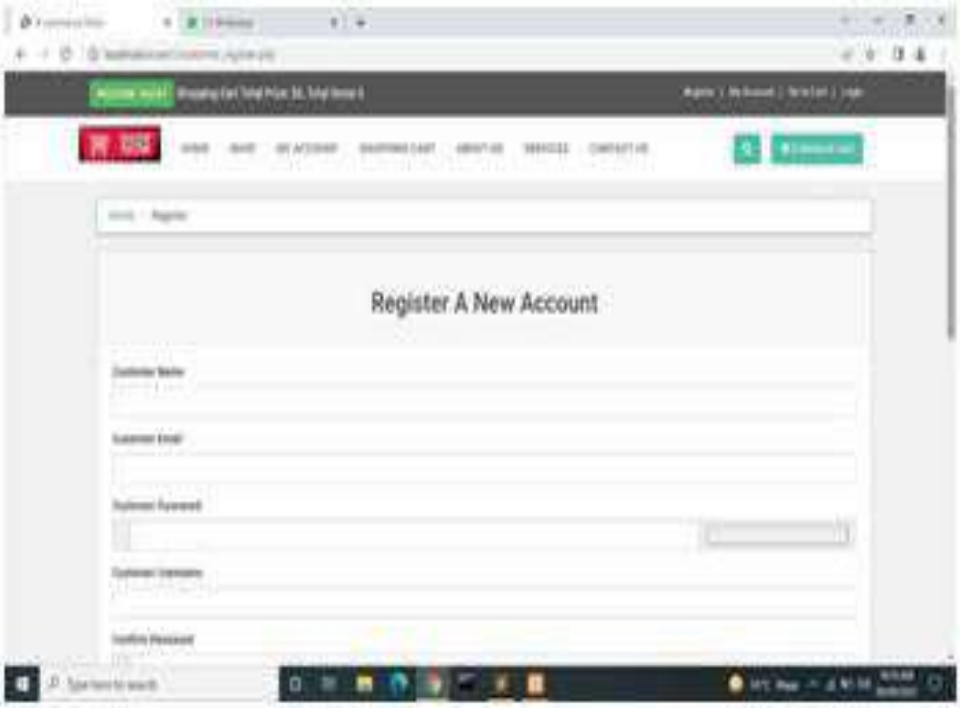
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.832
Bartlett's Test of Sphericity	Approx. Chi-Square	840.055
	df	190
	Sig.	.000

KMO Measure of sampling adequacy is a statistic that indicates the proportion of variance in the variables that maybe caused by underlying factors. Any value above 0.6 is considered adequate. The KMO of the variables in this studyis 0.832 which shows that the variables are highly appropriate for the analysis.

IV.RESULTS

A) Home Page

B) Login Page



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Multiple Regression Analysis

Multiple regression analysis is employed in this study. All variables hypothesized are entered in the single step. The enter method enables to include all variables in the proposed model.

HO: Access, Ease of Use and availability of multiple payment options, safety and security of online transactions and prices and offers will have no significant positive effect on customers' satisfaction with Ecommerce websites.

H1: Access, Ease of Use and availability of multiple payment options, safety and security of online transactions and prices and offers will have a significant positive effect on customers' satisfaction with Ecommerce websites.

Table 2: Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.672[a]	.451	.422	.93799

a. Predictors: (Constant), Price, Safety and Security, Ease of Use and Payment Options, Access

The coefficient of determination (R^2) is .422 which means that 42.2% of variation in customer satisfaction with Ecommerce websites in Oman can be explained by the predictor variables Access, Price, Safety and Security, Ease of Use and Payment Options. The remaining part is explained by various other factors.

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	68.047	5	13.609	15.468	.000[b]

Table 3: Anova

Shown in Table 3, F- value of 15.468 is significant at 0.05 levels indicating that there exists at least one independent variable affect to dependent variable. Hence, this research rejects the Ho and accepts H1 that Access, Ease of Use and availability of multiple payment options, safety and security of online transactions and prices and offers will have a significant positive effect on customers' satisfaction with Ecommerce websites.

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	Constant	.937	.377		2.488	.015
	Access	.008	.099	.008	.081	.936
	Safety	-.058	.093	-.059	-.627	.532
	Ease of Use	.291	.093	.301	3.109	.002
	Price	.504	.097	.502	5.205	.000

Table 4: Table of Coefficients

The variables having the highest standardized beta coefficients are Price (.502) followed by Ease of Use (.301), Access (.008) and Safety and Security (-.059). Thus, Price has the highest influence on customer satisfaction followed by Ease of Use and Payment Options, Access and Safety and Security respectively. The variables Ease of Use and Price have got the maximum t – values of 3.109 and 5.205 respectively. This shows that Price and Offers has the maximum impact on customer satisfaction followed by Ease of use and multiple payment options. The p values of Ease of Use are .002 and for price it is .000 at .05 level ofsignificance. However, the p values of Safety and Access are .532 and .936 respectively which indicate that they are not significant at this level of confidence.

Thus the model is:

Customer Satisfaction with Ecommerce Sites = .008 (Access) + .301 (Ease of Use and Payment Options) +.502 (Price) -.059 (Safety and Security).

CONCLUSION

This study was conducted to analyse the key factors affecting satisfaction of customers in Sultanate of Oman with Ecommerce firms and online purchases. Four variables namely, Access , Ease of Use of the website and availability of multiple payment options, Safety and Security and Price were identified as antecedent variables affecting satisfaction of online customers. The analysis shows that these factors together explain 42.2% variation in the customers' satisfaction with Ecommerce websites in Oman. Out of these predictor variables, Price and Ease of Use and availability of multiple payment options have been found to have a significant impact on customers' satisfaction while the impact of Safety and Security and Access was not so significant. This finding is consistent with the study of Thomas and Harry (2004) revealing that the respondents with experience in purchasing were more likely to be influenced by price. This may be due to the fact that most customers buy online to avail of the significant offers and discounts offered by etailers. Luxury products are rarelysold online . At the same time, a website that is user friendlyand easy to navigate will further encourage customers to spend more time online and look at more products. A choice of payment options like credit and debit cards as also Cash on Delivery increase the convenience of customers. This is in line with the findings of Jiradilok, Malisuwan, Madan, and Sivaraks (2014) who claim that that the shopping experience plays an important role in attracting customers as the experienced customers have sufficient knowledge of the price, the reliability of the website and the payment security.Access to online websites is not an issue these days due to easy availability of affordable internet services includingmobile data in Oman. Additionally, safety and security are assumed to be the responsibility of all Ecommerce platformsand this may explain its relative insignificance.

In addition to these factors, reliability, quality and assurance are also key factors that attract customers to online retailers. Thus Ecommerce companies have to formulate consistent policies and ensure that these are properly communicated to customers at all times.Innovative pricing strategy is the key to success in the online retail scenario. The rretailers have to formulate the right mix of offers, discounts and allowances that will keep customers coming back for repeat purchases. This is very important considering that the cost of customer acquisition is significantly higher than that of retention. An attractive and user friendly website is also a key prerequisite to a successful online venture. The site has to be kept fresh and updated regularly. All possible payment options should be offered to increase the attractiveness of the offering. The other attributes like appropriate pricing, responsibility, website information quality, and reliability should also be added into the websites .

REFERENCES

[1] Sneha Sankhe, (2015), "Improved Matching Integration in Heterogeneous Image Rich Information Network", International Journal of Scientific Engineering and Technology Research, ISSN 2319-8885, Vol.04, Issue.08, April-2015, Pages 1447-1453

[2] Deep Jhaveri , Shilpy Kumar , Sayali Naik, Sneha Sankhe , Mohammad Zakir Shaikh, (2015),"Content Based Image Retrieval", International Journal of Scientific Engineering and Technology Research, ISSN 2319-8885, Vol.04, Issue.09, April-2015,Pages:1626-1629

[3] Sneha Sankhe, (2017), "Mobile Application Interface to Register Citizen Complaint: E-Police Complaint", International Journal of Advanced Research in Computer Engineering & Technology, ISSN: 2278 – 1323, Vol. 6, Issue 4, April-2017, Pages 510-514.

[4] Sneha Sankhe, (2018), "Automated water distribution and effusion Detection by adopting embedded system", International Journal of Advance Research in Science and Engineering, ISSN(O): 2319-8354, ISSN(P): 2319-8346, Volume No 7, Issue No 4, April-2018, Pages: 130-134, UGC serial no.: 47721.

ISSN 2394 - 7780

[5] Sneha Sankhe, (2018), "Emotion Recognition and Reaction using Neural Networks and Raspberry Pi 3", International Journal of Advance Research in Science and Engineering, ISSN(O): 2319-8354, ISSN(P): 2319-8346, Volume No 7, Issue No 4, April-2018, Pages: 143-147, UGC serial no.: 47721.

[6] Sneha Sankhe, (2014), "Enhanced Matching Integration in Image Rich Information Network", International Conference of Emerging Trends in Engineering and Technology, IFERP, Mumbai.

[7] Kiran Gurav, Krishnakumar Yadav, Avinash Pardeshi, Ameya Gharat, Sneha Sankhe, (2018), "Automated water distribution and effusion Detection by adopting embedded system", International conference on recent developments in Science, Engineering, Management & Humanities, ISBN : 978-93-87793-23-1 held on 14th April, 2018, at The Institution of Engineers, Maharashtra state Centre,Mumbai, India.

[8] Anish Pimple, Prathamesh Shinde, Aaditya Paradkar , Mohit Mhashilkar, Sneha Sankhe, (2018), "Emotion Recognition and Reaction using Neural Networks and Raspberry Pi 3", International conference on recent developments in Science, Engineering, Management & Humanities, ISBN : 978-93-87793-23-1 held on 14th April, 2018, at The Institution of Engineers, Maharashtra state Centre,Mumbai, India.

[9] Chirag Namdeo Mande, Sneha Sankhe, Nitesh Uday Talekar, Vaibhav Vishwas Neman, "PORTAL FOR FARMER TO SELL PRODUCT AT BETTER RATE", International Research Journal of Engineering and Technology (IRJET), Volume: 08 Issue: 04, Apr 2021, e-ISSN: 2395-0056, p-ISSN: 2395-0072.

[9] Roshan Sunil Kamble, Sneha Sankhe, Tejas Avinash Mahade, Shubham Subhash Dalvi, "Online Police Portal with Face Detection and Recognition", International Research Journal of Engineering and Technology (IRJET), Volume: 08 Issue: 04, Apr 2021, e-ISSN: 2395-0056, p-ISSN: 2395-007

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SHOP NOW ECOMMERCE WEBSITE

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ABSTRACT
Ecommerce, also known as electronic commerce or internet commerce, refers to the buying and selling of goods or services using the internet, and the transfer of money and data to execute these transactions. Ecommerce is often used to refer to the sale of physical products online, but it can also describe any kind of commercial transaction that is facilitated through the internet. These business transactions occur either as business-to-business (B2B), business-to-consumer (B2C), consumer-to-consumer or consumer-to-business. Ecommerce provides several benefits to sellers over traditional retailing. Some key benefits include: overcoming geographical limitations, lower costs, 24 X 7 availability of products, gaining new customers through better search engine visibility, create targeted information, enable comparisons while shopping and eliminating travel time and costs for customers.

Ecommerce is becoming increasingly popular in Arab countries due to its various advantages over traditional brick and mortar retailing. Sultanate of Oman is one of the important economies in this region and is a key emerging market. Oman has witnessed a boom in Ecommerce activities including B2B and B2C activities. Attaining customer satisfaction is one of the keys to success in today's crowded and competitive online market. This study attempts to find and analyse the important factors affecting customer satisfaction with Ecommerce websites and online purchasing in Oman. The study shows that Price and Ease of Use and availability of multiple payment options are the important factors that positively influence customer satisfaction.

Keywords: Ecommerce, Customer Satisfaction

I. INTRODUCTION

Ecommerce, also known as electronic commerce or internet commerce, refers to the buying and selling of goods or services using the internet, and the transfer of money and data to execute these transactions. Ecommerce is often used to refer to the sale of physical products online, but it can also describe any kind of commercial transaction that is facilitated through the internet. These business transactions occur either as business-to-business (B2B), business-to- consumer (B2C), consumer-to-consumer or consumer-to- business. The terms e-commerce and e-business are often used interchangeably. The term e-tail is also sometimes used in reference to the transactional processes for online shopping .Electronic commerce draws on technologies such as mobile commerce, electronic funds transfer, supply chain management, Internet marketing, online transaction processing, electronic data interchange (EDI), inventory management systems, and automated data collection systems.(www.wikipedia.org).

Modern electronic commerce typically uses the World Wide Web for at least one part of the transaction's life cycle although it may also use other technologies such as e-mail. There are three areas of e-commerce: online retailing, electronic markets, and online auctions. Whereas e-business refers to all aspects of operating an online business, ecommerce refers specifically to the transaction of goods and services.

B. Benefits of E-Commerce

Ecommerce provides several benefits to sellers over traditional retailing. Some key benefits include : overcoming geographical limitations, lower costs , 24 X 7 availability of products, gaining new customers through better search engine visibility, create targeted information, enable comparisons while shopping and eliminating travel time and costs for customers. However, some customers prefer purchasing physical products as it enables them to touch, feel and try them out prior to buying.

C. Customer Satisfaction with Ecommerce Services

At a global level, customer satisfaction leading to loyalty (e.g. customer retention) is generally very strongly related to the profitability and long-term growth of a firm [Reichheld ,1995]. Small increases in customer retention rates can dramatically increase profit [Huffmire, 2001]. Loyal customers visit their favorite websites twice as often as non- loyal customers, and loyal customers spend more money [Dialscore.com 2000].According to analysts, 35 to 40%of e-commerce website sales revenue comes from repeat visitors [Rosen , 2001]. As such, it is not surprising that customer loyalty has been found to be a critical asset fore-retailers. Reichheld and Schefter [2000]found that the high cost of acquiring new online customers could lead to unprofitable customer relationships for up to three years. Consequently, it is very useful to determine the key antecedents or factors that influence customer satisfaction with ecommerce websites.

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Previous research found that e-retailers experience difficulty maintaining customer satisfaction despite the recent rapid growth in B2Ce-commerce[Hoffman and Novak , 2000]. Although there are certainly challenges shared by both traditional retailers and e-retailers, e- retailers face greater competition due to the fact that on the Internet a competitor is only a click away[Mithas, Ramasubbu, Krishnan, and Fornell ,2007] . Due to the ease of surfing websites, etailers face an uphill task in attracting, satisfying and retaining customers. This study Looks some of the key factors affecting customer satisfaction with regards to Ecommerce websites in Sultanate of Oman.

Though numerous studies have been conducted to determine the factors affecting customer satisfaction with Ecommerce in several countries, the number of such studies in Arab countries is quite limited. A the same time, the number of people buying products online has seen a steady increase in the Sultanate of Oman, with websites like Namshi, Roumaan and Souq becoming increasingly popular among people, especially the youth, who are internet savvy. Thus the motivation of this study is to determine the key factors affecting the satisfaction and loyalty of customers of online services in the Sultanate of Oman. In addition it aims to determine whether access, ease of ease of use of website and online payments , safety and security and pricing of products are direct antecedents of customer satisfaction. Theresearch questions addressed in this study are as follows:

1. What are the key factors affecting customersatisfaction with ecommerce websites in Sultanate ofOman?
2. Do access and quality of interface, ease of use and payments, safety and security and pricing of products affect the satisfaction of customers with ecommerce websites?

As there are very few studies on the key factors affectingcustomer satisfaction with ecommerce websites in the gulf region in general and Oman in particular, this study willplay a role in addressing this gap in the extant literature. Also, the managers of ecommerce companies can utilize the findings to identify the gaps and shortcomings in their service offerings in order to improve customer satisfaction levels and customer loyalty. From an academic perspective, this study provides insights that will improve our understanding of the impact of various factors related toe- commerce customer loyalty in the context of Sultanate of Oman as one major developing country in the Middle East. The study will add value to the literature of e-commerce in terms of improving our understanding of the impact of ease of access, website user interface design, e-payments, e-security and price on e- satisfaction.

II. LITERATURE REVIEW

Firdaus Khan and Noura Al Jahwari (2018) in their study on in their study on factors affecting customer satisfaction of online shopping in Oman concluded that the perceptions of the youth confirming the product quality & service guarantee influenced comfort and satisfaction to the online customers. The study also revealed that the service tangibility concerning the guaranteed package and delivery process along with the lowest price motivated them to go for online shopping repeatedly. The study illustrates through Quality Safety Assurance (QSA) model, the factors viz. Product Quality, Application Safety, Delivery Guarantee, and Offers should be focused to improve the online customer satisfaction, and the best-buy offers are the factors which need more attention to increase the Omani clientele.

Zatalini and Pamungkas (2016) pointed out that the factors leading to customer loyalty and the successful implementation of online retailing are the privacy of customer information and security and the speed of service. According to Suh and Han (2003), security is the biggest issue, the online shopping customers worried about and so higher the system security; higher will be the customer satisfaction security, and the speed of service. According to Suh and Han (2003), security is the biggest issue, the online shopping customers worried about and so higher the system security; higher will be the customer satisfaction.

Oxley and Yeung (2001) confirmed that online shoppingis widely preferred because it provides easy access to a large amount of information at reduced costs. AlGhamdi, Nguyen, Nguyen, and Drew (2012) claimed that the factors encouraging companies to engage in online retailing are the Government action in the form of reliable and secure online payment option, e-commerce support, strong ICT infrastructure, and educational e-commerce awareness programs in the country.

Christian & France (2005) proves that customers satisfied the most were privacy (Technology factor), Merchandising (Product factor), and convenience (Shopping factor); also followed by trust, delivery, usability, product customization, product quality and security. Surprisingly, security was chosen as the last choice comparing to others. Thus customers assume that security is a standard attribute present in all websites and other factors take precedence over it. David J. Reibstein (2002) did a study on the role of price in attracting customers to the site and retaining them. However, it was found that price alone is not a decisive factor as

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customers tend to shop at other sites unless the vendors provide them good customer service and on-time delivery. Interestingly, e-shopping site using low prices or price promotions to attract customers do mostly tend todraw price-sensitive customers who are well known as having low loyalty and are prone to switching.

Jarvenpaa & Todd (1997) in their study found that convenient and dependable shopping and ease of use of website are the most significant factors to satisfy online customers since the shoppers make their purchase decision depending on the process of delivery starting from accurate information of merchandise availability, anticipated deliverydate, and confirmation e-mail for specific order. Hence it is necessary to explain all policies including returns and refunds clearly and this will increase the trust of the customers.

III. METHODOLOGY

E. Conceptual Framework and Hypotheses

i. Conceptual framework

This study aims to investigate the impact of the antecedent factors on customer satisfaction with ecommerce sites with variables shown in Fig. 1.

Fig 1: Conceptual Framework

ii. HYPOTHESES

1. Easy access to the website has positive effect on Customers' satisfaction with Ecommerce websites.
2. Ease of use of site and availability of multiple payment options has a positive effect on Customers' satisfaction with Ecommerce websites.
3. Safety and security of online transactions has apositive effect on Customers' satisfaction with Ecommerce websites.
4. Prices of products and offers have a positive effect on Customers' satisfaction with Ecommerce websites.

F. Population and Sampling

The population of the study are citizens and residents in the Sultanate of Oman who have at least a onetime experience in shopping online. The sample size of this research is 150 and descriptive research design has been utilized in this study as it is found to be most appropriate forthe research problem. Convenience sampling has been used to collect the data for analysis.

G. Research Instrument

The data collection instrument used in this study is structured questionnaire. This questionnaire consists of 20 questions to measure the customers perceptions about the variables used in the study. A 5 point Likert scale has been used to measure the responses.

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H. Reliability and Validity

The most popular test of reliability used by numerous researches is Cronbach's coefficient alpha (Cronbach's alpha) which will test the consistency of respondent's answers to all the items in the measurement. The Cronbach alpha of all the variables exceed 0.7 which makes them acceptable for the study.

Table 1: Kmo Measures

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.832
Bartlett's Test of Sphericity	Approx. Chi-Square	840.055
	df	190
	Sig.	.000

KMO Measure of sampling adequacy is a statistic that indicates the proportion of variance in the variables that maybe caused by underlying factors. Any value above 0.6 is considered adequate. The KMO of the variables in this studyis 0.832 which shows that the variables are highly appropriate for the analysis.

IV. RESULTS

Multiple Regression Analysis

Multiple regression analysis is employed in this study. All variables hypothesized are entered in the single step. The enter method enables to include all variables in the proposed model.

HO: Access, Ease of Use and availability of multiple payment options, safety and security of online transactions and prices and offers will have no significant positive effect on customers' satisfaction with Ecommerce websites.

H1: Access, Ease of Use and availability of multiple payment options, safety and security of online transactions and prices and offers will have a significant positive effect on customers' satisfaction with Ecommerce websites.

Table 2: Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.672[a]	.451	.422	.93799

a. Predictors: (Constant), Price, Safety and Security, Ease of Use and Payment Options, Access

The coefficient of determination (R^2) is .422 which means that 42.2% of variation in customer satisfaction with Ecommerce websites in Oman can be explained by the predictor variables Access, Price, Safety and Security, Ease of Use and Payment Options. The remaining part is explained by various other factors.

Table 3: Anova

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	68.047	5	13.609	15.468	.000[b]
	Residual	82.703	94	.880		
	Total	150.750	99			

Are .532 and .936 respectively which indicate that they arenot significant at this level of confidence

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Thus the Model Is
Customer Satisfaction with Ecommerce Sites = .008 (Access) + .301 (Ease of Use and Payment Options) +.502 (Price) -.059 (Safety and Security).

a. Dependent

Variable:
Customer Satisfaction

With

V. CONCLUSION

This study was conducted to analyse the key factors

Ecommerce Sites

b. Predictors: (Constant), Price, Safety and Security, Ease of Use and Payment Options, Access

Shown in Table 3, F- value of 15.468 is significant at

0.05 levels indicating that there exists at least one independent variable affect to dependent variable. Hence, this research rejects the Ho and accepts H1 that Access, Ease of Use and availability of multiple payment options, safety and security of online transactions and prices and offers will have a significant positive effect on customers' satisfaction with Ecommerce websites

Table 4: Table of Coefficients

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficient s	t	Sig.
		B	Std. Error	Beta		
1	Constant	.937	.377		2.488	.015
	Access	.008	.099	.008	.081	.936
	Safety	-.058	.093	-.059	-.627	.532
	Ease of Use	.291	.093	.301	3.109	.002
	Price	.504	.097	.502	5.205	.000

a. Dependent Variable: Customer Satisfaction with Ecommerce sites.

The variables having the highest standardized beta coefficients are Price (.502) followed by Ease of Use (.301), Access (.008) and Safety and Security (-.059). Thus, Price has the highest influence on customer satisfaction followed by Ease of Use and Payment Options, Access and Safety and Security respectively. The variables Ease of Use and Price have got the maximum t – values of 3.109 and 5.205 respectively. This shows that Price and Offers has the maximum impact on customer satisfaction followed by Ease of use and multiple payment options. The p values of Ease of Use are .002 and for price it is .000 at .05 level of significance. However, the p values of Safety and Access affecting satisfaction of customers in Sultanate of Oman with Ecommerce firms and online purchases. Four variables namely, Access , Ease of Use of the website and availability of multiple payment options, Safety and Security and Price were identified as antecedent variables affecting satisfaction of online customers. The analysis shows that these factors together explain 42.2% variation in the customers' satisfaction with Ecommerce websites in Oman. Out of these predictor variables, Price and Ease of Use and availability of multiple payment options have been found to have a significant impact on customers' satisfaction while the impact of Safety and Security and Access was not so significant. This finding is consistent with the study of Thomas and Harry (2004) revealing that the respondents with experience in purchasing were more likely to be influenced by price. This may be due to the fact that most customers buy online to avail of the significant offers and discounts offered by etailers. Luxury products are rarely sold online . At the same time, a website that is user friendly and easy to navigate will further encourage customers to spend more time online and look at more products. A choice of payment options like credit and debit cards as also Cash on Delivery increase the convenience of customers. This is in line with the findings of Jiradilok, Malisuwan, Madan, and Sivaraks (2014) who claim that that the shopping experience plays an important role in attracting customers as the experienced customers have sufficient knowledge of the price, the reliability of the website and the payment security. Access to online websites is not an issue these days due to easy availability of affordable internet services including mobile data in Oman. Additionally, safety and security are assumed to be the responsibility of all Ecommerce platforms and this may explain its relative insignificance.

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REFERENCES

[1] AlGhamdi, R., Nguyen, A., Nguyen, J. & Drew, S.," Factors influencing e-commerce adoption by retailers in Saudi Arabia: A quantitative analysis, "International Journal of Electronic Commerce Studies, 3(1), 2012, pp. 83-100, 2016 .

[2] Determinants of E-Commerce Customer Satisfaction, Trust, and Loyalty in Saudi Arabia. Available from: https://www.researchgate.net/publication/228867201_Determinants_o f_ECommerce_Customer_Satisfaction_Trust_and_Loyalty_in_Saudi_ Arabia [accessed Aug 26 2019].

[3] Dillon T. and Reif H., "Factors Influencing Consumers E-Commerce Commodity Purchases," Information Technology, Learning, and Performance Journal, vol. 22, pp. 1, 2004.

[4] Hoffman, D. and T. Novak,"How to Acquire Customers on the Web,"Harvard Business Review, Vol. 78, 3:179-185, 2000.

[5] Huffmire, D. "Improving Customer Satisfaction, Loyalty, and Profit: an Integrated Measurement and Management System,"Choice, Vol. 38,5:946-947, 2001.

[6] Jarvenpaa S.L. and Todd P.A., "Consumer reactions to electronic shopping on the World Wide Web," International Journal of Electronic Commerce, pp. 59-88, 1996.

[7] Jiradilok, Malisuwan, Madan, and Sivaraks, "The Impact of Customer Satisfaction on Online Purchasing: A Case Study Analysis in Thailand," Journal of Economics, Business and Management, Vol 2, No1, pp.6-11, 2014.

[8] Khan, F., Al- Jahwari, N.S, and Al-Kalbani, G.K., "Factors Influencing Customer Satisfaction of Online Shopping in Oman – Youth Perspective," Humanities & Social Science Reviews, Vol 6, No.2, pp.64-73, 2018.

[9] Mithas,S., N.Ramasubbu, M. Krishnan and C. Fornell, "Designing Web Sites for Customer Loyalty Across Business Domains: A Multilevel Analysis," Journal of Management Information Systems, Vol. 23, 3:97–127, 2007.

[10] Oxley, J.E. & Yeung, B., "E-Commerce Readiness: Institutional Environment and International Competitiveness," Journal of International Business Studies, 32(4), pp.705-723, 2001.

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ANALYSIS AND OPTIMIZATION OF PERVIOUS CONCRETE

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ABSTRACT
Pervious concrete is a mixture of cement, water, coarse aggregate and little to no sand. It is also called as porous concrete and no fines concrete. This paper deals with the experimental results of pervious concrete based on three different sizes of aggregates with three sand contents. A mix design of Grade M25 was developed. The sizes of aggregate taken are 10, 12 and 16mm and the sand content is reduced to 5%, 10% and 15%. Three cubes and three cylinders were casted for each size and sand content respectively. A total of 27 cubes are casted which are tested for compressive strength and infiltration rate. Based on the analysis of the results obtained, applications of pervious concrete will be recommended

INTRODUCTION
A Conventional Concrete is a composite material composed of fine and coarse aggregate bonded together with a fluid cement (cement paste) that hardens or cures over time. Pervious concrete is a type of concrete that has a low water to cement ratio and contains none or very little amount of sand. It is usually a mixture of 9mm to 19mm average diameter aggregate, hydraulic cement, other cementitious materials, admixtures and water. Pervious concrete also called as permeable or no fines concrete has a high porosity which can be used for concrete flatwork applications that allows water from precipitation and other sources to pass directly through, thereby reducing the runoff from a site and allowing groundwater recharge.

Pervious concrete is been used in European countries since the 1800s for pavement surfacing and load bearing walls. Due to its cost efficiency, it was also used for two storey homes in Scotland and England. It was introduced in India only in the late 2000s and due to its low strength and structural capacity, the use of pervious concrete in India is limited mostly to parking facilities, low volume roads, sidewalks etc. As for highly developed expressways and heavy volume roads, pervious concrete may not conform to the required structural and bearing capacity. Taking this issue into account various researches and studies are being carried out at different institutions for its implementation on a larger scale for roadway applications.

AIM AND OBJECTIVE
- To develop mix design for Pervious concrete by reduction of sand.
- To carry out test for infiltration and compressive strength of perviousconcrete
- To analyse its suitability for various applications.

LITERATURE REVIEW
High porosity is one of the basic characteristics of pervious concrete. This property of pervious concrete was enhanced during research conducted in the year 2015 at Indonesia by using volcanic pumice which is a waste material as aggregate replacement on porous concrete. Materials used were OPC, normal coarse aggregate, volcanic pumice, water and plasticizer. In this study the effect of varying proportions of volcanic pumice per normal aggregate and the proportion of aggregate to cement with a constantwater cement ratio was evaluated on the mechanical properties of volcanic pumice porous concrete and on porous concrete with normal aggregates. The tests were conducted for void content, compressive strength and flexural strength. Thus, based on the tests results it was concluded that volcanic pumice could be effectively used to improve the porosity of pervious concrete without much reduction in its strength.

In the year 2014, research conducted in states suggested the application of perviousconcrete in the construction of highway shoulders for effective storm water management. The study was conducted on three different types of permeable shoulders with stone reservoirs, Porous Asphalt and Pervious Concrete Pavement with Permeable interlocking concrete pavements for full infiltration, partial infiltration and no infiltration systems. In Full infiltration system since there was no provision of outlet pipe the entire water was allowed to pass to the sub-grade. In the next system the excess water above infiltration capacity was removed via outlet pipe. While in the third one thatis No infiltration system the entire water was removed by outlet pipe and no water was allowed to pass to the sub-grade by provision of impermeable geo-synthetic material. The result of the research conducted showed that Pervious concrete pavements with partial infiltration system was the most suitable for roadway applications. The design of pervious concrete pavements was based on Street pave system (2012). Thus, pervious concrete pavements can be used to minimize the environmental impacts, to minimize the runoff and

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flooding, to reduce the erosion and improve the ground water recharge. Also, the use of stone-reservoirs helps in removing the pollutants. Hence it can be concluded from this study that pervious concrete can be effectively used in pavements like roadway shoulders for sustainable development.

METHODOLOGY

The Methodology Adopted for the Study is as Follows;

- Identification of the problem.
- Testing of aggregate and calculating the mix proportion and forming a mixdesign
- Casting of concrete cubes and cylinders
- Testing of concrete

Identification of Problem

There is no specific code for the design of pervious concrete. Hence the mix design is developed by following the IS codes 456-2000, 10262-2009 but making some modificationsaccording to the requirements to make the concrete pervious.

Mix Design

Concrete mix design can be defined as the process of finding the right proportions of materials for concrete to achieve target strength in structures.

Concrete mix= Cement:Sand: Aggregates

STEP1: Calculation of target mean strength.

Characteristic strength= 25N/mm^2 Target mean strength= fck + 1.65*s

=25+1.65*4=31.6N/mm2

STEP2: Calculation of water/cement ratio (w/c);Based on strength criteria, w/c ratio= 0.48 (IS10262-1982) Based on

Experience criteria, w/c ratio= 0.43

Based on grade of concrete,

Max. w/c ratio=0.5 (IS456-2000, Tab.5)

Least of the above values, we adopt w/c ratio value of 0.43.

STEP3: Calculation of water and cement content;Water content,

Max. water content=186kg (IS10262-2009, Tab.2) Thisvalue of water content is for 50mm slump.

So for every 25mm increase in slump, water content is increased by 3%. Therefore for 125mm slump there will be increase in water content by 9%,Water content= 186 + 186*9/100 = 202.74kg~ 203kg. Cement content,

w/c ratio= 0.43 Water content= 203

Cement content= 203/0.43= 472.09~ 473kg/m3

STEP4: Calculation of content of Course and Fine aggregates;

Volume of coarse aggregate per unit volume of Total aggregates=0.62(IS10262, Tab.3)

The above value is for w/c ratio of 0.5. So the coarse aggregate is increased at a rateof 0.01 for every decrease in w/c ratio of 0.05.

Adopted w/c ratio=0.43Difference=0.07

% Increase in volume of coarse aggregate=0.07x0.01/0.05=0.014 Volume of Coarse aggregates= 0.62+0.62x 0.014= 0.629~0.63

Volume of fine aggregates=1-0.62=0.37.STEP5: Calculation of mix proportion;

Assuming 1m3 of concrete,

Absolute volume of cement=473/3.15x1000=0.150m3Absolute volume of water=203/1000=0.203m3

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Absolute volume of total aggregates=1-(0.15+0.203) =0.647m3

Weight of coarse aggregates=0.647x0.63x2.6x1000=1059.78~1060kg/m3 Weight of Fine aggregates=0.647x0.37x2.75x1000=658.32~659kg/m3 Mix proportions,

Cement -473kg/m3Water -203kg/m3

Fine aggregates -659kg/m3 Coarse aggregates -1060kg/m3

Wet density of concrete-2395kg/m3 w/cratio: 0.43

STEP6: Site corrections;

Absorption of fine aggregates=2%

Amount of water absorbed =659x2/100=13.18litAbsorption by coarse aggregates=1.4%

Amount of water absorbed=1060x1.4/100=14.84lit.Total absorption=13.18+14.84=28.02lit

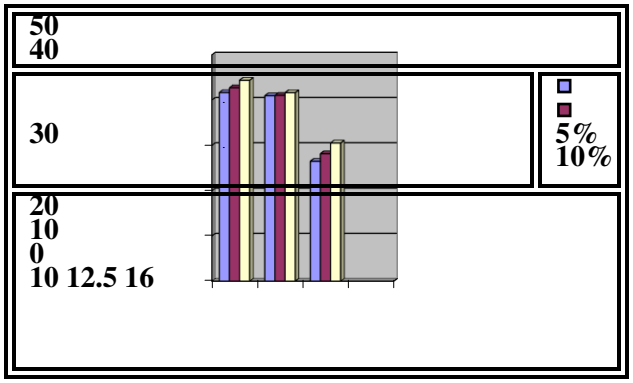
Actual amount of water to be used=203+28.02=231.02kg/m3 Actual weight of fine aggregates=659-13.18=645.82kg/m3

Actual weight of coarse aggregates=1060-14.84=1045.16kg/m3

STEP7: Calculation of Mix Design;Proportion of materials,

Sr. No	Materials	Proportions
1.	Cement	473kg/m3
2.	Water	231.02kg/m3
3.	Fine Aggregate	645.82kg/m3
4.	Coarse Aggregate	1045.16kg/m3

RESULT



Test results for infiltration rate are obtained by performing tests on cylinders.

Sand Content Size of aggregate	Infiltration rate mm/hr.		
	5%	10 %	15%
10mm	57	44	31
12.5mm	92	76	49
16mm	113	98	85

CONCLUSION

Pervious concrete is a mixture of cement, water, coarse aggregate and little to no sand. It is a special type of concrete with a high level of porosity that allows water from precipitation and other sources to pass directly through the sub grade. It helps to reduce the run off thereby allowing ground water discharge.

Experimental results of pervious concrete, for compressive strength and infiltration rate, based on three different sizes of aggregates with three sand contents were analyzed. A mix design of Grade M25 was developed. The sizes of aggregate taken are 10, 12.5 and 16mm and the sand content is reduced to 5%, 10% and 15%. Three cubes and three cylinders were casted for each size and sand content respectively. A total of 27 cubes and 27 cylinders are casted which are tested for compressive strength and infiltration rate respectively

It was found that the compressive strength of concrete increases with the increase in sand content and decrease in the size of aggregates. Infiltration rate of concrete increases with the increase in size of aggregate and decrease in sand content.

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REFERENCE

[1] Stephakn A. Arhin, Rezene Madhi and Wasi Khan, "Optimum mix designs for pervious concrete for an urban area," IJERT Vol. 3Issue 12, pp. 42-50, December 2014.

[2] Praveen Kumar Patil and Santosh M. Murnal, "Study on the properties of pervious concrete," IJERT Vol.3 Issue 5, pp.819-822, May 2014.

[3] Aneel Manan, Mushtaq Ahmad, Fawad Ahmad, Abdul Basit and Muhammad Nasir Ayaz Khan, "Experimental investigation of compressive strength and infiltration rate of pervious concrete by fully reduction of sand," CEJ Vol. 4, No. 4, pp. 724-731, April 2018.

[4] Djoko Sarwono, Djumari, Rochim and Ary Setyawan, "The application of porous concrete filled with soil and sands for low volume traffic roa," ELSEVIER Procedia Engineering 171 (2017) 1429-1434

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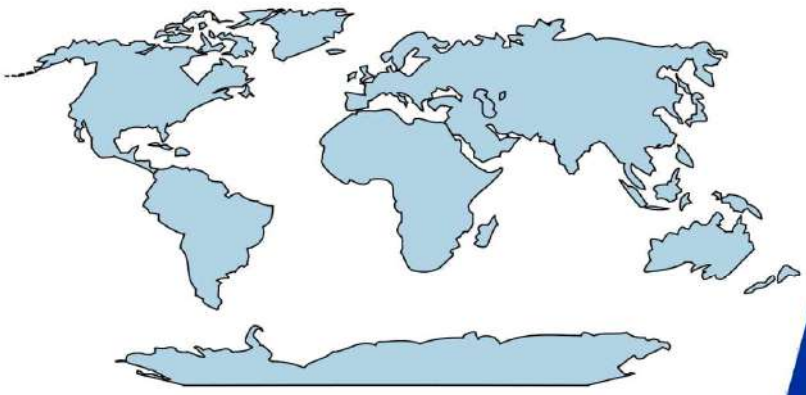

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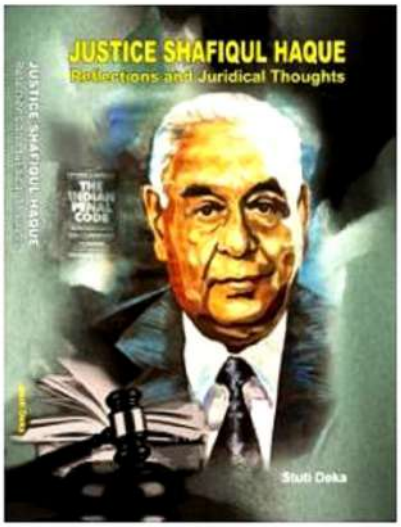

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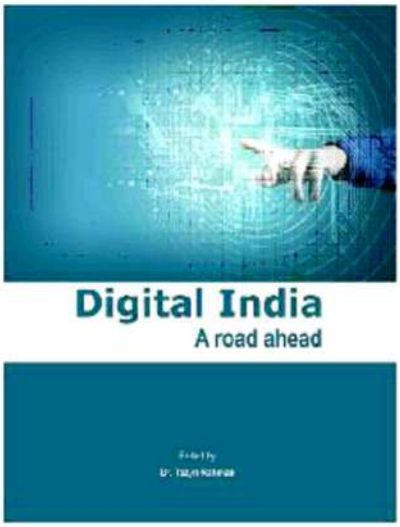

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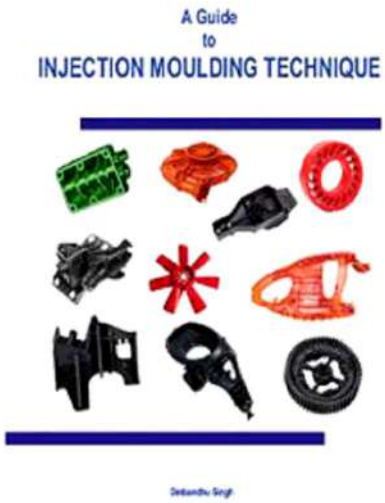

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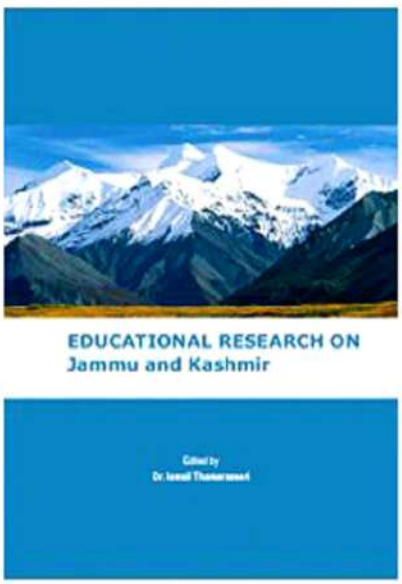

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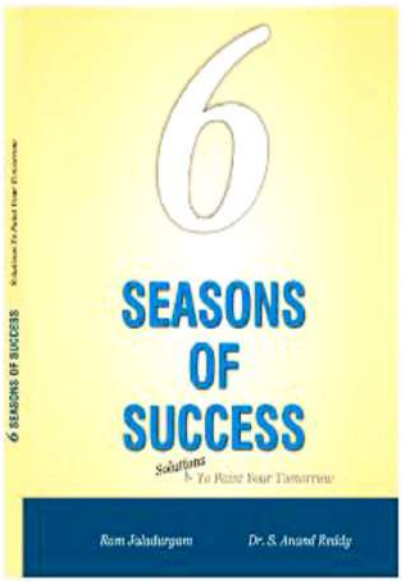

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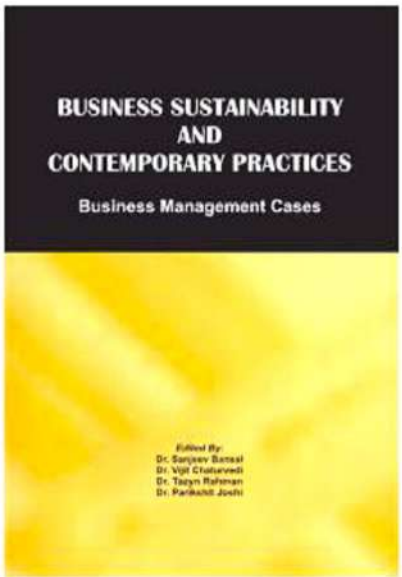

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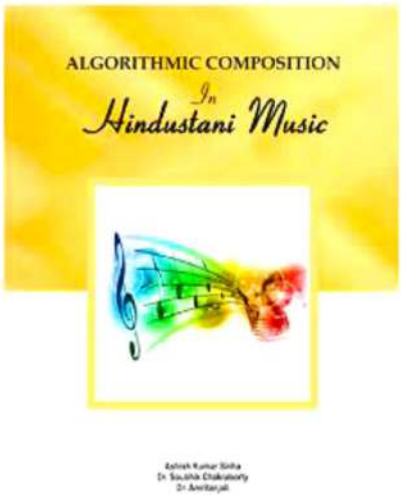

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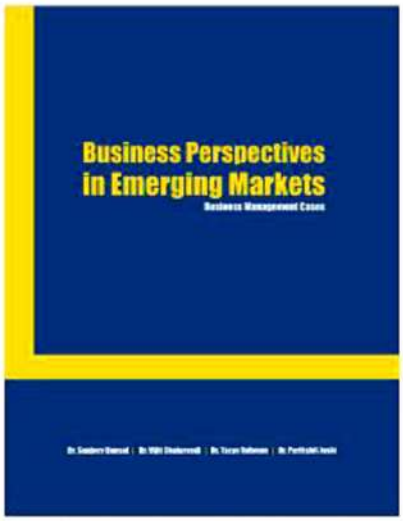

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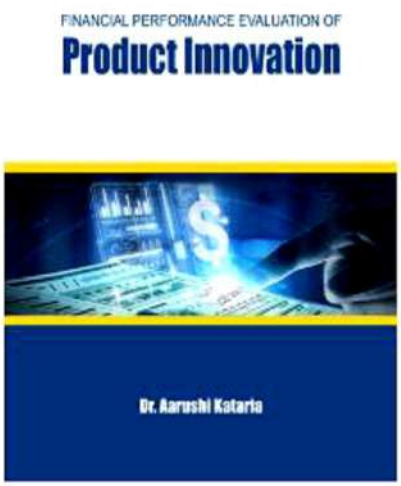

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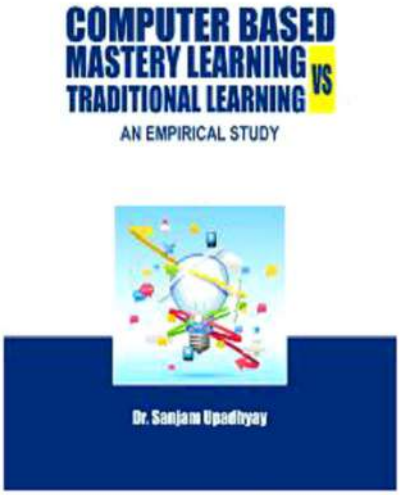

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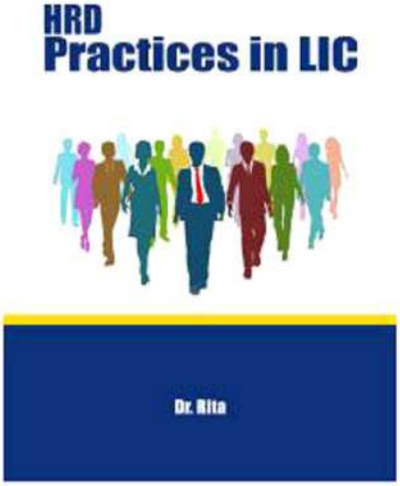

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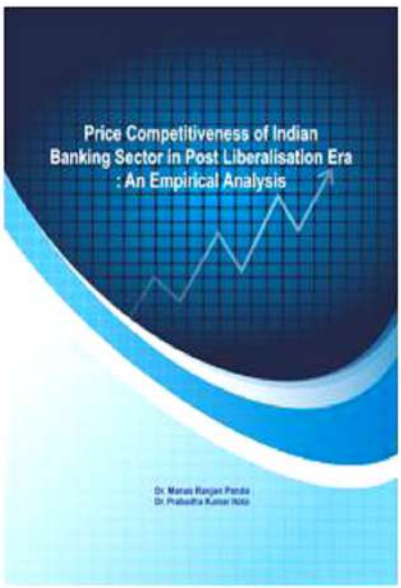

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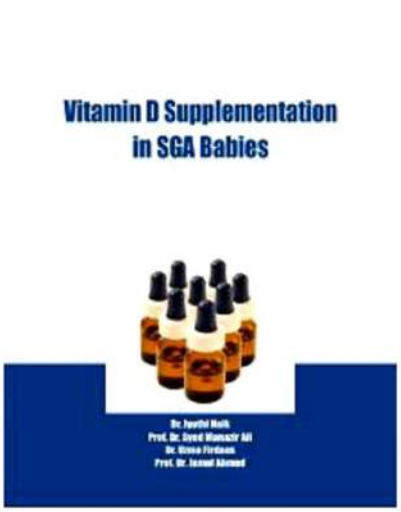

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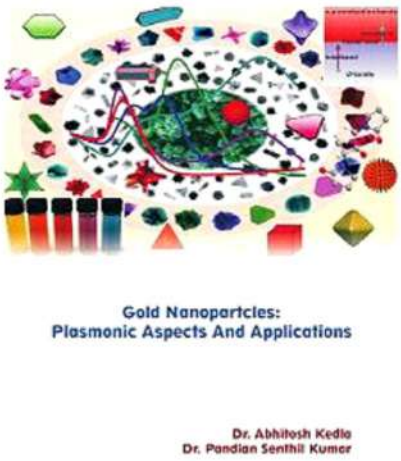

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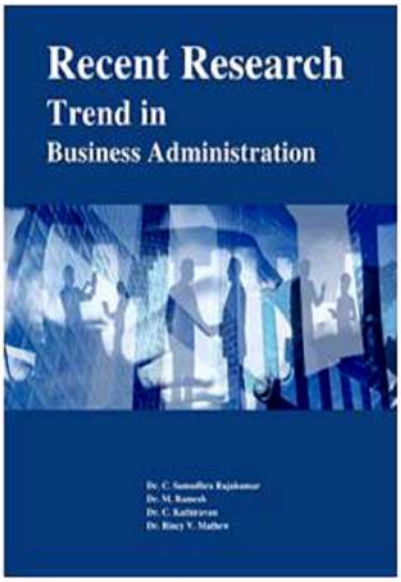

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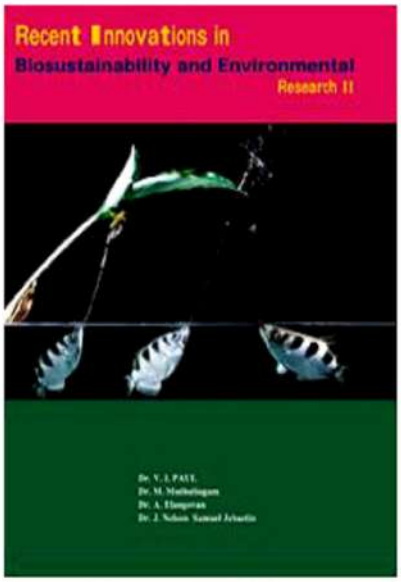

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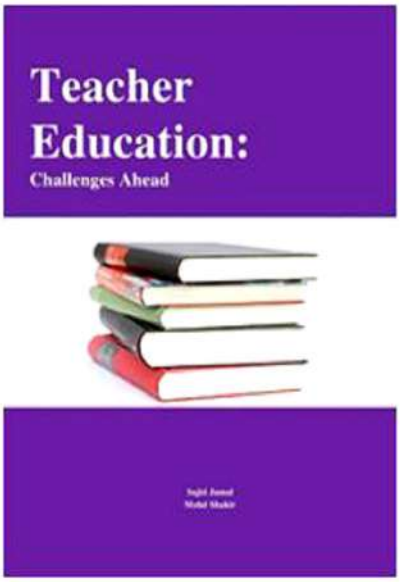

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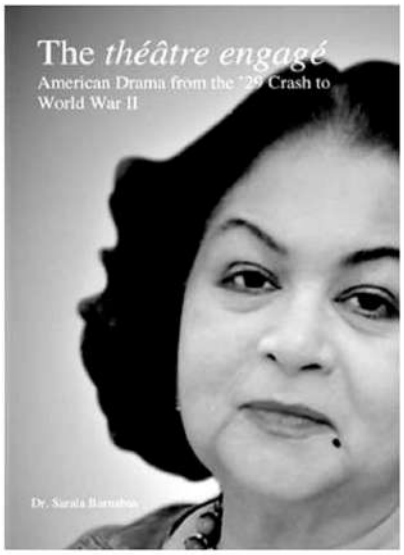

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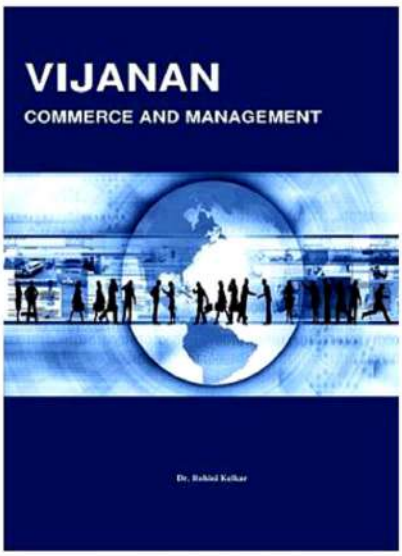

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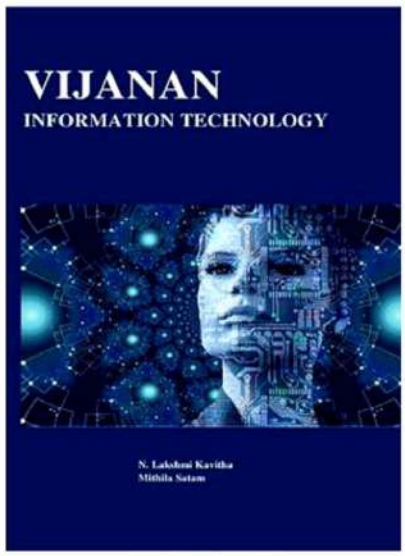

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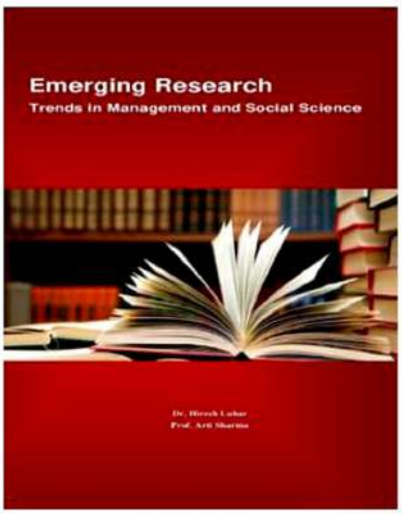

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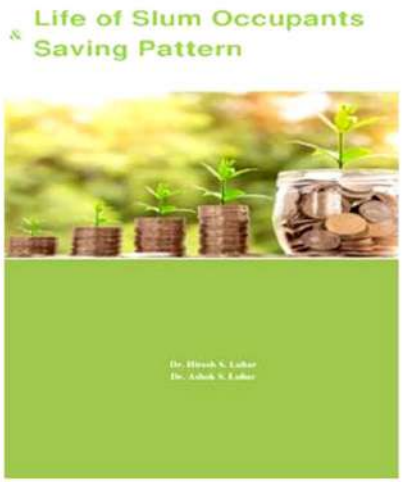

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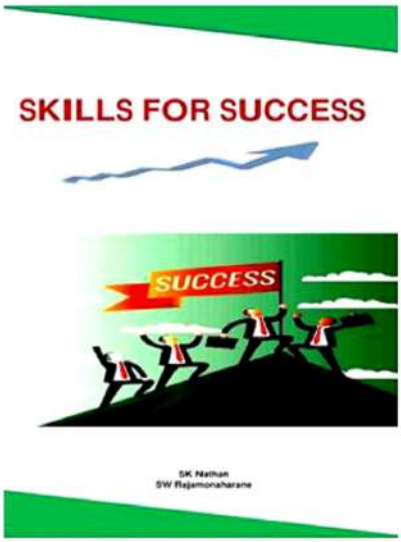

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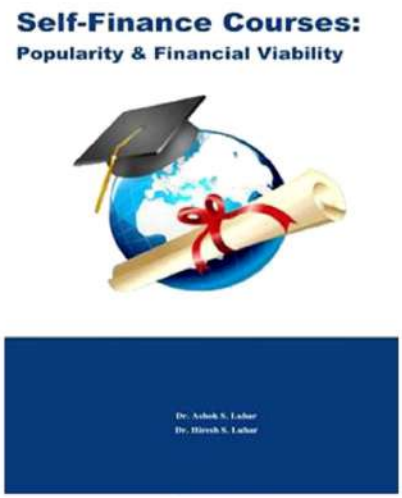

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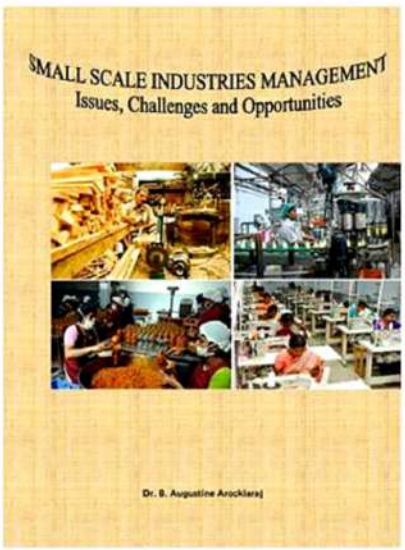

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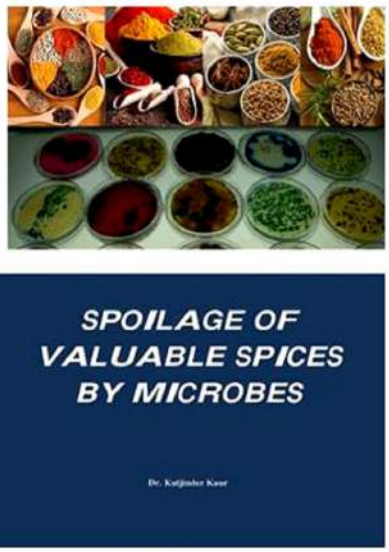

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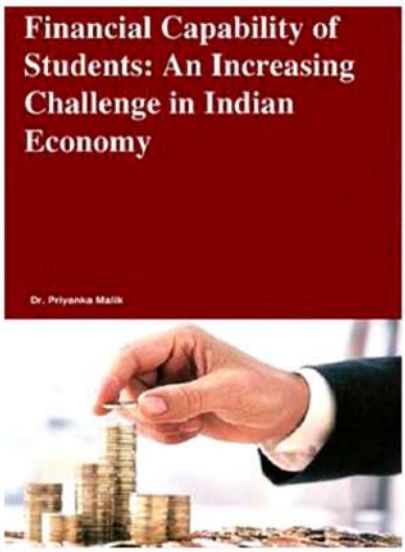

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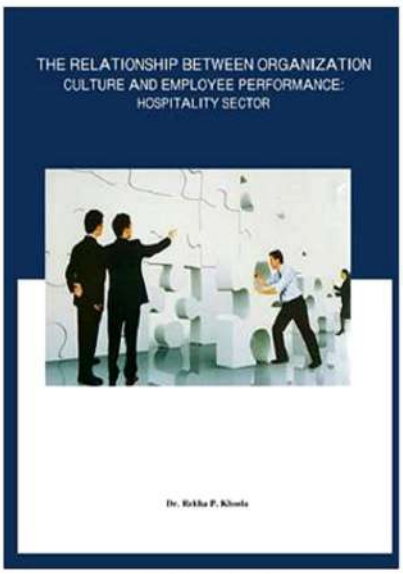

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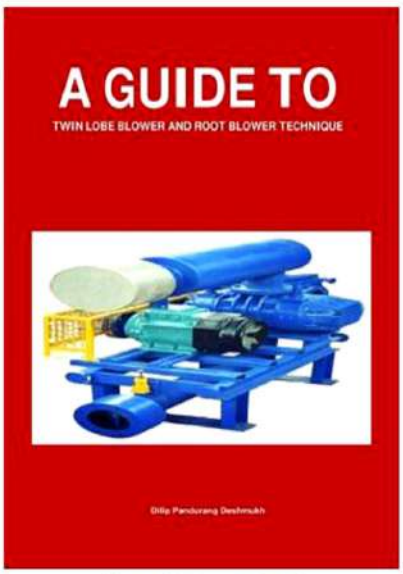

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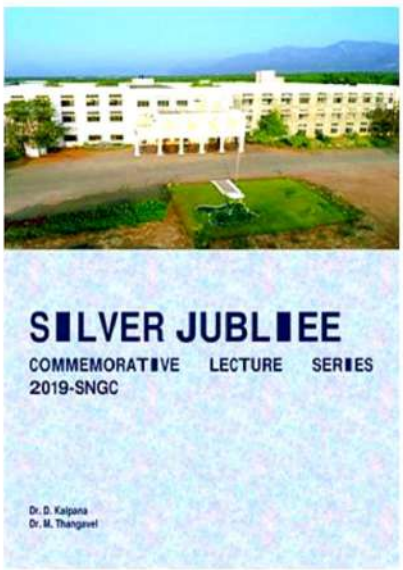

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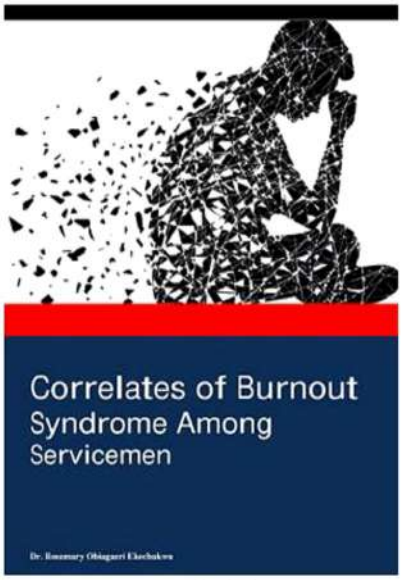

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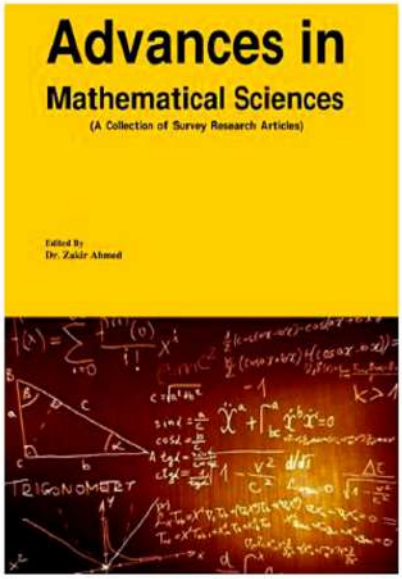

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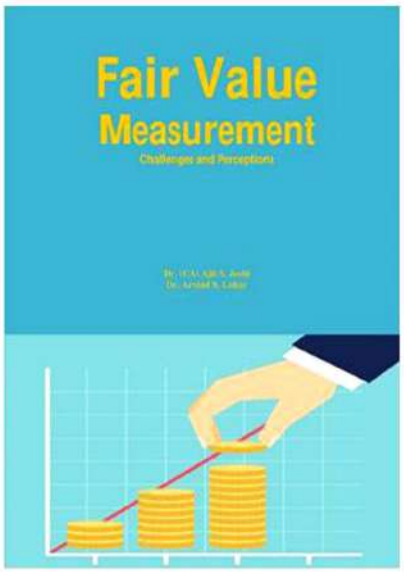

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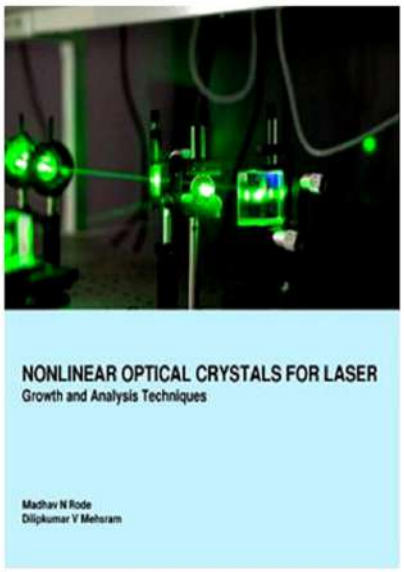

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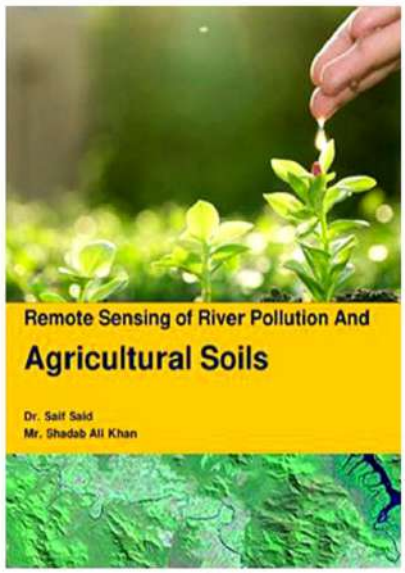

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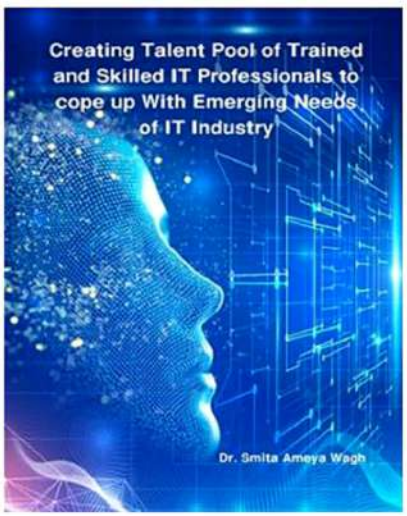

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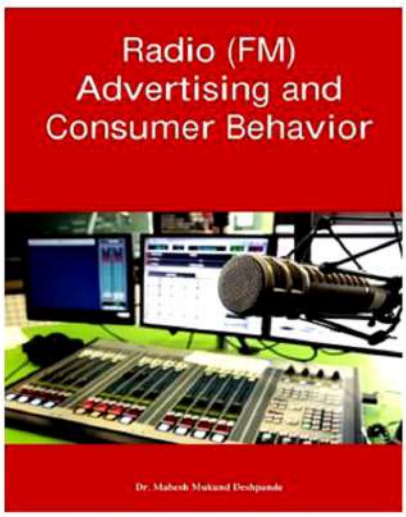

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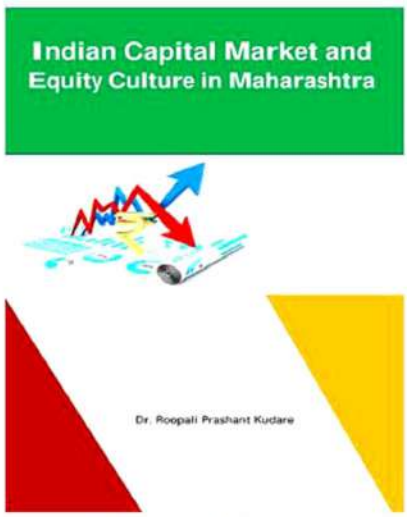

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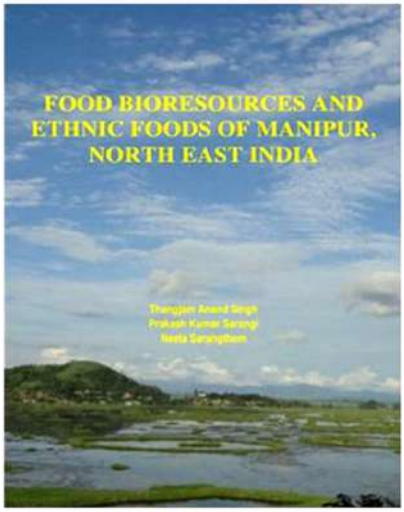

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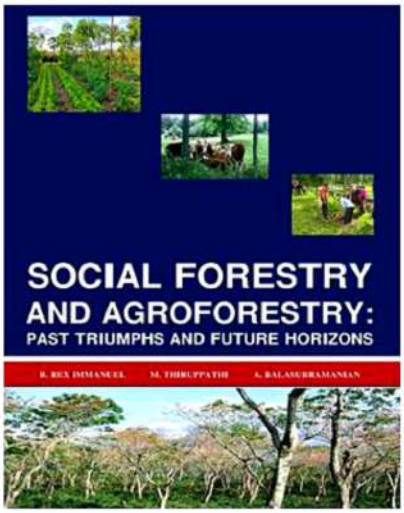

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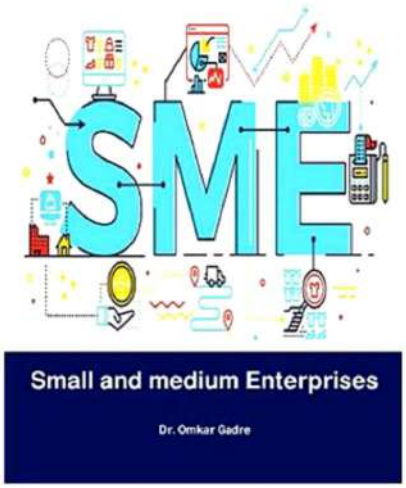

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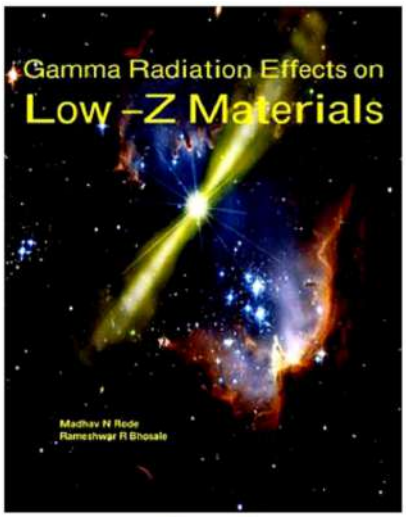

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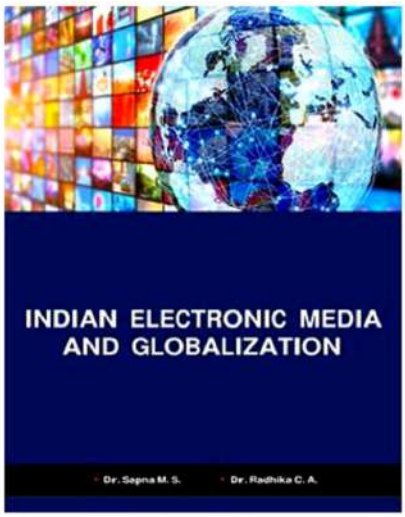

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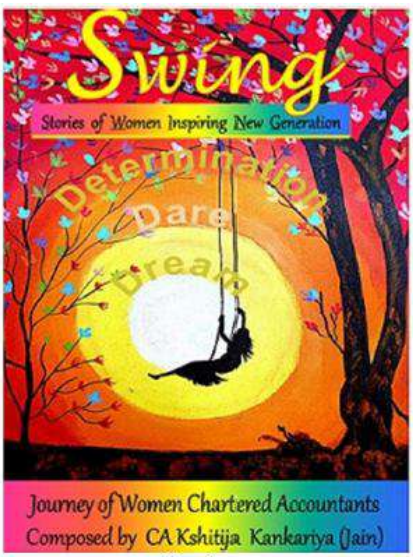

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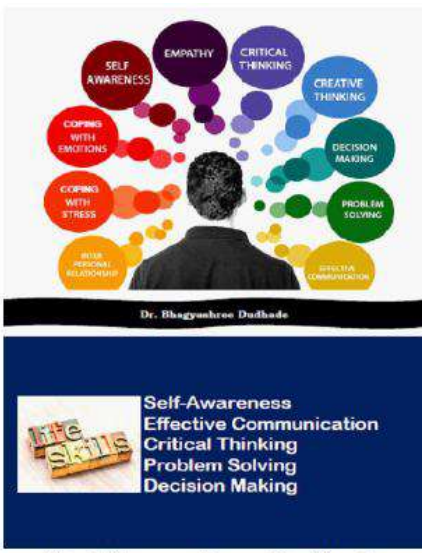

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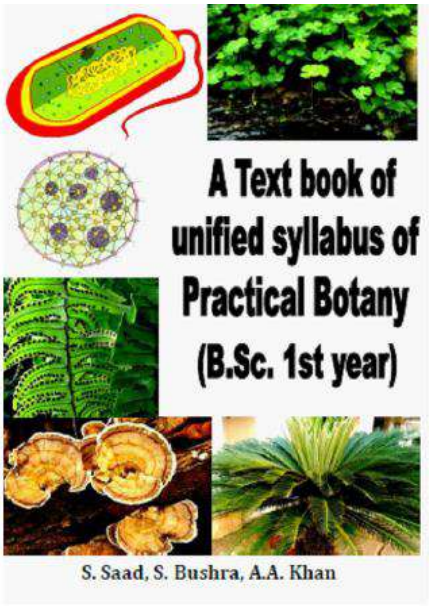

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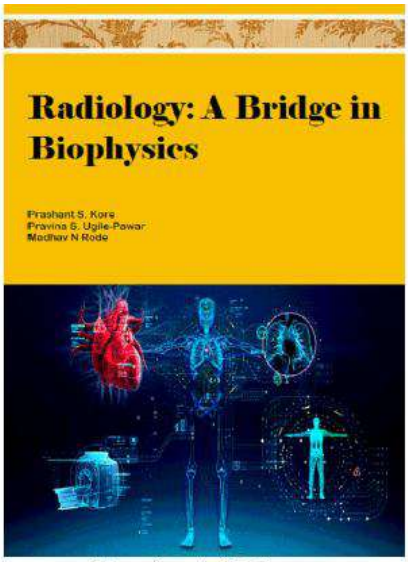

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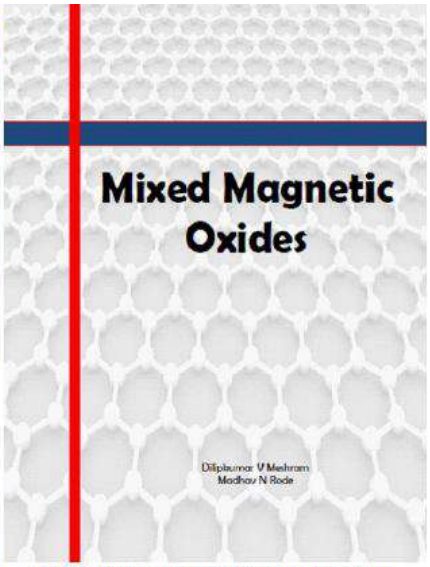

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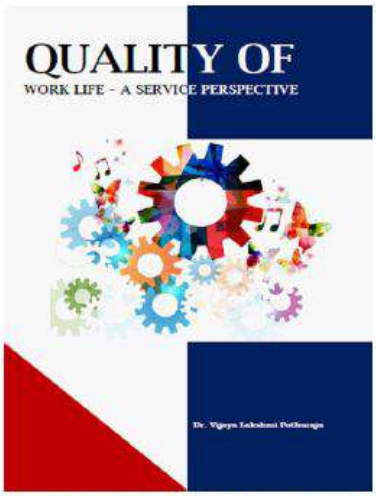

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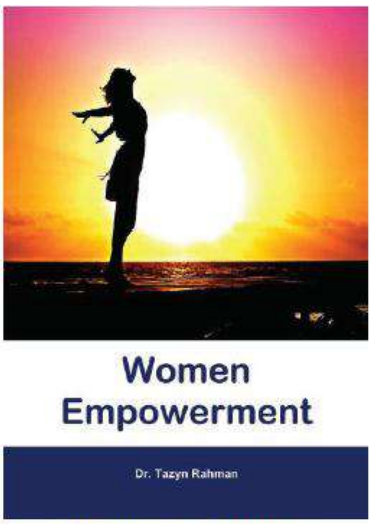

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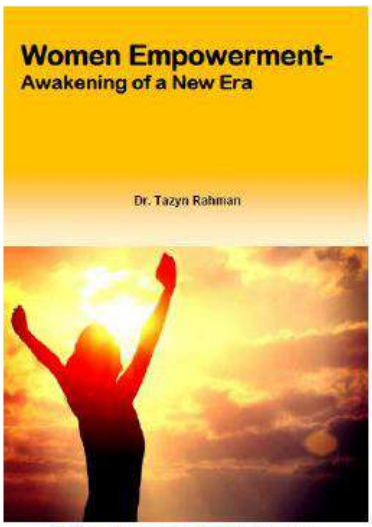

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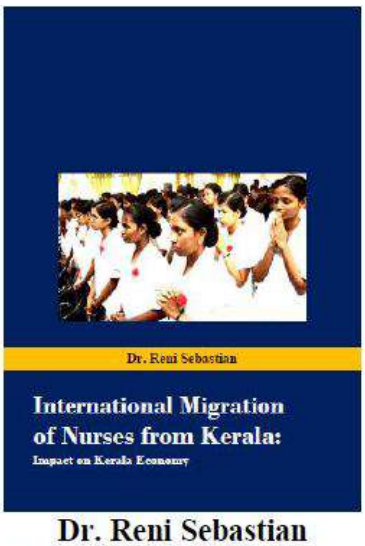

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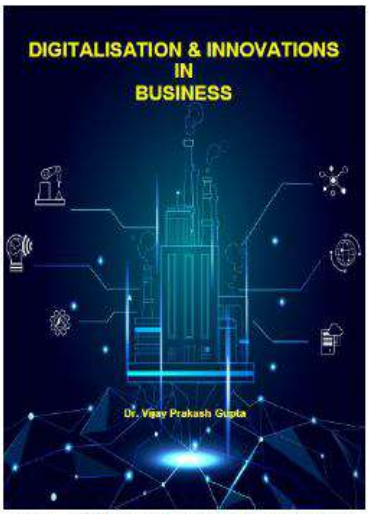

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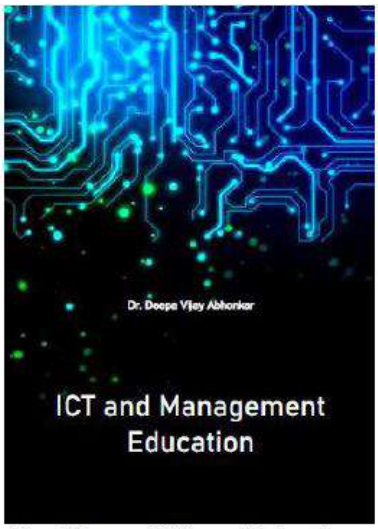

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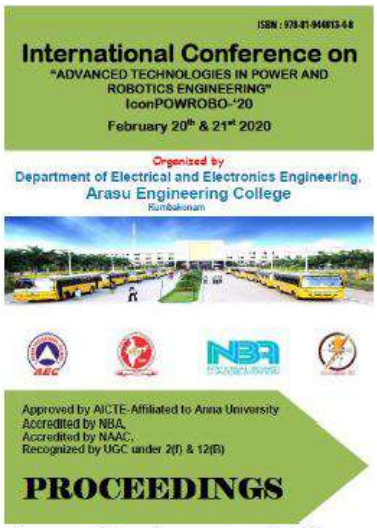

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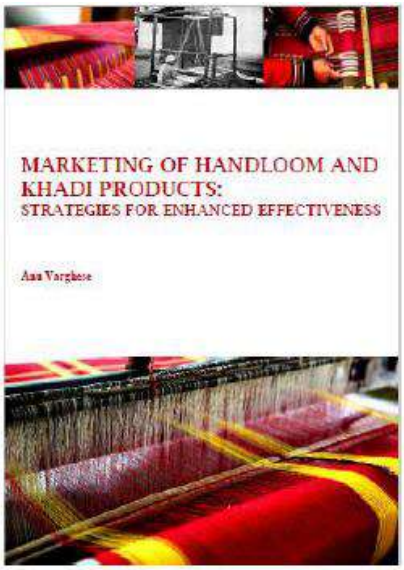

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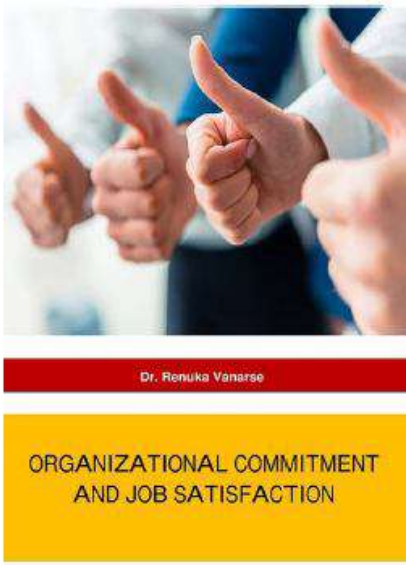

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