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ACCIDENT PREVENTION & CRACK DETECTION SYSTEM FOR RAILWAY TRACKS

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ABSTRACT
Railways provide the cheapest and most convenient mode of passenger transport both for long distance and suburban traffic. Also, most of the transport in India is being carried out by railway network. Still, accidents are the major concern in terms unidentified crack and faults in rail tracks in Indian railway. About 60% accidents are occurring due to crack in railway tracks resulting in loss of precious life and loss of economy. Therefore, there is need to think about new technology which is robust, efficient and stable for fault detection in railway track. In this paper a crack detection system is proposed which detects the crack without human intervention and sends the location of fault of rail track to the authorized person. This project discusses a Railway track crack detection using image processing and is a dynamic approach which combines the use of Raspberry Pi 4, wheel encoder and GSM module to send alert messages and the geographical coordinate of location to the concerned person. A Raspberry Pi 4 is used to control and coordinate the activities of these devices. This project prevents train derailment by detecting a crack in railway track using internet of things technology.

Keywords— Raspberry Pi 4b ,Pi Camera, Railway track, Rail faults, wheel encoder.

1. INTRODUCTION

Rail track is one of the most important infrastructures for the rail transport, plays major role for the comfort and safe journey of the passengers. Inspection of railway tracks is essential in ensuring the safety of railway system. Poor track management leads to degradation in the quality of ride, flange contact, flange climb, finally to the derailment. There is old method for inspecting the condition of the track. One is portable devices which involves engineers to operate along the track line during the midnight. It's a time-consuming work and the quality can't be guaranteed since it depends on the ability of the workers. This project propose a designing railway track crack detection system using Raspberry Pi 4, Image Processing and wheel encoder sensors. The central component of the whole system is a Raspberry Pi 4. If any crack or fault is detected on the track the location of the crack is identified and the location latitude and longitude coordinates are procured. The GSM module is used to send these location coordinates in the form of Short Message Service (SMS) to the pre-defied interface device or railway station. In a world, one of the largest railway networks is India. Therefore, Inspection by manually and detection of crack in railway track is very time consuming and human resources and it is also a very tedious process.

2. OBJECTIVE & SCOPE

The main aim of the project is to design and develop an automatic railway crack detection system based on image processing technology and to detect crack on railway using the camera and wheel encoder. The Indian Railways doesn't have new technologies; hence chances of human error are more and it is one of the major causes of rail accidents in India. The reasons for compromising safety measures are low budget, delay in installing anti-collision devices and lack of skilled manpower. Image Processing has been used in a number of tasks involving automatic detection and monitoring. In this project, a computer-based methodology has been discussed to automatically detect railway track cracks and inform the authorities to take evasive action on time

The objective of this project are as follows:

- The main objective of this project is accident prevention of trains due to cracks in railway track .
- Reduces the manual labor.
- Reduce time consuming.
- To provide real-time monitoring of railway tracks as well as detection of any crack on railway tracks and in case of detection send the information with the location to the receiver side using encoder module via GSM

Scope

With respect to current scenario in the railway systems, it is necessary to have safety elements in order to avoid accidents. The main cause of accidents is the existence of cracks on the tracks. This project deals with the efficient methods to avoid accidents due to cracks fault. The main aspect of our project is to identify a crack in a track and to alert the control room at the very same moment. The proposed system sets a benchmark of how to

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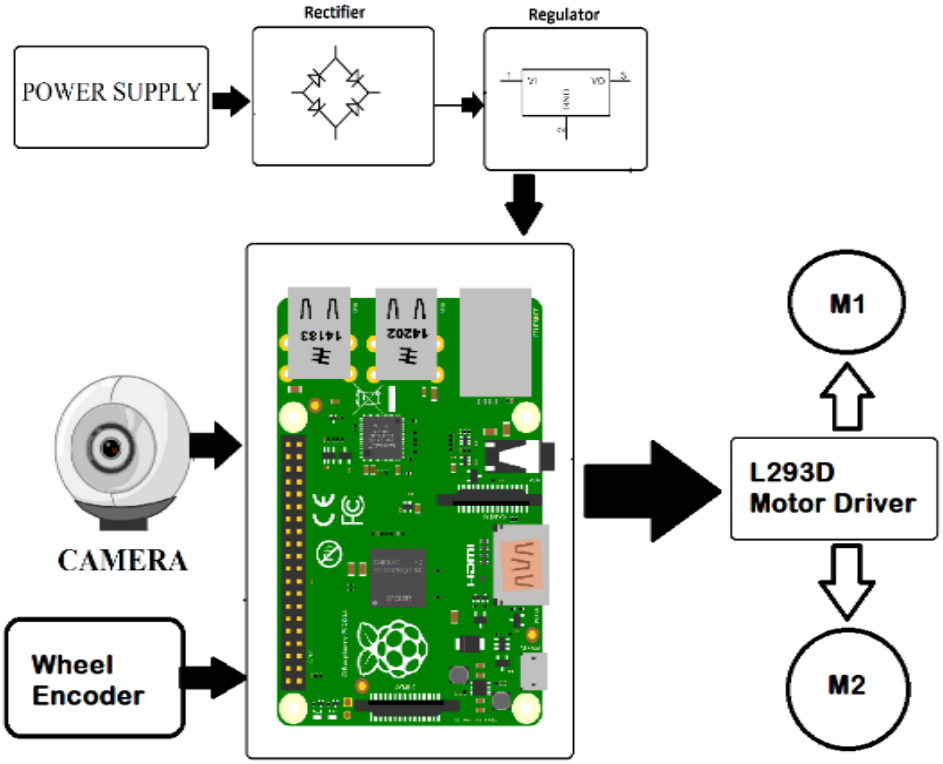
use raspberry pi and encoder module efficiently for railway track crack detection. This technology can be used at all railway tracks in the country. This method is more efficient than manual technique of crack detection.

BLOCK DIAGRAM



This project consists of the following hardware & software components mentioned below:

1) Raspberry pi 3
2) Raspberry pi camera version 3.1
3) 5v 500ma adapter
4) 16 pin Ribbon Cable
5) L293D Motor Driver Circuit
6) Wheel Encoder
7) Robot Chassis kit.
8) Rpi Official Noobs latest version
9) Open CV Toolbox
10) Python Idle
11) Python Compiler

3. METHODOLOGY

This project consists of power supply, rectifier, regulator, camera module, wheel encoder, Raspberry pi and motor driver circuit. Raspberry pi works on 5v DC supply and we have to power it, if we have to work on it, so we will make the power supply unit which consist of the 5v 1amp output and 230v AC supply as input. Our main task is to identify the fault present on the tracks, for that we connect the camera on raspberry pi and taking images from camera. Camera is fixed in the middle of the train wheel and continuously taking images of the track, we used deep learning algorithm in our python code in which the images come from camera compared with the previous images stored in it while training the Raspberry pi4. If the recent collected image is matched with the faulty one stored image, then it identifies that the track is defected and generate the signal. Wheel encoder is basically an IR sensor which follows the given Circuit. This sensor works by detecting the movement of small teeth connected to a motor through the reflection of infrared light. By measuring the amount of reflected infrared light, you can tell not only how far each wheel has traveled but how fast the wheels are

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turning. By using the wheel encoder sensor, we are tracking the distance from start point as when the faulty signal is generated by python code then the current distance is forward to Receiver. And this signal is send to the authorities. l293D motor Driver Circuit. In our project train continuously moves in forward direction but, when camera detects the fault, so controlling train's motor start and stop we are using the l293D module.

4. CONCLUSION

This project aims to detect crack present in the railway track. In this paper crack is detected by image processing technique and get the location of the crack through reader module. This method replaces the manual inspection of the track section by automatic inspection. It reduces human error and provide more accuracy in detecting the crack in the railway track. This idea can be implemented in the large scale, in the long run to facilitate better safety standard for rail tracks. By using this technique, we can achieve better results in future.

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IMPORTANCE OF ELECTRONIC MEDIA IN COMMUNICATING HEALTH MESSAGES: A SURVEY OF JALANDHAR DISTRICT

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ABSTRACT
Health is a state of complete physical, mental and social well-being, not simply the absence of disease or weakness (WHO 1948). Health is a complex concept that involves not only the voice of a person's body, but also their condition, the quality of a person's mind and the social environment in which he lives. Good health and effective medical care are essential for the smooth functioning of society. Social inequality is characterized by quality health and healthcare services (Atkin, 1981). A good health can't be defined in terms of physical structure of a body but mental satisfaction is equally important. The demand for information about health has increased rapidly over the years. Media is an important collaborator in any public health situation and plays an important role between health departments and the public. Health officials organize health seminars and other conferences on health problems which is then relayed through various types of media formats, easily accessible to the public. Mass media helps health workers to reach the general audience, which is very important for health communication. Mass Media provides an important link for the people suffering from health diseases. As electronic media, radio and television an effective way to persuade the target audience to adopt new behaviors, or to remind them of important information. Apart from informing the public about new diseases and getting help, they also keep the public updated about health programmes and schemes (Flay, 1987). To provide basic health facilities to all citizens, under the Ministry of Health and Family Welfare, the Punjab government has initiated and implemented various health schemes and programs. This research paper provides statistics related to electronic media to inform public about health programs, policies, schemes, forms etc. through media campaigns and advertisements. The present study also intends to find out the level of awareness of health issues among the people and to find out the most effective mode of communication with rural and urban people of Jalandhar state, Punjab, India.

INTRODUCTION
India is the largest democratic country in the world, with more than 130 crore people. In the context of large-scale economic development in industrial and agricultural sectors, the need for communication with people has assumed great importance through various mediums. Communication with people is necessary for any society and any form of government, especially democratic society depends very much on it. People are described government schemes, programs, policies, activities, success and achievements through media only. Responses from people in policies and programs are reached out to government through mass media only. Mass media helps to involve people in national issues and other programs. Mass media is a potentially powerful tool to address many public services and other social challenges facing by the country (Hyman & Sheatsley,1974). Media is developing a strategic plan to address the health communication, research, creative strategy, production, distribution and evaluation. To provide basic health facilities to all citizens, under the Ministry of Health and Family Welfare, the government has initiated and implemented various health schemes and programs. Many health programs are running by the government regarding HIV / AIDS, helping youth recognize the dangers of tobacco, smoking and promote physical activity (Wallack, 1981). These are some examples of behavior change communication that focus on methods which encourages people to make healthy choices. In this regard, there is a great role of electronic media to motivate public for the development of their mental and physical health. Electronic media directly or indirectly inspires people to discharge these functions. As well as interactive user feedback, constructive participation in any state in a meaningful and purposeful manner are the backbone of development in any nation.

OBJECTIVE OF THE STUDY
- To analyze the electronic media reach and access.
- To know the electronic media utility by public.
- To study the knowledge of public health service advertisements.

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RESEARCH DESIGN AND METHOD

The study was mainly concerned with the evaluation of health advertisements and programmes through television and radio channels. This study is conducted through survey method using questionnaire tool. The study uses both primary and secondary data. The primary data is collected using questionnaire tool. The secondary data is collected through the books, journals, internet and other publications. To study the electronic media consumption, awareness and impact of health advertisements and programmes, twenty questions were framed to survey two hundred respondents i.e.100 each urban and rural respondents of Jalandhar district, Punjab. Research sample is based on convenient sampling technique.

REVIEW OF LITERATURE

Institute of medicine conducted a study in 2002 on "The Future of the Public's Health in the 21st Century" explored that media plays a number of roles in educating the public regarding problems related to health and has an accountability to report accurate health. Research committee disclosed the unfolding news coverage of HIV/AIDS which shows a good example of how an important health concern may be unseen to the people' eye until the media brings it to the limelight. Maben & McLeod-Clarke, 1995 mentioned in the study **"**Health Promotion: A concept analysis" that health promotion is aimed at providing healthy and easy choices to people. The main objective of health promotion is to inform people about the options available to them within the given framework. It also informs them of what is healthy and what is unhealthy for them. A research study "The role of mass media in public health" stated that mass communication has an important role in public health. The mass media is applied to all the stages of public health so that some effects occur such as new behaviour in health is created, right information regarding health is being learned and change in the value and attitude of health. The author then also emphasizes that mass media makes a right impression on a specific people rather than all people (Griffiths & Knotson 2002). The study "The role of the media in steering public opinion on health care issues", depicts that electronic media can play an important role in influencing both demand and supply of medical treatment regardless of evidence of effectiveness. The role of the media in influencing health officials is discussed both for intervention and for large-scale testing of patients' awareness and medical expectations. The study reveals that the media has the potential to play an important strategic role in disseminating accurate information on health-related issues (Benelli, 2003). In the book "The Mass Media in Health Promotion", the researcher believed that instead of asking whether mass media works. We should ask what kind of impact we can expect from different types of media used in different situations and contexts to present health messages to different target groups about different types of health problems. We should also ask questions about both intended and unintentional or accidental effects of mass media - and examine how such effects should be taken into account or even deliberately promoted by health promotion (Tones et al.,1990). Whitehead mentioned in his study "Health promotion and health education: Advancing the concepts" that health education relates to activities that expose individuals to the causes and causes of illness and the personal vulnerability associated with nature and their lifestyles and behaviours. Whitehead further states that the main purpose of health education is to motivate individuals, groups and communities to adapt the process of behaviour change by influencing their value systems, attitudes and beliefs (Whitehead, 2004).

NATIONAL MEDIA REACH

Media access is not equal to media availability or access. It is a combination of availability and the willingness of the audience to use the media within a reasonable time frame. Thus, first and foremost, the audiences should have access to media. Media presence is dependent on two factors - firstly buying media through paid space and secondly editorial space through advertising. This report states Purchase of media space.

Mass Mediums	Reach of Mass Media Channels
TV	72%
Cable	36%
Dailies	24%
Radio	25%
Magazine	10%
Cinema	6%
Internet	6%

An analysis of the national media scene depicts that average 49% of the Indian audience can be reached by at least one of the electronic media channels i.e., either through Television, or Radio, followed by Cable, Dailies, Magazines, Cinema and Internet. Television is the medium with the highest 72% reach in the country while Radio reaches to 25% of listeners.

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- Television Reach: included all individuals who have viewed TV at least once in a week.
- Cable Reach: included all individuals who have viewed Cable TV at least once in a week.
- Print Reach: included readers who have read an average issue of at least one Publication.
- Radio Reach: included listeners who have listened to Radio at least once in a week.
- Cinema Reach: included cinema goers who have been to Cinema at least once in three months.
- Internet Reach: included surfers who have accessed Internet in the last month.

Electronic media utility

Medium	Response	Percentage
TV	114	57%
Radio	86	43%
Total	200	100%

The above table shows electronic media consumption of respondents. 57% of the respondents favored television and 43% preferred radio for information, education and entertainment.

Knowledge of public health service advertisements among public through electronic media

Responses	Respondents	Percentage
Yes	126	63%
No	74	37%
Total	200	100%

The table shows the knowledge of public health service advertisements among respondents. Majority of the respondents (63%) are aware of public health service advertisements and 37% of the respondents were not aware of Public health service advertisements.

Knowledge of polio advertisement

Responses	Respondents	Percentage
Yes	180	90%
No	20	10%
Total	200	100%

The table shows the knowledge of polio advertisement among respondents through electronic media. Majority of the respondents (90%) have watched or listened the above advertisement through electronic media while only 10% of the respondents have not given attention to the above advertisement.

Knowledge of HIV advertisement

Responses	Respondents	Percentage
Yes	120	60%
No	80	40%
Total	200	100%

The table shows that 60% of the respondents have watched the above advertisement on electronic media while 40% of the respondents have not paid attention to this particular advertisement.

Influence of health advertisements on public

Response	Respondents	Percentage
Yes	110	55%
No	70	35%
Can’t say	20	10%
Total	200	100%

Majority of the respondents (55%) told that health advertisements have great influence on their life and behavior. On the other hand, 35% of the respondents disagreed with it and 10% respondents have no opinion about it.

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Special Health programmes on TV& Radio

Electronic Media Channels	Radio	Television	Neither Radio Nor TV
Health based Interview prog.	80 40%	30 15%	90 45%
Health Based discussion prog.	90 45%	40 20%	70 35%
One to One health prog.	70 35%	20 10%	110 55%

Majority of the respondents (45%) told that there are not health based special interview programmes telecasted by radio and television. Same as 35% and 55% respondents mentioned that health based discussion programmes and one to one programmes are also the not top priority of television and radio channels.

RESULTS AND FINDINGS

An analysis of the electronic media scene reveals that it is possible to reach maximum audience through electronic media. Television is currently the medium with the highest reach (74%) in the district. A majority of the respondents i.e., 57% utilize television while 43% utilize radio, which shows that there is a great role of electronic media in the life style of people. When it comes to knowledge about public health programmes among people, it is seen that majority of the respondents (63%) are aware of public health service advertisements. Majority of the respondents (90%) are aware of pulse polio advertisement while 60% of the respondents are aware of HIV advertisement through electronic media. Respondents (55%) are of the opinion that the health advertisements transmitting on electronic media have major role to change their mental and physical health.

CONCLUSION

Electronic media provides an important health information to rural as well as urban residents of the district Jalandhar, Punjab. There are many programmes being telecasted by radio and television channels to promote health related schemes among public and people are getting benefit out of these schemes with the help of widely reached electronic media. In the form of mass media, radio and television are effectively persuading the target audience to adopt or remind a new health information. Apart from informing the public about new diseases and seeking help, they are also keeping the public updated. Out of the data, it is found that television is an effective audio-visual medium as it reaches a large population. This is an essential communication force to convey the message of health care services through advertisements and other health programs. but there are a very smaller number of respondents mentioned that radio and television telecast special health related programmes like discussion, interview and one to one health-based programmes which need to be taken care of by electronic media channel managements.

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DIGITAL SPEECH WATERMARKING ISSUES, CHALLENGES, AND THEIR CHARACTERISTICS

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ABSTRACT:
Digital speech watermarking techniques are used to secure our information during transmission through internet. In this paper, we have discussed issues, challenges, application and their mode of working system. We have discussed the types of watermarking techniques and its difficulties during embedding and extracting process. In this paper, we explore application in speech watermarking area and their characteristics. We competently focused on all point which is needed for speech watermarking frameworks.

Keywords: Speech watermarking, Robustness, Issues, Application, Categorization of wa- termarking.

I. INTRODUCTION

The process of watermarking is cloaking digital information in a carrier signal, yet not obligated to accommodate a relationship of the bearer signal. Sharing data on the Internet turn into a normal proceeding nowadays which bring digital watermarking into a great insistence. The digital image watermarking can be segregated into two fundamental categories that are visible and invisible watermarks. In visible watermarking, the text or image overlaid on the original image is either conspicuous or semi-transparent. It acquiesces the host image to be perceived, but it still extends copyright preservation by characterizing the image as its owner's equity. An imperceptible watermark is an embedded picture that can't be seen with human eyes. The electronic instrument can only detect the obscure evidence to single out the ownership. Appropriate digital contents such as text, images, video [1], speech [2] [3], or even sound are used to substantiate its legitimacy in invisible watermarks. Speech watermarking intent to hide watermark data such as file transaction, user identity, records, publisher information, etc. into cover signal without stirring its normal convention. Digital watermarking strategies are classified in a few different ways based on subsequent characteristics of the watermarking:

- Robustness: A digital watermark is called robust when it resists a denominated class of changes. Robust watermarks might be utilized in duplicate insurance operations to convey duplicate, and no entrance controlled data [2].
- Perceptibility: A digital watermark is categorized as imperceptible only when the authentic enclosed signal and the conspicuous signal are perceptually indistinguishable. If the existence of a conspicuous signal is spectacular, the watermark is termed as perceptible.
- Capacity: The two principle collection of the digital watermarking pattern is administered by the length of embedded information. First comprises zero-bit or presence watermarking schemes and second one non-zero-bit or multiple-bit watermarking pattern. Embedding method: If the conspicuous signal is retrieved by an additive transformation, a digital watermarking approach is called as spread-spectrum (SS) [4]. SS watermark is established to unobtrusively powerful, yet in addition to having an uninformed limit because of host obstruction. The conspicuous signal is retrieved by quantization since the water- marking mechanism is said to be of quantization type. The notable signal is embedded by the additive transformation, which is analogous to the spread spectrum approach. A digital watermarking scheme is invoked as amplitude modulation, if the watermark is embedded in the spatial domain. The component of watermarking and compression is first to embed the data into the host picture and afterwards compress the watermarked picture. Since the compression transaction disposes of in most of the cases and, in this way, precludes the impeccable restoration of the concealed message.

II. CATEGORIZATION OF DIGITAL WATERMARKING

Digital watermarking can be grouped on the basis of signal, perceptivity, robustness wa- termark type, the domain of watermark embedding, application, and as indicated by the information required for watermark extraction.

1) Type of Document: The watermarking method can be classified relying upon the media into which watermark is embedded. Text watermarking embeds a watermark in the textual style shape and the space among characters and line spaces. It has a few impediments that one can't distinguish the watermark if there should be an occurrence of adjusting the textual styles. Image watermarking embeds uncommon information (logo, stamp, label, and so forth.) to an image and identifies or separates it later for possession affirmation. This methodology is most broadly utilized, and it uses the qualities of the human visual

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system. Video watermarking is an expansion of image watermarking. This strategy requires continuous extraction and robustness for compression. Video is a three-dimensional signal having two dimensional (2D) in space (image) and one-dimensional (1D) in time. Time synchronization is one of the most significant parameters, which distinguishes video watermarking from image watermarking. Audio watermarking expands on account of the web music, MP3.

2) Transform Domain: The spatial domain is where a digital image is characterized by the spatial directions of its pixels. Another area considered in image processing is the frequency domain where a digital image is characterized by its disintegration into spatial frequencies, taking an interest in its development.

3) Human Perception: As indicated by human visual discernment, the watermark can be named visible or invisible. In visible watermarking, a watermark is transparent. As the watermark is visible to the viewer, it can't evacuate the copyright illegally. It affirms the verification and for the most parts utilized in the logo or trademark mark. A drawback of the visible watermark is its delicacy to attack. Additionally, the watermark embedding process debases the nature of unique content at times. Another kind of watermarking is invisible, which is primarily utilized as proof of possession. Imperceptible watermark is strong when contrasted with the visible watermark.

4) Reversibility: Reversible watermarking systems are likewise named as invertible or lossless and were destined to be applied essentially in situations where the realness of a digital image must be allowed, and the original content is authoritatively required at the deciphering side. It is critical to call attention to that, at first, a high perceptual nature of the watermarked image was not a necessity because of the way that the first one was recoverable and basic issues of overflow and underflow brought about by the watermarking procedure were not considered as well. Progressively likewise, this perspective has been considered as fundamental to allow to the end client to work on the watermarked image and to potentially choose to fall back on the uncorrupted form in a subsequent time if necessary.

III. REVIEW ANALYSIS OF SPEECH WATERMARKING

Blamey et al. [5] have presented auditory masking system based on threshold of one signal and the threshold of audibility of sound is raised by the existence of another sound.

Wang et al. [6] delve into the multi resolution analysis of DWT and the energy-compression peculiarity of DCT to accomplish adequate audio watermarking. The transform-domain audio watermarking approach can always cater to a higher audio aspect and much more robustness than audio watermarking positioned on time-domain. This is because they can entirely take leverage of signal essence and auditory equity.

Bhat et al. [7] interpreted that the traditional frequency transforms, such as Fast Fourier Transform (FFT), Discrete Cosine Transform (DCT), and DWT are appropriate to disintegrate a signal into a typical or essential set. DWT is the most prevailing or traditional technique for audio watermarking.

Hofbauer et al. [8] amid the watermarking mechanism committed to speech signals, they developed to exploit the fact that human ears are least sensitive toward the period of non- voiced speech. The approach was fixate on reinstating the excitation signal of an autoregressivesive depicted in non-voiced sections. On the other hand, embedded data via pitch alteration in voiced segments.

Singh et al. [9] perspective of robust audio watermarking for MPEG-1/ audio compressed domain. The design is achieved by tweaking the sub-band coefficients using adaptive QIM [10]. The coefficients pertinent to DCT have specified frequency location is then segregated into a number of frame pairs. The relevant DCT frame pairs for watermark embedding are picked, and watermarks are embedded into the preferred DCT frame pairs by tweaking the coefficients.

IV. ISSUES, CHALLENGES, AND CHARACTERISTICS OF DIGITAL SPEECH WATERMARKING

The primary issues in utilizing digital speech watermarking are because of the prerequisites, which are capacity, imperceptibility, and robustness. These prerequisites contradict each other to one another and making them difficult. The watermarking techniques should be robust against various attacks, for example, codecs, re-quantization, AWGN, amplitude modification, re-sampling, additive noise, and filtering. By embedding the watermark in fewer speakers explicit of the speech sub-bands, the debasement impact on the acknowledgement execution for this watermarking method is marginal. Fig. 1 shows the prerequisites of digital speech watermarking.

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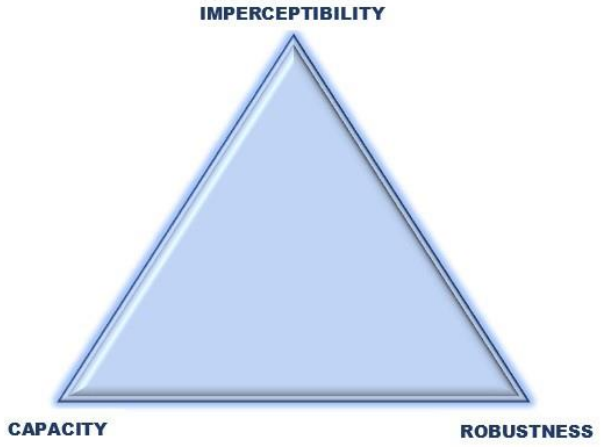

Fig. 1: Issues of digital speech watermarking (Kiah et al. [11])

Speech watermarking is a tradeoff among robustness, capacity, and impermeability. Contingent upon the applications, a few procedures center on robustness. In any case, different applications accentuate inaudibility and imperceptibility. In numerous applications, the perceptually superfluous portions of the speech are endeavored to be evacuated. This evacuation is an essential challenge for speech watermarking algorithm in order to save its robustness. Watermarking ought to happen perceptually in each significant speech part. The impediment on the quantity of perceptually pertinent portions is another concern for watermarking. In certain applications, the capacity turns out to be increasingly imperative to accomplish. Moreover, the capacity of speech watermarking is decreased when contrasted with that of audio because of the narrow usable bandwidth. This embedding capacity can be additionally decreased, when speech codec approach are applied.

Speech signal is additionally not quite the same as music signal as far as production, power distribution, transmission capacity, tonality, fundamental frequency, excitation designs, tonal span, and Zero Crossing Rate (ZCR). The speech has a reluctant time-varying signal, which is contemplated as almost stationary with the terse period. This essence causes the speech signal to have a well-entrenched and more anticipated spectrum. It must be referenced that these distinctions are utilized in speech/audio discriminator. The concise inequality is conferred shown in Table I.

TABLE I: Resemblance between speech and audio watermarking

Precedent	**Digital Watermarking**	
	Speech Watermarking	**Audio Watermarking**
Channel noise	May be high	Must be very low
Bandwidth	Narrowband (4kHz)	Wideband (20kHz)
Allowed distortion	Low	Must not be perceivable
Processing delay	Very low	No concern
Frequency spectrum	Random and noisy	Noiseless and Tonal
Imperceptibility	May be low	Must be high

V. APPLICATIONS OF DIGITAL SPEECH WATERMARKING

A. Ownership protection: In possession of ownership application, a watermark accommodating proprietorship data is inserted into the host signal. The watermark, known by the copyright holder, is required to be extremely strong and protected, empowering the proprietor to show the presence of watermark if there should arise an occurrence of the contest of possession. The watermark identification must have a little bogus alert probability.

B. Proof of ownership: Watermarking can be utilized as a choice for evidence of possession. The issue emerges when an adversary utilizes altering programming to supplant the first copyright notice with ones and afterward requirement to possess the copyright. On account of the initial watermark framework, the issue was that the watermark extractor was promptly accessible to the adver- sary as anyone that can distinguish a watermark can likely evacuate it too. In this way, since the adversary can without much of a stretch acquire an extractor, they can expel proprietors watermark and supplant it with their own. To accomplish the degree of the security important for evidence of possession, it is key to confine the

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accessibility of the locator. At the point when a foe doesn't have the detector, the evacuation of the watermark can be made very troublesome.

C. Copy control and access control: Cryptography calculations are exceptionally moderate, and the wafer may utilize programming, for example, DeCSS or figuring out procedures to decode a legitimate key. In any case, watermarking can be joined with certain substances for the chronicle device to decline to duplicate so that the watermarked bits are noticeable effectively. The fundamental issue for this application is that the more the expense, the less the estimation of the device. Rather than upholding by law, an answer is to make CSS patent permit as the necessity for watermark extractor.

VI. CONCLUSIONS

A review on digital speech watermarking based on issues, challenges, application, and their characteristics. We efficiently discussed the working methods of watermarking techniques and whatever facing difficulties during embedding and extracting process. Also, explores various application and characteristics. At that point, we competently explored the most significant exhibition criteria for speech watermarking frameworks, i.e., robustness, capacity, and imperceptibility.

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BULK PACK PREFERENCE: A STUDY OF CONSUMER SHOPPING PRACTICES DURING THE LOCKDOWN

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ABSTRACT:
Typically, some products are never preferred in big size, specifically if it has a possibility to lose its texture and teste like spices, and if the best-before date is too short and if the magnitude of its daily consumption is fairly low, e.g. biscuits. Every member in the family has a unique and separate preference in this category of products like bathing soap, or hair oil these products are preferred in a pack size in a suitable matching unit and preferably every one's preference is accommodated through buying a separate product rather than one for all. Selection of product according to its pack size is a critical parameter and is influenced by the individual's choice behaviour. Generally, the pack size selection is done at the extreme end in the shopping process. Thus, this decision of the pack size selection has multiple layers. Such as type and nature of the product purchased, nearness of the expiry date, magnitude of daily consumption and easy-ness of availability. The preference and selection in big size is equally influenced by the economic benefits awarded on account of the big quantity due to its bulk nature, thus the selection of a typical pack of any product during the shopping visit has number of factors which influence the selection.

This paper examines the consumer shopping visits motivated with application of simple heuristic rules for buying more per visit to avoid the frequency of immediate next trips. It was found that the big size of packs for the consumable items were preferred by the buyers during the restricted period of shopping protocols imposed deliberately during the Covid pandemic. The policy makers through the covid protocols provided only two hours limited time window for daily shopping, i.e. morning 7am to 11am. It had laid to follow certain reasoning by the buyers to get the products of consumable categories in high size of their SKUs. This research examines this preference for big pack size in the limited context as a pure result of the time pressure executed in the form of limited time window. The limitation had influenced to prefer in the way of leading them to go for unusual big packs as response.

This study may be useful for the practicing marketing professionals to understand the response behaviour under real time stress, to formalize suitable marketing strategies.

Key words: Time Stress, Big-packing, Covid Shopping Protocols, Tunnel Vision, Product Selection, Product Preference.

INTRODUCTION:

Selection of product pack size is a technical parameter influencing the choice behaviour at the extreme end of the shopping process. It has multiple layers. Such as type and nature of the product purchased, such as nearness of the expiry date, magnitude of daily consumption and easiness of availability. This selection of big size also influenced by the economic benefits specifically awarded on account of the quantity such due to its bulk nature, thus the selection of a typical pack of any product during the shopping visit has number of factors which influence the selection.

Typically, some products are never preferred in big size, specifically if it has a possibility to lose its texture and teste like spices, and if the best before date is too short and daily consumption magnitude is low, such as biscuits. Every member in the family has a separate preference in that case products like bathing soap, or hair oil these products are preferred in a pack size in a smaller matching unit and preferably every one's preference is accommodated separately by way of a reasonably small pack. The preference and selection in big size is equally influenced by the economic benefits awarded on account of the more quantity due to its bulk nature, thus the selection of a typical pack of any product during the shopping visit has number of factors which influence the selection.

Shopping become highly procurement oriented during the pandemic period. And it was noticed that frequent market visits were discouraged, on account of avoiding the contamination. It has created a new challenge of replenishment the requirement during the allowed market visits, and the narrow time windows. Simply, the pandemic guidelines reduced the time and frequency of shopping. It has exposed the consumers to a never-before scenario and for both the marketers, and the buyers as well. The response behaviour to such situation had been studied earlier in the experimental setup of research designs. This study had selected five products

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belonged to strong variety seeking shopping motive and tested the pre and during pandemic behavioral responses specifically preference for abnormally big pack size in that category.

LITERATURE REVIEW:

Every situation in which the availability of time to perform becomes a stiff limitation it leads in to psychological and physiological challenges called as time stress. Consumer's choice preferences also affect due to availability of time (Goldberger and Breznitz, 1982). In situations of heavy time pressure the buyers cannot conduct the cue processing properly and it may lead in-to assessment of the choices available and consumer may end in selecting the unwanted or not so suitable product choice (Easterbrook, 19589). Thus, the time stress has found that it deteriorates the choice due to the influence on the quality of cognitive aspects involved in any decision-making activity (smack, 1955). The focus on the assessment of all the available alternatives were even ignored since time stress leads in creating narrow vision, technically called the 'tunnel vision' (Broadbent, 1971). However, many of these claims were tested by applying the controlled experimental methods from the academic point of view. The choice strategies adopted under situations of time stress were always simple (Christensen Szalanski, 1980; Zakay, 1985). The confidence about the suitability and fitness about the choice selected reduces as the time pressure increases (Smith, Mitchell and Beach, 1982). The shopping visits were avoided since frequent visit for shopping has a strong psychological pressure since it has a possibility to get contaminated. So, the consumers applied simple heuristic rules of buying more per visit to avoid the frequency of immediate next trips (Rundh.B, 2013). It had been observed by the researcher that the big size of packs for the consumable items were preferred by the buyers during the period of Covid laid protocols. The policy makers through the covid protocols provided only two hours limited time window for shopping. There are certain specific reasoning other than discounts when it comes to preferring the product of consumable categories in high SKUs (Silayoi and Speece, 2007).This research examines it this preference for big pack size is sheer result of the time pressure executed in the form of limited time window or any other preference has laid them to respond. This study may be useful for the practicing marketing professionals to understand the response behaviour under realistic time stress, to formalize suitable marketing offers.

RESEARCH METHOD:

This research adopted survey method. Primary data were collected by a structured questionnaire-based interview. Secondary data were obtained from the local newspapers and periodicals about market trends during the lock down periods. The population for the study consisted of consumers who visited the market at either one of the most crowded cities in the state of state of Maharashtra i.e. Thane, Kalyan or Navi Mumbai markets, before and during the covid lockdown periods because the purpose of this study is to compare consumer assessment.

Because population size in this study cannot be determined, this study employed accidental sampling (Wibowo and Istiqomah, 2018). Under this sampling technique the selection of respondents were those individuals with whom the interviewer accidentally meets when observation was underway (Arikunto, 2013). The sample size was determined by the following formula (Johnson & Mowry, 2012):

$$n=\frac{Z^2}{4(Moe)^2}$$

Where Z is the level of confidence, Moe is the margin of error or the maximum tolerable error, and n is the sample size. With a confidence level of 95% the value of Z = 1.96 and margin of error = 10 percent i.e.0.1, the sample size in this study is can be calculated as follows:

$$N = \frac{1.92^2}{4(0.1)^2} = 92.16$$

As per the equation even though a sample size of 100 is enough, the author decided to maximize the sample size by three times to avoid outliers and get refined statistical results. The frequency of consumer's visit is assessed by how many times respondents shop these products. The frequency of buying these six products were collected as responses by the sample for this study. Samples were asked to get a number about their shopping these items before and during the restrictive covid shopping norms, applicable for their buying visits conducted in the month of April 2021.

RESEARCH DESIGN:

In this research paper the data suitable to address the research objective were adopted from the published surveys conducted during the time frame of COVID-19 at India and an in-depth discussions were held with few marketing professionals and small groups of consumers, since there was various type of restrictions during this

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period due to Covid-19 protocols for data collection, in the usual form. This article has attempted to analyze the major changes reflected in the consumer behaviour caused by the COVID-19 and subsequent lockdown period. Besides, appropriate literature was also explored to find out the reasons of these behavioral changes in consumer decision-making process during this situation of crisis.

A structured questionnaire had been designed and administered on the consumers intercepted at the easily available shopping places like small grocery shops, available at shopping lanes where access was granted for a limited time such as morning 7 to 11 am for shopping purpose. The data collection was conducted at Thane and Dadar, two prominent places preferred for shopping for the unorganized merchandise. The questionnaire was so designed that it could address the aim of measuring the change in the product preference in its pack size during the pandemic laid lockdown periods these were studied since, it had a major moderating factor as was a span of duration of market access restrictions and how it had influenced the consumers preferences for big size packs.

The inventory of products was selected for study were those categories of products which were consumed on daily basis but in low quantity individually, e.g. biscuits. While selecting the product it was ensured that every member in the family has a unique and separate preference in this category of products like bathing soap, or hair oil. Thus, this study had been based on consumable category including five prominent items e.g. biscuits, hair oil, bathing soap, toothpaste and shampoo.

The survey could interact with 340 individuals, but the number of properly filled questionnaires were only 325. These were collected from Thane and Dadar, during the months of November and December 2020. All willingly participating individual who had purchased some product on that specific day were requested to participate in the survey. Any type of monetary benefits was not granted for participation in this study. People were advised to send their responses online if they wanted to do so to avoid the time of interaction at these marketplaces.

DATA ANALYSIS:

The monthly purchases frequency for the six items deliberately selected as representative of two categories of consumption nature i.e. consumed as a result of personal choice and consumed at cumulatively at family as a consumption unit. These all six products were tested at a 95% confidence and at a 5% level of significance, based on their mean buying difference measured at pre Covid and during Covid scenario. For each item a null hypothesis stating no significance between in their pre covid and during covid average buying frequency in every market visit conducted in every month. These hypotheses were tested by applying paired T test, and the test results were as shown in the Table No.1 below.

A suitable research frame was designed for testing the above described hypothesis. The samples recruited after ensuring that their total quantity of consumption of these six items were remained same during the test period, and there was no other socio-economic reason existed causing the change in the quantity of consumption of these items. Hence, the change in the buying frequency was a sheer result of variation in the preferred pack size of these item. A numerical buying frequency had represented as a resultant of buying in the smaller packing and lowering in the item buying frequency was taken as representative of a result of buying the item in big size packing.

The tested significance level for all the above six products were below the set level of testing for the hypotheses at 95% level confidence, hence the test results for all items were a significant difference between pre covid and during Covid buying. As indicated in the Table No.1 below. Hence, it was established that during covid people preferred to purchase these items in big pack sizes, and there was a significant difference measured between the average frequency of buying these items and average frequency of buying these items during covid.

Table No.1 Results of Paired T Test

Comparison	N	Correlation	Standard Deviation	Sig.
Soap Before & Soap Now	325	0.040	1.145	0.000
Hair oil Before & Hair oil Now	325	0.011	**0.974**	0.000
Shampoo Before & Shampoo Now	325	**-0.081**	1.111	0.000
Wheat Floor Before & Wheat Floor Now	325	0.010	1.890	0.000
Edible Oil Before & Edible Oil Now	325	0.051	1.477	0.000
Biscuits Now & Biscuits Before	325	**-0.144**	1.576	0.000

(Source: primary data)

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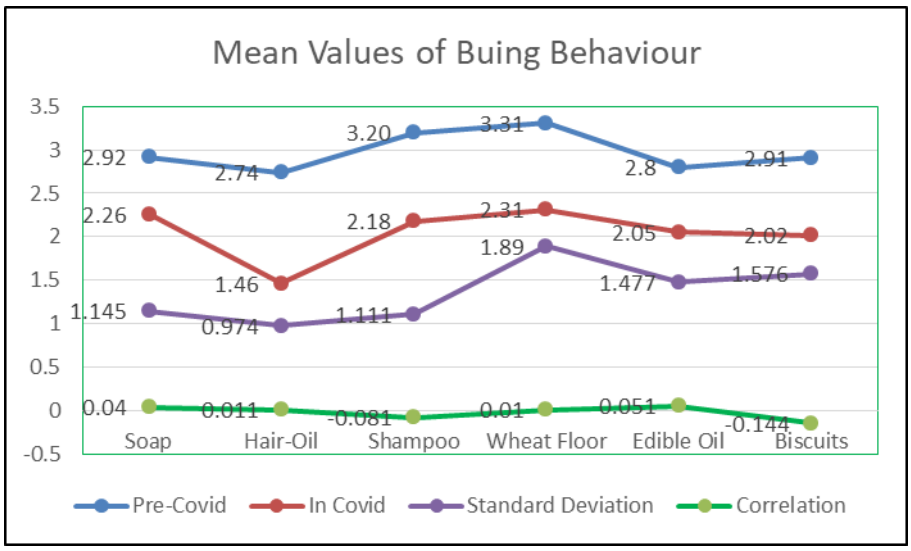
The correlation tested between pre-covid buying frequency and during covid tested negative for the two item Shampoo, and Biscuits. It had established that both these items were drastically purchased in big packs during the Covid. The homogeneity of the response behaviour for hair oil was more consistent since its standard deviation was the lowest i.e. 0.974 amongst all the items selected for this study.

The graphical representation of the results was as shown in the Chart No.1

Chart No.1



(Source: primary data)

To establish the effect further a post hoc test for specific factors were conducted. These results were tested with mode of chi square testing on the sample collected. The buying motives were measured as a categorial variable and measured in five levels as, savings, sales offer, individual preferences, to save time and genuine requirement. The classification with work mode of the samples had been shown in Table No.2 below:

Table No.2 Work Mode and Buying Motive

Motive-Now	Work-Mode					Total
	Regular-no Change	Work from Home	Lost job	Self-Occupied	Health Worker	
Saving	14	14	7	30	6	**71**
Sales-offer	15	25	11	15	9	**75**
Individual Preference	2	20	19	23	10	**74**
To Save Time	11	16	14	10	17	**68**
Genuine Requirement	4	11	5	7	10	**37**
Total	**46**	**86**	**56**	**85**	**52**	**325**

(Source: Primary data)

A Pearson chi square test was conducted to examine the association between motive of buying during covid and mode of work of the individuals. The Chi square value was 42.753 at a degree of freedom 16 and the association was very significant at 95 % level of significance. In case if the motive during covid kept as dependent the association stood at 0.245 and for the mode of work as dependent the eta value stood for 0.153, it established the superiority of work mode during covid on buying motive.

The buying motives were measured as a categorial variable and measured in five levels as, savings, sales offer, individual preferences, to save time and genuine requirement. The classification with Income level of the samples had been shown in Table No.3 below:

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Table No.3 Income Level and Buying Motive

Motive Now	Income Level					Total
	Up to Rs. 15,000 Monthly	Between Rs. 15,001 to Rs. 25,000	Between Rs. 25,001 to Rs. 35,000	Between Rs. 35,001 to Rs. 45,000	Above Rs. 45,001	
Saving	17	30	3	12	9	71
Offer	19	24	3	18	11	75
Individual Preference	9	8	24	19	14	74
To Save Time	24	15	5	15	9	68
Genuine Requirement	10	5	1	4	17	37
Total	**79**	**82**	**36**	**68**	**60**	**325**

(Source: Primary data)

A Pearson chi square test was conducted to examine the association between motive of buying during covid and level of income of the individuals. The Chi square value was 87.540 at a degree of freedom 16 and the association was very significant at 95 % level of significance. In case if the motive during covid kept as dependent the association stood at 0.250 and for the level of income as dependent the eta value stood for 0.234, it established the superiority of saving motives during covid on buying of items

FINDINGS:

Consumer buying preferences does change during the pandemic situation due to narrow window for shopping. Buying in big pack has sheer out of reducing the shopping frequency. Buying preference in big pack size for two items Shampoo and wheat-floor one consumed as personal preferences the other one as family need found buying in big size even before covid compared with during covid buying. These results were significant due to the working mode of the individuals. Individuals who were allowed working from home must be finding it difficult to spare time for shopping daily needs hence they prefer to buy in bulk pack.

CONCLUSIONS:

Marketing was susceptible for change in the elements of social environment, an innovative marketing strategy must be designed to respond new up-coming mode of work i.e. working from home. People's available time for shopping changes the product preferences for packing size.

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DETECTING FAKE REVIEWS THROUGH SENTIMENT ANALYSIS USING MACHINE LEARNING TECHNIQUES

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ABSTRACT
— Recently, Sentiment Analysis (SA) has become one of the top-tier interesting topics in text analysis, thanks to its promising commercial benefits. One among the most issues facing SA is the way to extract emotions inside the opinion and the way to detect fake positive reviews and faux negative reviews from opinion reviews. Also, the opinion reviews obtained from users are often classified into positive or negative reviews, which may be employed by a consumer to pick a product. This paper aims to categorize movie reviews of positive or negative polarity by using machine learning algorithms. During this study, we analyze online movie reviews using SA methods to detect fake reviews. Sentiment Analysis and text classification methods are applied to a dataset of movie reviews. More specifically, we compare five supervised machine learning algorithms are Naïve Bayes (NB), Support Vector Machine (SVM), K-Nearest Neighbors (KNN-IBK), KStar (K) and Decision Tree (DT-J48) for sentiment categorization of reviews using two different datasets, as well as movie review dataset V2.0 and movie reviews dataset V1.0. The measured results of our experiments show that the SVM algorithm outperforms other algorithms which reach the very best accuracy not only in text classification but also in detecting fake reviews.*

Keywords: Fake Reviews; Naïve Bayes; Support Vector Machine; k-Nearest Neighbor; KStar; Decision Tree - J48.

1. INTRODUCTION

Opinion Mining (OM), also referred to as Sentiment Analysis (SA), is the domain of study that analyzes people's opinions, evaluations, sentiments, attitudes, rating, and emotions towards entities like services, individuals, issues, topics, and their attributes [1]. ―The sentiment is typically formulated as a two-class classification problem, positive and negative‖ [1]. Sometimes, time is more precious than money, therefore instead of spending it reading and deciding the positivity or negativity for a review, we will use automated techniques for Sentiment Analysis.

The document, sentence or aspect level, whether the expressed opinion during a document, a sentence or an entity aspect is positive or negative. More specifically, the goals of SA are to seek out opinions from reviews then classify these opinions based upon polarity. consistent with [2], there are three major classifications in SA, namely: document level, sentence level, and aspect level. Hence, it's important to differentiate between the document level, sentence level, and therefore the aspect level of an analysis process which will determine the various tasks of SA. The document level reviews that a document is an opinion on its aspect, and it aims to organize an opinion document as a negative or positive opinion. The sentence-level using SA aims to line up the opinion stated in every sentence. The aspect level is predicated on the thought that an opinion consists of sentiment (positive or negative), and its SA aims to categorize the sentiment supporting specific aspects of entities.

The main contributions of this learning are summarized as follows:

• Using the Weka tool [29], we compare different sentiment classification algorithms which are wont to classify the movie reviews dataset into fake and real reviews.

• We have to put in the sentiment classification algorithms using two different datasets with stopwords. We understand that using the stopwords method is more efficient than without stopwords not only in text categorization but also within the detection of faux reviews.

• We perform several analyses and tests to seek out the training algorithm in terms of accuracy.

2. LITERATURE SURVEY

Our study engages statistical methods to evaluate the performance of the detection mechanism for fake reviews and evaluate the accuracy of this detection. Thus, we present our literature review on studies that applied statistical methods.

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A. Sentiment analysis issues: There are some issues to consider when conducting SA [13]. In this section, two major issues are addressed. First, the perspective (or opinion) observed as negative in a situation might be examined positively in another situation. Second, people do not always indicate opinions in the same way. Most recurring text processing techniques employ the fact that inconsequential changes between the two text fragments are unlikely to change the actual meaning.

B. Textual reviews: Most of the accessible reputation models depend on numeric data available in different fields; an example is ratings in e-commerce. Also, most of the reputation models focus at most on the overall ratings of products without considering the reviews which are provided by customers [14]. However, most websites let consumers add textual reviews to impart a detailed opinion about the product [15] [16]. These reviews are available for customers to read. Also, customers are increasingly depending on reviews alternatively on ratings. Reputation models can use SA methods to withdraw users' opinions and use this data in the Reputation system. This information may contain consumers' opinions about different features [17] and [18]. Filter and identification of fake reviews have considerable significance [19]. Morae's et al. [20] proposed a technique for categorizing a single content textual review. A sentiment classified document level is applied for declaring a negative or positive sentiment. Supervised learning methods are composed of two phases, namely selection and extraction of reviews utilizing learning models such as SVM. Extracting the best and most accurate approach and concurrently categorizing the customer's written reviews text into negative or positive opinions has attracted attention as a major research field. Although it is still in an introductory phase, there has been a lot of work related to various languages [21]-[23]. Our work used several supervised learning algorithms such as SVM, NB, KNN- IBK, K* and DT-J48 for Sentiment Classification of text to detect fake reviews.

C. A Comparative Study of different Classification algorithms: Table I shows comparative studies on classification algorithms to authenticate the best method for detecting fake reviews using different datasets such as the News Group dataset, text documents, and movie reviews dataset. It also proves that NB and allocated keyword vectors (DKV) are accurate without detecting fake reviews [11] and [12]. While [10] finds that NB is accurate and the best choice, but it is not aligned for detecting fake reviews. Using the same datasets, [8] detect that SVM is accurate with the stopwords method, but it does not focus on detecting fake reviews, while [9] detects that SVM is only accurate without using the stopwords method, and also without detecting fake reviews. However, in our factual study, results in both cases with movie reviews dataset V2.0 and with movie reviews dataset V1.0 prove that SVM is robust and explicit for detecting fake reviews.

3. EXISTING SYSTEM

Existing Systems train their neural network based on the dataset and classify the images using Classifiers then these classified images are used to detect the various objects in the image using the Localization algorithm. Current Existing Systems are:

- R-CNN: Selective Search generates potential bounding boxes, a convolutional network extracts features, the boxes are scored, a linear model adjusts the bounding boxes, and non- max suppression eliminates duplicate detections. all stages of this compound pipeline must be precisely strained independently and the resulting system is very slow, taking more than 40 seconds per image at test time.
- DPM (Deformable Parts Models): It uses a sliding window approach to object detection. DPM uses a disunite pipeline to extract stable features, classify regions, predict vaulting boxes for high scoring regions, etc.

4. PROPOSED SYSTEM

The problem is mainly concerned with the accuracy of image tagging and their classification. The model is trained for a small set of the training set of images which help and find which model can be used so that accuracy is very high. This project will pursue the benefits of using a CNN for image tagging and classification which furthermore will add more benefits for upcoming technologies etc.

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5. CONCLUSION

Judgements are very important for anyone who is going to make a decision. Web mining has appeared in recent times as an attractive technology to individuals and corporations to know others' opinions. Opinion mining is helpful for individuals when they want to buy a product and they can conclude which product to buy, by studying the summarized opinions alternatively of studying long reviews and making a summary themselves. Review text is an important source of information for the purchaser before purchasing any product from e-Commerce websites. In the last few years, review spam has received compelling attention in both business and academia. This survey covers prior studies, application areas, research challenges and research scope in opinion mining and reviews spam analysis. Although various methods have been proposed to detect review spam, still there is scope to improve & develop sentiment word identification, to apply sentiment analysis on short sentence-like abbreviations, to develop a fully automatic analyzing tool, to successfully handle bipolar sentiments, and effective analysis of policy/procedure opinionated content. To implement Big data and possible expression of new knowledge discovery processes and tools for analyzing and detecting review spam provide scope for future work.

6. ACKNOWLEDGEMENT

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A STUDY ON CONCEPT OF BLOCKCHAIN TECHNOLOGY ADOPTION AND IT'S IMPLICATIONS FOR PROFESSION

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ABSTRACT

Digital transformation which is taking place, the unique and most innovative one is Blockchain technology. Governments, regulators, banks and corporates in the world are eager to experiment with multiple blockchain prototypes so as to customise this emerging technology to fit multiple use cases. The study examines blockchain ecosystem and analyses impact of the technology on various industry/ sectors. The focus is to identify the implications of the Blockchain technology on accountancy profession, and develop a way forward to evolve current practices of Accounting and Advisory.

This study briefly explains basics and fundamental concepts and unique features of blockchain technology, highlighting current usage of this novel technology. It throws light on accounting and assurance of blockchain based systems, and also adoption and development phases by accounting firms. Case studies have been included for explaining practical aspects to the readers.

INTRODUCTION:

Blockchain is a shared, immutable ledger that facilitates the process of recording transactions and tracking assets in a business network. Virtually anything of value can be tracked and traded on a blockchain network, reducing risk and cutting costs for all involved. Blockchain is ideal for delivering that information because it provides immediate, shared and completely transparent information stored on an immutable ledger that can be accessed only by permissioned network members. A blockchain network can track orders, payments, accounts, production and much more. And because members share a single view of the truth, you can see all details of a transaction end-to-end, giving you greater confidence, as well as new efficiencies and opportunities.

So far, the focus of the discussion around this technology has centred on Blockchain used as a tool for financial services to improve transparency and efficiency and reduce cost within the industry. In response, Blockchain technology providers are being created all over the world, incubated independently or by innovation labs sponsored by banks and other entities. Start-ups are enthusiastically experimenting on applications of this technology to problems within the financial services domain.

It has been said that Blockchain will do for transactions what the Internet did for information. What that means is that it allows increased trust and efficiency in the exchange of almost anything. Blockchain can profoundly change how the world works. As described by the World Economic Forum, it is the future "beating heart" of the financial sector. The idea behind Blockchain, in short, is to be able to establish and verify trust without the need of a centralized system. Instead, this power would be given to a decentralized network, making it not only more secure but also both more efficient and faster to scale. This technology is still new, but the potential impact it can have on business and finance is exciting, and immense.

HOW DOES IT WORKS

Various participants on a Blockchain network play role in its operation. Following are descriptions of each of the participants:

- Blockchain user: A business user with permissions to join the Blockchain network, and conducts transactions with other network participants. Blockchain technology operates in the background, so there are, typically, multiple users on any one business network.
- Regulator: A Blockchain user with special permissions to oversee the transactions happening within the network.
- Blockchain developer: Programmers who create the applications and smart contracts that enable Blockchain users to conduct transactions on the Blockchain network. Applications serve as a conduit between users and the Blockchain.
- Blockchain network operator: Individuals who have special permissions and authority to define, create, manage, and monitor the Blockchain network. Each business on a Blockchain network has a Blockchain network operator.

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- Certificate authority: An individual who issues and manages the different types of certificates required to run a permissioned Blockchain. For example, certificates may be required to be issued to Blockchain users or to individual transactions.

ACCOUNTING ASPECT OF BLOCKCHAIN

Conventional accounting practice comprises of the financial records in private ledgers and relies on accountants to reconcile them against those maintained by the third-party counterparts. This tedious and labour-intensive work brings upon higher human resource cost, lower efficiency and work load especially on the month and year ends. Blockchain alters the conventional techniques for invoicing, documentation, contracts and instalment preparation. It mechanizes these physically performed assignments.

Potential to Enhance Accounting System

Modern financial accounting - Double entry bookkeeping revolutionized the field of financial accounting during the Renaissance period; it solved the problem of managers knowing whether they could trust their own books. However, to gain the trust of outsiders, independent public auditors also verified the company's financial information.

Blockchain technology may represent the next step for accounting. Instead of keeping separate records based on transaction receipts, companies can write their transactions directly into a joint register, creating an interlocking system of enduring accounting records. Since all entries are distributed and cryptographically sealed, falsifying or destroying them to conceal activity is practically impossible. It is like the transaction being verified by a notary – only in an electronic way.

Companies would benefit in many ways: Standardisation through blockchain would allow auditors to verify a large portion of the most important data behind the financial statements automatically. The cost and time necessary to conduct an audit would decline considerably. Auditors could thereby spend more time on areas where they can add more value, e.g., on very complex transactions or on internal control mechanisms.

Skills for the Future

Following are some skills that will be required by professional accountants in future –

- Areas of accounting concerned with transactional assurance and carrying out transfer of property rights will be transformed by Blockchain and smart contract approaches.
- Reduction in the need for reconciliation and dispute management, combined with increased certainty around rights and obligations, will allow greater focus on how to account for and consider the transactions, and enable an expansion in specific areas that can be accounted for.
- Many current-day accounting department processes can be optimised through Blockchain and other modern technologies, such as data analytics or machine learning. This will increase the efficiency and value of the accounting function.
- It is perceived that spectrum of skills represented in accounting will change. Some work such as, reconciliations and provenance assurance will be reduced or eliminated, while other areas such as, technology, advisory, and other value-adding activities will expand.
- To properly audit a company with significant Blockchain-based transactions, focus of auditor will have to shift. There will be little need to confirm accuracy or existence of Blockchain transactions with external sources, but there will be plenty of attention required to be paid to how those transactions have been recorded and recognised in the financial statements, and how judgemental elements such as, valuations have been decided.
- In the long term, more and more records could move onto Blockchains, and auditors and regulators with access would be able to check transactions in real time and with certainty over the provenance of those transactions.
- Accountants will be required to know how to advise on Blockchain adoption and consider the impact of Blockchain on their professional work. They also need to be able to act as the bridge, having informed conversations with both technologists and business stakeholders.
- Accountants' skills will need to expand to include an understanding of the principle features and functions of Blockchain.

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How Accountancy Profession Can Lead in Blockchain Landscape

Move to a financial system with a significant Blockchain elements offers many opportunities for the accountancy profession. Accountants are experts in record keeping, application of complex rules, business logic and standards setting. They can guide and influence how Blockchain is embedded and used in the future, and to develop Blockchain-led solutions and services. To become truly an integral part of the financial system, Blockchain must be developed, standardised and optimised. This process is likely to take many years . There are many Blockchain applications and start-ups in this field, but there are very few that are beyond the proof of concept or pilot study stage.

Accountants are already participating in research, but there is more for the profession to contribute in establishment of new financial services infrastructure and processes in Blockchain innovation landscape. Crafting regulation and standards to cover Blockchain will be no small challenge, and leading accountancy firms and bodies can bring their expertise to that work. Accountants can also work as advisers to companies considering joining Blockchain themselves, providing advise on weighing the costs and advantages of the new system, etc. Accountants' mix of business and financial nous will position them as key advisers to companies approaching these new technologies looking for opportunity.

CASE STUDIES

Case Study 1

R3 – Interbank Reconciliation

Blockchains are designed to be useful in systems that require reconciliation between parties. Many of the major players in banking are backing the R3 consortium, which is researching the use of a Blockchain like distributed ledger for interbank reconciliations and other financial applications. Currently, millions per year are spent reconciling ledgers between banks; however, if a distributed ledger solution could be created that is able to handle the volume of transactions between the banks, then this could be greatly reduced.

This kind of application would be a private ledger, i.e., one where only invited parties can view the records or participate in creating new entries. However, it would require that interbank transactions are consolidated to form a single, authoritative record that all parties could verify. This could reduce the considerable efforts currently spent reconciling books with counterparties and, therefore, would allow for a more efficient banking system.

A solution of this kind is not feasible with the present implementations of Blockchain, either in volume or in speed, and indeed the R3 project has now morphed into other distributed ledger applications for the financial sector. However, if these significant challenges could be overcome, this is potentially a very impactful area of application for Blockchain. Others are looking at supply chain integration for similar reasons.

Case Study 2

IBM Hyper Ledger

Hyperledger, a Linux Foundation project, is an open source community to help advance technology and thought leadership. It is deemed an "umbrella" for developer communities building open-source Blockchain and related technologies. Hyperledger was announced and formally named in December, 2015 by 17 companies in a collaborative effort created to advance Blockchain technology for cross-industry use in business. Now with over 130 members across the world, it is the fastest growing project in Linux Foundation history.

Hyperledger is curated by the Linux Foundation, which provides tools, training, and events to scale any open source project. IBM initially contributed what was then called Open Blockchain and is now called Fabric, and arguably that is the biggest/highest profile project. The idea is that Hyperledger rather than being a single platform (a la Ethereum) will be more akin to the Apache Project, with multiple projects under one umbrella that will be open source, freely available, and ideally have some measure of interoperability.

The vision of Hyperledger is to provide robust and efficient standards for Blockchain ledger technology to facilitate mainstream commercial adoption. Future applications will involve a world with many interconnected distributed databases and Blockchains, each of which will be specialized to suit the purpose of its users and will have the potential to communicate with other ledgers, as necessary.

Another goal for Hyperledger is to provide a modular Blockchain technology that contains a rich, easy-to-use application programming interface (API) and numerous core modules that enable easy development and interoperability. The API must be flexible enough to allow Blockchains built outside core Hyperledger to easily interact with their components and Blockchains. Further, Hyperledger believes that identity and patterns of behaviour of any party on a network must be difficult for unauthorized parties to ascertain by inspecting the

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ledger. Blockchain users must be able to make certain business logic and parameters of a transaction confidential, rendering them inaccessible to anyone other than the stakeholders.

CONCLUSION AND WAY FORWARD

Blockchain is an Internet of Values and Assets

As witnessed through Blockchain initiatives by first movers, this technology can be applied by professional service firms and other incumbents of the accounting industry to better meet client needs. In the years to come, Blockchain could be used regularly by professional accountants to manage a company's records, transactions, and performance. Triple-entry accounting, smart contracts, and automated taxation are just a few of the ways Blockchain can streamline accounting processes. Though no one can confidently predict the magnitude of Blockchain's growth, one thing is for certain, i.e., Accounting is just one block in the chain of industries being dramatically redefined by this disruptive technology.

There are still many unknowns with respect to how Blockchain will impact the audit and assurance profession, including the speed with which it will do so. Blockchain is already impacting auditors of those organizations using Blockchain to record transactions and the rate of adoption is expected to continue to increase. However, in the immediate future, Blockchain technology will not replace financial reporting and financial statement auditing. Audited financial statements are a cornerstone of business and play a key role in debt and equity financing, participation in capital markets, mergers and acquisitions, regulatory compliance, and the effective and efficient functioning of capital markets. Financial statements reflect management assertions, including estimates, many of which cannot be easily summarized or calculated in Blockchains.

Professional accountants need to monitor developments in Blockchain technology because it will impact their clients' information technology systems. They should be conversant with the basics of Blockchain technology and work with experts to audit the complex technical risks associated with Blockchains. In addition, they should be aware of opportunities to leverage their clients' adoption of Blockchain technology to improve data gathering during the audit. They should also consider whether Blockchain technology will allow them to create automated audit routines. The auditing profession must embrace and "lean in" to the opportunities and challenges from wide spread Blockchain adoption.

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HAPPINESS: IS IT DEPENDENT ON PSYCHOLOGICAL FACTORS? AN EXPLORATORY STUDY DURING PANDEMIC ON STUDENTS OF INDIAN HIGHER EDUCATIONAL INSTITUTIONS

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ABSTRACT

Purpose

Pandemic impacted each and every section of society. It devastated the happy going normal routine of the world. Education sector with the support of technology made itself stand strong during pandemic. This paper studies the impact of psychological factors effecting students' happiness during pandemic and further discusses suggestive measures to overcome from it leading to increased happiness and learning.

Design/Methodology

A self- administered structured questionnaire was used to collect data from 571 respondents with convenience sampling technique. SPSS was used for data analysis where liner regression was opted for measuring impact of psychological factors on happiness.

Originality

The research focused specially the impact of psychological factors on happiness for students of Indian higher educational institutions during pandemic

Research limitation/ implications

The research was carried on students of higher educational institutions from Uttarakhand and Uttar Pradesh during pandemic. For more generalised results, it should be conducted across nation.

Practical implications

The results of this research may help education system to address various psychological issues students are facing during pandemic thereby increasing happiness which ultimately influences learning capacity.

Social implications

Students whose psychological issues are considered and addressed will feel happier and overcome easily the effects of pandemic leading to better learning.

Keywords

Happiness; Higher educational institutions; Psychological factors; Pandemic

INTRODUCTION

Covid-19, the pandemic started from December 2019, Wuhan, China. It very quickly arrested the whole world. Every sector every section of society got badly hampered. Before even people can think for any solution, it effected many lives. By 18th May 2020, India got its first one lakh people infected with the virus. Various prompt measures were opted by government like lockdown, isolation, quarantine, using regular sanitizers, social distancing. Studies show that these measures caused fear of infection, boredom, frustration among many (Tian et al. 2020). Previously also MERS the infectious disease reported high level of mental health problems (Jeong et al. 2016).

Any nation's development and future lie in the hands of coming generation. The energetic, fresh, fear free, experimental, risk takers, responsible group of society actually comprises of young generation rather better say college going ones. They were forced to stay indoors. Routine costing their huge physical energy suddenly stopped. Daily running for presence in physical classes, meeting friends, performing group projects and activities all came to stand still. This all started online, where students were not able to express clearly their excitement, anxiety, confusion, happiness, etc with teachers and friends as they use to do it before. Further an unclear future and seeing lack of opportunities, students started developing mental and psychological issues.

To prevent or reduce mental health problems (Gjerde, 1993) various intervention strategies are important to incorporate. It is seen that students have developed various issues like lack of concentration, increased anxiety,

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frustration, sleeplessness, improper diet consumption, irregular exercise patterns etc. For this it's time to dig out psychological issues faced by students during pandemic, address them and strategize accordingly.

CONCEPTUALIZATION

Happiness has different meanings for different people. It differs person to person. It can be called as feeling of a moment for a feeling for a stretched period. It can be defined as subjective well-being too. It can also be defined as recurrent positive and infrequent negative effect (McBride, 2010). Another way for description of happiness can be "overall appreciation of one's life as -a- whole" (Veenhoven, 2001).

Students spend their life's most important time in college. Students taking admission in college, are always superbly excited about their careers. They feel as if their life is on set path and soon, they will be absorbed by good companies. They work hard for their grades, participate in extra curricular activities, group works, team building exercises etc for their overall development. Students knowingly unknowingly compete with their friends and improve themselves for better achievement. They get ample opportunity in college to interact with their mentors, teachers, guides for having feedback for their work and to share inner feelings.

Pandemic completely changed the way of education. It has influenced and left a remarkable impact on education sector. From physical mode it went online mode, making a distance between teachers, students and friends. Students no longer are able to express themselves completely. Virtual mode though helped education system to sustain in pandemic but made it difficult for students to concentrate and raise questions in classes. Long classes demand long sitting durations, which impacted student's physical health and reduction in concentration power also. As students are future budding professionals, its highly important to timely keep a check on their issues faced during pandemic. Various studies on education system impacted during pandemic are already there, but this research uniquely checks if psychological factors impact happiness of students in Indian context and suggests appropriate measures for timely address.

LITERATURE REVIEW

Happiness

The goal of everyone's life is happiness. Its meaning differs from person to person. It can be explained as positive feeling, moment of joy. Happiness can be defined as " What I experience here and now" by Daniel Kahneman (Mandel, 2018). Pursuit of happiness compels people to do different things. Having positive perception about self-relatively, but not with complete absence of negative emotions is also defined as happiness (Diener and Satvik, 1991). Researcher explains that happiness is inherited by our parents, changes and have fluctuations, it's a subset of our nature (Graham et al., 2004). Sheldon & Lucas, 2014 suggests that it has a set point governed by genes and nurture. Mostly all experience ups and downs in their lives. One of the happiness theories suggests that people have a set governed point, so people tend to come back and so the level of happiness remains constant throughout life. Contradicting to this theory, it is also found that heritability does not limit increase in happiness (Nes, 2010). World leaders explains that happiness has various aspects to it attached. Dr. Ashley Whillans, assistant Professor, Harvard Business School, explains the people who valued time over money reported higher happiness. He is leading scholar for time, money and happiness. Another Professor Sir Cary Cooper, raises the point that real success lies in happiness of employees and citizens and their mental health. He is leading scholar in occupational health and wellness research.

PSYCHOLOGICAL FACTORS EFFECTING HAPPINESS

Students of college are at very delicate phase of their lives. They need to be handled with lot of care. They enter college with lot of dreams, they aspire to do best. Along with devotion towards studies, having fun in college they equally feel responsible for their future. Various past researches (Cheng & Furnham, 2002) with college students for happiness show that factors like being famous, childhood health, managing people skill, friendship, love for nature, grades, serious hard-working living, self- confidence (Watson, 1930) related with happiness. It can also be related to various factors like consumption of type of food, mood swings, proper sleep, stress perceived, social surroundings etc. Research found shyness and loneliness to be inversely related to happiness (Richard booth, David Bartlett, 1992). Already students had to manage their happiness during normal colleges days and suddenly pandemic arrived and disturbed their skill to manage it.

Covid-19 pandemic affected badly everyone's life. It did not only give high mortality but also left everyone affected by it with low, medium and high-level impacts. Education system also is facing crisis. Every student is some or the other way facing mental and psychological crisis due to it. It badly impacted the thought process of a student leaving him with issues like panic attacks, anxiety, depression (Ahorsu *et al*., 2020; Qiu *et al*., 2020). Shifting from physical pattern of classes overnight to virtual classes was neither easy for education sector nor for its students. Access to internet, adapting to technology, doing submissions online etc. all imposed pressure

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on student's mind. One study showed that outdoor activities contributed to higher emotional well-being, while more screen time and indoor activities contributed to lower emotional well-being (Stieger *et al.*, 2021). Further anyhow going for outdoor exercise and cutting on screen time promotes general health in addition to mental health (Colley *et al.*, 2020). Another research discovers that unhealthy food, having excessive snacks, anxiety leads to increase in weight ultimately to psychological issues (AlMughamis *et al.*, 2020). Pandemic brought negative impacts on economy, physical activities, delay in academic activities etc. all positively related to anxiety (Cao *et al.*, 2020).

OBJECTIVES

- To explore the impact of psychological factors on happiness for students of higher educational institutions.

HYPOTHESIS

- There exists no impact of psychological factors on happiness for students of higher educational institutions.
- There exists impact of psychological factors on happiness for students of higher educational institutions.

RESEARCH METHODOLOGY

The study was carried on students of higher educational institutions during pandemic from January 2021-February 202. This research was carried for Uttarakhand and Uttar Pradesh college students. Total of 571 respondents gave their responses with their wish on the terms of keeping their data confidential. The data was collected through self-administered questionnaire having Cronbach alpha 0.877 having 50 questions in all. The questionnaire was based on five-point Likert scale where 1 stands for strongly disagree, 2 stands for disagree, 3 for neutral, 4 for agree and 5 stands for strongly agree.

RESULTS AND DISCUSSION

For statistical analysis, SPSS was used. There were 11 questions for this analysis and their reliability came out to be 0.636 shown in table 1.

Table I: Reliability for Psychological Questions

Cronbach's Alpha	N of items
0.636	11

Factor analysis showed the categorisation of variables for psychological factors giving Kaiser- Meyer- Oklin (KMO) value as 0.777, stating that the sample size was appropriate for conducting the test. Factor analysis extracted four factors explaining 57.02 variance. The extracted factors are shown in table 2.

Table II: Factor Analysis

Psychological Factors	Variables	Factor loadings
Opportunities	I wish I am able to anticipate things	0.719
	I wish to feel excited about wide variety of opportunities	0.552
	I wish to feel that I get chance to be involved in the things around me	0.708
Positive Attitude	I wish to do my work with great excitement	0.531
	I wish to do my work with great energy	0.876
Hope	I wish there are various ways to solve any problem	0.717
	I wish to take past experience as learnings	0.636
	I wish to feel great future ahead me	0.696
	I wish to have enough opportunities in life	0.376
Perceived Stress	I do not feel anxious during ordinary days of semester	0.751
	I do not feel anxious during exam and end semester period	0.828

Hypothesis Testing

Now to check whether psychological factors impact significantly the happiness of students or not, liner regression is carried out. Table 3 provide model summary and details for *R*, the liner correlation coefficient predicting dependent variable happiness.

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Table III: Model Summary

Model	*R*	*R* Square	Adjusted *R* Square	Std. Error of the Estimate	*R* Square Change	F Change	df1	df2	Sig. F Change
1	0.766	0.586	0.586	13.59	0.586	890.2	1	628	0.000

The value of *R* is 0.766, considered as good, concluding that the independent variable which is psychological variables do predict dependent one that is happiness of students very well. R square represents R^2 coefficient of determination which is 0.586, means psychological factors explains 58.6% of variability for happiness. Table 4, ANOVA -good fit, states that the independent variable which is psychological factors statistically significantly predict the dependent variable, $F(1, 628)= 890.2$, $p < 0.0005$, concluding regression model is good fit of the data.

Table IV: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	164502.88	1	164502.88	890.25	0.000
	Residual	116042.61	628	184.781		
	Total	280545.498	629			

Now table 5, represents statistical significance of independent variable with "Sig." which is $p < 0.05$. Concluding that psychological factors do predict happiness significantly.

CONCLUSION

Pandemic spreader Covid-19, arrived without letting people strategize to handle it. Every sector got impacted and mankind got badly hurt. Education sector though very timely and consciously switched to online mode, but it left short- and long-term impact on students. Students being very adaptable, readily accepted the change in education pattern but also faced various issues like psychological, social, physical, financial etc. Students tried hard to mould themselves according to new normal. The long online classes with less breaks, long sitting hours, sleepless nights due to online submission load, new messages coming anytime on different groups of college, trying to remain updated, pressure of maintaining grades, etc. Students got impacted due to various reasons like not able to share feelings with mentors, teachers, friends, social distancing, lockdown, isolation, home quarantine, etc.

This paper focused on the psychological aspects of students during pandemic. The results show that happiness is significantly impacted by psychological factors. The main four variables surfaced by the analysis were opportunities, hope, positive attitude and perceived stress. This research compels us to think for the strategies which can build trust among students that they will be provided with good opportunities in future, they should always hope for the best with lot of positive attitudes and there is no need of taking unnecessary stress. Education sector need to once again become student centric, as a happy student becomes more efficient and learns better leading to ultimately increase the result of college.

SUGGESTIONS FOR FUTURE

Education system may opt for various student centric approaches where prime importance is given to mental and psychological health of a student. Online classes should regulate the timings of class, where teachers are motivated not to exceed the session time so to give students proper break between sessions. Teachers should motivate students for healthy diet intake with different tools like linking it with some games. Mentors should monitor the sleep cycle of student also, by boosting them not to adhere with gadgets in night. Mentors should also ask students to speak with them more frequently so as to share feelings and thoughts. College should interact with parents too and motivate them to give more time to youngsters. To overcome from the ill effects of this pandemic we as society whole has to come together and support coming generations by making them positive about future by showing upcoming opportunities and reducing their undue stress by making them sure to be there when help is needed.

LIMITATIONS

This research was conducted on students of higher educational institutions based in Uttarakhand and Uttar Pradesh. Thought the data collected was good but to generalize the results, it is advised to increase the data collection India wide.

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ENHANCING AES ALGORITHM TO SECURE FRAME WORK IN CLOUD COMPUTING

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ABSTRACT
Globalization of clouds computational and massive growth has gain interest and enabled intensive security on resource –constraint clients devices. Simultaneously smart mobiles are enabled to deploy data on the demand service model of remote clients data centers. However Personal outsourcing and confidential data to the data servers is challenging for the new aspects involved in data privacy and security. The traditional advanced encryption standard (AES) algorithm needs to be enhanced in order to cope with the emerging security threats in the cloud environment. Research work represents the Framework with Key features including enhanced security and owner's data privacy. It modifies the 128 AES Algorithm to increases the speed of encryption process, 1000 blocks per second by the double round key feature. However traditionally there is a single round key with 800blocks per second.

Proposed Algorithm involves less power consumption better load balancing and enhanced trust and resource management on the network. The proposed Frame work include deployment of AES with 16, 32, 64, and 128 plain text bytes. Simultaneously results are visualized in a way that depicts suitability of the algorithm while achieving particular quality attributes. Results sows that the proposed framework minimizes energy consumption by 14.43%, network usage by 11.53%, and delay by 15.67%, Hence proposed framework enhances security, minimizes resource utilization, and reduces delay while deploying services of Computational Clouds. .

1. INTRODUCTION
cloud technology is used in a number of architectures , services with further technologies, and various software design approaches [1] Cloud service model include Platform as a service (PaaS), Software as A Service (SaaS). Infrastructure as a service (IaaS). Architecture solutions for the private, Public, community, and hybrid systems depends on four cloud platform deployment models[2]. Advantages of Cloud Computing includes Flexibility, accessibility , and capacity when linked to traditional online computing or storage method [3]. However a number of security concerns are associated with computational clouds including (i) Privacy and security issues with cloud service providers and (ii) Customer related security issues [4]. In the literature various types of attacks related to the strength of the AES (Advanced Encryption Standard) algorithm have been proposed [5], for instance different fault analyses which attack and introduce faults in to the AES (Advanced Encryption Standard) structure with the targets to retrieving the secret information[6]. Furthermore , Cloud Computing standard can propose some feasible practices of service area, by means of computational resources on behalf of extraordinary performance in cloud computing applications, telecommunications services, social networking, and web services [7,8] . In addition , Cloud storage in data centers is very valuable for users just before storing and accessing their data distantly at any time without any further load [9,10] . On the contrary the main problem of cloud data storage is security. As a result , cloud data centers must have some mechanism which are capable to ensure storage perfection and integrity of data that are stored on Cloud [11]. Existing security system employee one or two attributes at a time, i.e low security and more time consumption to encrypt /decrypt the data. It makes the process more time consuming and therefore increase the network use power consumption and delay in the network[12-16].Cloud Computing is that kind of platform which shares the data and resources efficiently, and therefore Security must be provided to the users as security is the important aspects of Cloud Computing. So this is the responsibility of Cloud service providers with provide security with all attributes, such as less power consumption, delay of network , and time consumption [17-23]. Already traditionally available methods are not able to quantify the security of Cloud Services effectively. Secure Framework in a Cloud Computing is a method that provides simplified management and accessing of computing resources, and cost-effective approach is the need of the hour. i.e Framework should use low power, time, and delay of network consumption with encryption and decryption that enhance the security of data in cloud computing. .

This Paper contributes towards the design of the security frame work by implementing a new scheme of encryption / decryption. It also determines the serious components of the security framework with in the cloud Computing. It would be the helpful for those cloud users and cloud service providers who have similar requirements in terms of Security during Implementation, i.e Framework helps in faster computing with lesser

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power consumption, network usage, a reduced algorithm delay due to the smart algorithm , i.e framework employs a symmetrical encryption method to provide trust to user and enable trusted gateways, i.e Proposed framework includes the key feature including enhanced security and owner data privacy. It modifies the 128 AES Algorithm to increase the speed of the encryption process 1000 blocks per second by the double round key feature. However , traditionally , there is a single round key with 800 blocks per second, i.e Proposed algorithm involves enhanced trust and resource management on the network. i.e Proposed framework includes the deployment f AES with 16, 32, 64 and 128 plain text bytes. Simultaneously results are visualized in a way that depicts suitability of the algorithm while achieving particular quality attributes. Results show that the proposed framework minimizes energy consumption by 14.43% network usage by 11.53% and delay by 15.67% . Hence the proposed framework enhances security , minimizes , resource utilization, and reduces delay while deploying services computational clouds. The remainder of this paper is configured as the following sections: Section 2 details the literature review. Section 3 defines the framework architecture. Section 4 includes the experimental environment. Section 5 presents the performance results of both existing and proposed frameworks. Section 6 defines the for the coming features associated with the paper exertion

2. LITERATURE REVIEW

Several modifications were introduced in AES in order to enhance the performances speed and security by introducing some complexities in algorithms : These modifications are implemented on different software and hardware designs. However , Preview framework security is always concern due to some security constraint and problem with Cloud Computing. The security is provided to the information which is stored on the cloud by using Cryptography algorithms. There are extensive security frameworks for cloud computing that uses enormous encryption techniques. Security frame work is based on the multi cloud environment to store digital data at all . In order to prevent data disclosure they practiced a segmentation approach to fragment the input appearance in to several areas. Integrity of the outsourced clients data helps to verify water marking techniques. Any accidental change to outsourced client's data can be detected by the digital signature and watermarking methods [24].This paper focuses on the computation of different methods which explain how to increase data security so that prevention from different security attacks and breaches can be made. Mitigation approaches used in this research on the HMAC (Hash Message Authentication Code) were ECC and MD5. Is proposed solutions is based on different security levels, as a result access control, authentication , confidentiality, integrity, and encryption are achieved in this work authors performed and checked the security solution in real-time as well as in real cloud computing environment and also concluded that the solution that is been provided has very low overhead for upload and download service time.[17] The framework presented in this study is more secure , and it provides privacy to the data. This framework splits data in to different locks of bit. On every two blocks of bits, genetic algorithm is applied. Concluding output of each genomic algorithm procedure is a cipher text along with two block of bits. Each Cipher text is stored on the cloud at a distinct location , and the location of the Cipher text is not secure . What makes it more secure from attackers to find to find the exact location of the Cipher text ? The innovative security framework puts on a genetic algorithm on minor block size that increases the security. Further more the framework uses the proficiency list aiming to secure and to access data.[18]

In this paper , authors proposed a new framework that ensures the data security and integrity and also focused on the encryption and decryption approaches facilitating the Cloud user with data security assurance. The Proposed solution talked about the increased security along with the performance their solution also included functioning of the forensic , virtual machine, malware detection , and real time monitoring of the system [25]. In this paper , the authors suggested a framework such that the objective is to store data in various clouds. The given framework is found based on 3DES and RSA Encryption. On the Contrary , this methodology is lacking in efficiency, privacy, and overload middleware , through multiple functions [26]. In this paper the author studied , multilevel licensing framework approval author preservation cloud penetrating data. Safeguarding the familiar and delicate cloud data is obtained by the three cover's framework. Those restrictions are being the security and privacy strategies, safety and approval policies which outcomes from the three film's security framework [19]. In this Paper the authors proposed quality metrics and details probe on the instance Cloud service broker framework are provided . These streak metrics help in enforcing standards on Cloud service provider by using quality -based Cloud service broke framework (QCSB). The algorithm and Implementation of QCSB have been obsessing. At last the authors concluded that the proposed material QCSB not only assists cloud computing to locate optimal CSP (Cloud Service Provider) for Cloud service but also affiliates candidate CSPs according to user quality preference [20]. These detects were an effect of dismiss logical purposes in the Mix Column conversion of AES. These reasonable tasks were eradicating in the modified version of AES Afterward on utilizing the modified AES, a 13.6% reduction in LUTs, 10.93 % share discount, and a 1.19%

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reduction in interruption eating was attained . Likewise the reduction in interruption eating was attained . Likewise, the small dispersal rate me through the conservation AES as the initial nonentity and important agenda sequences are spoken in [27]. In this research they examined five metrics specifically the graphics study , file size, radiance histogram, assessment by pixel, and distance. In the file scopes, there were differences wherever it displays the regular worth of the fraction variations to -23.85% from the encrypt duplicate and -1.45% percentage worth from the innovative to the decrypt duplicate [28] is paper showed an overview of the latest research studies that are going on in fog computing and the IoT and its uses; it also enlightened the research gaps and directions for further research studies in the integration of fog computing and IoT (Internet of Things). A modern fog computing framework was presented [29].The modified AES contained 10series for encrypting, and the replacement and addition processes of the columns have been substituted by the line change and pixel standard summary. These processes not only decrease the spell complication of the algorithm but also improve the dispersal attitude to the CCAES (combing the chaos and AES) algorithm The encrypted descriptions by the CCAES algorithm remained unaffected to the variance occurrences. The project algorithm is protected along side the entropy occurrences. The simulation consequences illuminate that the minor deviation in the unique appearance and consequences in the important fluctuations in the encrypt duplicate and the innovative appearance cannot be retrieved [30]. This is paper described the CloudSim simulator counting its architecture , aces, convicts, and CloudSim forms . Likewise it characterized exactly how to practice CloudSim demonstration and replication in the Cloud environment. Further more it also describe the way to calculate approximate presentation limits like regular reversal time, amount, implementation period, types pan and entire conclusion period etc [31]. This paper reported dissimilar data safety and privacy security concerns in a cloud calculating environment and suggested a technique for dissimilar security services such as verification , approval , and privacy along with observation in suspension. Cloud computing plans a different techniques for obtaining cloud data in the actual environment. 128 bit AES encryption is recycled for privacy along with observing in suspension. Cloud computing plans a different techniques for obtaining Cloud data in the actual environment. 128 bit AES encryption is recycled for privacy, genuineness, and contact controller [32]. In the future work, load balancer by means of My Load Balancer optimization method has been compared with the two greatest well –known weight balancer techniques, i.e Round-Robin and supper present Implementation Freight, also recognized as Active Monitoring Load Balancer. All such java –based virtual techniques are used to create Cloud analyst toolkit. Graph procedure have been recycling to prove the comparative analysis is[33]. The procedure of Cryptography involves two main methods which are encryption and decryption. In the encryption method , a basic manuscript is converted to an innovative text which the others cannot deliver and understand additional than the receiver . Blowfish and AES procedure are exploited for executing a hybrid approach connected to cryptography is consequence in cryptograph text which can merely be decrypted by the receiver this one [34]. In this paper , obtain able low- control AES Architecture by exploiting humble shift catalogues and variation for Key/ data stored to decrease journey magnitude and control consumption. A low-power method, called clock gating is used to control ex-changeable on S-box[35]. In the present study , Abikoye et al's modified AES algorithm [13] is presented which is also used in applications to make a comparison . K-L T sai et al. presented the modified AES-based algorithm for power reduction in IoT using Cloud Computing applications [14]. In this paper , similarly , VM (Virtual machine) allocation policy is used for security which is almost similar to the technique used in the previous work [36]. In general the main purpose of all research studies related to the subject areas is to investigate the possible ways to improve the security of Cloud Computing services. Therefore , in this work , a secure frame work has been proposed systems using AES encryptions methods. Finally, a comparison of the results obtained through this proposed framework and traditional framework formulated in the past is made which is showed significant improvement of Cloud Computing using the proposed framework. The differences between our modified AES and previously developed or modified AES in the JAVA cipher –based security framework have been discussed in the manuscript it is pertinent to mention here that our trust –based framework blocks the suspicious users from the network and maintains a queue for such users to protect the trusted users.

.3 ARCHITECTURE OF THE PROPOSED SECURE FRAMEWORK FOR CLOUD COMPUTING (SFCC)

The architecture of the proposed secure framework cloud computing (SFCC) is presented in Figure1. Framework of secure cloud computing is proposed on the security architecture show in Figure 1, which describes the information for each component and their applications which are required for secure technologies to operate between components in cloud computing is framework acts in the

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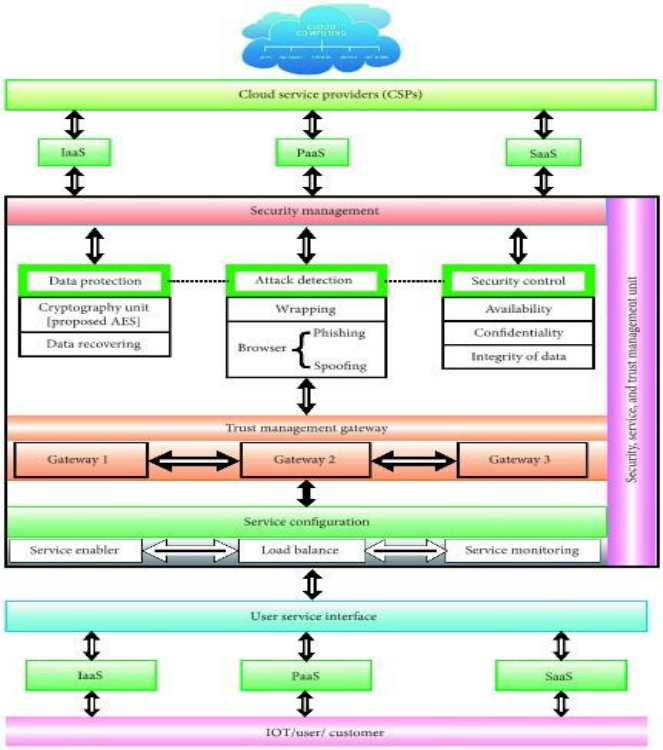

Figure 1 : Secure Framework for Cloud Computing (SFCC)

Following Conditions Checking Security, Privacy, load balancing, and trust. When the user directs a demand to the Cloud benefactor , it responds to the users request and passes the data through framework gateways. The Proposed framework includes the following components :

Cloud Service provider (CSP) layer: The CSP controls the important sources and ability in construction and calculates the dispersed cloud storage server processes and directs the live obscure work out method. Its main component is software as a service (SaaS), this is a model in which end users are provided software application (as a service) . Platform as a service (PaaS) : this model proposed an atmosphere for requests. Development tools are essential for advanced applications are also provided in this model. Infrastructure as a service (IaaS): this is a platform that offers compulsory properties such as physical machines, virtual machines, and virtual storage.

Security service trust management unit: Security service trust management controls all the unite which include security management , trust management gateways also controls the service configuration , respectively . Further details of all units are described in the following:

Security management layer: the Security management factors offers security and privacy details and implantation functionality. Security service has the following model and their details.

Security control unit: availability is the percentage of time customer access the service. Confidentiality (authentication, authorization, and identification) is an integral component of security . It ensures that the information stored on the cloud is protected against the unintended or authorized access. Identification user is typically skillful by retaining usernames and passwords after utilizing web browser in order to admit in Cloud. Integrity of data security control is responsible for maintaining the accuracy of data computation that is coming from the combination of different files and is also responsible for its delivery.

Attack detection unit: Ultimately, slightly usual activities that hover the cloud security necessities 9e.g, Integrity , confidentiality, and availability) are measured to be occurrences. Wrappings is when the attacker attacks by wrapping the communications between two people, while the users do not know this and think data are still coming from the actual root. Unethical browsing is to find bad actions happening , for example, Phishing and spoofing and changing browser certificates

Data protection unit: Proposes the AES algorithm to enhance the data security by means of cryptography techniques is using AES Ciphers as they can encrypt 128 bits data blocks with in 1000 blocks per second with the double round key feature with less power consumption, Load balancing , trust , and resource management

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on the network efficiency. We used symmetric identification for security , i.e, the same key for encryption and the same key for decryption as identifications of data streams in the form of security. It provides greater efficiency for software as well as hardware. The advantage of using symmetric . Key is to secure a large amount of data . data recovery if data is lost in a disaster that it has a capability to regain or restore it.

Trust management gateway layer : for the forth layer trusted gateways are implemented . These gateways get the encrypt data and decrypt only if the trusted source is connected with a valid internal protocol address of given domain . These gateways in which two gateway is being attacked and misused, other safe gateways shall be chosen to ensure data communication.

Service Configuration layer : The service enabler makes provision for personalized cloud service using the user's profile for integration and interoperation. Load balancing can be implemented on hardware , software, or a combination of both. It is important in this configuration that all instances of identity server share the same directory server. Service monitoring : an automatic facility –checking system to assure an extraordinary level of facility presentation and obtain ability.

User Service interface layer: This layer provide different service to select the user via internet : Software as a Service (SaaS), Platform as a Service(PaaS), Infrastructure as a service (IaaS).

Service Configuration layer: the last unit for the user , IOT, and Customer to send and receive data.

4. EXPERIMENTAL SETUP AND IMPLEMENTATION OF SFCC :

The SFCC can be implemented in real time. The results gathered from the simulations are very accurate. These results are theoretically consistent. Everything is implemented accordingly. Codes are very consistent with real-time mechanisms. SFCC is developed using CloudSim and iFog Sim simulators on the Eclipse integrated development environment. CloudSim is very well –known and popular amomg simulators for Cloud-based applications. It is responsible for the simulation and events handling at Cloud. Some libraries are used for different purposes. Libraries used are Java Script object notation (Json) data server, common math and JFreeChart. The developed simulation comprises SFCC. The purposedframework is generic so that anyone could put one's idea or logic in this simulation has the ability to store and generate, a large amount of data. It allows a user to measure the factors such as encryption, descrption , power communication , network usage, delays, trusted devices, and service management . The advanced encryption and decryption for data protection is used. The alogorithms is discussed in later sections. The characteristics of the layers and devices are described in Table 1-11.

4.1 Components : Data Center refers on premise hardware , while the cloud refers to off-premise computing. The Clouds stores your data in the public cloud, while a data center stores your data on your hardware. Data center configuration is displayed in Table 1.

Infrastructure as a service (IaaS): this is a platform that offers compulsory resources such as Physcial machines, virtual machines, and virtual storage. Infrastructure –as – a –service configuration is displayed in Table 1.

Infrastructure as a service (IaaS) : this is platform that offers compulsory resources such as physical machines, virtual machines, and virtual storage. Infrastructure-as –a- service configuration displayed in Table2.

Software as a service (SaaS): this is a model in which end users are provided software applications (as a service) Software-as-a –service configuration is displayed in Table3.

Platform as a service (PaaS) : this model proposed an atmosphere for requests. Development and deployment tool that are essential to advance applications are also provided in this model. Platform –as-a-configuration is displayed in Table4.

Table1 : Data Centre Characteristics of Cloud.

Name of the device	Cloud
Level	1
Uploading Bandwidth	5000
Downloading Bandwidth	12000
Million instructions per second	130.0
RAM	45000
Rate per processing usage/ MIPS	10000

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Table 2: Data centre characteristics of Infrastructure as a service

Name of the device	Cloud IaaS
Level	2
Uploading Bandwidth	4000
Downloading Bandwidth	5000
Million instructions per second	50000
RAM	40000
Rate per processing usage/ MIPS	400.0

Table 3: Data centre characteristics of Software as a service

Name of the device	Cloud SaaS
Level	2
Uploading Bandwidth	4000
Downloading Bandwidth	5000
Million instructions per second	50000
RAM	40000
Rate per processing usage/MIPS	400.0

Table 4: Data Centre Characteristics of Platform as a service

Name of the device	Cloud SaaS
Level	2
Uploading Bandwidth	4000
Downloading Bandwidth	5000
Million instructions per second	60000
RAM	40000
Rate per processing usage/MIPS	50000

Security management: The security management factor offers the security and privacy details and implementation functionality table .Security management configuration displayed in Table 5.

Table 5 : Data Centre Characteristics of Security Management.

Name of the device	Security Management
Level	4
Uploading Bandwidth	5000
Downloading Bandwidth	5000
Million instructions per second	40000
RAM	35000
Rate per processing usage/MIPS	600.0

Gate way devices the second-last level of the hierarchy gateways devices are created. Theses gateway devices are part of the layer responsible for communication with proxy servers and cloud devices. Here are the characteristics of the gateway devices. Gateway device configuration is displayed in Table 6-8.

Service configuration: Is facility modifies the cloud service using the user's profile by integrating service enabler, load balancing, and service monitoring. Service configuration is displayed in Table -9.

Service Provider: This is the last unit of users and customers to send and receive data. Service provider configuration is displayed in the Table -10

Virtual machines are created and allocated to hosts to support processing and load balancing mechanism. Theses virtual machines come with the proposed strong encryption algorithms to support the security and trust feature. The Virtual machine Configuration is displayed in

Table 11.

The materials and methods section should contain sufficient detail to repeat all procedures It may be divided in to headed sections if several methods are described in to headed sections if several methods are described.

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Table 6 : Data centre Characteristics of Gateway1

Name of the device	Trusted Gateway1
Level	3
Uploading Bandwidth	3000
Downloading Bandwidth	4000
Million instructions per second	30000
RAM	20000
Rate per processing usage/MIPS	1000.0

Table 7 Data Centre Characteristics of gateway 2

Name of the device	Trusted Gateway 2
Level	4
Uploading Bandwidth	5000
Downloading Bandwidth	5000
Million instructions per second	40000
RAM	35000
Rate per processing usage/MIPS	600.0

Table 8 : Data Centre Characteristics of gateway 3

Name of the device	Trusted Gateway 3
Level	3
Uploading Bandwidth	4000
Downloading Bandwidth	4000
Million instructions per second	50000
RAM	34000
Rate per processing usage/MIPS	600.0

Table 9 : Data Centre Characteristics of Service Configuration

Name of the device	Service Configuration
Level	1
Uploading Bandwidth	5000
Downloading Bandwidth	5000
Million instructions per second	100000
RAM	40000
Rate per processing usage/MIPS	500.0

Table 10: Data Centre Characteristics of Service providers

Name of the device	Service Provider
Level	1
Uploading Bandwidth	5000
Downloading Bandwidth	5000 Gbits/Sec
Million instructions per second	50000
RAM	20000 gb
Rate per processing usage/MIPS	100.0

Table 11: Virtual machine Configuration .

Virtual machine number level	Virtual machine number	Processing Elements	Bandwidth (Uplink)	Latency (Input)
Level 0	2	20000	800	10
Level 1	4	18000	1000	6
Level 2	6	16000	1200	8

4.2 Physical Topology of SFCC : The Physical topology shows the pattern of nodes and devices in the network. Physical entities are created, and their competence, capability, and configurations are specified . Theses entities include sensors, actuators, gateways, and Cloud VM (Virtual Machines) . These

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established Physical network topology is important to understand the pattern of the network, how various network devices are organized and how they communicate with each other. These configurations and capacity determine the load a network can tolerate and the amount of data it can transfer. The Physical network topology is shown in Figure 2.

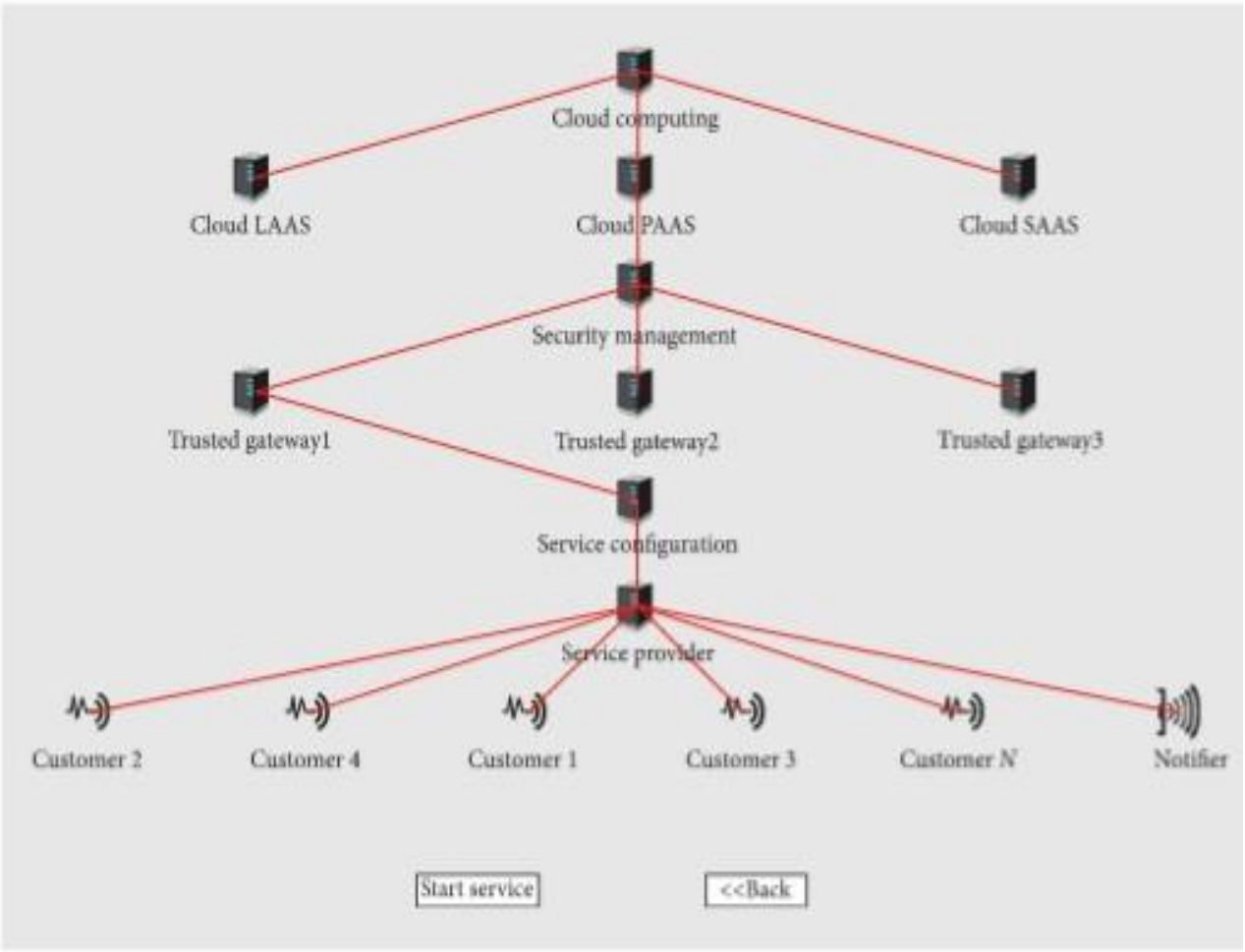

Figure 2: The Physical network topology

4.3 Explanation Topology: The Computing mechanism of Cloud always happens at the top. Cloud stays at the top to manage the lower –level architecture [37]. The three different types of Cloud stay below the top layer and act as CSPs [38] according to customer's need. For the rhrd layer, the virtual machine allocation policy mechanism is implemented to support data offloading and privacy for security [39] in the proposed system. Offloading the modules not only provides a load balancing but also solve the security issue of Cloud by providing new layer of the hosts. Virtual machines are created and allocated to the hosts to support processing and offloading of the modules to support the load balancing mechanism. These virtual machines come with a strong encryptions algorithm support the security and trust feature. Virtual machine requires some storage and processing capabilities similar to a host H in nature. Equation (1) represents the conditions for creating a virtual machine. Vm size is always smaller than the available host H and Storage S, where the number of Vms depends on the size of load (β).

$$\text{If } H=\{H1,\ H2,\ H3,\ \ldots,\ Hn\ \} \text{ and } V=\{Vm1,\ Vm2,\ Vm3,\ldots\ Vm\ N\}, \text{ then}$$

$$\exists Vm \in H \cup S:\ Vm \propto \beta \text{ where } H \cap S \gg Vm,$$

$$: Vm1, Vm2, Vm3, \ldots, Vm < H1, H2, H3, \ldots, H,$$

$$\cdot \forall V\ \exists Vm1, Vm2, Vm, \ldots, VmN \in H. \qquad (1)$$

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Equation (1) represents how VM Creation carried out under various rules and conditions. For the fourth layer , trusted gateways are implemented . Theses gateways get the encrypted data and decrypt only if a trusted source is connected with a valid internet protocol address of a given domain. These gateways support the issues of trust [40]. There are 3 gateways in which 2 are alternate manner. In case of a normal gateway is being attacked and misused other safe gateways shall be chosen to ensure data communication as shown in Figure 3.

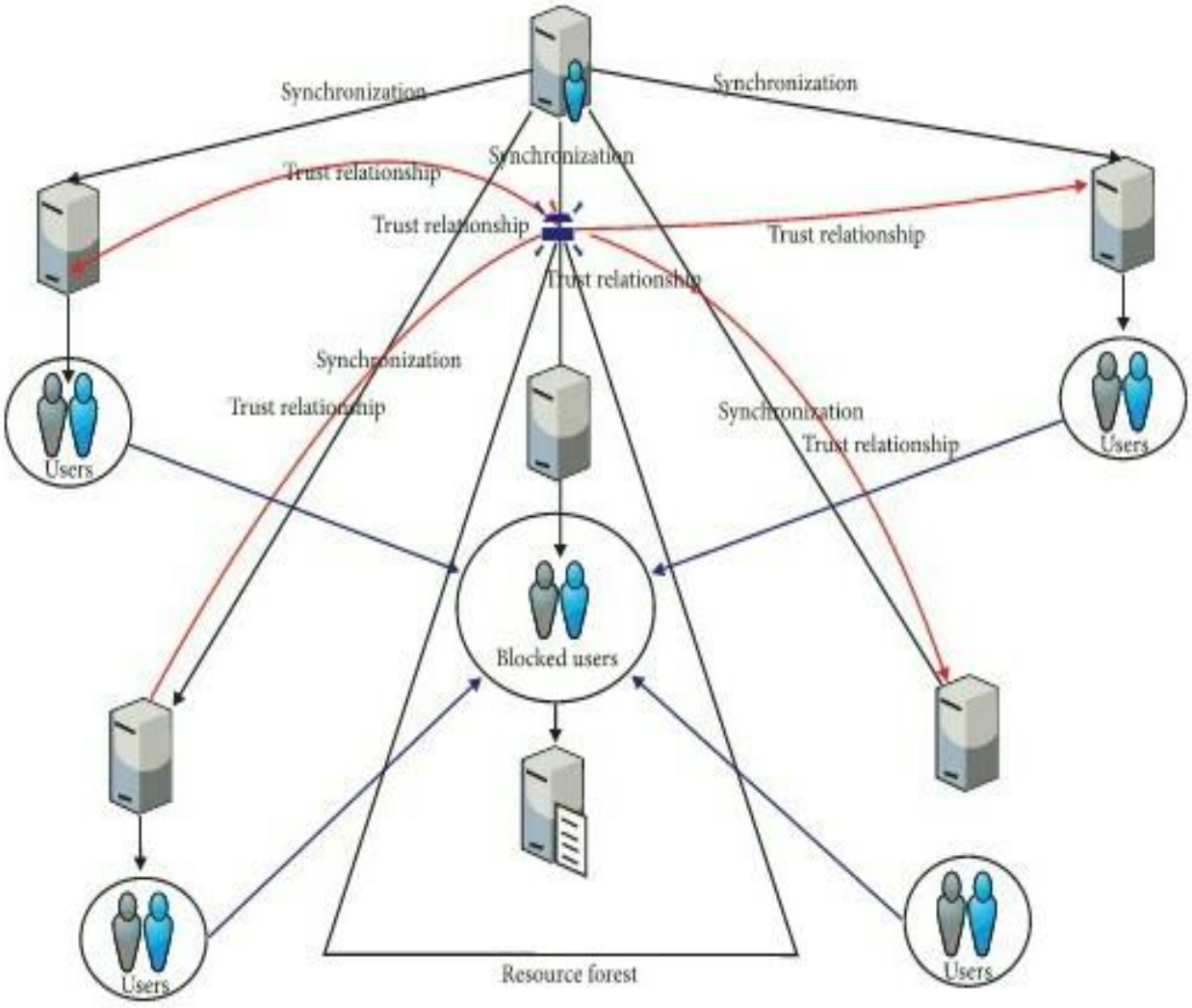

Figure 3: Trusted network Gateways

Trusted gateways put the blacklist users in to the blocked user's category to ensure the security and privacy of trusted users' The fifth layer is responsible for 3 functions. These functions include service monitoring, load balancing, and service enabling/ disabling. The bottom –most layer is based on the users of cloud, and it represents the internet of things layer in the proposed system. This is how all the a for mentioned proposed frameworks work. The trusted customers stay as long as a mediator (trustee)stays. And a mediator stays as long as the cloud service providers are trustable. The Chain of trust can be seen in Figure 4 [41] .

4.4 Changes in Traditional AES Algorithm : The high level flow of the proposed AES algorithm is a standard way is presented in Figure 5.

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Figure 4: Mediator of Cloud Service Provider Trusted Chain

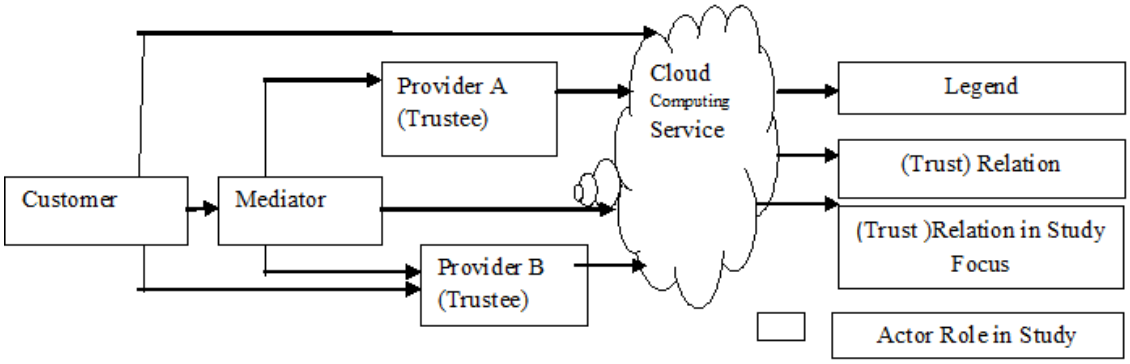
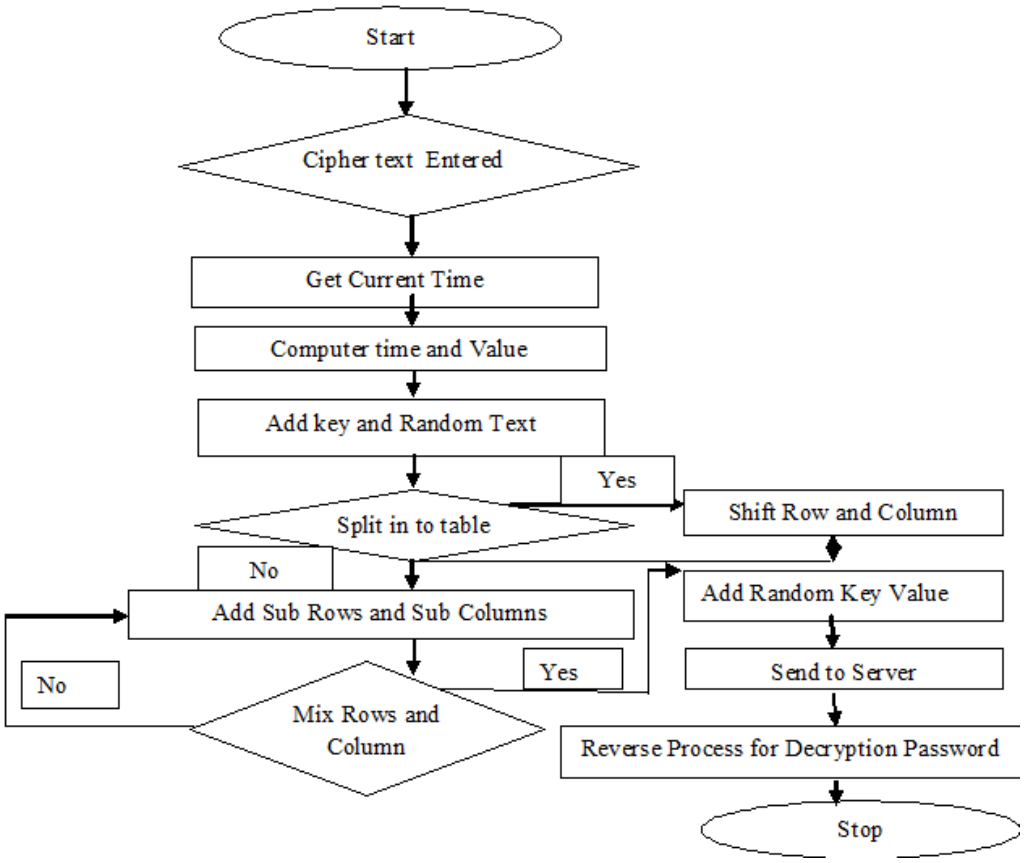


Figure 5: Flow diagram of Proposed Algorithm



4.4.1 : Changes in the Traditional AES Algorithm Vs the Proposed Algorithm:

The Cloud Computing confidentiality , framework is presented in this paper . In this framework, data integrity mechanism is used to enhance the data security by the means of cryptography techniques. The modified AES (Advanced Encryption Standard) ciphers as it can encrypt 128bit data block with in 1000cycles with low power time, and delay of network consumption, The other work of the framework is load balancing , trust, and resource management on the network efficiently.

We have used symmetric identification of security i.e the same key of encryption and decryption as identification of data streams in the form of security. The difference between the proposed and previously developed AES is that we have also encrypted 1000 blocks per second with the double round key feature . Previously developed AES uses a single round key with 800blocks per second. The advantage of using symmetric key is to ensure a large amount of data.

4.5 . AES Substitution Box (S-Box) : The Primary stage to around remains to organize a byte by byte replacement through a look up table called a substitution box or simply A non linear revolution is vital for current encryption algorithm and shown to be solid cryptographic original in contradiction to direct and disparity cryptanalysis. i.e S-box is shown in Figure 6. All the values represents in hexadecimal notation [42-48]. The general substitution box for adding round keys is given in Figure 6.

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Rows are represented by X. and Columns are represented by y, The mixing process is done with XOR denoted by the symbol ⊕ The binary example in the following will illustrate the functionality of the XOR Operator. The Row and Column mixing and shifting are done by shift (x, row and y, Column) function. The transformed arrays x and y are converted in to binaries using ASCII – ASCII 256 standard. Then the XOR operator performs its ⊕ Operation on the bits to generate the ASCII- (American standard code for Information Interchange) generated Cipher text , The Cryptographic techniques used in SFCC is present in the low level language as follows:

$$CiT\,(\text{enc}) = \frac{1}{N}\sum_{i=0}^{3} X_r \oplus Y_{c+} \qquad (2)$$

$$CiT\,(\text{dec}) = N\sum_{i=0} X_c \oplus Y_{r-} \qquad (3)$$

⟶putfieldjavax.crypto.Cipher.spi:
javax.crypto.CipherSpi
exec_0 [this] exec_2 [x__rows] (i)
⟶putfieldjavax.crypto.Cipher.provider:
java.security.Provider
exec_0 [this] exec_3 [y__columns] (ii)
⟶putfieldjavax.crypto.Cipher.transformation:
java.lang.String
exec_0 [this] (iii)
⟶getstaticjavax.crypto.CryptoAllPermission.
INSTANCE:
javax.crypto.CryptoAllPermission (iv)
⟶putfieldjavax.crypto.Cipher.cryptoPerm:
javax.crypto.CryptoPermission

.

		y															
		0	1	2	3	4	5	6	7	8	9	a	b	c	d	e	f
x	0	52	09	6a	d5	30	36	a5	38	bf	40	a3	9e	81	f3	d7	fb
	1	7c	e3	39	82	9b	2f	ff	87	34	8e	43	44	c4	de	e9	cb
	2	54	7b	94	32	a6	c2	23	3d	ee	4c	95	0b	42	fa	c3	4e
	3	08	2e	a1	66	28	d9	24	b2	76	5b	a2	49	6d	8b	d1	25
	4	72	f8	f6	64	86	68	98	16	d4	a4	5c	cc	5d	65	b6	92
	5	6c	70	48	50	fd	ed	b9	da	5e	15	46	57	a7	8d	9d	84
	6	90	d8	ab	00	8c	bc	d3	0a	f7	e4	58	05	b8	b3	45	06
	7	d0	2c	1e	8f	ca	3f	0f	02	c1	af	bd	03	01	13	8a	6b
	8	3a	91	11	41	4f	67	dc	ea	97	f2	cf	ce	f0	b4	e6	73
	9	96	ac	74	22	e7	ad	35	85	e2	f9	37	e8	1c	75	df	6e
	a	47	f1	1a	71	1d	29	c5	89	6f	b7	62	0e	aa	18	be	1b
	b	fc	56	3e	4b	c6	d2	79	20	9a	db	c0	fe	78	cd	5a	f4
	c	1f	dd	a8	33	88	07	c7	31	b1	12	10	59	27	80	ec	5f
	d	60	51	7f	a9	19	b5	4a	0d	2d	e5	7a	9f	93	c9	9c	ef
	e	a0	e0	3b	4d	ae	2a	f5	b0	c8	eb	bb	3c	83	53	99	61
	f	17	2b	04	7e	ba	77	d6	26	e1	69	14	63	55	21	0c	7d

Figure 6 : Substitution Box [42]

exec_0 [this]aconst_null (v)
⟶putfieldjavax.crypto.Cipher.lock:java.lang.Object
return []; (vi)

The example of ⊕ is given as follows.
Let $X = 1110_2$ and $Y = 1001_2$. Then, XOR of X and Y is represented by Z:

$$Z = X \oplus Y = 0111_2. \qquad (4)$$

$Z = 0111_2$ is the result of this operand. Table 12 displays the result in the tabular form.

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Table 12: XOR Operations

X	Y	Z (Result)
1	1	0
1	0	1
1	0	1
0	1	1

5. RESULTS AND DISCUSSION

In order to check and test the efficiency of the proposed algorithm a simple code is used .This test helped us to prove that the proposed AES Algorithm is better than any other AES algorithm and after implementation of AES and advanced AES Code on hardware will reduce the execution time. The SFCC results as performed and the implementation of this security framework for cloud computing. The period act as an energetic character during the peer of key, encryption and decryption procedure. Altogether inquiries remain complete on Intel ® Core-i3 with CPU 2.27 GHz processor, 4 GB RAM on Windows 10 at the work framework by using CloudSim with I FogSim as simulators on Eclipse integrated development environment.

CloudSim is very well-known and popular among simulators for Cloud-based applications. Various parameters such as encryption, decryption, energy consumption, network usage, network delay, trusted devices, and service management devices are compared . The same algorithms are implemented in real time applications to solve aforementioned issues results gathered from the simulations are very accurate codes are very consistent with real –time mechanisms. The simulators are redesigned according to the application need. The implementation period is a basic of the spell that is required to change a basic text to a cipher text and decryption which is referred to the time required to convert a cipher text to a plain text rapid and approachable system. Moreover this execution time somehow is contingent on the layout of the system used .

Table 13 offers the execution period in milliseconds (ms), which is obtained by computing the average encryption/ decryption time after encrypting/ decrypting the input text in 0.5 MB sizes

While using the same key run on 16,32, 64, 128,bytes.

Table 13 presents the execution time test results in milliseconds (ms) , which are attained by computing the average encryption/ decryption time after encrypting / decrypting , the input text in 0.5MBsizes of the while using the same run key run on 16, 32, 64, 128 bytes. The results of Figure 7-9 specify that existing AES has a minor rise in the encryption and decryption time after matched to the existing AES Algorithm. Table 13 presents the time comparison between existing AEs and different proposed AES.

Table 13 : Execution time test Result [13]

Plain text size (bytes)	AES	Avrg. encryption time (ms)	Avrg. decryption time (ms)
16	Existing AES	0.1658	0.1789
	Proposed AES	0.1190	0.1481
32	Existing AES	0.2976	0.3114
	Proposed AES	0.2507	0.2839
64	Existing AES	0.4564	0.4626
	Proposed AES	0.3916	0.4590
128	Existing AES	0.6984	0.5911
	Proposed AES	0.6014	0.5805
0.5	Existing AES	2359.65	2269.32
	Proposed AES	2159.8	2207.1

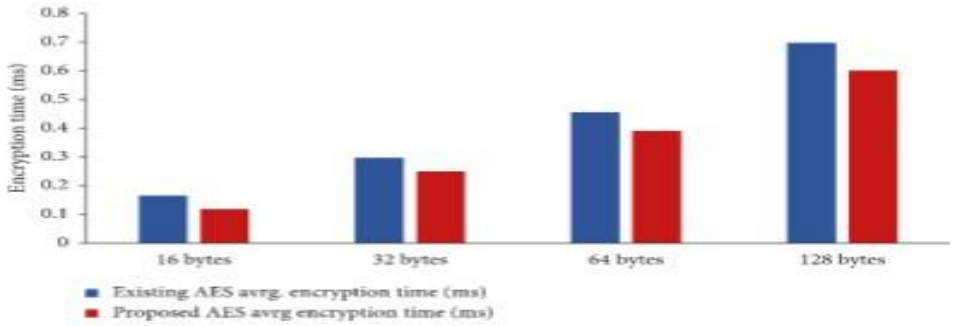

Figure 7 : Encryption time : Existing AES vs. Proposed AES

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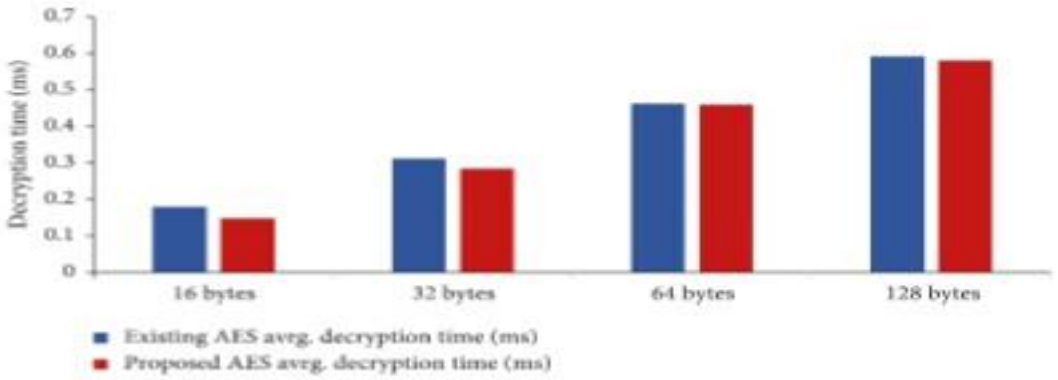

Figure 8: Decryption time: Existing AES Vs. Proposed AES

5.1 Avalanche Effect : In Cryptography , stuff called dispersal reproduces the cryptographic asset of an algorithm. If there is a small alteration in an input , the output changes . meaningfully . This is called the in undation effect. Avalanche consequences is leisurely by means of pretense reserve. Hamming reserve in material philosophy is the amount of variation . Playacting reserve is the amount of bit by bit XOR bearing in mind ASCII values as it develops informal to devise programmatically. A high gradation of dispersal, i.e extraordinary avalanche consequence , is anticipated . Avalanche's conclusion reproduces the presentation of cryptographic . The avalanche effect is described in Table 14. The avalanche effect is described in Figure 10 (Simulation results from Table 14)

Table 14 : Avalanche effect test result obtained after flipping a single bit in the plain text [13]

Execution program	Plain text	Secret key	Encryption and decryption time	Execution time
First time execution	I Love Unimorin!	H2 + 3S + MuePgIPK3h9SAHOtl6THtl8ak062IgB3ixEto	Encryption time Decryption time	0.05172414 0.03448276
Second execution	I Love Unimorin!	1mRVUf7lRS7W/K + BWFRkP3// KKjf0FtIaSnIGArvudY=	Encryption time Decryption time	0.06666667 0.044444446

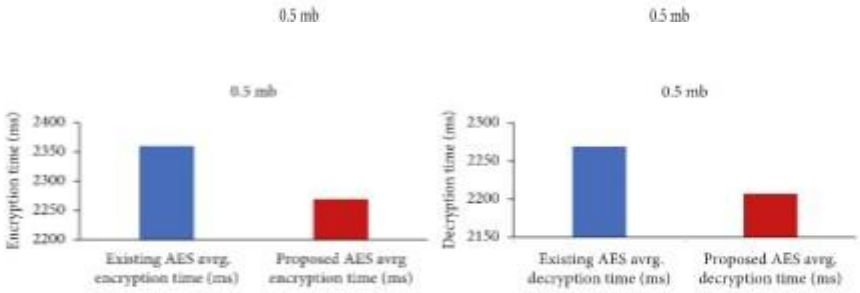

Figure 9: Encrypting and decrypting time : Existing AES Vs. Proposed AES

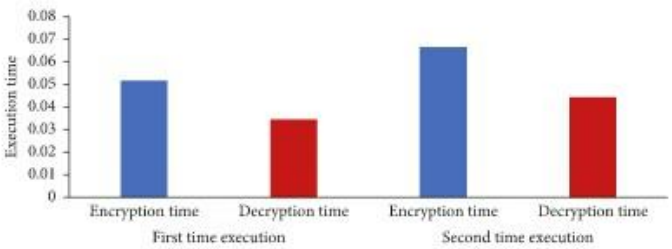

Figure 10 : Avalanche effect test Results

5.2. Comparative Analysis of Computed Results with Existing Work: A Comparative analysis of computed consequences with the current work is presented as follows . however , some researchers analyzed the performance of their advanced AES version. Mean while many authors used encryption and decryption time as their performance metrics. The simulation environmental comparison between proposed AES and other AEs using the CloudSim simulator is graphically represented in Figure 11 and 12.

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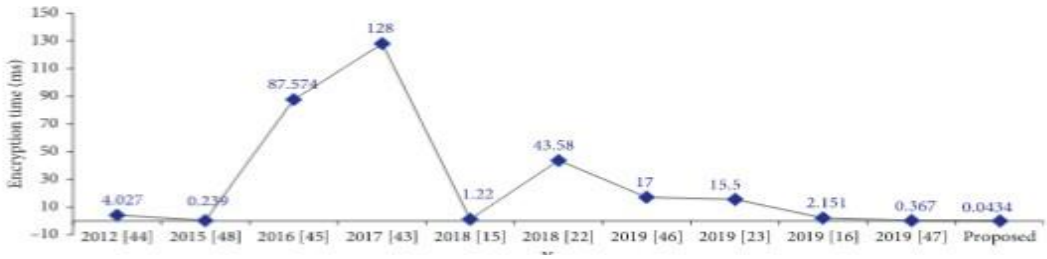

Figure 11 : Encryption Processing time factor in different AES

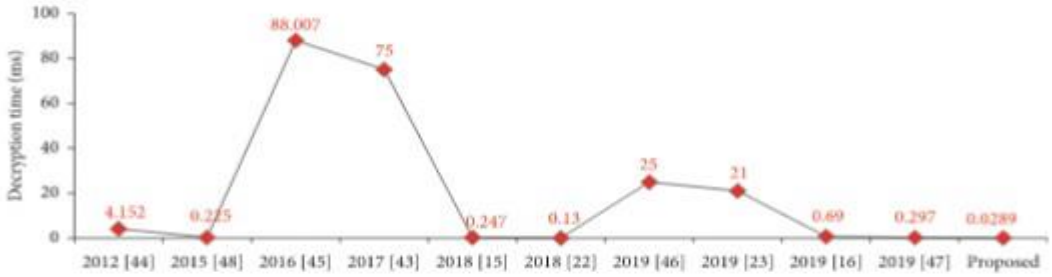

Figure 12 : Decryption Processing time factor in different AES.

5.3 Average Energy Consumed : By using the same techniques described in [13], the energy consumption is being evaluated. These experiments shared that the proposed frameworks have 14% less energy consumption as compared to [13]. Actual cost taken is given by encryption and the average current that is used by every CPU clock cycle. Equation (5) is used to calculate energy cost per byte as well as various keys of AES encryption schemes.

$$\therefore \sum E = E_c + \left(T_L - \frac{T_c}{T_u}\right) - \mathrm{P} * \mathrm{M}, \qquad (5)$$

where C, L, and u represent the current, last, and updated, respectively.

The energy consumption E is the amount of work done on processing Mips M under a time frame T using power

Where c, L, and u presents the current , last, and updated respectively. The energy consumption E is the amount of work done on processing Mips M under a time frame T using power model P. The mathematical notation to represent the energy consumption in Figure 13.

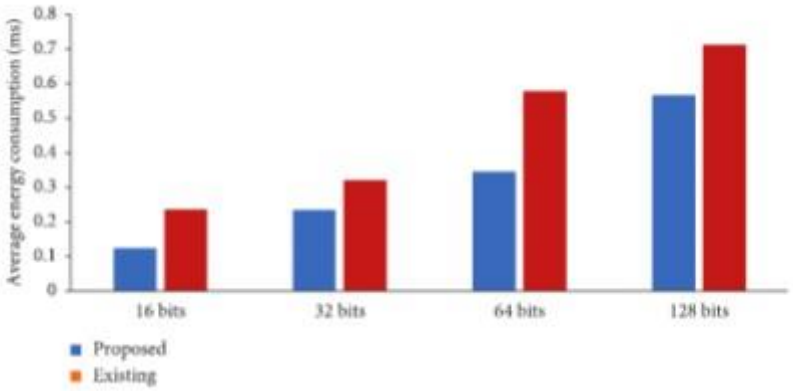

Figure 13 : Energy Consumption for different Key AES encrypting and decrypting

5.4 Average Network usage : Network usage is the overall network usage for the system. Network usage is represented in kilobytes. This parameter defines the usage of network resources. The length is reduced and approaches of requests to lower hierarchy by using service configuration so that the request cloud be

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processed in the lower hierarchy rather than sending it to cloud again and again. This algorithm reduces3 – hop communication to single hop communication . Thus low network usage is obtained through the proposed framework. The more the network is used , the more the expenditure . Efficient network topologies prefer to use minimal network. In these experiments, the network usage is evaluated using the same techniques described in [13]. In the proposed framework network resources are reduced 11 % as compared to [13]. The network while running the implement encryption schemes is evaluated using the following equation .

$$\therefore \sum Nu = Ni + \frac{(L * D * B)}{T}, \qquad (6)$$

Where Ni is the initial network usage (Nu at 0). The network usage mathematical notation Nu is the number of bits b Communicated in a certain time frame on devices under sets of data D with latency L. Simulation result is clear from Figure 14.

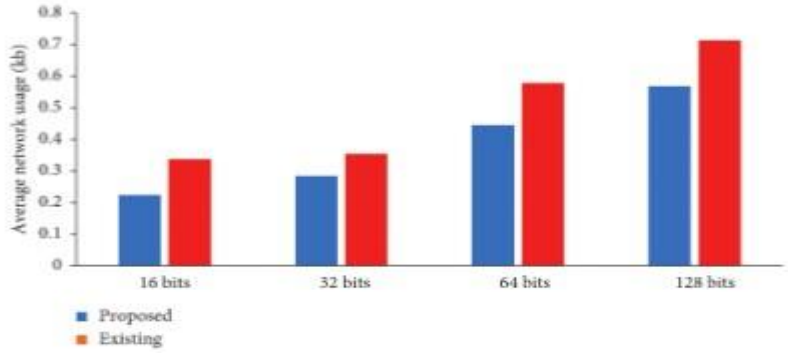

Figure 14 : Network usage for different key AES encrypting and decrypting

5.5 . Average Networking Delay : In the Calculation of testing and evaluating whether the data are secured , delay is likewise evaluated . In the local host cloud environment amount of consumers ; the data traffic will develop tall, which will have influence on the scheme . In a real environment , numerous issues , which will cause suspensions and overcrowding . The large numbers of key indicate increased delay due to the time when more data encrypt generate. When the key it is originally split in to dissimilar blocks formerly encryption . The Scope of individual block may have contingence influence on the scope. The delay comparison the previous methodology [13] and the research shows that the significant differences in the delay indicate that the proposed framework is 15% better than the previous solution [13].

$$\sum D_n = B_s * \frac{L}{T} - B_d * \frac{L}{1} - \frac{T}{T_e}, \qquad (7)$$

The delay D represents the time that the bits B take to reach a processing device from an end device under a certain latency L and connection time T. The observed delay is calculated using the equation. The mathematical notation to represent the delay is described below and by simulation result it is clear from figure. The delay calculation is shown in Figure 15.

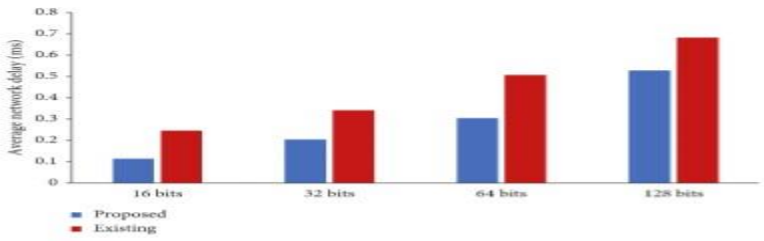

Figure 15 : Networking delay for different key AES encrypting and decrypting

6. CONCLUSION

To provide data confidentiality and information integrity of user's data in the cloud computing environment, an effective security framework is proposed that provides a mechanism through which communication is protected

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a mechanism through which communication is protected and authorized access is restricted . The proposed security framework allows cloud users to securely handle the privacy and integrity of data. It also allows security, privacy, integrity of data.

It also allows security, privacy, network usage and storage in the cloud provider. The application of the AES Algorithm provides a strong foundation that protects data stored in the cloud as well as authorizes access to data only on successful actual environment vary in different situations all of which are not considered in this framework. Results show that the proposed framework minimizes energy consumption by 14.43%, network usage by 11.53% and delay by 15.67%.

Hence , the proposed framework enhances security, minimizes deploying services of computational clouds.

Data Availability : The data used to support the finding of this study are available from the corresponding author up on request.

Conflicts of Interest : The author declare that they have no conflicts of interest.

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EXPLORING MUMBAI'S ONLY PRE-COLONIAL NICHIREN BUDDHISM AND SUBSEQUENT JAPANESE TEMPLE ARCHITECTURE

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ABSTRACT

This paper is based on the personal visit, actual photographs, videos, published articles in journals, newspapers, internet content, newspaper cuttings displayed at the actual site, and an interaction with the attendant of the temple. This temple has been situated at crowded Worli Naka, Dr. E. Moses Road, Mumbai - 400018. The temple was erected in 1907 as a graveyard for the Japanese warriors and the sex workers who were buried and their ashes were enshrined inside the graveyard. The land of the graveyard was procured by Japanese monk Nichida Tsu Fujii (1885-1995) popularly known as "Fujii Guruji", the title gave him by Gandhiji. He came in India for the fulfilment of the prophecy of his Guru Nichiren (1222-1282), the founder of Nichiren Mahayana Sect of Buddhism in Japan that 'the ultimate salvation of humanity, which was contaminated by all that was evil, lay in India.'

In the first section of the paper it has tries to trace the historical background of the only lesser known Japanese graveyard cum Buddhist temple and practice of the Nichiren Mahayana Buddhism that followed in the city of Mumbai at the temple itself. It also highlights how the Japanese monk of the temple contributed to the peace in India in general and the city in particular.

Later on, the same premises was converted into a Nipponzan Myohoji Temple which was constructed in 1952 A.D. by Jugal Kishore Birla a philanthropist who has been the family member of Sheth Raja Baldeo Das Birla and their Trust even today maintains the temple.

The second section of the paper elaborates the architecture of the Temple in detail. It has influences of Buddhist architecture as well Hindu style of architecture. The pillars, the arches of the windows, the designs and depiction, symbols of flowers and Swastik, the quality of stone etc. has its specific feature which have never brought to the light in any of the print as well as electronic media.

Key Words: Nichiren, Nichida Tsu, Fujii Guruji, Graveyard, Architecture

INTRODUCTION

In the city of Mumbai, there have been many more UNESCO World Heritage Sites such as CSTM Station, the Elephanta Caves etc. apart from that many Victorian buildings are also declared as the heritage sites and accordingly have been taken care of the construction. To mention some, are the High Court Building, Mumbai University building, Municipal Corporation of Greater Mumbai (MCGM) Head quarter building and many more. But a unique and lesser known site in the city of Mumbai, has been a Nipponzan Myohoji Temple, a first and only Japanese temple situated at crowded Worli Naka, Dr. E. Moses Road, Mumbai - 400018. The word 'Nippon' stands for Japan which means the 'Land of Rising Sun'. The temple has not been much revered and paid attention by the people, and the Government respectively.

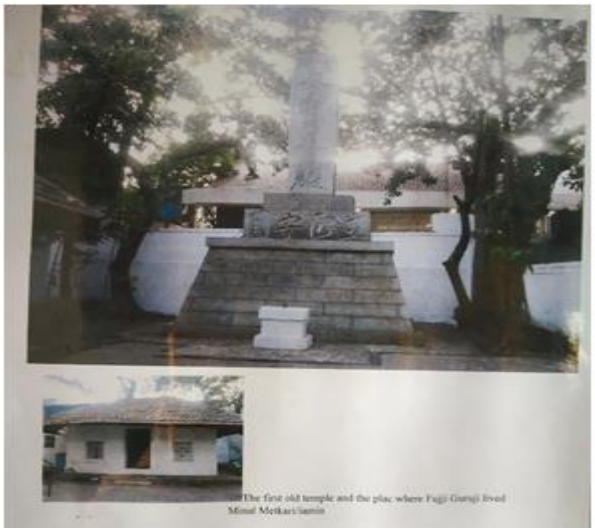

Image 1: A Cemetery,1907

Image 2: White Coloured Temple,1952

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Cemetery to Temple: Before its conversion into a temple or Vihara it was used as a cemetery since 1907 named Nipponzan Bochi and the only Japanese cemetery in the city. The current care taker monk T. Morita says in his interview published long before, that a large Japanese population once lived in the city consisting mostly of traders and sex workers. Traders reportedly came to Mumbai via the sea route to buy cotton and the sex workers were brought by the Raj (British).There were over a thousands of Japanese residents in Mumbai then and a graveyard was badly required. Fujii Guruji the founder of the sect was able to procure the land. However, only around 300 Japanese are estimated to be living in Mumbai now.

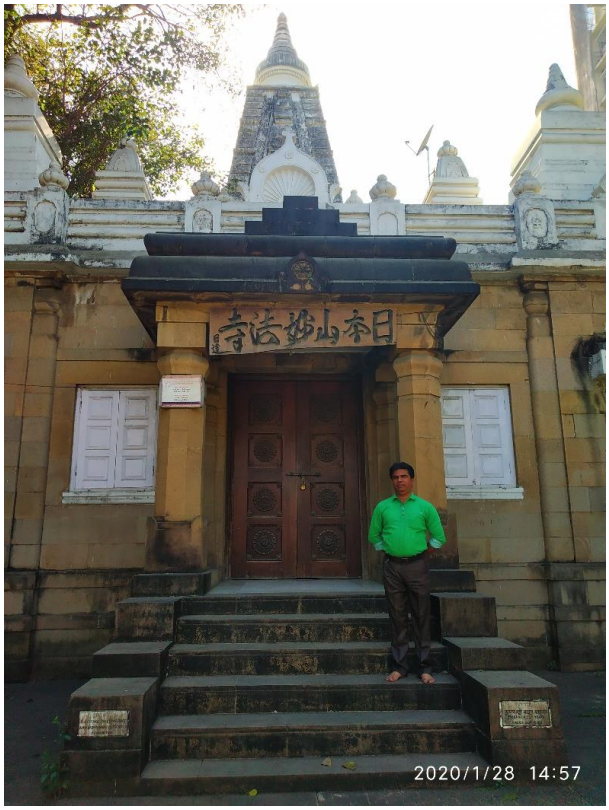

Image 3: Visit to Shrine on 28-01-2020

Bhikshu Morita is unsecure about how many individuals' ashes have been enshrined at the cemetery. But he says that the ashes of the last person to have been enshrined belonged to a 25 years old youth. "It was in 1977, just a year after I arrived, I don't remember, how he died, but it turned out to be the last time the graveyard was used" said Bhikshu Morita in the interview published in the newspaper. According to him, there have been over 50 graves that include those of the Japanese businessmen who were settled in India along with their geishas.

A Japanese priest Nichida Tsu Fujji Guruji fondly referred to as Fujii Guruji lived here and later led to the construction of a Japanese shrine in 1952. Bhikshu Morita who now takes care of the cemetery stays in the shrine behind the main temple as a resident monk.

In 1931, Japanese monk Nichida Tsu Fujii Guruji arrived to fulfil his divination and built a small temple in Worli Naka. In 1956, this structure was converted into a free Dharmashala and nursery school for underprivileged children and a new temple structure was built on the same premises. Mr. Vasant Mane, 69 is working as an attendant here since last 20 years says that the Japanese Bhante is staying in the shrine at the back side of the main structure and holds the festivals like Buddha pournima etc. The Japanese delegates from Consulate also visit the temple some times.

Nichida Tsu Fujii Guruji, the first disciple of Nichiren had come here in India to fulfil the prophetic vision of Nichiren Daishonia who had been the first as the only way to repay boundless debt of gratitude to the Buddha in his original land of the dharma.

Nichiren Buddhism:

All we know that Buddhism spread to many countries of the world and it travelled to Japan from China and Mongolia. Nichiren has been one of the Mahayana Buddhist practice in Japan and Nipponzan Myohoji has been associated with Nichiren branch. It has been more-than-700 years ago this sect was developed by a Japanese monk Nichiren (1222–82), in the 13th century. He had prophesied that the ultimate salvation of humanity,

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contaminated by all that was evil and impure, lay in the western heaven of India, the country that was home to Buddhism. The practice continued to be developed in Japan but it was only in 20th century, a Japanese monk, Nichida Tsu Fujii (1885–1985), a fervent pacifist and founder of the Nipponzan-Myohoji- Daisanga order of Nichiren Buddhism, came to India i.e. 1931 with a group of disciples, with the intention of fulfilling that prophecy by communicating the Lotus Sutra in India.

'Daimoku', a Japanese hymn **'Na Mu Myoho Renge Kyo'**, has been the basis of the Lotus Sutra which has been recited for the attainment of salvation.

Image 4: Daimoku-Visit to Shrine on 28-01-2020

It was on the 28th day of the fourth Lunar Month of 1253, Daimoku which also stands for Saddharma Pundarika Sutra of Mahayana Buddhism was revealed by the Japanese Buddhist priest Nichiren. According to this school, Daimoku benefits all sentient beings in particular men and women of today, when embraced in our heart and minds, chanted through our mouth and offered to others as a guide to the Dharma. The practice is regularly going on at this Mumbai temple too. In Indian Buddhism, the practice in Pali language is taken in the Three Jewels (Three Refuges) and followed like 'Buddham Sarnam Gachhami, Dhammam Sarnam Gachhami and Sangham Sarnam Gachhami' which stands for 'I bow down before Buddha which means a Sakyamuni -learned preacher, his preaching and his order of Sangha'. Accordingly, in the Nichiren School **'Namu'** means bow down before the Sakyamuni Buddha. **"Myō Hō Ren Ge Kyō"** refers to the Lotus Sutra in Japanese which is the essence of Sakyamuni Buddha. Thus, the verse means bowing down or venerating the truth of the Lotus Sutra or Saddharma Pundarika Sutra of Mahayana School of Buddhism.

However, this Daimoku or hymn must be pronounced with beating of the drums there. A large drum called **'Odaiko'** and a smaller hand fan like drum called **'Uchiwa Daiko'** wherein **'Uchiwa'** refers to a hand fan in Japanese and **'Daiko'** or **'Taiko'** refers to a percussion instrument in Japanese language. The sticks to beat the drums are called **'Bachi'** that is traditionally made by hardwood like oak. The reverberation of these drum beats and the chants of the Daimoku are believed to relieve us of all negativity, instil in positivity, making us at peace with ourselves and others and open our way to Buddhahood.

Image 5: Odaiko

Image 6: Uchiwa Daiko

This practice is done ideally facing the '**Gohonzon'**, a Japanese term used to refer to the calligraphical mandala inscribed by Nichiren that sits in the main shrine of worship. **Contribution of Bhikshus to Peace Marches in India:**

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Everybody know that the Buddhist Philosophy is known for non-violence and Emperor Asoka followed the same with law of piety during his reign. The Nichiren Buddhist order in the city also strived for the peace at various occasions during colonial period as well as post-colonial period. They registered their contribution to non-violence and peace being the followers of Buddha in his home. Nichida Tsu Fujii, the pioneer of the sect, played a key role in the Indian Independence struggle and the sounds of the Odaiko and Uchiwa Daiko continued to beat louder after 1947, thus spreading Buddhist Dharma and peace, far and wide.

Image 7: Fujii Guruji ***Image 8: Bhikshu T.Morita***

This religious sanctuary has been the link in strengthening relations between surrounding communities and also the countries of India and Japan. Nichida Tsu Fujii Guruji, was a dear friend of Mahatma Gandhi that he began to call the Japanese monk "Guruji," a name that has happily stuck for the rest of Nichida Tsu Fujii Guruji's 100 year life. In fact, the love and respect between the two men was so strong that Gandhi incorporated Guruji's practice of drumming and chanting 'Namu Myo Ho Ren Ge Kyo' into his prayers for the rest of his life.

Fujii Guruji contributed much to India's non-violent freedom movement during 1931-38. As a token of his service towards Indians, Jugal Kishore Birla, a philanthropist constructed this temple funded by Raja Baldeo Das Birla which officially opened on December 27, 1956 and has been maintained by the Birla trust ever since. Fujii Guruji was conferred upon the Jawaharlal Nehru Award in 1978 by the Government of India as an acknowledgement of his services to India, the land of Buddha.

Fujii Guruji was succeeded by Bhikshu T. Morita who reached Orissa as a 28 year old disciple accompanying renowned peace messenger in 1976 A.D. He also made his contribution to the non-violent ways for maintaining peace and order in India.

In 1987, he was accompanied with Sunil Dutt for Shanti Padyatra from Mumbai to Amritsar when there was clashes between Punjab and Haryana. The March was welcomed there against the terrorists. When in 1993 Babari Masjid controversy and there had been communal riots in the city of Mumbai, he defied the fundamentalists who fuelled hatred in the city. He has mentioned one of his own experience that even during the communal riots, he was walking the deserted streets of the city sensitive areas like Byculla spreading the message of Buddha's Peace and Harmony beating his Uchiva Daiku and repeating the hymn 'Namu Myo Ho Ren Ge Kyo'. He says that when you resolve to establish the peace you do not worry of your own life. In 1995, he walked from Kanykumari to Delhi (2742 kms.) to commemorate the 50th Anniversary of Hiroshima-Nagasaki attack. In 2005, he enacted the Dandi March in New York. He said, "The response from the wealthy NRIs was humbling."

Bhikshu T. Morita is hopeful about the extension of Indo-Japanese relations and his goal to arrive in India. According to him, "More Japanese will head to Mumbai with opening of an economic corridor connecting India's Metros. Globalisation is taking over, but India must keep its Sanskriti intact. I came here with plenty of faith in humanity. India was my last resort and it didn't disappoint."

Architecture of the Temple:

The temple is located on a crowded road, which witnesses traffic and honking sounds throughout the day. It is all yet spacious. The paintings on the wall depicts scenes from Buddha's life and the marble statue of Buddha with beautiful lamps lit all around it brings an immediate sense of calm and comfort. The temple has two structures of which one has been converted into residential and KG school for the poor children from nearby area. At the very entrance gate we find two columns in rectangular shape at the gate about 10 feet in height. The

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engraved granite plate have been fixed on both the pillars, one in Marathi and other in English which introduces the Vihara and its construction year 1952 by Birla Trust.

On the capital of the pillar, there have been a wheel on four sides inside which the eight petals of the flower are engraved in white colour. Then above there is a spire almost 1.5 feet in height. The temple has been spread over 820 square meters in total.

Image 10: Entrance Gate to structure and inside temple

The Temple is a rectangular in shape and built in a yellow sand stone similar to Porbandar stone which are bonded with lime mixtures like heritage Victorian stone buildings in the city. The corner stones are 'L' shape. There have been four external windows each at the four sides of the structure. The last windows at the structure have window frame with decorated carvings in white colour and at the top of the window there is a inverted lotus with Swastik symbol at the centre of it. The design resembles with the typical Buddhist architecture in India. It also work as a window shield during rainy season.

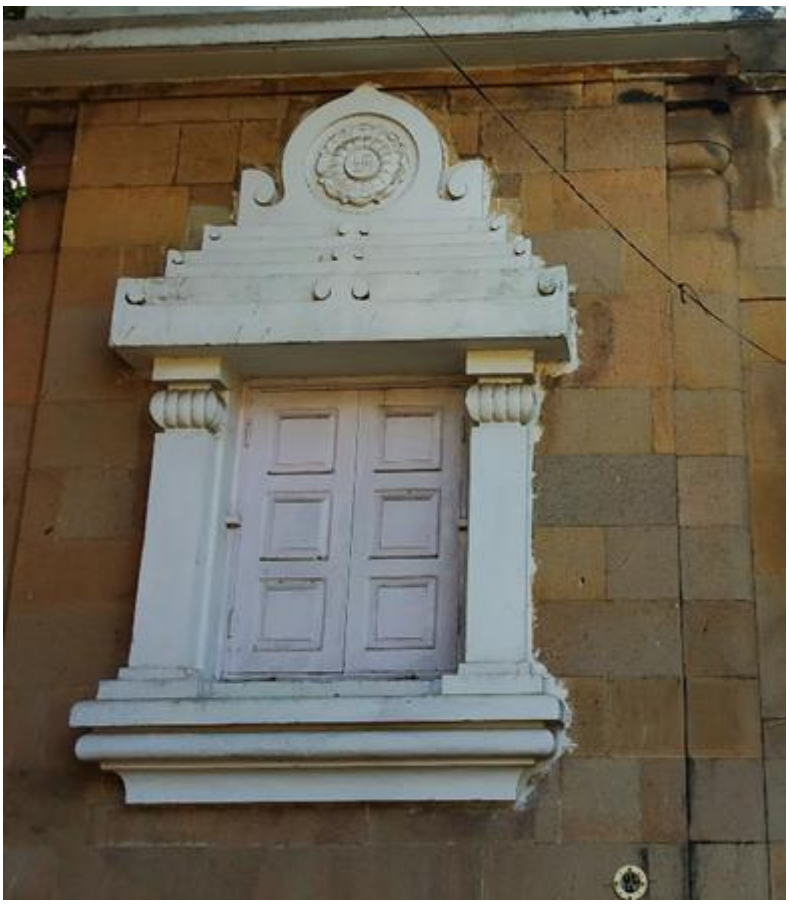

Image 11: Yellow Sand Stone & Window Frame Design

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Uchiwa is the smaller drum and the daiko means the stick to beat these drums. While the Mantra of 'Na Mu Myo Ho Ren Ge Kyo' is pronounced, it also follows the drum sound.

On its centre-top a stupa arch is made inside which an inverted lotus is inscribed. These arch symbols have been found all over the structure. The entrance arch is in rectangle and has four pillars standing. A shaft of the pillar has been made of two octagonal pieces and bottom is in square like vase-shaped and broad than them. These pieces have been bonded with lime mixture and copper bold accurately

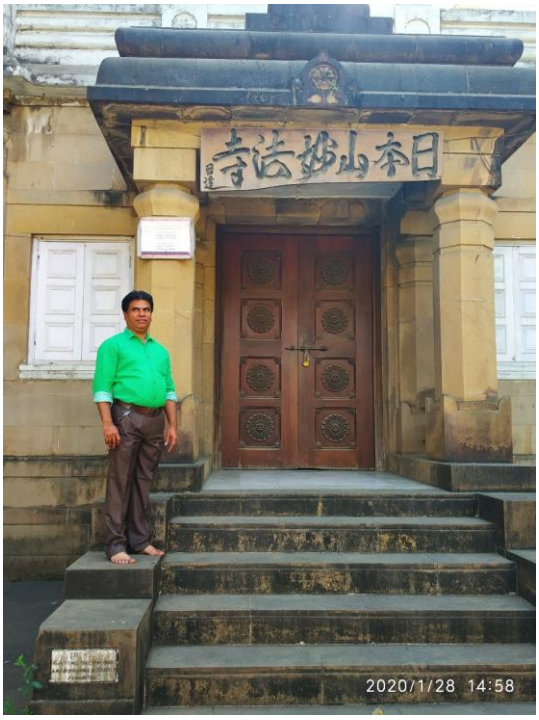

Image 12: Inscription, Arch & Pillars

fitted into Tenon made for it and top have certain typical designs carved in stone until its capital.

The side pillars have been joined with small railings of stone bonded with lime and tenon which has been the symbol of Buddhist architecture railings at Stupas.

There have been eight doors to the structure to be enter from outside so as to have proper ventilation inside the temple. Although the doors have entrances but only the main entrance have the design different from others. No timber has been utilised anywhere in the construction. On both the sides of the structure there are four rooms with doors opening from inside out

Image 13: Pillar Bottom, Shaft, Top & Railings

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and back side door at the centre of the structure. The doors are made of pure teak wood but only front door has designs on it and has warnish wooden finish whereas other doors and window have been coloured with white paint. The side window frames have different designs than the front.

Image 14: Roof top, Swastik symbol, Arch, Spire, Harmika, Chhatravali

On the roof top there is a large Arch at the front (Stupa or horse shoe design) inside which rays of the rising sun have been engraved. The roof has small spires at the four corners and centre has been capped by a large spire. The spire is resembling to the Mahabodhi Temple at Bodhgaya. It has Harmika and Chhatravali which have been made of the mixture of Buddhist as well as Hindu style of temple. The roof top also have been fortified with the railings about 3 feet in height around all the sides. The railings have joined with nine small pillars on each of the four sides on which a Swastik symbol which is almost found in many religions has been engraved. The philanthropist Raja Baldeo Das Birla and Jugal Kishore Birla were the staunch Gandhians. Once Jugal Kishore Birla met Bhikshu Fujii Guruji and was very much influenced by his world view of Buddhism. Then he resolved to build the temple which was done in 1952.

As we enter the temple we find that the hall is like any of the Vihara of ancient Indian Buddhist architecture.

Besides the two columns at the front, it has row of the five columns each at both sides of the hall which divide whole area into nave in the centre and double aisles all around the colonnade**.**

There have been a stretch of paintings running across the walls depicting the life of the Buddha. At the Sanctum sanctorum, a white marble monolith of Buddha is placed which has been carved out in Kazakstan. At left side there is a wooden image of Buddha.

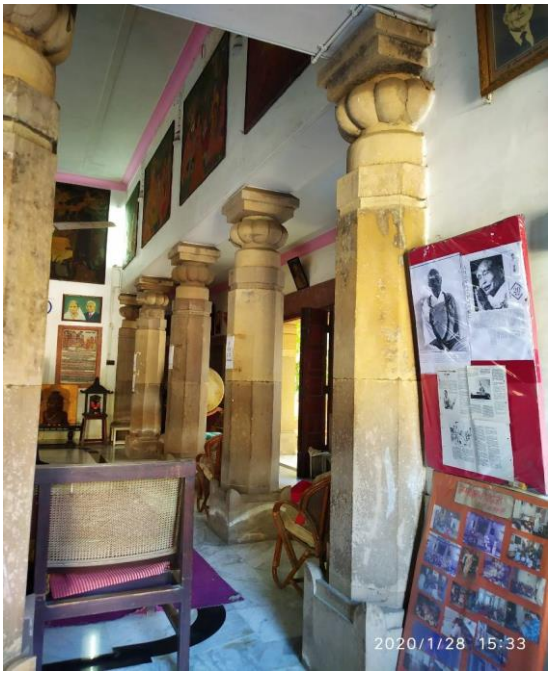

Image 15: Columns like Ancient Vihara

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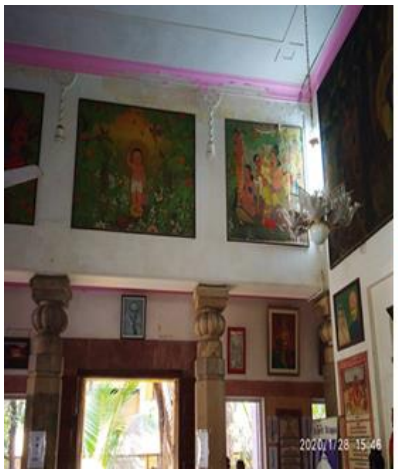

Image 16 Paintings

Image 17: Sanctum Idol from Kazakstan

Image 18: The Japanese idols in golden coloured metal with symbols

Image 19: Budhha for Goraksha

Image 20: Vedic Prayer

Another thing that as the temple has been constructed by the Birla family and they were the non-Buddhists, they have incorporated the Vedic/Hindu symbols and verses on the marble reliefs. The symbols and the above marble reliefs have been the features of the temple. These marble reliefs that have been written with the Buddhism as considered by them that the Buddhism has been the branch of Hinduism and accordingly, the verses of Shankaracharya have been found there. The Hindu philosophy regard Buddha being an incarnation of

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Vishnu and hence they have tried an inter connection of Vedic and Pali Mantras displayed variedly here inside the temple.

CONCLUSION:

The Japanese temple have been in existence since 1952 and its construction have been done like the Victorian buildings in Mumbai city. As government and the heritage conservation committee pays attention to these Victorian buildings, they must also pay attention to the Nipponzan Myohoji Temple. Now the cemetery has been the forgotten history and it is now the Buddhist Philosophical prophecy of Nichiren Buddhism from Japan. As the school of this branch of Buddhism is the unique one in India, the government also pay attention to its look after. The funds must be provided to the temple as now the structure has been caught with fungal deposits against its speciality of white colour. The fungal deposits have made the outside structure as ugly and some of the small spires with inverted lotus have been disappeared. They must be replaced with the material in consultation with the conservation architects. The permanent security guards must be deployed by the government so as to avoid its damages if any.

REFERENCE

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- *A Newspaper cutting* displayed bearing no name and date of the paper.
- **Geishas:** The term "**geisha**" is made of two **Japanese** words, (gei) meaning "art" and (sha) meaning "person who does" or "to be employed in". The most literal translation of **geisha** to English is "artist". **Geisha** are much respected and it is hard to become one. Another term for a **geisha** is geiko.
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- Craig Lewis, op. cit.

- ***Bodhgaya*** is the place in Bihar where Buddha got enlightenment and therefore the Buddhist temple has built there.
- ***Harmika*** means a square balcony in decorative form enclosing a pedestal on top of the dome of the Stupa.
- ***Chhatravali*** is an umbrella supported by Yashti like wheels above the Harmika over the traditional Stupa.
- ***Swastik*** is found in the various countries of the world in different forms. In Buddhism, the symbol varies as per the branches and linked to auspicious, good fortune and long life. Buddhist monks in India regard it as "Seal on Buddhist Heart". It is an aniconic sign for the Buddha in many parts of Asia and homogenous with dharma of wheel. It is also mean conducive to well-being.
- ***Nave*** is the principal part in the temple where people sit for congregation.
- ***Aisles*** are a passage between rows of seats in a building such as a Vihara or a church.
- ***Colonnade*** is a row of evenly spaced columns supporting a roof, an entablature, or arches.

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FRUGALITY, ALTRUISM, PRO-ENVIRONMENTAL AND EQUITY INDICATING SUSTAINABILITY BEHAVIOUR OF BUSINESS STUDENTS

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ABSTRACT
The purpose of the paper is to explore the dimensions of sustainability behaviour of the business students and to study the impact of academic level, age and gender on these dimensions. Primary data has been collected through the E- Survey. The four dimensions of sustainability behaviour have been extracted by applying Exploratory Factor Analysis. Dimensions are labelled as Frugality Behaviour, Altruism Behaviour, Pro-Environmental Behaviour and Equity Behaviour. ANOVA is used to find the impact of academic level and age. Impact of gender has been tested applying t-test. The study indicated coherent factors correlated to the students' reported sustainability behaviour. Gender hasn't impacted the sustainability behaviour. The intensity of sustainability behaviour of the students found same at all academic level and at different age group. Educational programmes and actions do not produced significant statistical difference among the students on various academic levels. Possible reasons explaining the lack of influence of educational programme is discussed.

Key Word: Higher Education, Sustainability, Business Education for sustainable development, sustainability behaviour.

INTRODUCTION:
Sustainability is not a new phenomenon in fact recognised decades before. In 1972 it was realize that development and environment is not different phenomenon any more. In 1978 the term sustainable development first time defined in Brundentland report as "*Development which meets the need of present without compromising the ability of future generation to meet their own need"*. With passage of time sustainable development has been elucidate with three dimensions; Environment, Society and Economy. It recognised as three pillars of sustainability.

Simultaneously concept of Education for sustainable development also came into existence at Rio Conference in 1992. UNESCO Stated that *Education for Sustainable Development (ESD) empowers learners of all ages with the knowledge, skills, values and attitudes to address the interconnected global challenges we are facing, including climate change, environmental degradation, loss of biodiversity, poverty and inequality.*

Blewitt (2010) explicate three ways to implementation of sustainability education: Formal, Non-formal and Informal

- **Formal learning** defined as the hierarchically structured, chronologically graded education system running from the primary school through the university.
- **Non-formal education** consist any educational activity organised outside the established formal system like co-curricular activities.
- **Informal education process** is considered as a lifelong process where every individual acquires attitudes, values, skills and knowledge from day to day life experiences.

Business Education for Sustainable Development is way to reorientation of the business education towards sustainability issues and provides knowledge, skill, attitude and values to the potential managers to do business in sustainable manners (Lans et. al., 2014; Shane and Venkataraman, 2000). Sustainability education prepares students to go sustainable in their personal as well as in personal life. ESD is not just about to teach the concept of sustainable development but also teach them how to implement learned knowledge, skills & values practically and behave in sustainable manner in their day to day life (Kagawa 2007; Michalos et. al., 2012; Sharma, 2014; Al-Naqbi & Ashnnag 2017). Teaching sustainability to business students provides a platform to the business students to discuss interrelated issues of business and sustainability that create values and leadership skill to behave sustainable while making decision (Sharma, 2014; Weybrecht, 2017; Fahama et. al., 2016). They learn to make money in different way aligning the goal of environmental and social goals along with financial goal. It encompasses the students the real - word skill they can use to improve planet and people wellbeing while earning profit (Wybrecht, 2017). According to report published by the Statista Research Department (2020), consumers behave more sustainably after covid-19 pandemic and relatively give more

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importance to sustainability while choosing brand. Now it becomes responsibility of the business school to train the potential managers to understand the sustainability as opportunity and respond in sustainable way.

LITERATURE BACKGROUND

SB is defined as a set of ''*action aimed at conserving the integrity of the socio-physical resources of this planet*'' (). Corral- Verdugo, 2012, recognized compatibility between the positive psychology and sustainability behaviour and belief that when people are sustainably oriented, they are involved in rational and fair use of environment, economic and social resources (Ehrlich & Ehrlich, 2004, Corral-Verdugo et. al. 2012;). Sustainability behaviour constitutes at least four type of sustainable action: Pro- Ecological, Frugal, Altruistic and equitable (Bamberg & Möser 2007, Corral-Verdugo et al. 2010, 2012, 2016; Tapia-Fonllem 2017). Pro-Ecological Behaviour is a dispositional variable that considered environmental responsible individual, Frugality is considered as avoiding wastage of resources and consumerism, Altruism is a trait of being kind and caring toward others, Equity represents being fair and to do morally right with others. These four determinants are suggested by the literature to determine the sustainability behaviour of an individual. Corral-Verdugo (2012) purposed that intervening sustainable development in education leads to create the positive psychology of sustainability behaviour which helps to promote optimism, creativity, self efficacy and social well being among the student. Sidiropoulos (2014) insisted that education for sustainable development in business education is a matter of values. Researcher developed a business program intervening sustainability and after implementing, research revealed that it impact the students views, attitude and behaviour toward sustainability.

Business & Management education for Sustainable development generate competencies in potential managers to put sustainability management into organisational practices for corporate contribution toward sustainable development (Hesselbarth & Schaltegger; 2013)

Most of the previous studies has been done in developed countries and failed to represent the developing countries like India. Only few studies have been done on business education for sustainable development and no study was found that measure the sustainability behaviour of the business students. Present research has been tried to fill the gap and attempt to study the sustainability behaviour of the students involved in business and management education.

RESEARCH QUESTIONS

RQ1. What are the various determinants of the sustainability behaviour?

RQ2. What is the impact of age, gender and academic level on the extracted determinants?

METHOD AND MATERIAL

Research is based on cross sectional primary data. E- Survey has been conducted to collect the data. Data has been collected from business students of the higher education institution of Punjab. An adapted scale has been use to collect the data. Scale consisted thirty five items and five point likert scale from strongly disagree to strongly agree has been used to know the level of agreement. Most of the items of the scale were taken from Tapia Fonllem et al. 2017 and Corral Verdugo et al. 2016. The items were minor modified to fit it in Indian context. Online questionnaire has been developed using Google Form to conduct the survey. Convenience sampling method has been use to collect the data. Data has been collected from the 152 respondents.

For data analysis Explorative Factor Analysis has been used and appropriateness of the data to apply factor analysis has been checked with the help of Kaiser-Meyer-Olkin Measure of Sampling Adequacy: Bartlett's test of sphercity, Communalities, Eigen value, Factor loading. An internal consistency reliability coefficient (alpha) was calculated for each scale. ANOVA is used to check the impact of age and academic level on the sustainability behaviour factors. Independent t- test is used to gender impact over the sustainability behaviour of the students.

RESULT

Factor analysis has been run using principal component matrix and Varimax rotation to examine the dimension of sustainability behaviour of the business students. Initially factorability of the 35 items of scale was examined. Several well recognised criterions for factorability of correlation were used. Firstly it was observed that items were correlated at least .3 with at least one other item suggesting reasonable factorability. Secondly Kaiser Meyer Olkin (KMO) measure of sampling adequacy was found .856 above the recommended value of .6. KMO varies between 0 to 1, values closer to 1 interpreted as better. Bartlett's test of Sphericity was significant (Chi-Square = 1325.640, $P < .05$) which shows the null hypothesis "variables are uncorrelated in the population" is rejected. The diagonal of Anti-image Correlation were also all over .5. Finally Communalities were all over .5, further confirming that each item shared some common variance with other items.

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Principal component analysis was used with Varimax rotation to extract the factor at minimum .5 loading and no cross loading over .3 or above. A total of seventeen items were eliminated because they did not contribute to the common factor structure and fail to meet the minimum criterion.

At final stage of Principal Component Analysis Varimax rotation was conducted on 18 items and Four Factors were extracted explaining 65. 372 % of the variances which have Eigen Value more than 1**.** With four factors, reducing to the 18 statements we have lost only 34. 628 % of the information content while 65.372 % is explained by the 4 factors extracted from 18 statements.

The extracted factors have been labelled on the basis of previous literature (Corral- Verdugo, 2012 and Tapia – Fonllem 2017) as it seems fit to explain the determinant of sustainability behaviour (Table 1).

Table 1

Rotated Component Matrix

	Component				Communalities
	1	2	3	4	
Frugality Behaviour					
Buy more food than needed.	.817				.700
Mostly spent on buying more clothes.	.813				.701
Use car when going out nearby market.	.794				.698
Harm the property of organisation.	.785				.723
Buy lots of shoes.	.777				.610
Altruism Behaviour					
Provide some food to homeless		.758			.665
Assist senior citizens.		.738			.694
Cooperate with colleagues.		.726			.584
Help other to perform their jobs in better way.		.690			.613
Help weaker section of society.		.651			.664
Pro- environmental Behaviour					
Buy products in refillable package.			.767		.598
Encourage family and friend to recycle.			.754		.732
Reads about environmental issues.			.722		.713
Find ways to reuse things.			.701		.719
Equity Behaviour					
I respect rich and poor people in the same manner.				.739	.566
Employee should have right to participate in decision making				.738	.700
In my house girls and boys have equal opportunity of education.				.657	.556
Wives should have same right a husband should have at home.				.575	.531
Variance Explained	19.645	16.995	15.104	13.629	65.372
Eigen value	6.353	2.714	1.401	1.299	
Cronbach's Alpha	.880	.828	.800	.755	.875
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. [a]					1.401
a. Rotation converged in 6 iterations.					1.299

The first factor labelled as Frugality Behaviour with higher loading and consisting the statements like Buy more food than needed, Mostly spent on buying more clothes, Use car when going out nearby market, Harm the property of organisation, Buy lots of shoes. This factor involved negative statements reverse coded before analysis. This factor explains 19.645% of variance and alpha value .880. The second factor is explained as Altruism Behaviour represent the items, Provide some food to homeless, Assist senior citizens, Cooperate with colleagues, Help other to perform their jobs in better way, Help weaker section of society. This factor explained 16.995% of variance and alpha value is .828. Third factor is labelled as Pro- environmental Behaviour

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consisting the statements buys products in refillable package, Encourage family and friend to recycle, Reads about environmental issues, Find ways to reuse things. Variance Explained by this factor 15.104% and alpha value is .800.

The fourth factor labelled as Equity Behaviour including items like I respect rich and poor people in the same manner, Employee should have right to participate in decision making, In my house girls and boys have equal opportunity of education, Wives should have same right a husband should have at home. This factor explained 13.629 % of variance and alpha value is .755.Cronbach's Alpha of the scale is .875. Cronbach's Alpha value of every factor is more than .7 that establishes the good internal consistency reliability of the each determinant. The present analysis retained the determinants of sustainability behaviour suggested by the previous literature.

In order to find the impact of gender, age and academic level on these behaviour determinants factors scores have been used.

RESULT OF T-TEST

In order to study the difference between the sustainability behaviour of male and female students, independent t-test has been applied on each determinants, using the factor score and there is no significant difference is found, as all the values of t-test is insignificant i.e. P= >.05.

Table: 2 (Gender)

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Frugality Behaviour for analysis 1	Equal variances assumed	.005	.941	.584	150	.560	.12468087	.21332047	-.29682019	.54618192
	Equal variances not assumed			.569	35.178	.573	.12468087	.21903531	-.31990417	.56926590
Altruism Behaviour for analysis 1	Equal variances assumed	1.614	.206	.779	150	.437	.16856776	.21633210	-.25888399	.59601951
	Equal variances not assumed			.981	48.723	.332	.16856776	.17190286	-.17693372	.51406923
Pro- environmental Behaviour for analysis 1	Equal variances assumed	4.533	.035	1.568	150	.119	.33629078	.21448721	-.08751563	.76009720
	Equal variances not assumed			2.150	57.350	.036	.33629078	.15639454	.02315752	.64942405
Equity Behaviour for analysis 1	Equal variances assumed	.758	.385	-.081	150	.936	-.01749009	.21676778	-.44580270	.41082252
	Equal variances not assumed			-.088	39.464	.931	-.01749009	.19954097	-.42094826	.38596808

Result of ANOVA test

In order to study the difference between the sustainability behaviour of the students on the basis of the age groups, test of ANOVA has been applied (Table 4). There is no significant difference is found as all the p values are insignificant (p = > .05) as shown in the table below. It is predicted that students have same level of sustainability behaviour at different age group.

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Table 3 (Age Group)

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Frugality Behaviour for analysis 1	Between Groups	5.394	3	1.798	1.827	.145
	Within Groups	146.606	149	.984		
	Total	152.000	152			
Altruism Behaviour for analysis 1	Between Groups	.445	3	.148	.146	.932
	Within Groups	151.555	149	1.017		
	Total	152.000	152			
Pro- environmental Behaviour for analysis 1	Between Groups	4.127	3	1.376	1.386	.249
	Within Groups	147.873	149	.992		
	Total	152.000	152			
Equity Behaviour for analysis 1	Between Groups	.711	3	.237	.233	.873
	Within Groups	151.289	149	1.015		
	Total	152.000	152			

In order to check the difference in sustainability behaviour of the students at different academic level author again applied the test of ANOVA and there is no significant difference is found at the different Academic level as the all p values are insignificant i.e. p = >.05. It is observed that students have same level of sustainability behaviour at each academic level.

Table: 4 Academic levels

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig. (P)
Frugality Behaviour for analysis 1	Between Groups	6.141	5	1.228	1.238	.294
	Within Groups	145.859	147	.992		
	Total	152.000	152			
Altruism Behaviour for analysis 1	Between Groups	2.876	5	.575	.567	.725
	Within Groups	149.124	147	1.014		
	Total	152.000	152			
Pro-Environmental Behaviour for analysis 1	Between Groups	5.392	5	1.078	1.081	.373
	Within Groups	146.608	147	.997		
	Total	152.000	152			
Equity Behaviour for analysis 1	Between Groups	4.960	5	.992	.992	.425
	Within Groups	147.040	147	1.000		
	Total	152.000	152			

DISCUSSION

Results of Exploratory Factor Analysis strongly supported with the previous literature. The sustainability behaviour is reflected with the four major indicators named Frugality Behaviour, Altruism Behaviour, Pro-environmental behaviour and Equity Behaviour 0 (Corral Verdugo 2010, 2012, Tapia-Fonllem et al.2017). All the factor loadings are more than .50 that indicated co-relation among the items of the corresponding factor is more than 50% is an indicator of the good scale. The value of Cronbach's Alpha more than .7 for all factors indicated that the scale has good internal consistency and reliability. Result of t-test is matched with the results of research conducted by Al-Naqbi & Alshannag (2018) at UAE university's students. It shows that gender does not impact the sustainability behaviour of the students. The result of ANOVA test also sustain by previous research of Maiteny (2002) , the author stated that "pro-environmental behaviour change is more likely to endure in the long term if it is rooted in, and driven by, significant and meaningful experience". In fact, the

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process which makes possible any behaviour change is very complicated, as Folke (2003) states: ". . . . directing human behaviour towards improved environmental performance and sustainability is not just a simple matter of providing information and policy prescriptions but a complex socio-cultural process. It will require understanding of the contexts that form, shape and reshape habits of thought and action" (quoted by Kagawa, 2007). Observation regarding effect of academic level on sustainability behaviour is contradicted in previous literature. Al-Naqbi & Alshannag (2018) reported a significant difference in sustainability behaviour of UAE university students at different academic level whereas reported that there was no difference was found among the fresher Mexican students and last year students' sustainability behavior. The present research complies with the Tapia-Fonlemm (2017) research and found no significance difference. May be the possible reason is, due to lack of intervention of sustainability concept in business education program, universities action and plans does not produce any statistically positive influence on sustainability behaviour of students. The reported sustainability behaviour of the students may be cause of informal education where they learn from the society they live and from the day to day life. Previous literature stated that integrating sustainability in education can bring the positive psychological change in the sustainability behaviour of the students (Corral- Verdugo, 2012; Sidiropoulos, 2014). The higher education Institutions should introduce sustainability in business curriculum to enhance the knowledge & understanding of the students and providing sustainability skills to do business in sustainable manner. Business education for sustainable development will develop the knowledge, attitude and behaviour of the business students (Sidiropoulos, 2014) and help to broaden their thinking ability to become a change agent for the sustainable society and corporate world (Hesselbarth & Schaltegger, 2013; Lans et al., 2014; Sharma, 2014).

CONCLUSION

The paper discussed the need of integrating sustainability in business education to enhance the knowledge and sustainability behavior of the students. Four determinants of the sustainability behaviour have been assessed by author by grouping the variables. These determinants are frugality behaviour deal with avoiding wastage of resources, altruism behaviour deal with care for others, Pro- sustainability behaviour show concern with environment, equity behaviour i.e. being fair to others. These four determinants reflect the sustainability behaviour of the business students. Research revealed that gender, different age group and education make no statistical differences in the sustainability behaviour of the university students. So there is need to reorientation of the business education towards the sustainability and improve the education policy as it is still at nascent stage in developing countries (Wu et al., 2010). Sustainability should introduce in the education structure in formal as well as non-formal way to bring a behavioural change. Non-formal education will help them to understand the live situation of the issue and help to develop skill to solve it. Embedding sustainability in the education could play vital role to improve the sustainability behaviour of the students.

This is an initial study; the confirmatory analysis can perform in future research to validate the scale. Results may be varying by changing the sample size and region.

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A STUDY OF FINANCIAL LITERACY AMONG WOMEN WORKING IN PRIVATE SECTOR

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ABSTRACT
Financial literacy can also be termed as financial education. Financial literacy is very important for any country's economic growth and development. Financial literacy means understanding of finance. Personal finances are very difficult to handle. If they are handled skillfully then returns are very attractive. Financial literacy is not only meant for rich people. It is a need for each and every individual who wants to grow and sustain in the world of heavy inflation. Financial planning is needed for college goers, employed persons, businessmen, and sole traders for retired person as well as Women. Many institutions have undertaken various measures to help in saving people's money. Government of India is also undertaking measures to educate people. RBI has launched financial literacy and credit counseling centers to help with finances. The concept of improving financial literacy is considered as a national project. Most of the countries are adopting a unified and coordinated national strategy for financial education. Formulation and implementation of strategy is very necessary. The formulation and implementation of National Strategy for Financial Education will definitely gain benefits in long run. Financial Literacy among working women will lead high economic growth.

Keywords – Financial literacy, investment, Financial education

INTRODUCTION
"The number one problem in today's generation and economy is lack of financial literacy."- Alan Greenspan. A survey conducted by Standard & Poor's Ratings Services Global Financial Literacy Survey (S&P Global FinLit Survey) in December 2015 shows that 76% of Indian adults lack financial awareness. "Only 24% of Indian respondents adequately understand key financial concepts, including risk diversification, inflation and compound interest," "The performance on different dimensions suggests the real lack of understanding of the basic principles related to money in everyday life," the survey said. Worse, it also concluded that a large number of young professionals are not aware about even the most commonly available savings instruments. More than 20% didn't even know about fixed deposits, the most popular way to save in India, after savings accounts.

OBJECTIVE OF STUDY
- To Study behavior of working women towards investment.
- To Analyze how women take financial decisions.
- To study measures taken by government in spreading financial education.

METHODOLOGY
The study is based on Primary Data Collection. Questionnaire was formed for a sample size of 30 women working in private sector between the ages of 21 to 50. Simple random sampling method was used.

BACKGROUND
Need for Financial Literacy among working women

Most of the today's generation is unaware about concepts of investment in right areas as well as simple concepts and key words of investment. Most of people rely on decision of family member or some brokers while taking any financial decision. Income and expenses should be calculated and financial plans must be prepared for next 5-10 years according to the age of an individual.

In male dominated countries like India, all the earnings of the women are handed over to male member of the family. Instead of that women should learn to invest their money. This is possible only through financial education.

Financial planning is advantageous for all ages of consumers. It is also helpful for all income groups. For women population, it can give basic understanding of saving which will automatically help them to budget themselves for upcoming expenses and some serious difficulties. It will also help them to discipline themselves and their family in saving habits. Women's attitude towards finance also affects overall growth of the country. It is needed for sustainable and balanced lifestyle. Financial literacy helps in building quality of life.

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Initiatives by Government

- **RBI Branch Authorization Policy:** RBI has opened Service Branches to the customers keeping in mind the end goal to build up the saving money system in non-banked zones, common consent has been conceded by Reserve Bank of India to family units private and public sector.
- **Swabhimaan Scheme:** It is campaign of Government of India which was organized with an aim of providing banking services to rural masses. This was proposed to cover 20000 villages to offer banking products and services. At Economic Editors' Conference in New Delhi, finance minister Pranab Mukherjee said, "Swabhiman - a nationwide programme on financial inclusion, estimated to cover approximately five crore households, is now ready for roll out."
- **Swavalamban Pension Yojana:** Government will contribute Rs. 1000 p.m. in NPS accounts. Amounts are exempted from tax at the time of withdrawal.
- **RuPay Card:** Rupay is an Indian card launched by National Payments Corporation of India to fulfill the desire of RBI to have domestic and multilateral systems of payment in India. the promoters of these cards are six public sector banks that includes SBI, BOB, UBI, PNB, BOI and Canara Bank and with support of two major private sector banks ICICI Bank and HDFC Bank. Rupay card become mostly popular with introduction of Jan Dhan accounts and that ultimately leads to financial inclusion in country.
- **Pradhan Mantri Jan-Dhan Yojana (PMJDY**): To access financial services like saving accounts, deposits, remittance, and insurance benefits etc. bank accounts were opened. It created a Guinness world record of opening 1.5 crore accounts.
- The Reserve Bank has undertaken a project titled 'Project Financial Literacy'. The objective is to provide information regarding the central bank and general banking concepts. Various target groups, such as, school and college going children, women, rural and urban poor, defence personnel and senior citizens. Information is shared with the help of banks, local government machinery, NGOs, schools, and colleges through presentations, pamphlets, brochures, films, as also through the Reserve Bank's website. The Reserve Bank has already created a link on its web site for the common person to give him/her the ease of access to financial information in English and Hindi, and 12 Indian regional languages.
- A financial education site was launched on November 14, 2007. Mainly aimed at teaching basics of banking, finance and central banking to children in different age groups. The comic books format has been used to explain complexities of banking, finance and central banking in a simple and interesting way for children. The site has films on security features of currency notes of different denominations and a games section.
- In addition, with a view to promoting financial awareness, the Reserve Bank conducted essay competitions for school children on topics related to banking and financial inclusion. The Bank has also been participating in exhibitions to spread financial literacy. Last year, it participated in the exhibition aboard the 'Azadi Express' a train to commemorate 150 years of India's freedom struggle which began in the year 1857. The train during a year's run will cover several places in the country.
- Recently, the Reserve Bank launched 'RBI Young Scholars Award' Scheme amongst students undergoing undergraduate studies to generate interest in and create awareness about the banking sector and the Reserve Bank. Under the scheme, up to 150 young scholars would be selected through country-wide competitive examination and awarded scholarships to work on short duration projects at Reserve Bank.

DATA ANALYSIS

According to the survey conducted 60% women earn salary of around Rs.10,000 to Rs. 30,000. They try and maintain written record of their monthly budget but only around 35% women could maintain such record. 78% of women take their own investment decision.

Around 26% women invest regularly while 61% women invest depending on finances available. Majority of women invest only 10% of their income while few are not sure about their percentage of investment.

70% of women consult their immediate family members. And around 37% take advice of their colleagues and friends. As far as investment pattern is concerned 57% women consider traditional way of investment through bank deposits while 53% women invest in mutual funds. 60% of the responders think that they should try new ways of investments and government should also take initiative for educating women for investment. 93% of

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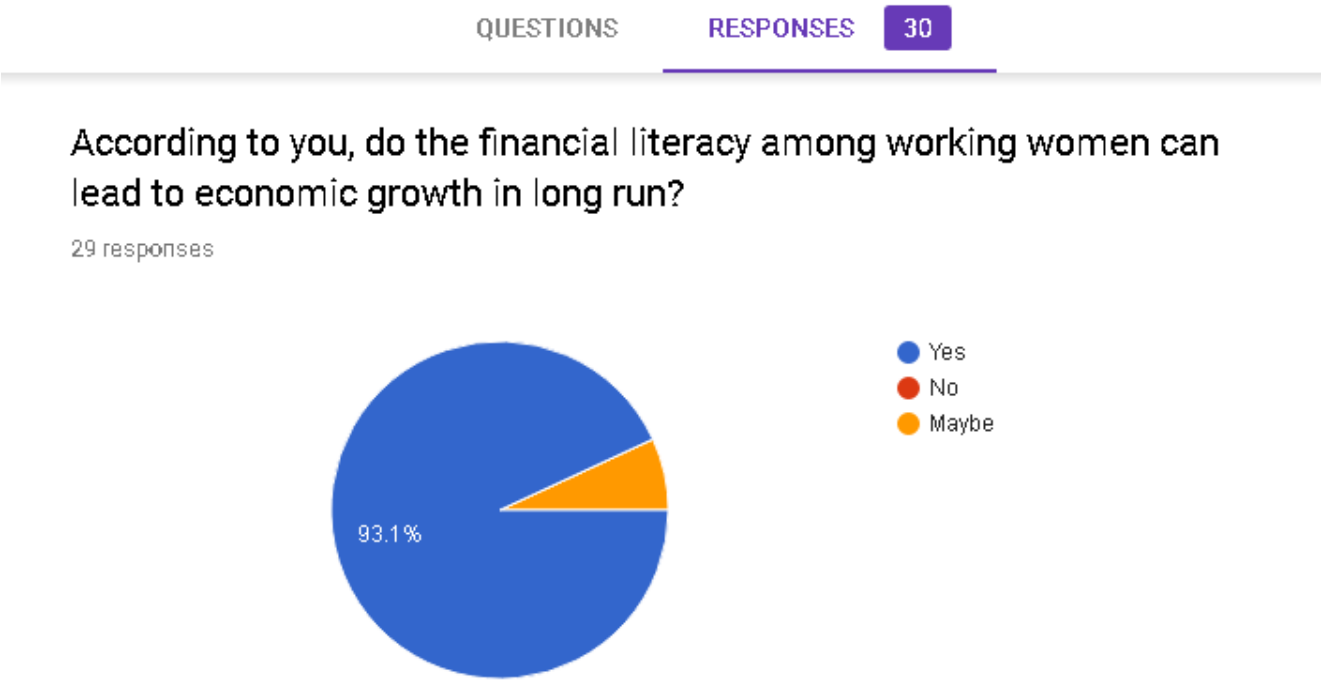
the women fill that financial literacy among women can lead to Economic growth in long run. Around 86% of women are willing to take extra efforts for learning new ways.



CONCLUSION

Skill of financial literacy can help a person to develop a financial road map to identify what he earns, what he spends and what he owes. Programs must be developed as to understand information regarding client and advising them for long –term financing. National campaigns, specific websites, free information services, and warning systems on high-risk issues for financial consumers should be promoted. Financial problems and issues are dynamic in nature. Advanced systems and training and development centers can help the individuals in taking right steps. Educating women in financial aspect will help in faster economic growth.

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A STUDY ON SINGLE EDUCATION BOARD FOR THE STUDENTS OF INDIA

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ABSTRACT
The purpose of this study is to highlight the need for single education system for the students of India as it's the need for the hour. A sample of 30 parents and 30 students studying in different boards within Mumbai city was randomly selected. Education, especially primary education should be given utmost importance. Government should invest heavily in this field as this investment will help to pay off rich dividends in the form of "Educated Population". This paper emphasizes on to devise a simple & friendly system with practical & interesting syllabus. This paper suggests many changes which need to be infused to enhance the present education scenario in India. The paper also emphasizes on ending state boards and establishing a unique education system throughout India.

Keywords: School Education, Primary Education, Secondary Education, Educational Board in India.

INTRODUCTION:

"The object of education is to prepare the young to educate themselves throughout their lives." by Robert Maynerd Hutchins.

According to most Educationists, Education is the best investment. A well educated person has more opportunities to grow and more talent to help a country grow. Primary education thus, is the deciding factor in the life of an individual. The values and the habits inculcated in a child during his childhood remains with him forever. That is why maximum focus is given to the primary education of a child.

School Education:

School education is the base for future education of a student. There are various schools in India and many new ones are also coming up. Different types of schools like residential schools, boarding schools, government schools, day schools, primary schools and secondary schools operate in the country.

All the schools in the country are governed by the rules of the respective boards under which they run. Besides the state boards the Central Board of Secondary Education (CBSE), Council for Indian School Certificate Examination and National Institute of Open schooling are some of the boards that look after school examination in India. These boards conduct school leaving certificate examinations across the country.

Primary Education in India:

In India, like many other countries, primary education is generally divided in three categories: Preparatory School, Nursery Education and Elementary Schooling. The Pre-Schools {Preparatory Schools} are the first step that a child takes independently .Children between the age of 2-4 years are generally sent to Pre-schools. Here children learn to sit in a school and take part in fun activities which do not burden them too much. This is a child's first introduction to schooling. The Pre-Schools in India are growing at the rate of 40% annually due to the increasing number of working women who are unable to provide their children essential early education.

Nursery Education again is very vital for the proper growth of a child. The 4 year old child is sent to nursery. The importance of nursery education can be understood from the fact that The Indian Supreme Court has taken special measures to ensure that a child receives it in a rightful manner. Nursery education imparts knowledge to the children in a playful manner. They are taught in a creative fashion which ensures that they learn it for lifetime.

The Primary or Elementary Schooling in India is one of the most essential phases in education. Elementary Education in India means first eight years of schooling from the age of six. Elementary Education has been made compulsory for each and every child of the Country by Government of India. Various programmes have been launched for the implementation of compulsory education act by Government. SARVA SIKSHA ABHIYAAN is one such programme.

However, due to shortage of resources and lack of political will, this system suffers from massive gaps including high pupil to teacher ratios, shortage of infrastructure and poor levels of teacher training. Figures released by the Indian government in 2011 show that there were 8,816,673 elementary School teachers in India There are various Private and government schools in India for the purpose of education at various levels.

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Secondary education

The National Policy on Education (NPE), 1986, has provided for environment awareness, science and technology education, and introduction of traditional elements such as Yoga into the Indian secondary school system. Secondary education covers children 14–18 which covers 120.5 million children according to the Census, 2011.

A significant Highlight of India's secondary school system is the emphasis on inclusion of the disadvantaged sections of the society. Professionals from established institutes are often called to support in vocational training. Another highlight of India's secondary school system is its emphasis on profession based vocational training to help students attain skills for finding a vocation of his/her choice. A significant new highlight has been the extension of SSA to secondary Education in the form of the Madhyamik Shiksha Abhiyan.

Educational Boards in India:

There are various Education Boards in India other than the respective State Education Boards. All these Boards are responsible for managing the School Education in India. Parents must make sure that they send their wards to schools run only by those boards that are recognized by the Department of Higher Education, Ministry of Human Resource Development, and Government of India.

Each State has its own board that conducts school leaving certificate examination for schools affiliated to it. The State Boards also look after the various educational issues of these schools.

RESEARCH PROBLEMS:

1. **Sense of Inequality:** The hype surrounding new and upcoming Educational Boards tends to show the traditional boards in abandoned state. School students often feel discrimination on the basis of the Educational Boards they have taken up. Gradually, this results into; they look down upon their own board & want to move on to newer and most popular Boards. These thoughts deviate their focus from education and create a sense of insecurity in their own board while giving rise to constant domestic arguments with parents. They also are unable to make friends and communicate freely with students from several other boards due a feeling to inequality.
2. **Achievement of educational goals:** The current economic system makes it almost impossible for low-income parents to prepare their children for success in school. Some of these hindrances include the absence of a living wage, parents working two jobs (meaning little time with their children), too many single-parent families, young, poor, and uneducated young people becoming parents, many parents who speak little or no English, and costly child care. Poor parents need to be made available with the necessary resources and support they need so that they can devote the time and energy necessary to prepare their children for academic success. Poor children should be provided with the chance to develop all the required necessary attitudes and skills for quality learning.
3. **Stress free college admissions:** The required marks for getting admission into city colleges are soaring high every year, making it difficult for students to get admission. In addition to this, students from different boards have different cut-offs. Every year college admissions are delayed due to court stay orders emerging out of complaints from agitated parents and associations. The prime reason for the delay is trying to bring a consensus amongst different boards. As a result, to avoid this problem, many students continue in their own boards rather than changing over to state board after 10^{th}.While the rest find themselves at the mercy of the cut-off lists. Further, this procedure has encouraged corruption in the Education System.
4. **Right to quality education to every child:** 86th Constitutional Amendment (2002) enjoins upon the State to provide free and compulsory education at the elementary stage (class I-VIII) to all children as a Fundamental Right. Given the current scenario, the dream of educating every child less than 14 years of age seems unrealistic. Deteriorating state run schools, high dropout rates, poverty, etc are not doing any good to upturn this. Thus Right to Education (RTE) remains only a fundamental right in our constitution. The only way we can award this fundamental right to our country's children is by devising a single board education system wherein every kid in the country whether studying in a high end urban school or a remote rural school will be able to acquire the same education thereby blurring the lines & raising the bar of education.
5. **Converting Population Explosion into a strength**: The Education Commission (1964-66) had recommended a Common School System of Public Education (CSS) as the basis of building up the National System of Education with a view to "bring the different social classes and groups together and thus promote the emergence of an egalitarian and integrated society." The Commission warned that

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"instead of doing so, education itself is tending to increase social segregation and to perpetuate and widen class distinctions." It further noted that "this is bad not only for the children of the poor but also for the children of the rich and the privileged groups" since "by segregating their children, such privileged parents prevent them from sharing the life and experiences of the children of the poor and coming into contact with the realities of life also render the education of their own children anaemic and incomplete. (emphasis added)" The Commission contended that "if these evils are to be eliminated and the education system is to become a powerful instrument of national development in general, and social and national integration in particular, we must move towards the goal of a common school system of public education."

LITERATURE REVIEW:

Education in India is provided by the public sector as well as the private sector, with control and funding coming from three levels: central, state, and local. The Nalanda University was the oldest university-system of education in the world. Western education became ingrained into Indian society with the establishment of the British Raj.

Education in India falls under the control of both the Union Government and the states, with some responsibilities lying with the Union and the states having autonomy for others. The various articles of the Indian Constitution provide for education as a fundamental right. Most universities in India are controlled by the Union or the State Government.

Indian has made progress in terms of increasing primary education attendance rate and expanding literacy to approximately two thirds of the population. India's improved education system is often cited as one of the main contributors to the economic rise of India. Much of the progress especially in Higher education, Scientific research has been credited to various public institutions. The private education market in India is merely 5% although in terms of value was estimated to be worth $40 billion in 2008 and has increased to $100 billion by 2016.

However, Indian continues to face stern challenges. Despite growing investment in education, 25% of its population is still illiterate; only 15% of Indian students reach high school, and just 7%, of the 15% who make it to high school, graduate. The quality of education whether at primary or higher education is significantly poor as compared with major developing nations. As of 2016, India's post-secondary institutions offer only enough seats for 7% of India's college-age population, 25% of teaching positions nationwide are vacant, and 57% of college professors lack either a master's or PhD degree.

The National Council of Educational Research and Training (NCERT) is the apex body for curriculum related matters for school education in India. The NCERT provides support and technical assistance to a number of schools in India and oversees many aspects of enforcement of education policies. In India, the various curriculum bodies governing school education system are:

- The state government boards, in which the majority of Indian children are enrolled.
- The Central Board of Secondary Education (CBSE). CBSE conducts two examinations, namely, the All India Secondary School Examination, AISSE (Class/Grade 10) and the All India Senior School Certificate Examination, AISSCE (Class/Grade 12).
- The Council for the Indian School Certificate Examinations (CISCE). CISCE conducts three examinations, namely, the Indian Certificate of Secondary Education (ICSE - Class/ Grade 10); The Indian School Certificate (ISC - Class/ Grade 12) and the Certificate in Vocational Education (CVE - Class/Grade 12).
- The National Institute of Open Schooling (NIOS).
- International schools affiliated to the International Baccalaureate Programme and/or the Cambridge International Examinations.
- Islamic Madrasah schools, whose boards are controlled by local state governments, or autonomous, or affiliated with Darul Uloom Deoband.
- Autonomous schools like Woodstock School, Auroville, Patha Bhavan and Ananda Marga Gurukula.

In addition, NUEPA (National University of Educational Planning and Administration) and NCTE (National Council for Teacher Education) are responsible for the management of the education system and teacher accreditation.

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India is going to experience a paradox of nearly 90 million people joining the workforce but most of them will lack requisite skills and the mindset for productive employment according to a report in DNA. India has about 550 million people under the age of 25 years out of which only 11% are enrolled in tertiary institutions compared to the world average of 23%.

On a honest note, the real critical aspect of Indian public education system is its low quality. The actual quantity of schooling that children experience and the quality of teaching they receive are extremely insufficient in government schools. Poor quality of education with weak infrastructure and inadequate pedagogic attention is a common feature in all government schools.

What the government fails to realize right now is that education which is a source of human capital can create wide income inequalities. It will be surprising to see how income inequalities are created within the same group of educated people. Let me illustrate this with the help of an example:

Let us take P be an individual who has had no primary or higher education. His human capital is zero and hence it bears no returns. Let Q be an individual who completed his MBA from S.P Jain College and let R be an individual who completed his MBA from IIM Ahmadabad. The average rate of return for an MBA student is 7.5% (hypothetical). Q gets a rate of return of 5% and R gets a rate of return of 10% due to the difference in the reputation and quality of the management school. Let the income of P, Q and R be 1.In a period of 10 years, P will be having the same income as he does not possess human capital. For the same time period Q will earn an income of (1+0.05)^10=1.63 and R will earn an income of (1+0.10)^10=2.59. Now let's see what happens when the rate of return on human capital doubles. Earnings of P will not change since he does not have any human capital. Now Q is going to earn (1+0.10)^10=1.63 and R is going to earn (1+0.20)^10=6.19. Flabbergasting! As soon as return on human capital increases proportionately income inequality increases. With return on human capital doubling, Q'S income increases by 59% and R's income increases by 139%.

The above example just shows the effect of the quality of human capital n income inequality. So in a nutshell to sum-up, if the government does not improve education system particularly in rural areas the rich will become richer and the poor will get poorer.

Hence, it is imperative for the government to correct the blemishes in India's education system which will also be a step towards reducing income inequality.

Certain policy measures need to be taken by the government. The basic motive of government education spending today must surely be to ensure that all children have access to government schools and to raise the quality of education in those schools. One of the ways in which the problem of poor quality of education can be tackled is through common schooling. This essentially means sharing of resources between private and public schools. Shift system is one of the ways through which common schooling can be achieved. The private school can use the resources during the first half of the day and the government school can use it during the second half. It is noteworthy that quality of education is directly linked to the resources available and it is important for the government to improve resource allocation to bring about qualitative changes in the field of education. Common schooling is one of the ways in which government can use limited resources in an efficient way and thus improve resource allocation.

Another reason for poor quality of education is the poor quality of teachers in government schools. Due to inadequate teaching facilities and low salaries in Government schools are unable to attract good quality teachers. The government currently spends only 3% of its GDP on education which is inadequate and insufficient. In order to improve the quality of education, the government needs to spend more money from its Budget on Education.

According to most economists the "voucher scheme" is the suggested remedy to the ills of the public schooling system. Under the voucher system, parents are allowed to choose a school for their children and they get full or partial reimbursement for the expenses from the government. But however, the voucher system will further aggravate the problem of poor quality of education in government schools. Such a system will shift resources from government schools to private schools. This will worsen the situation of government schools which are already under-funded. Moreover, if the same amount given as vouchers can be used to build infrastructure in schools then the government can realize economies of scale. For example- The centre for civil society is providing vouchers worth Rs 4000 per annum to 308 girls. This means that the total amount of money given as vouchers is Rs 1232000. If the same amount can be used to construct a school and employ high quality teachers who are paid well then a larger section of the society will enjoy the benefit of education. A school can definitely accommodate a minimum of 1000 students.

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Government of India is aware of the plight of higher education sector and has been taking constant efforts to bring reforms; however, 15 bills are still awaiting discussion and approval in the Parliament. One of the most talked about bill is Foreign Universities Bill, which is supposed to facilitate entry of foreign universities to establish campuses in India. The bill is still under discussion and even if it gets passed, its feasibility and effectiveness is questionable as it misses the context, diversity and segment of international foreign institutions interested in India. One of the approaches to make internationalization of Indian higher education effective is to develop a coherent and comprehensive policy which aims at infusing excellence, bringing institutional diversity and aids in capacity building.

SIGNIFICANCE:
The significance of this research paper is that:

- Education, especially primary education will be given utmost importance.
- Government will invest heavily in this field as this investment will help to pay off rich dividends in the form of "Educated Population"
- Will help to devise a simple & friendly system with practical & interesting syllabus which doesn't complicate the already stressed & pressured students.
- Will contribute to churn out a confident individual out of every ordinary child.

Objective:
- To promote single education board in India.
- To study the inclination of parents & students towards establishment of single education system in India.

RESEARCH METHODOLOGY:
A.PRIMARY DATA:
Primary data was collected from Mumbai based parents & students, through Questionnaire.

B.SECONDARY DATA:

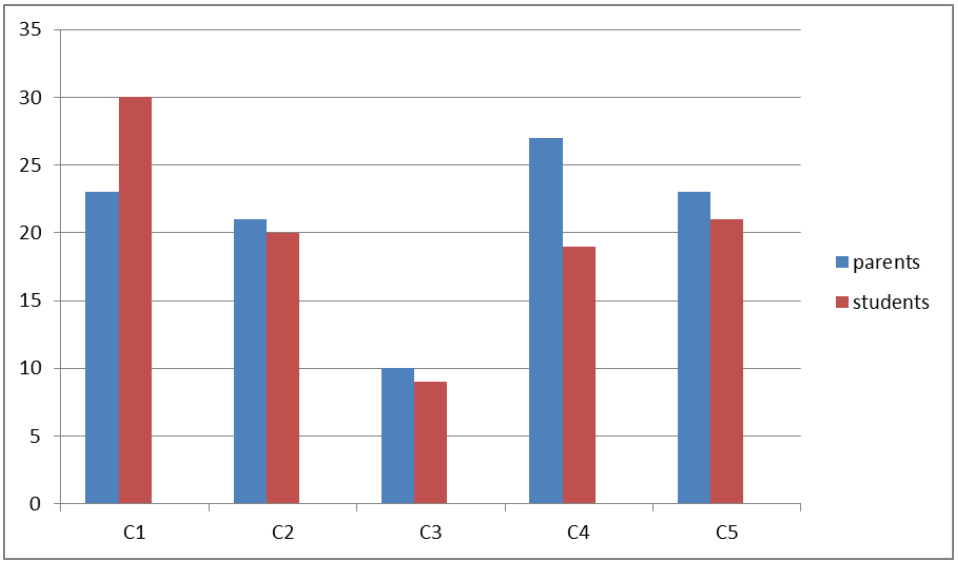
Secondary data was collected from various references which already exist and would be published in future books, articles in news papers like Hindustan Times, DNA and Times of India, etc. from time to time. The articles in magazines as well as Web and Internet were considered for the purpose of secondary data collection.

Data analysis, Interpretation and suggestions:

Sample size:

Questionnaires were distributed to 30 pupils, and 30 parents whose children are studying in various boards of studies.

There were mix responses on the proposal. However, majority of the sample size are of the view that there is a need for change in the board of studies. The survey can be better understood with the help of charts given below:



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ANALYSIS:
From the above graph, the column C1 refers to question no.2, C2 refers to question no.5, C3 refers to question no.6, C4 refers to question no.09 & C5 refers to question no. 10 in the questionnaire respectively.

C1 shows that students are happy with the education provided by their respective boards, whereas 23 parents out of 30 in our sample survey size are happy with the quality of education. Rest are not. The remainder of 7 parents comprises of approximately 25% of sample size. Hence this shows that 25% people are not satisfied with the quality of education their wards are getting.

As far as C2 is concerned, 9 parents from our sample and 10 students from our sample feel they do not get a competitive advantage as compared to other boards. But a point has to be noticed that those who feel so, are from state board, i.e SSC board except one student who is from ICSE board. This shows that students from state board are insecure and feel biased when it comes to gaining a competitive advantage. This partial feeling can be eliminated through forming a single board of studies.

C3 is all about the satisfaction, the feedback of the sample size, whether they feel spending thousands a month worth it. But unfortunately, as seen in the graph, this question has the lowest bars, which indicates least respondents have positively responded to this question, which is a big concern. People are not happy with the fees charged against the services provided to them.

It is said that "Education is more than a luxury; it is a responsibility that society owes to itself."

The above line clearly reflects that education is not for sale. Instead it is a responsibility towards the society. But nowadays education has become commercial. Middle class parents cannot afford good boards even though their child is an outstanding performer. These problems can be eliminated through uniformity in board of studies.

Better services should be provided, as people are not satisfied with the services.

C4 & C5 reflects our main proposal & it can be observed that 90% of the parents asked are of the opinion that they are ready for a Switch from their present board to "Single Education Board" & further they also agree that 'Single Education Board 'system will strengthen the right to education, where as 80% of the students think single educational board would be beneficial.

When asked how much educated men were superior to those uneducated, Aristotle answered, 'As much as the livings are to the dead.' So, education not only means knowing something, instead learning something. And to learn something, we need to practice. Applying things practically and gaining practical knowledge makes a person experienced, and a person learns the best lessons only through his experiences.

Jawaharlal Nehru quoted that 'Upon the education of the people of this country, the fate of this country depends.' And education is the main pillar. So, steps are to be taken towards a better system of education.

SUGGESTION:
Govt. of INDIA is surely going to face oppositions against establishment of Single Education Board for students in India. Still in my opinion there should be a common board for whole country.

Every established system in the country always attracts severe criticism. The Indian Education system especially has been the target of many allegations from students, parents and teachers.

The following are some of the suggested changes to infuse in our education system through the Single Education Board:

1. Eradication of Rote learning: Yes, we do know that many IB schools across India are trying to bring in interactive education and we laud that immensely. But the evil of rote learning is yet to be wiped out from a majority of Indian schools. Immemorial rote learning has continued due to the fixated style of question papers that have been doing the rounds in board exams since the past. I am very sure that most students won't be clear about many of the basic foundation concepts taught in school even after they've graduated. In today's current scenario students are even mugging up balanced equations. This is one fundamental change that needs to be overcome in our Indian Education System.
2. Proper Marking System: All the other evils of the Indian education system ultimately come down to the method in which students are marked. Is it justified that a student is evaluated only on the basis of his/her performance for the duration of three hours of the exam? If the axis of grading and marking is shifted to classroom participation, project work, communication and leadership skills and extracurricular

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performance, only then a genuine student shine out. The Indian education system badly needs to bring about this change.

3. Respect for all streams: *In India the psychology is that if a person has done MA in English than he/she will end up becoming a teacher*. Further, a *person completing a diploma in hospitality management is perceived to do a job in a hotel as a cook.* Don't you think it's time to stop these perceptions? How long are we going to look down upon vocational streams and look up to medicine, engineering, the IIT's and the IIM's? Students at the school level need to be educated through career counseling regarding the kind of streams that exist and what importance each of them plays to make an economy diverse.
4. Need for Variety in education streams: Indian students are generally envious of their counterparts in the USA, It's because there are just three options that student have after Class 10 – they're stuck with Science, Arts or Commerce. If they're not good enough for either of these, they jet set straight into diplomas and certificate courses. Don't you think the Indian education system needs to introduce combination courses in which students can opt for a major and a minor subject? If students in America can pursue Physiotherapy with Art History and Biological Science with Photography, then Why not in India?
5. Abolishment of the system of tuition classes: Commenting on this subject is like plunging one's hand into a vicious cycle which seems to have no beginning or end. Reasons for tuition classes mushrooming are because students say that the teaching in schools is negligent and not good enough for them to clear exams. Whereas teachers are of the opinion that students jump ahead many chapters in the tuition classes before they are even taught in school. This makes them loose all motivation and steam to attend school in the first place. Forget all of this, what about the poor parent who's hard earned money gets drained in school and tuition fees alone? Although the picture does seem gloomy, there is hope because some of these changes are slowly being made by select education providers. But how quickly will these changes percolate down to common man in India, only time will tell.
6. Strengthening the Right To Education: A uniform education board will provide the same quality education to all the children of the country. This will positively affect the standard of education in our country. The poor kids will be provided a fair platform to show their efficiency, thereby reducing the disparity & helping them to overcome poverty & raise their standard of living.

CONCLUSION:

To conclude, this research paper highlights that there is a need for a uniform board of studies. e.g, when the concepts of stock exchanges were introduced for the first time in India, there arise a need for a centralized body and hence NSE and SEBI were set up. Here we have to take this matter seriously because the future of the country is in the hands of these kids who are studying at the moment. It is very important to make them feel secured & satisfied about the education they are getting.

There should be a uniform board so that each and every student is compared through a uniform platform and no child gets a competitive edge from the other just because of the school one went to, or the board their parents chose for them.

It is said that **"Instruction ends in the school-room, but education ends only with life."**

So, to put the above quote in simple terms, the whole life of a person depends upon his education, primary education to be more precise. Next is importance to freedom and justice is popular education, without which neither freedom nor justice can be maintained. Education should consist of a series of enchantments, each raising the individual to a higher level of awareness, understanding, and harmony with all living things.

Hence, our system should be more practical and serious about primary education. When we discuss this issue with any individual, each and every one agrees with this point and are of the view that there is a need for change in the prevailing system. But no one is aware where to start from, and it has to be a mass movement, a single individual or a group of individual won't make any difference. More over it will be a long and time taking process. So in my opinion the proposal may visualise by 2020 at least, and by doing so, we can identify the true winners of our society.

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Appendix:

The following was the Questionnaire filled by parents & their respective children:

1. Mention the education board you/your ward belong/belongs to:

   a)SSC b) ICSE c)CBSE d) IB e)Other

2. Are you satisfied with the quality of education your board provides you/your ward?

   a)Yes b) No

3. What according to you are the benefits of your board?

   a) Quality Education.

   b) Wide exposure to curriculum.

   c) Personality development.

   d) Updated syllabus.

e) Ample opportunities for extra- curricular activities.

4. What according to you are the disadvantages of your board?

   a) Continuous pressure to perform.

   b) Wide syllabus to cover in short duration.

   c) Problems faced at the time of admission to colleges.

   d) Hectic schedules due to long school hours.

   e) Very high fees.

5. Do you feel that by the virtue of the board in which you/your ward are/is studying, you gain a competitive edge over others from several other boards?

   a)YES b) No

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6. Does your/your ward's school provide you with amenities in accordance with the fees they charge you?
   a)Yes b)No
7. How strongly would you recommend your/your ward's board to fellow mates?
   a) Very Strongly.
   b) Strongly.
   c) Not very Strongly.
8. What is your opinion about a single education board all over India?
   a) Excellent Proposal.
   b) Good but not very satisfactory proposal.
   c) Very bad Proposal.
9. If given a chance would you like to switch over to a single education board school?
   a)Yes b)No
10. Do you think a 'single educational board' system will strengthen the Right to Education?
    a) Definitely.
    b) No, not really.

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A REVIEW ON THE RELATIONSHIP MANAGEMENT AMID SALESPEOPLE IN THIS PANDEMIC PERIOD

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ABSTRACT
In recent days Employee Relations is maturing into a strategic force in all the level of Organizations. Most of the firms start focusing on relationship management amid employees and executives at the workplace. Relationship management process, data, and analysis are used to reduce risk, to improve the firm's transparency, to create a safer feel at the workplace. A perfect study on relationship management on salespeople will drive the concern for better decision-making. Every individual is a human being and not a robot to start working without knowing whom they work with. In sales without teamwork, the workplace seems to be hostile. It creates negativity in their mind and it will harm their individual's performance. Engaging with colleagues and managers feels safer at the workplace.

A good ERM execute hallmarks of mutual understanding and respect result the effective communication. This study shows the challenges and difficulties faced by salespeople in maintaining the relationship with their team members in the pandemic period. Management hardly works on getting to engage the staffs to give better result from the Sales Department. It shows improving the relationship management process amid employees can facilitate their companies' post-pandemic recovery.

Key Words: Relationship management, Salespeople, Pandemic Period, Employee engagement.

1. INTRODUCTION:

Employee relation is an upcoming force handled by the Department of Human Resources at all levels of the Organization. This strategy helps to drive the organization's decision–making. By focusing on relationship management between employees and executives at the workplace shows the satisfaction and level of efficacy in their job. Matured and healthy relationships from a lower to a higher level of employees result in easy attain goals of an organization. It results in expresses via motivation, self-confidence, job security, skills, challenges they faced easy adaptability of working situations for experienced people.

The teamwork of every Department has to focus on relationship management or else it seems to be hostile. The absence of relationship management leads to negativity and will harm individual performance. Engaging with co-workers with spirit will feel safer at the workplace. Communication, Collaboration, and Cooperation build the workers to give the best easy-going relationship, it will result in their performance and productivity.

1.2 Human Resource role in Employee Relationship Management

Every Company has its own culture and style; it builds by cultivating peer relationships amid employees from production level to sales level. When a work organized is teamwork there can find every individual has specific skills. These skills can be learned from each other, it will motivate and gets collaboration amid employees to boosts morale, improve performance, and easily attain their targets. Making individuals engaged from various departments of a company attain more benefits in learning about their work. The collaboration of work makes them understand the needs of the individual, problem sharing, creates innovative ideas, easy decision making, efficient problem solving, and more.

In relationship management salespeople takes more part to maintain the interactive activity towards customers, consumers, co-workers also with executives. Human resources focused on encouraging social interaction amid salespeople is mandatory for every manager in the management. Team building is one of the significant activities to strengthen the relationship, paves the way for building trust, sharing ideas, knowledge, opinions makes to work more job satisfaction. Recent growth in technology makes salespeople strengthen their communication anywhere around the world at any time. In employee relationship management, every manager or executive has to ensure that the relationship between employees is positive. Concentrating on small business salespeople relationship monitoring will be direct to keep things running smoothly.

1.3 Employee Relationship Management amid Salespeople in the Pandemic Period.

The pandemic period of COVID – 19 is originated in China in Dec 2019 which spread over the world to proliferate. This significantly disrupted the economic level of middle-level people and the way small business works. The fact of this period shows that companies start work remotely, due to this executive couldn't contact their staffs face – to – face communication sense of distance happens from top management. Maintaining

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employee morale is a great challenge for every concern without a physical presence, team events; group discussions with executives make more crises for the sales department. It makes a hurdle for an employer to motivate, boost the spirits of employees.

Work from home for salespeople makes the more problematic vision in this pandemic period. This period makes a gap between consumers, sales peoples, and their co-workers. Trust is more reliable when selling and purchasing a product. This period makes the concerns to order their staffs to work from home. It is beneficial that every individual can work and spend time with their loved ones, hobbies, and interests. Selling an experienced product of a new product among the public faces a great challenge for salespeople.

Employees are forced to screen their faces from the site of consumers and co-workers because of a pandemic. Without physical appearance, they are forced to sell their product with the help of technology.

1.4 Challenges and Changes in employee relationship management in the Pandemic Period COVID – 19

The Pandemic period of COVID – 19 agitates the world hardly like a storm. It affects many ways the nature of living to technology. In this paper, the discussion is about relationship management amid salespeople in the pandemic period. We can directly see the effect of the pandemic in the organizations and as well as individual life. Even in these circumstances the concerns are doing their best to perfect business continuity and improving productivity. There are two major functions in this period is digitalization and adoption of a new style of business in the forthcoming days. Organizations have to predict that how long digitalizing may operate their needs. In the sales and marketing department the new product or an existed are in sales means in the hands to shape the business. Human touch is the key for the sales department. It cannot be completely virtual. It is doubtful that how technology will give success in selling a target product for an employee. Working from home changes the way to approach public and managers and salesman interactions. Every individual in sales cannot adapt to technology. If they can't get comfortable with the technology make them feel insecure on the job.

Managing Employee retention via relationship management will give you trust in the concern. Work in the sales department in this quarantine period is difficult in maintaining relationships amid employees are a challengeable framework. Making employees work remotely is not even possible over a night. There is some need for a plan, system, and cultural support.

The challenges faced by employees have to be positively viewed along with the management. Regular motivations, slow down the progress of the sale, make them steady in the job with positive communication and recognition will help salespeople to keep up employee morale. Executives should frankly stress the fact of work from home will give them additional accountability and also express the company's trust in when employees make the best using the responsibility. Here improving the progress of self-worth by following calls and messages are valued by team members.

Finally, in recent days over this pandemic period, Human Resource Managers are working in closed doors make them double their efforts. Managers are expected to solve the crisis faced by the employee and their relationship, quick respond, making employees volunteer participation, appreciating the changes over challenges faced will all reduced fear on pandemics and insecurity about the job. Keeping them motivated will lead to getting success for a company under any circumstances. The measure of healthcare, well-being, physically and mentally will fit into the new workspace of remote working.

Need for the Study:

The study on relationship management amid salespeople in this pandemic period helps to make employees engaged and feel secure in their job. The remote work with a new style of sales using technology simply by calls or messages to customers makes critical. Without teamwork, it will be hostile. This study of relationship management will reduce unwanted correlates among employees. Also improves the quality of work, confidence, and trust in concerns.

Scope of the Study:

This paperwork mainly focuses on relationship management amid salespeople in the pandemic period of South Tamilnadu. Challenges faced and changes they adopt at the end period of COVID-19. With the help of relationship management, the study also gets a chance to show the morale, retention, engagement, teamwork of every individual. The study executes concerning these aspects.

Statement of the problem:

The core value of relationship management amid salespeople in the pandemic period is examining the employee needs and makes them engaged in remote working and motivated to move towards the new way of work style analyzed.

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Objectives of the Study:

1. To study the level of the modern relationship among salespeople in south Tamilnadu.
2. To find the obstacles for relationship management.
3. To know the challenges faced and analyses for having problems.
4. To find the level of job security and trust proffered by the concern.
5. To execute the proposals of employees regarding relationship management in this pandemic era.

RESEARCH METHODOLOGY

Research is the skill of scientific investigation. According to C.R Kothari Research Methodology is defined as "a scientific and systematic search for pertinent information on a specific topic"

Primary Source

Studies done with salespeople, a questionnaire administered.

Secondary Source

Blogs, Journal Magazines, books and, articles from leading websites

This paper is a quality paper. The questions asked for a survey.

REVIEW OF LITERATURE:

Singh P.N and Neeraj Kumar, (2010) in the book "**Employee Relations Management**" discussion is about employee relations management act towards employee empowerment and industrial relations management reports of consultation and participation. It is an informal process that is done beyond employee and employer in the organizations. Here employee relations define as the relationship among the employer, executives and employees goals are to build and maintain morale and trust to create a productive and feel secure workplace.

V.Chitra and R.Shanthi (2019), in the book **"Employee Relationship Management,"** discussed that ERM is the ability and it is an activity done among the employees to increase the relationship and job satisfaction. Here they define the relationship between employer-employee as an unwritten mutual contract. In this discussion, it is considered an important factor for interpersonal relation management.

ANALYSIS OF RELATIONSHIP MANAGEMENT AMID SALESPEOPLE

First and foremost the survey is about analyzing the recent relationship level among the salespeople. In this view maximum number of salespeople are monitoring remotely working conditions by their executives/supervisors. In sales work from home is not possible in this pandemic period, so some of the concerns are allowed to work with 10% to 25% of employees in routine. Employees are not compelled to do multiple works at a time. Day by day salespeople are attending meetings to get engage maintain relationships and get motivated by their managers, where all employees can easily share the pandemic obstacles and finding a way to sort them out. It shows that targets are not highly forced.

Secondly, the survey is about the obstacles to relationship management. In this survey, most of the employees accept that there is no change in a relationship while the work is in remote mode. Less capability of technology used to work or communicate is difficult to maintain employee relations. Some obstacles like participating in a meeting, webinars, training, and development program engage with the team by using technology. Improving market intelligence is not at all suffered in marketing coz there is less obstacle in relationship management. Following remotely working policies is moderately affected due to the pandemic era.

Thirdly, analysis is taken for a reason for having problems. In the banking sector openly see, decrease in the demand of taking policy and insurance and as like. Middle to high-level people focused in maintain their family and economic level in business. This pandemic makes transportation inconvenient for salespeople. Also apart from FMCG products, other product salespeople faced difficulty in attaining targets, managing customer retentions.

Fourth is to analyze the level of job scrutiny and trust proffered by the concern. This discussion clearly shows the pandemic risks in job retaining. Every people can't discuss problems at every time, the company expects that they must overcome the problem and make to attain targets. Target achievers are getting job assurance others are automatically at risk. Most of the heads give the training to increase sales in a pandemic, creates new opportunities, and allows to work with a new style.

The final survey is about proposals for employee relationship management in this pandemic era. Employee engagement is planned and executives help to work with technology in three fourth of the sales concerns. This

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point is less applicable to a low-level working employee. To get employee job satisfaction, motivation is given also analyze health/family crisis to support them physically and mentally by fulfilling their needs to maintain healthy employee relationship.

SUGGESTION:

Marketing brings profit to the concern but employees are the wealth of the concern. Maintaining good employee relationships with salespeople will easy and motivate each other to attain the target. Healthy competition must lead by the team head. Due to this pandemic period, most of the people in sales face critical customer, sales targets, analyzing market intelligence, and more. This Covid-19 never seen any partiality, so at this time we have to be safe and secure. There should not be any work pressure teamwork has to be enabled with good relationship management. Even though work from home process continuous healthy employee relationship will attain success.

CONCLUSION:

A good Employee Relationship executes mutual understanding and results in effective communication. The study shows the challenges and obstacles faced by salespeople in maintaining the relationship with their team members in the pandemic period. Management hardly works on getting to engage the staffs to give better result from the Sales Department. It shows improving the relationship management process amid employees can facilitate their companies' post-pandemic recovery. So from small to big companies have to adapt to the pandemic era and retain employees by executing healthy relationship management amid salespeople.

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BLENDED LEARNING: A BRIEF REVIEW

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ABSTRACT
Modern period has brought about significant changes in the whole process of teaching-learning. The process has influenced a lot with everyday advancements taking place in the field of technology, particularly Information and communication Technology (ICT) along with Electronic Technology. And in the COVID-19 pandemic the entire world has experienced online, as we are restricted to our homes. There is no work with physical presence almost in every field, including education. Particularly, the field of education is transforming at a rapid pace. So many changes have taken place in terms of procedures, methods, techniques, and pedagogy, so far as education is concerned.

Nowadays education is no longer just about putting pen to paper and memorizing facts. Today, innovative educators in both higher education and corporate learning & development are improving learning through technology, as evidenced by the rapid adoption of technology-assisted teaching methods and blended learning models. Basically, blended learning is an approach to education that combines online educational materials and opportunities for interaction online with traditional place-based classroom methods. It requires the physical presence of both teacher and student, with some elements of student control over time, place, path, or pace.

This conceptual and descriptive research paper discusses the historical perspective, terminology, models, and advantages of Blended Learning (BL).

Keywords: Blended Learning or Hybrid Learning, Classroom Learning, Online Learning, Models.

INTRODUCTION:

Gone are the days where instructor-led trainings were conducted and teaching-learning process was conducted with the traditional methods and techniques. Over a period of time the methods and techniques of training as well as methods, techniques, and pedagogies of teaching-learning have been changed considerably. Nowadays, we all are experiencing technology-based training, teaching and learning as the use of modern technology and tools has been increased. In fact technology has influenced it a lot.

In fact, the world is changing constantly and the various domains are also influenced by the change. There is no exemption even in the education domain. The evolution of the digital learning platforms has a huge impact in educational institutions and has eventually put the traditional methods in the back seat. However, there are demands for both technology and traditional learning methods. As a result of this, the art of combining digital learning tools with more traditional classroom face to face teaching gave birth to the term "Blended Learning".

Today, computers, tablets and smartphones are available to the majority of the world's population, and technology-enabled learning has become more varied and accessible. More and more institutions and teachers are adding web-based learning to their delivery methods, and learners have access to many applications to support their learning. Particularly, technology-based learning helps us a lot in the COVID-19 pandemic situation. The mantra "anytime, anywhere" has been taken up to describe the new wave of education.

However, this notion is being challenged by education practitioners and researchers, who know that learning competence is not universal, student skills are very different from skills needed to participate in social media, and access to broadband Internet is not evenly distributed. Teachers are still a key part of blended learning - teachers who have subject-matter expertise and basic technology skills, along with the new pedagogies that go with technology, such as constructivism and collaboration. Blended learning expertise provides both. Moreover, it is to be said that blended learning and its models with the significant advantages is becoming more and more popular day by day.

HISTORICAL PERSPECTIVE:

Technology-based training emerged as an alternative to instructor-led training in the 1960s on mainframes and mini-computers. The major advantage that blended learning offers is scale, whereas one instructor can only teach so many people. One example is PLATO (Programmed Logic for Automatic Teaching Operations), a system developed by the University of Illinois and Control Data. PLATO in particular had a long history of innovations and offered coursework from elementary to the college level. Mainframe-based training had a

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number of interface limitations that gave way to satellite-based live video in the 1970s. The advantage here was serving people who were not as computer literate. The major challenge was the expense required to make this work. In the early 1990s, CD-ROMs emerged as a dominant form of providing technology-based learning as bandwidth through 56k modems wasn't able to support very high quality sound and video. The limitation to CD-ROMs was tracking completion of coursework, so learning management systems emerged as a way to facilitate progress tracking. The aviation industry used this heavily to track how well one did on courses, how much time was spent, and where someone left off. AICC, Aviation Industry Computer-Based Training Committee, was formed in 1988 and companies such as Boeing used CD-ROMs to provide training for personnel. Modern blended learning is delivered online, although CD-ROMs could feasibly still be used if a learning management system meets an institution's standards. Some examples of channels through which online blending learning can be delivered include webcasting (synchronous and asynchronous) and online video (live and recorded). Gradually, blended learning is developing as an approach to education that combines online educational materials and opportunities for interaction online with traditional place-based classroom methods. It requires the physical presence of both teacher and student, with some elements of student control over time, place, path, or pace. While students still attend "brick-and-mortar" schools with a teacher present, face-to-face classroom practices are combined with computer-mediated activities regarding content and delivery. Today, besides in the field of education, blended learning is also used in professional development and training settings.

TERMINOLOGY:

First and foremost, blended learning is simply the integration of technology into the curriculum. Whether students are utilizing digital media to gather information or computers to complete assignments, the actual combination of technology and the curriculum is the hallmark of blended learning. It includes:

- Delivery methods through which students learn from a digital source
- The use of online classrooms and discussions
- Identifying gaps in knowledge by using automatically corrected assignments
- Computer mediated activities

It means it is a combination of classroom learning and online learning. Mathematically it can be expressed as, Blended Learning = Classroom Learning + Online Learning.

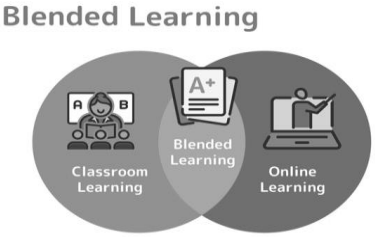

Fig. 1 Blended Learning

Blended learning is highly context-dependent, therefore a universal conception of it is difficult. Blended learning is sometimes used in the same breath as "personalized learning" and differentiated instruction. The terms "blended learning", "hybrid learning", "technology-mediated instruction", "web-enhanced instruction", and "mixed-mode instruction" are often used interchangeably in research literature. Although the concepts behind blended learning first developed in the 1960s, the formal terminology to describe it did not take its current form until the late 1990s. One of the earliest uses of the term appears in a 1999 press release, in which the Interactive Learning Centers (ILC), an Atlanta-based education business, announced a change of name to EPIC Learning. The release mentions that "The Company currently operates 220 on-line courses, but will begin offering its Internet courseware using the company's Blended Learning methodology." The term "blended learning" was initially vague, encompassing a wide variety of technologies and pedagogical methods in varying combinations (some making no use of technology whatsoever). In 2006, the term became more concrete with the publication of the first Handbook of Blended Learning by Bonk and Graham. Graham challenged the breadth and ambiguity of the term's definition, and defined "blended learning systems" as learning systems that "combine face-to-face instruction with computer mediated instruction". In a report titled "Defining Blended Learning", researcher Norm Friesen suggests that, in its current form, blended learning "designates the range of possibilities presented by combining Internet and digital media with established classroom forms that require the physical co-presence of teacher and students".

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Blended learning (also known as hybrid learning) is a method of teaching that integrates technology and digital media with traditional instructor-led classroom activities, giving students more flexibility to customize their learning experiences. In the Oxford Dictionary the term "blended learning" has been defined as, "a style of education in which students learn via electronic and online media as well as traditional face-to-face teaching". Basically, defining hybrid or blended education is a trickier task than one might think–opinions vary wildly on the matter. In a report on the merits and potential of blended education, the Sloan Consortium defined hybrid courses as those that "integrate online with traditional face-to-face class activities in a planned, pedagogically valuable manner." Educators probably disagree on what qualifies as 'pedagogically valuable,' but the essence is clear: Hybrid education uses online technology to not just supplement, but transform and improve the learning process. In Wikipedia it mentioned that blended learning is an approach to education that combines online educational materials and opportunities for interaction online with traditional place-based classroom methods. It requires the physical presence of both teacher and student, with some elements of student control over time, place, path, or pace.

In general, blended learning refers to the following:

- Some learning happens online in a format where the student has control over the path and pace at which they engage with content
- Some learning happens in an instructor-led classroom
- Online and in-person learning is complementary, creating a truly integrated learning environment

Just think for a moment about some related practices and phrasing: "blended education", "eLearning", "remote learning", "hybrid learning", and "flipping the classroom". All of these practices involve learning, the concept of place or distance, and the use of technology. Whatever one chooses to call it, blended learning combines classroom and online education. And because of improvements in both school curriculum and digital technology, as a learning model it continues to gain momentum. While education experts continue to debate the efficacy of hybrid learning, its existence has challenged them to re-evaluate not just technology's place in (and out of) the classroom, but also how to reach and teach students more effectively.

Most importantly, the power of blended learning methods lies in their ability to improve the student experience. Studies have shown "blended learning" reduces failure rates, improves learning, and boosts engagement. Blended learning combines the best aspects of face-to-face teaching and online instruction in ways that enable students to learn at their own pace. For example, a student in a blended learning course who masters a concept earlier than his peers can move on without having to wait, and conversely, a student who needs more time is not forced to move forward before fully grasping the subject. It is proving to be a scalable learning model that simply works for diverse populations of students.

Thus, it is an instructional methodology, a teaching and learning approach that combines face-to-face classroom methods with computer mediated activities to deliver instruction. This pedagogical approach means a mixture of face-to-face and online activities and the integration of synchronous and asynchronous learning tools, thus providing an optimal possibility for the arrangement of effective learning processes.

FEATURES:
Blended Learning environment has certain essential features as:

- Increased student engagement in learning
- Enhanced teacher and student interaction
- Responsibility for learning
- Time management and flexibility
- Improved student learning outcomes
- Enhanced institutional reputation
- More flexible teaching and learning environment
- More amenable for self and continuous learning
- Better opportunities for experiential learning

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MODELS OF BLENDED LEARNING:

Although there are four basic models of blended learning, the possibilities are endless when it comes to the ways in which instructional technologies can be blended into a teacher's pedagogical approach. The flipped classroom, for example, is one type of blended learning model in which students view lecture material prior to class, and then spend class time engaging in exercises under the supervision of the teacher.

There is little consensus on the definition of blended learning. Some academic studies have suggested it is a redundant term. However, there are distinct blended learning models suggested by some researchers and educational think-tanks. These models include:

- **Face-to-face driver –** where the teacher drives the instruction and augments with digital tools.
- Rotation – students cycle through a schedule of independent online study and face-to-face classroom time.
- Flex – Most of the curriculum is delivered via a digital platform and teachers are available for face-to-face consultation and support.
- **Labs –** The entire curriculum is delivered via a digital platform but in a consistent physical location. Students usually take traditional classes in this model as well.
- Self-blend – Students choose to augment their traditional learning with online course work.
- **Online driver –** Students complete an entire course through an online platform with possible teacher check-ins. All curriculum and teaching is delivered via a digital platform and face-to-face meetings are scheduled or made available if necessary. It is important to note that even blended learning models can be blended together and many implementations use some, many, or even all of these as dimensions of larger blended learning strategy. These models, for the most part, are not mutually exclusive. There are many components that can comprise a blended learning model, including "instructor-delivered content, e-learning, webinars, conference calls, live or online sessions with instructors, and other media and events, for example, Facebook, e-mail, chat rooms, blogs, podcasting, Twitter, YouTube, Skype and web boards".

ADVANTAGES:

The advantages of blended learning for students include increased learning skills, greater access to information, improved satisfaction and learning outcomes, and opportunities both to learn with others and to teach others. Recent research identifies the following key benefits of blended learning:

- Opportunity for collaboration at a distance, where individual students work together virtually in an intellectual endeavour as a learning practice.
- Increased flexibility as technology-enabled learning allows for learning anytime and anywhere, letting students learn without the barriers of time and location but with the possible support of in-person engagement (any speed, any mode, and any language).
- Increased interaction as it offers a platform to facilitate greater interactivity between students, as well as between students and teachers.
- Enhanced learning through additional types of learning activities improve engagement and can help students achieve higher and more meaningful levels of learning.
- Learning to be virtual citizens because learners practice the ability to project themselves socially and academically in an online community of inquiry. Digital learning skills are becoming essential to be a lifelong learner, and blended courses help learners master the skills for using a variety of technologies.
- Making Blended Learning Work Technology Integration in itself is not necessarily blended learning.
- Blended Learning provides making learning resources and experiences repeatable, reliable and reproducible.

Thus, blended learning offers benefits to both the players. It helps students to explore technology and use different tools or techniques for learning, for example, PowerPoint, Virtual classrooms, Video lectures, etc. It improves the quality of education and information assimilation while making teaching more efficient and productive. Most importantly, blended learning provides a more flexible approach to education on two distinct levels. For students, it gives them the freedom to find a way of learning that will help them understand content on a deeper level – this approach to instruction banishes the idea of one-size-fits-all education.

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CONCLUSION:

From the above discussion it is very much clear that blended learning is not a mere mix of online and face-to-face mode, but it refers to a well-planned combination of meaningful activities in both the modes. The blend demands consideration of several factors, mainly focussing on learning outcomes and the learner centred instructional environment.

It is to be noted that blended learning mode is to be used nation-wide to help learners develop 21st century skills along with the effective learning and skill development related to the subject-domains. It should be carefully implemented and should not be replacing classroom time as a privilege. Every institute should strive to be a model institute to demonstrate a successful implementation of blended learning at every level of education.

Finally, it is to be said that with the emergence of digital technologies and the emerging importance of leveraging technology for teaching-learning at all levels from school to higher education. The National Education Policy (NEP) 2020 of India in particular recommends for use of blended models of learning. The policy states that while promoting digital learning and education, the importance of face-to-face in-person learning is fully recognized. Accordingly, different effective models of blended learning will be identified for appropriate replication for different subjects. This suggests that instead of blind adoption of blended learning, wise adoption of it very much necessary to ensure its benefits.

Authors' Contribution:

The author has conceived the idea of this research study through his readings on the subject, actual real-life experience had during the COVID-19 pandemic situation, and by understanding scenario in the world; developed the conceptual framework; collected the information and processed it; and wrote the research paper.

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OWNERSHIP STRUCTURE AND REAL EARNINGS MANAGEMENT, THE MEDIATING ROLE OF TECHNOLOGICAL INNOVATION, A CONCEPTUAL STUDY

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ABSTRACT
The purpose of this study is to provide a comprehensive description of the relevant literature related to the mediating role of technological innovation on the relationship between the ownership structures, namely; family ownership, managerial ownership and Real Earning Management (REM) via comparative quantitative research method. As a result, this study predicts that family and managerial ownership may play a prominent role in real earning management through the mediating role of technological innovation . The outcomes of the paper further widen the literature related to understanding the influences of ownership structure on earnings management in the context of emerging economies.

Keywords: Family Ownership, Managerial Ownership, Technological Innovation , Real Earnings Management

1.0 INTRODUCTION

In today's financial market, accounting manipulation, fraud, and scams are emerging issues in corporate world. In firms with previously managed earnings, financial fraud is significantly greater in corporate accounting practice (Perols & Lougee, 2011), high-profile corporate failures, fraud and massive corruption are very high in the world economy during financial crisis period, such as the American International Group, Enron, Freddie Mac, HealthSouth, Tyco and WorldCom that have occurred worldwide (Sorensen & Miller, 2017). Thus, regulators worldwide have begun to concentrate on corporate governance systems, particularly ownership structure aspects to enhance the quality of financial reporting (Al-Fayoumi et al. 2010). Similarly, corporate failures in Sri Lanka, such as Golden Key Card Company, Pramuka Savings, Development Bank, Lanka Marine Services Ltd, and Vimukthi Corporation Services Ltd collapsed due to material financial manipulation due to poor accounting practices leading to a lack of stakeholder control (Edirisinghe, 2015), because managers purposefully alter financial records or manipulate the financial information to mislead users (Healy & Wahlen, 1999), and managers generally preferred to manipulate the discretionary expenses (e.g. research and development, and training expenses) to improve the cashflow in financial report (Roychowdhury, 2006). Thus, the manger uses Real Earning Management (REM) practice since it is less detectable even if participating firms are more expensive (Cohen, Dey & Lys, 2008). However, the range of discretionary spending for REM limit the technological innovation potential if their Research and Development (R&D) intensity proves to below the industry average for firms (Brown, 1997).

On the other hand, the literature on innovation has shown that the technological innovation influenced by dynamics of ownership structure (Lee & O'Neill, 2003) such as, family and managerial ownership. Family ownership is the dominant form of business around the world and there is ample literature that studies family ownership issues (Villalonga & Amit, 2006). For instance, the literature shows that family owners follow strategies of conservatism by maintaining regular income and restricting investment in innovation to avoid risk, which ensures the security of their wealth (Claessens, Simeon, Fan & Lang, 2002). Moreover, Rezvani, Khosravi, and Dong (2017) found that the high level of involvement in ownership by top managers can positively influence different facets of management such as innovative management practices.

Prior research in earnings management, the researchers mainly examine the influence of ownership structure on accrual earnings management (AEM), such as, family ownership (e.g. Wang, 2006; Yang, 2010; Adıguzel, 2013), managerial ownership (e.g. Gabrielsen, Gramlich, 2002 ; Yang, Lai, & Leing, 2008; Alves, 2012) on AEM. However, our understanding of the corporate governance effect of ownership structure on technological innovation, and technological innovation on real earnings management (REM) is limited. Furthermore, the role of ownership structure on innovation from the agency perspective does not capture the relationship in the emerging markets (Choi, Park and Hong (2012). Thus, we aim to provide evidence from Sri Lanka, on the relationship between ownership structure and REM, and the role of technological innovation in between ownership structure and REM . Recent research in Sri Lanka reveals that listed companies' specific characteristics are dominated by family and management ownership and have large influential shareholders (Kuruppuge, Ekanayake, & Nedelea, 2018), and management ownership in Sri Lanka is far higher than institutional and foreign ownership (Smarokoon, 1999). which probably has a fundamental influence on REM, on the other hand, the percentage of managerial ownership continuously increases and represents a significant part of managerial wealth and innovation project in Sri Lankan companies. Thus, we focus on two undiscussed

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dimensions of ownership structure related to Sri Lankan listed firms: family ownership and managerial ownership, and we propose to examines how their ownership structure effect technological innovation and REM. In addition, we propose to examine the mediating role of technological innovation in the relationship between ownership structure and REM .

This paper will extend the existing research in agency theory by integrating both an institutional and an external resourcing perspective to provide a better framework for evaluating the effect of ownership structure on technological innovation and REM in emerging economies. Further, prior research has only directed on the relation between ownership structure and AEM. Besides the limited empirical studies, they have focused mostly on R&D activities in family-controlled business, leaving the direct examination of the role of family and managerial ownership on technological innovation. Thus, we contribute the agency theory and earning management literature by examine the relationship between ownership structure and REM, and investigating the mediation role of firm innovation in the relationship between ownership structure and REM.

The remainder of this research proposal is organized as follows. Section 2 presents the literature review and hypotheses development. Section 3 introduces the dataset and describes the variable design and econometric models. Section 4 concludes the study with implication.

2.0 LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1 Earnings Management

Roychowdhury (2006) defines earnings management as "management actions which deviate from the usual practice taken to meet certain thresholds of earnings'', earnings management is classified as Accrual Earnings Management (AEM) and Real Earnings Management (REM). Managers intend to mislead stakeholders in published reports to have confidence and use earnings information (Roychowdhury, 2006). Thus, managers prefer REM since it is hard for external parties to find out about REM compared to AEM (Graham et al. 2005; Zang, 2012). Also, REM has affected the company's actual performance compared to manipulating accruals (Baber & Fairfield, 1991). In developed countries, earnings management has been studied extensively (Alves, 2012; Habbash, 2013; Alhadab, 2018). However, developing countries like Sri Lanka, where there are still weak investors' right and legal protections issues related to REM continue to deserve research attention and empirical investigation. Furthermore, previous research on earning management only investigate the composition of the board of directors, the size of the board of directors, the financial competence of the board of directors, stock return, and ownership structure on AEM in Sri Lanka (Bhaumik & Gregoriou, 2010; Wijesinghe and Kehelwalatenna, 2017; Anver & Buvanendra, 2019). Therefore, we contribute to the existing literature in earnings management by focus on family, managerial ownership structure and in real earnings management through the mediating effect of technological innovation.

2.2 Family Ownership and REM

As family owners often have an active role in managing companies (Anderson & Reeb, 2003), they are autonomous to adjust their regular operations and investment activities. Family companies more often implement REM in developing countries than AEM (Cohen & Zarowin, 2010). Although earnings management studied in recent decades, research in the family-based business is still limited (Vieira, 2016). Based on the agency theory (owners-managers), Fama and Jensen (1983) presumed a significant role of family ownership in reducing agency problems. Also, Gomez-Mejia et al. (2007) has developed a "Socio-Emotional Wealth Theory" which speculates that family ownership would accept financial performance without achieving the goal of preserving it is Socio-Emotional Wealth for the next generation. The existence of controlled stakeholders is a high level of ownership in Sri Lanka, and the number of businesses is family-owned enterprises (Mapitiya et al . 2016). Previous studies have shown that family ownership is linked to higher earnings quality REM (Chen et al . 2015; Achleitner, Günther, Kaserer, & Siciliano,2014). Similarly, Achleitner et al. (2014) state that family firms in the US are less likely to manage earnings than non-family firms, and family firms tend to have a negative impact on REM in Indonesia. Furthermore, Achleitner et al. (2014) provided evidence that Bangladesh's family firms are engaged in REM. Chen et al. (2015) also found that REM is lower for family firms than non-family firms. Thus, I propose the first hypothesis as follows:

Hypothesis 1: The level of real earning management relates negatively to the percentage of family ownership structure

2.3 Family Ownership and Technological Innovation

Drawing from agency theory, the agency problems in firms of developed markets exist afflict family firms in emerging markets. However, we argue that the degree of such agency problems, particularly between majority and minority shareholders, are less severe. The benefits of concentrated family ownership that help overcome

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institutional underdevelopment and facilitate in obtaining external resources outweigh these agency costs, and these benefits are essential for technological innovation. Whereas the agency theory drives the internal corporate governance mechanism, external mechanisms, such as institutional development, complements the impact of family ownership on innovation in emerging markets and promotes the evolution of dynamic capabilities for innovation in family firms. According to the previous studies, Lee and Neill (2003) show that the dynamics of ownership structure can influence technological innovation. However, Le Breton, Miller, and Lester (2011) found contrasting evidence of family firms' investment in innovation. Similarly, Claessens, Simeon, Fan, and Lang (2002) reveals that family owners follow conservatism policies by maintaining their daily revenues and limiting investment in innovation to reduce risks, thus safeguarding their capital. hence, I propose the second hypothesis;

Hypothesis 2: There is a negative relationship between family ownership and technological innovation.

2.4 Managerial Ownership and REM

Managerial ownership is the second key factor in ownership. Morck, Shleifer, and Vishny (1988) suggest that if management owns a large proportion of its ownership, its market value should increase. In other words, if management ownership increases as a firm stock, they will be more likely to align their strategic goals with shareholders' goals gradually. Previous literature on managerial ownership and earnings management shows that managerial ownership is positively linked to earnings management (Mitani 2010; Cheng & Warfield 2005), while Warfield et al. (1995) claim that managerial ownership affects managerial earnings management practices. Consequently, earnings management activities expected a significantly negative association with management ownership. Banderlipe (2009) argues that high managerial ownership reduces earnings management and that an increase in manager shares discourages managers from participating in manipulating earnings. Warfield et al. (1995) found a positive, significant relationship between managerial ownership and accrual earnings. However, the above findings only study the effect of ownership on AEM and do not study REM.

According to agency theory, managerial ownership can encourage managers to improve the firm value and align interests between managers and shareholders. Higher management ownership could therefore restrict earnings management incentives to enhance short-term compensation — the higher the percentage of managerial ownership, the more significant the negative impact on earnings management (Chen, Cheng, Lo, & Wang, 2015) (cited in Dong, Wang, Zhang, &Zhou, 2020). The share of management ownership in Sri Lanka is considerably higher than institutional and foreign ownership (Smarokoon, 1999). Thus, I propose the third hypothesis as:

Hypothesis 3: The level of real earning management relates negatively to the percentage of managerial ownership structure

2.5 Managerial ownership and technological innovation

According to the agency theory, it indicates that the purposes of managers and owners can differ when ownership is separated from management. Failure to own the firms they managing will lead to a lack of management's ability to promote or take through the risk associated with innovation (Wright et al., 1996). Managers can also be encouraged to make greater efforts in decision-making, allocation of resources and management for R&d activities (Jensen & Meckling, 1976). As a result, the management ownership makes the wealth of executives more dependent on the long-term success of their firms. This provides an opportunity for managers to encourage innovation that will improve their companies' productivity in the long run (Zahra et al., 2000). Further, Song, Wei, and Wang (2015) concluded that the more the agents (managers) were invested in the company and allowed to take risks and plan for the firm's future, the more innovative they get. Finally, Rezvani, Khosravi, and Dong (2017) also found that the high level of involvement in ownership by top managers can positively influence different facets of management such as innovative management practices. Thus, we propose the fourth hypothesis:

Hypothesis 4: There is a positive relationship between managerial ownership and firms' innovation

2.6 Technological innovation and REM

According to innovation literature, the companies as marked with a high innovation potential if their R&D intensity proves to exceed the industry average for firms having reported positive R&D spending range (Brown, 1997). Subsequently, in earning management literature, Roychowdhury (2006) found evidence that managers willingly manipulate cashflow with the intention to minimise or eliminate the annual losses by providing discounts to increase the sales revenue, thereby engaging in lower cost of goods sold, thus actively minimizing discretionary spending, such as advertising, research and development (R&D), employee training and

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maintenance with the purpose of increasing margins. Furthermore, the reduction in R&D might engender a reduction in cash outflows and, consequently, an increase in abnormal operating cash flows which improve the real earning during the income management period. In the same vein, Chouaibi, Zouari and Khlifi (2017) also reveal that R&D intensity engage in upward REM in innovative firms. Therefore, we propose fifth hypothesis,

Hypothesis 5 : There is a positive relationship between technological innovation and REM

2.7 Mediating role of technological innovation.

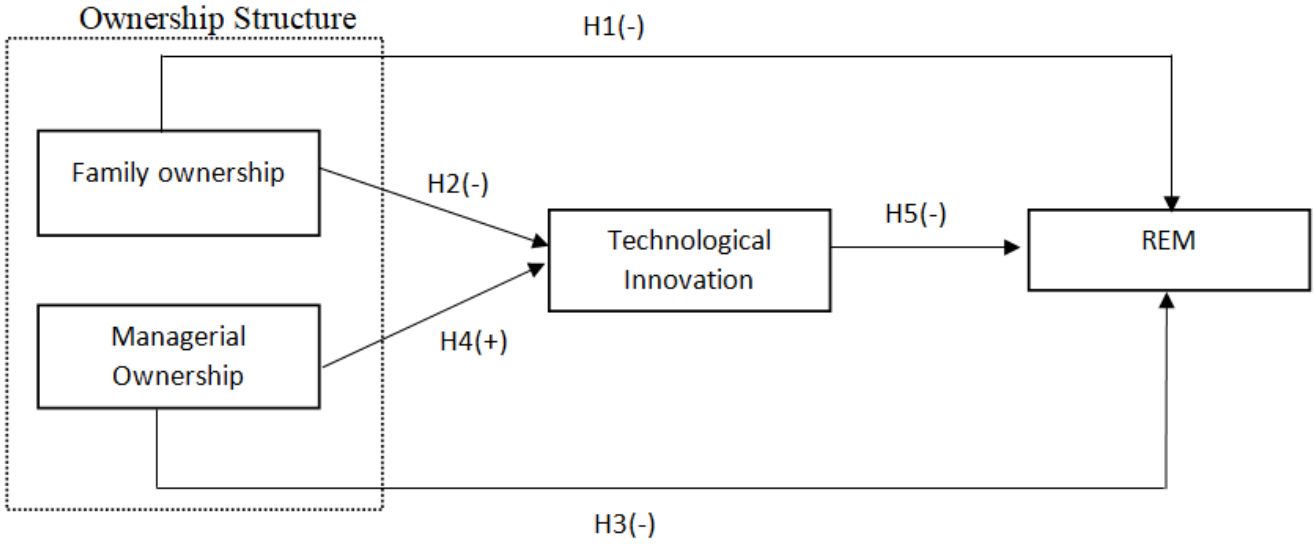
Combining the arguments from the above hypothesis two four and five, we predict a mediating role of technological innovation in the relationship between ownership structure and REM , such that high level of involvement of management in firm ownership structure enhances the R&D activities because they bear significant risks in the event of failure of such an activity and have a positive influence on innovation policy (James, 2005). Furthermore, higher family shareholding is negatively associated with R&D investments due to the risk-aversion of controlling families and their need for stability and cash flow protection (Munari, Oriani & Sobrero, 2010). Consequently, the management adjust reported profits towards an increasing trend for earning management by manipulating the discretionary spending in R & D activity of technological innovation. In contrast, cashflow (real earnings) arises when the discretionary expenses of innovation activities are manipulated, and innovation decisions occur when management takes control of the firm. Thus, the baseline relationship is not complete without the bridge firms' innovation. Therefore, I propose the final hypothesis,

Hypothesis 6a: Technological innovation mediates the relationship between family ownership and REM.

Hypothesis 6b: Technological innovation mediates the relationship between managerial ownership and REM

Conceptual Model

A model illustrating the hypotheses is shown in Figure 1



Note: Hypothesis 6 (not shown) states that technological innovation mediates the relationship between ownership structure and REM.

3.0 RESEARCH DESIGN

3.1 Data and Sample

The current study investigates Sri Lanka's real earnings management phenomenon, and family and management ownership structure. Secondary data from the published annual CSE reports form the population for this study. All 206 companies take part in the sample, based on the availability of the data other than 15 Bank , 50 Finance and 11 Insurance sector companies were eliminated from the sample because they are highly governed by stringent rules and regulations and follow a diverse method of the accounting treatment for their financial statements. Data collection coincide with the economic boom, recession, recovery and stabilisation of 2011/2012 to 2019/2020. This time, therefore, makes it possible to study the activities of REM under different economic conditions. This study uses a quantitative approach to measure family and management ownership's effects on REM activities.

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3.2 Measuring Variables

Main variables in this study and their measurement have adopted from current literature, as confirmed by significant researchers in earning management. Roychowdhury (2006) argues that manipulation in different directions affects operating cash flows, making the net effect ambiguous as abnormal cash flows are only considered a robustness test. Thus, this research proposed by three REM metrics; Abnormal cash flows from operation (ACFO), Abnormal production costs(APROD), and Abnormal discretionary expenses (ADISX), Also, this research proposed the measures for family ownership structure (OWNFAM); family or an individual as the, 'controlling family' when the entity mutually owns at least 10% of the firm's total shares (Claessens et al., 2000), and managerial ownership (OWNMAN); the percentage of common stock directly owned by the board of directors (Guo and Ma, 2015).

Furthermore , this study proposes the technological innovation as mediating variable on the relationship between ownership structure and real earnings management. The variable, as represented by R&D intensity, is measured under the form of R&D investments to the firm sales ratio, as expected from the data stream database, as a proxy of the firm's technological innovation level (Lundstrom, 2002). This operationalization proves to testify the importance extent allotted to R&D in respect of the firm's overall strategy. This variable is lagged by every single year in the panel structure in order to allow for temporal manifestations of our advanced presumption effects. The definition of main variables is presented in Table 1.

In Addition to the main variables for empirical analysis, in this study we use control variables to ensure greater robustness and validity results, namely, Firm size (FSIZE) , Firm growth (FGRWTH) , Return on Assets (ROA) , Leverage (LEV) and Audit quality (ABIG4). Definitions of control variables for the current study have presented in Table 1:

Table 1: Definitions of variables

Variable	Acronym	Definition	Evidence
Dependent Variable			
Abnormal cash flows from operations.	ACFO	Cash flow from operations as reported in the statement of cash flows (CFO)	Roychowdhury (2006).
Abnormal production costs $_{it}$	APROD	The sum of costs of goods, sold (COGS), and the change in inventories (ΔI).	Roychowdhury (2006). Roychowdhury (2006).
Abnormal discretionary expenses $_{it}$	ADISX	The sum of advertising expenses, R&D expenses and Selling, General and Administrative Expenses (SGA).	
Independent Variables			
Family ownership.	OWN FARM	Family or an individual as the, 'controlling family' when the entity mutually owns at least 10% of the firm's total shares.	Claessens et al. (2000)
Managerial ownership.	OWNMGT	Percentage of common stock directly owned by the Board of Directors,	Guo and Ma (2015)
Technological Innovation	TECINO	R&D investments to the firm sales ratio The number of patents registered and the Intellectual Property Rights Index.	Lundstrom, (2002) Jalles (2010)
Control Variables			
Firm size	FSIZE	Natural logarithm of sales of firm i for the period t	Yasser and Mamun (2016)
Firm growth	FGRWTH	Sales growth of firm i form the period t−1 to t.	Ji et al. (2015)
Return on Assets	ROA	Net income (Profit after tax) divided by total assets	Alzoubi (2016)
Leverage (LEV)	LEV	Ratio of total debt at the end of the period to the total assets at the end of the period t of firm i	Lai and Tam (2017)
Audit quality (ABIG4)	ABIG4	Coded "1" if the auditor is a Big 4 audit firm, and "0" otherwise of the firm i for the period t	Chen et al. (2007)

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3.4 Estimation Model

Following Roychowdhury (2006), we propose three matrices of normal cash flow from operations, production costs, and discretionary expenses in the following equations for the measurement of real earnings management estimates for each firm and year.

$$CFOit /A it -1 = \alpha0 + \alpha1 (1/A it -1) + \beta1 (St / A it -1) + \beta2 (\Delta S it / A it -1) + \varepsilon t, \quad (1)$$

$$PROD it /A it -1 = \alpha0 + \alpha1 (1/A it -1) + \beta1 (Sit / A it -1) + \beta2 (\Delta S it / A it -1) + \beta3 (\Delta S it -1 / A it -1) + \varepsilon t, \quad (2)$$

$$DISEXP it /A it -1 = \alpha0 + \alpha1 (1/A it -1) + \beta(S it -1 / A it -1) + \varepsilon t, \quad (3)$$

where,

Ait : Total assets at the end of period t, Ait-1 is the lagged total assets.

S it : Sales from the ordinary operation of firm i in year t.

ΔS it : Changes in sales from the ordinary operation of firm i in year t, ΔS -1 is the lagged total asset.

β : Coefficients.

α : Intercept.

εt : Residual of firm i in year t.

CFO i, t ; cash flow from the operation of firm i in year t.

PROD i, t : production costs of firm i in year t.

DISXP i, t : represents the discretionary expenses of firm i in year t.

In REM measurement, company-year residuals from the above regression equations, calculate as abnormal cash flow (ACFO), abnormal production costs (APROD), and abnormal discretionary costs (ADISX) (Roychowdhury, 2006). We then aggregate the three real measures of manipulation of activities into one proxy, AREMt, by taking its sum as follows:

$$AREMiit = A CFO it + A PROD it + A DISXP it \quad (4)$$

Then, we propose the following models to estimate the regression in order to find the association between family ownership, managerial ownership, and real earning management:

$$AREM it = \beta0 + \beta1 OWNFAM it + \beta2 OWNMGT it + \varepsilon i \quad \text{(Model 1)}$$

$$TECINVO it = \beta0 + \beta1 OWNFAM it + \beta2 OWNMGT it + \varepsilon i \quad \text{(Model 2)}$$

$$AREM it = \beta0 + \beta1 TECINVO it + \varepsilon i \quad \text{(Model 3)}$$

$$AREM it = \beta0 + \beta1 OWNFAM it + \beta2 OWNMGT it + \beta3 TECINVO it + \varepsilon i \quad \text{(Model 4)}$$

$$AREMit = \beta0 + \beta 1 OWNFAM it + \beta 2 OWNMGT it + \beta3 TECINVO it + \beta 4 FSIZE + \beta 5 FGRWTH + \beta 6 FLIV + \beta 7 ROA + \beta 8 ABIG4 + \varepsilon i \quad \text{(Model 5}$$

4.0 CONCLUSION

Despite the introduction of many new control mechanisms, it has expected that the general trend of financial fraud will continue to increase, particularly in developing countries. Then it is essential and timely to consider the factors that affect the intentions of REM expropriation. For two key reasons, REM is a very critical financial issue for any business firm. First, it entails cash flow implications, and second, it is tough to detect than AEM. The research proposal is organised in the summary of the literature and addresses the current research gap in the literature by investigating whether family and managerial ownership significantly impact the technological innovation and REM. Further, the we expected examine the mediating role of technological innovation on the relationship between family , managerial ownership and REM. This research can contribute to complementing the agency theory by integrating both an institutional and an external resourcing perspective to provide a better framework for evaluating the effect of ownership structure on technological innovation and REM in emerging economies. Besides the limited empirical studies, they have focused mostly on R&D activities in family-controlled business, leaving the direct examination of the role of family and managerial ownership on technological innovation. Thus, we contribute the agency theory and earning management literature by extend prior research on the relationship between ownership structure and REM through examining the mediation role of firm innovation in the relationship between ownership structure and REM. The finding also significant in reducing the risk of protecting shareholders, debt holders and suppliers of financial capital

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from earnings mismanagement. Finally, this study would also improve auditors' knowledge of detecting REM activities.

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COMPETITIVE STRATEGIES FOR PLATFORM ECONOMY

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ABSTRACT
In today's marketing environment it will be difficult for any manufacturer or a marketer to think about his product reach without the use of the platform economy. As per one of the reports 47% of the people go for search of their products in Amazon. This is particularly true since last decade. As company's becomes dependent on platform economy. The platforms are taking advantages of this structure by framing the rules in their favour as they know that they have the right to dictate the rule on continuity of the dependent business, taxing or charging the fee as per their thoughts, they are judge, jury & the rule-maker, they even have the right to dictate the pricing of products or what all priced products can be on their list on the platform, restricting customer relationship with the platforms which is the biggest tool for any independent businesses can have (relationship of a particular business with their customers), governing all these in their favour poses dependent businesses a major threat not only for their growth but also for the survival. This paper discusses about these challenges in detail & the ways to mitigate these challenges along with the strategies to move forward.

Keywords: Marketing Strategies, Competitive strategies, internet platforms.

INTRODUCTION:

In business data is of prime importance for its competitiveness. Platform economy works with data through the machine learning tools which allows you to attract more customers as you are directly giving them the option of their liking for the products or in many cases even addressing their requirement to a great extent. The product on the platform economy can collect information such as customer personal details, choices of content, search behaviour, social media posts & their usage patterns etc. So after studying these patterns via machine learning & than algorithm find out the ways to put it across the targeted customers. These data based learning are much more useful than consumers insights gathered earlier. The attempt had been made here to appreciate utilities of platform based economy, explore the challenges coming across & suggest ways by way of giving strategies to mitigate the challenges as in today's world these platform interfaces cannot be avoided by businesses at large.

Research Methodology: The author's for the paper has done extensive secondary research with the latest research papers published particularly in last two years along with the latest addition of the reputed magazines covering the topics on digital tools being used by the organisations to serve the customers in this competitive world. Also the example of the various organisations in different sector has been quoted to cover the diversification of sectors in terms of digital adaptation.

Literature Review: Digital internet platforms like Amazon, Google have changed the way the products were earlier getting marketed particularly from the last decade. These platforms not only have rewritten the rules of the game in which they would like to engage with the organisation that uses the platform like Amazon as an intermediary for their products. The dynamics of value creation & competitions had been reorganised by these digital platforms. The organisation that wants to market their products feels the need to be on these digital platforms not only for the growth but even for their survival also. Digital platform performs the function of providing the sellers the place to showcase their products & buyers gets to know the similar products description along-with the current scheme/s with those products so that the buyer can take the decision of what suits the best for them. The aim of the platform is to provide the seller a large number of customers for their products and to the buyer the choice's available for their demand/s. The entry cost for the seller & the advertisers are low. On the other end buyer pays only when he actually buys. Here the aim of the digital platform is to increase & have largest market share in comparison to its competitors. The success of the platform depends upon market share that it has and the earning that it will have by charging a substantial tax (fees) to a product to be sold through their platform.

The need for platform had become the necessity for any product organisation and most of the company's do not have the platform of their own. These companies are increasingly dependent on Platforms for their businesses & also compete with them. However more you are depended on them the greater the challenges you may come across. The various challenges are discussed here as:

a) Continuity Predictability: Decade old rules of the game like "Loyalty pays in the long run" can be thrown out with the arrival of the new arrangements. This can be well explained with the help of new happening in Jan 2019, when e-commerce platform Amazon closed the deal with the Apple to sell its products with a

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preferential arrangement. Amazon wrote the letter to all its small businesses partners who were doing business in refurbished Apple products stating that your existing offers will be removed from an upcoming date. These small businesses were doing the business with e-commerce giant since 2011 and for them it was like end of their businesses & livelihood like a knee-jerk reaction.

b) Favouring self-business - Unfair Play: Expedia's CEO had mentioned that when you search for Travel platform, it will show how Google's platform will get favoured. It will therefore said that there are entities like Google , Amazon & likes of these bodies are putting other out of their own business due to mechanism in the system which leads to unfair play.

c) Tax or Fees charged: E-commerce platform charges a particular fee for using its marketplace which is quite high as Google charges to the tune of 30% of all revenue earned in their App stores. Esty takes 20% plus 5% on its transactions costs which also includes shipping. Whereas You-tube is charging 45% of the revenue created by its content creators. The company like Epic systems had filed a legal complained against Apple & Google saying that no matter to whatever extent (heavy amount of business) that they do the fees charged are non-negotiable.

d) Powers to Platforms: The e-commerce platforms have unilateral powers like they are rule-makers, judge, jury & Gate-keeper. The businesses who want to take advantage of the platform can either accept the rules or they can exit it.

e) Limiting Unique Selling Preposition: As per management Guru Michael Porter, the better you differentiates your product or service as a seller the better value/price that you will command in the eyes of the customers but the platform economy limits all these creativity as they follow the system of equitable information should get displayed by all the sellers when the customer searches a particular product category. Terms like description of the product, search terms and various images are governed by the platform. Since the platform is looking for their own interests & they do not value/ care about the interests of the dependent businesses.

f) Constricting Pricing: On kindle platform the amazon discourages the pricing on the books if they are below 2.99 $ or above 9.99$ and it penalizes the publisher by halving their pay-outs from 70% to 35% of sale price. By doing these Amazon does not want anyone to enter the e-book market. Also as the Spotify, Apple Music & You Tube has their playlist created with different labels as the Amazon does like that. Whereas if these labels could had come separately they could had charged multiple pricing based on their differentirion and uniqueness. This flexibility goes away because of being on the e-commerce platform.

g) Customer relationship owned by the Platform: The buyer buys the products from the sellers via the platform but the system is designed in such a way that to avoid the contact or relationship between both of them (buyer- Seller). This being the major hurdle in building further relation of the seller with buyer & subsequently there cannot be further organic growth. Also the business can be suspended even without giving any warning. There was a case of multimillion Weapon Company manipulating the reviews in their favour. It came out later the account was hacked by its competitor & they did all this in order to put the weapon company in a fix & thereby getting their delisting. By the time the truth got revealed, it had already lost the business worth of 1, 50,000 $ during its suspension.

h) Platform taking undue Advantage: When a particular market segment /product which its dependent sellers are doing a business gets successful than the Amazon tries to use that segment/product made by third party as its competition. Here the Amazon is using the existing product seller as a testing bed. Testimony to all this was a third party vendor who was selling car trunk organiser. When the product got hit it's all the details were taken up by the Amazon employee & the similar product was brought in competition. Though amazon denied all the allegations but it was indisputable.

Competitive strategies for growth in Platform Economies: The platform economy works in new environment & it has its own rules. Those businesses which want to thrive in this economy need to have following mitigating strategies for their growth:

a) Platform multi-homing: When a seller tries to put his portfolio of products in different platforms than there will be role of risk diversification to the business & if the other platforms that he had engaged in has a reach to customers which caters to different Segments than it will be good for its growth. Epic games the video game company behind Fortnite, followed the same strategy for its growth as it venture out in market in 2017. It was launched in Xbox one with limited cross-platform & later on it was available in Microsoft windows, Android, MacOS etc. The other businesses can sell the commodity very easily on different

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platform like Wal-Mart, Etsy, eBay or on Amazon, Flip cart etc. Even the Hotel industry costs to get booked through different travel agencies like Makemytrip.com, Hotel.com & Booking.com is also very low & it's beneficial to have it through multiple Platforms.

b) Channel multi-homing: Even if the business is dependent on the platform, it can be served to the customers through its own website to have a better control & also the customer relation can also be built in this way. A business of hotel even if it is done via a e-commerce platform although we cannot offer it at a lesser price via our website but the Hotel can offer it at the same price with additional spa or any other scheme valuable to the customer for free in order to have better revenue for the Hotel owner as well as building a long term relation with the customer. Another way out is like Travel book what they had done is that they are selling their high demand books through Kindle and are selling the most profitable ones via their physical store & thereby building the required customers relations also. Another way to differentiate is that without changing the price as U.K. company Chilly's bottles was doing that the reusable bottles that it was selling through its website. It was giving the customer the option of writing or engraving their name on the bottle which was not being done when it was getting sold through Amazon.

c) Marketing through E-commerce Platform: Businesses can market their products through platform as the people search their products on platform. As per report around 47% of the people do online search of their products on Amazon. The respective platform will make sure that your advertisement gets displayed when the customer is planning to look out for these products. These platforms can also be used for test marketing with low volumes that how the products gets a review & to what extent it gets into demand.

d) Using the Algorithm game: Many times it is possible to play the game of algorithm in such a way so that it works for you like how to engage customers in terms of review. Which day & time will be good to post on a particular platform or what keywords to be used or it will what kind of presentation will create quality engagement with the customers. There are other ways that some agencies get into for examples they sponsor the influencers to have more followers on Instagram or in some cases they even offer cash to new followers. Domino did this in 2017 in which they said if they follow & leave a comment on the company's profile they stand a chance to win 10,000$. That post got more than 25,000 reviews & more than 4500 likes.

e) Income diversification: After building your brand on a platform, the businesses can en-cash on the higher brand equity built on the platform as was done by Company by the name Anker which started selling replaceable laptop batteries & soon became very popular on the space with high brand equity. The company then diversified into smart phones & wall chargers so that its income does not depend only on Laptop batteries & it had multiple products to bank on or to diversify & mitigate its risk. Following the same strategy Anker diversified into many other electronic accessories. Many of the You-Tubers working on the same lines of income diversification after developing their reputation on the platform have diversified themselves into endorsing other products, getting into book publishing etc as now people know them & they respect the You-tuber. Beside income diversification, the interests of the small businesses can also be saved if the Govt. of these countries in which these platforms are operating can also mediate as was done in India by the association of small & medium size retailers in India against the Amazon & Wal-Mart in the year 2019. After listening to the arguments from both sides by the Competition commission of India asked the Amazon & Wal-Mart to stop selling their own products along with its vendors. Furthermore the Competition Commission of India also asked the platform to share their source code as well as algorithm. The other platform like Tik-Tok, Facebook, and Uber also got impacted by this decision. The learning for the companies here comes from the fact that the companies which are depended on the platform economy they need to keep evolving themselves with the changing business environment & protect their rights as either as a business entity either we on in the menu or we are there on table.

Interpretation, Conclusion & Suggestions: In this digital age if any of the business has to thrive, it requires change in mind-set. Even in the platform economy if the product has an inherent value achieved over the period of time with testing done with the increment number of customers it will be very difficult to beat or replace the product/s as in the case of Mobileye- the leader in providing advanced driver assistance system (ADAS) which provides for prevention of collision & warning signal on lane diversion. The accuracy provided by Mobileye after large number of tests with the customers is 99.99% whereas any competitors if they want to reach that level of accuracy is highly difficult in short time to give a reasonable level of competition to Mobileye. As the accuracy is paramount here & valued so these types of innovation strategy can go long way even if platform economy prevails as it's difficult to copy it with the desired accuracy. The other strategies like platform-multi-

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homing, channel-multi-homing, using the Algorithm to your advantage as well as diversification of income stream. All these strategies go long way to mitigate the risk in platform economy.

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HISTORICIZING THE STATE: UNDERSTANDING THE IMPORTANCE OF HISTORICAL SOCIOLOGY IN INTERNATIONAL RELATIONS

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ABSTRACT
The aim of this study is to underline the importance of historical sociology for the discipline of International Relations and to suggest this research approach for the analysis of nation-state-building processes. Mainstream theories of International Relations, like neorealism and neoliberalism, argue that state behaviour is determined by the international system (or structure). Since these theories attribute to the international system and play a key role in understanding state actions without having a state theory of their own, these theories fail to understand the transformations of the state throughout history. In this research, it is argued that the discipline of International Relations should analyse the state and develop a theory of it. It is also argued that the way of achieving this goal is to historicize the state with a historical sociological approach.

Keywords: Historical Sociology, International Relations, International System, Nation-State.

1. INTRODUCTION
With the establishment of the discipline of International Relations as a separate field of social sciences, history and sociology are treated as unrelated research areas, since the discipline relies upon the distinction between local and international. Analysing the local one, in other words the state and the society, is considered as the study field of sociology and history, whereas examining the international one is seen as the mission of International Relations (Yalvaç 1991, 2013). Mainstream theories of International Relations treat history as a material storage for the validation of their theories. This has resulted in "*chronofetishism*" *a*nd "*tempocentrism*": these theories take an approach that makes the current order absolute, ignoring historical processes/transformations (Hobden and Hobson 2002: 5-7). The discipline's dominant paradigms disconnect the discourse of International Relations from both world history and relations of production. By placing the state at the centre of analysis, they exclude social classes and class struggles from the discipline (Hobden 1998, 1999). That is precisely why the discipline, although having developed historically, is dominated by neorealist approach (Hobden and Hobson 2002). Moreover, it is also very contradictory that neo-realism, a theory that considers the state as the principal actor, does not have a state theory of its own and does not attribute any role to the state in affecting the international system (Hobson 1998).

From this problematic background, this article argues the importance of historical sociology for the discipline of International Relations and its efficacy for the analysis of nation-state-building processes. Mainstream theories of International Relations, like neo-realism and neo-liberalism, argue that state behaviour is determined by the international system or structure. Hence, they fail to understand the state's transformations throughout history. This article argues the discipline of International Relations should analyse and develop a theory of the state, and that the way of achieving this is to adopt a historical sociological approach. This article provides a case study using historical sociology as an alternative method for examining Germany's nation-state-building process. It is suggested that historical sociology be employed for further studies in this research area.

2. HISTORICAL SOCIOLOGY AND INTERNATIONAL RELATIONS
There are various approaches among international historical sociology studies. This article mentions two of these approaches. The first one is the uneven and combined development model and the other one is political Marxism. Rosenberg first brought historical sociology into international relations in his 2006 essay, "Why is there no international historical sociology?" (Rosenberg 2006). He wanted to develop a historical materialist theory of international relations. Rosenberg argues the concept of the "international" originated historically in Trotsky's theory of an uneven and combined development model. This theory of uneven and combined development tries to explain it in the international context rather than looking at developments in a single society. The concept of development, used in the model, does not mean a one-way process where all states will go through similar stages, as the modernization theories suggest. Rather, development is seen as a dimension of uneven and combined social change. Studies have been carried out on the relationship between capitalism and emergence of nation states, based on this conceptual model.

Political Marxists have developed approaches that prioritize class struggle and relations of production. Teschke, the most important representative of political Marxism in the discipline of International Relations, argues that

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modes of social relations of production are the starting point for understanding the structure of and change in international relations (Teschke 2003). According to Teschke, tracking the transformation in the relations of production leads to the formation of state. Therefore, he examines both the role of social property relations and international dynamics during the capitalist transition in Europe and how these two developments affect each other. According to Teschke, modern states are shaped by both the existing capitalist transformation in social property relations and the geopolitical context. In every single state experience, social property relations are the most significant factor for understanding different transition processes. The expansion of capitalist property relations from England forms the geopolitical context which Teschke mentions. In his words: "While the endogenous development of capitalism was unique to England, its expansion was not transnational but a geopolitically mediated process that transformed the dynastic states on the continent into modern states in a long-term process of geopolitically combined and socio-politically uneven development. In this process, international relations in nineteenth-century Europe were largely about the management of the modernizing pressure created by the new British state/society complex, which puts its European neighbours at a competitive and economic comparative disadvantage. This forced state classes to design counterstrategies that led to a series of "revolutions from above" - the introduction of capitalism" (Teschke 2003: 11-12).

International historical sociology, as summarized so far, is an attempt to historicize the state. It is argued that mainstream theories of International Relations ignore relations of production and capitalism while examining state relations. At this point, historical sociology establishes a mutual relationship between internal society and the international system. In this sense, international historical sociology re-conceptualizes state. Historical sociological studies in the discipline of International Relations explore internal and external social forces that play a role in the formation of the state system. Accordingly, an historical sociological approach consists of two integrative issues: the transformative effect and pressure of the international system on social class relations, and the role of social relations in the transformation of production relations and, gradually, in the formation of the state (Halliday 2002). The traditional approach, treating the state as a function of the international system, is thus abandoned. This new approach tries to understand state within the interrelation of production relations, social forces and international system (Cox 1981). In line with historical sociology, there is no single model or social structure in the development of societies; historical change always takes place depending on the society's concrete conditions. The method of historicizing state involves investigating it in the context of a capitalist transformation of the modes of production, as well as in relation to the expanding nature of the international capitalist system.

3. THE STATE AS A PRODUCT OF THE TRANSITION FROM FEUDALISM TO CAPITALISM

The question of the emergence of the first absolutist nation states in Western Europe has developed within an old debate on the origins and evolution of capitalism in Europe. The argument that the European states system and capitalism is linked closely depends on the essential unity of politics and economics. The so called "transition debate" gives a theoretical background on the interdependence of the emergence of capitalism and the states system in Western Europe (Sweezy and Dobb 1950, Takahashi 1952, Dobb and Sweezy 1953, Hilton and Hill 1953, Ashton and Philpin 1987, Lachmann 1989). This debate on the transition from feudalism to capitalism has made major contributions to explain both the class structure and dynamics of pre-capitalist societies and the elements of the transition itself. Changes in the mode of production and class relations interact together and determine each other. The formation of a political unit and the change in the relations of production are intertwined. Another important contribution of this debate is that it has established a close relationship between social relations and class structure before capitalism -in the feudal period- and the organization of political power (Brenner 1987a, Brenner 1987b). Finally, this debate does not ignore the internationalization of modes of production in explaining the emergence of capitalism, stating that capitalism was first developed in England and that the birth of British capitalism was a factor profoundly affecting the transition to capitalism in other parts of Europe. In other words, this debate considers the uneven character of capitalist development which plays an important role in determining the transition process in continental Europe.

Political Marxists like Wood, Brenner, and Teschke define capitalism as a social order based upon social property relations whereby direct producers are forced to sell their labour to the owners of the means of production as a commodity at the market. In this definition, the logic of production and social class relations are emphasized. In capitalist relations of production, unlike the feudal one, the exploitation of labour is not achieved directly by physical means of force or violence. In feudal system, economic and political exploitation are two sides of the same coin (Anderson, 1974). By contrast, capitalism represents a rupture from feudal relations of production, since in capitalist system of production, the economic and political exploitation areas seem to be separated. This leads us to the relationship between capitalism and the state. The historical role of

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the state is important in transforming the economic and political structure of feudalism into the pure economic exploitation inherent in capitalism. In capitalism, although state and market are directly linked, they *appear* structurally as two separate areas (Brenner 1987a). Tracing the transformation of the feudal relations of production into the capitalist one leads us to the formation of the state. In Wood's words: "Just as the separation of the 'political' and the 'economic' in capitalism ended the contestation of sovereignty among competing sites of extra-economic power, so it helped to fix the state's territorial borders by detaching them from the fluctuating fortunes of personal property and dynastic connections. There were, to sum up, two sides to the historical relation between capitalism and the nation state. On the one hand, that state was not itself produced by capitalism. The 'modern' state, together with 'modern' conceptions of territoriality and sovereignty, emerged out of social relations that had nothing to do with capitalism, in the tensions between politically divided sovereignties and centralizing monarchies. On the other hand, the rise of capitalism, which took place in the context of a rising nation state, brought that state to fruition- or, to put it more precisely, the particular form of English state formation belonged to the same process that brought about capitalism. The transformation of politically constituted property into capitalist property was at the same time, and inseparably, a transformation of the state" (Wood 2002: 174175).

4. AN EXAMPLE OF HISTORICAL SOCIOLOGICAL METHOD: THE GERMAN EMPIRE

This study argues for an historical sociological approach for the analysis of nation-state-building processes. Provided here is an example of this approach in dealing with the first German nation-state, i.e., the German Empire. Following an analysis of the dominant paradigm in the German historiography, a historical sociological approach will be outlined for future studies.

Historians at the University of Bielefeld, who became renowned as the Bielefeld School, founded West Germany's critical social history in the 1960s and 1970s, leading to a paradigm shift in German historiography (Fletcher 1984). Hans-Ulrich Wehler and Jürgen Kocka, two important representatives of the Bielefeld School, pioneered an historical thesis called *"Sonderweg"*, meaning special path. This research compares historical developments in Germany with those in Britain and France. At the center of the *Sonderweg* thesis is the claim that the dominance of the great landowners (Junker class) persisted in Germany even after the feudal period (Rosenberg 1943, 1944). According to this thesis, German history deviated from the history of Britain and France because in Germany the bourgeoisie revolution failed in 1848 to terminate Junker, i.e., aristocratic landowner class, rule. In this context, Wehler claims the "feudalization" of the German bourgeoisie due to the failed revolution in 1848 (Wehler 1981: 478–487). Kocka, like Wehler, argues that German history has two significant distinctions from other Western European states. The first one is that it underwent a late and from-above nationalization process (not a bourgeois revolution from below). The second difference is that the state structure was organized along bureaucratic and authoritarian (not liberal) lines due to dominance by the Junker class (Kocka 1988). Despite these differences, the feudal relations of production transformed into capitalist ones, but without the redistribution of political power, that is, without the strengthening of the bourgeoisie against the land nobles.

While the *Sonderweg* thesis is an important paradigm in German historiography, it can still be criticized on some points. The thesis is based on the comparison of the developments in Germany with the ones in Britain and France. However, each society has specific ways of development that are shaped by its own social dynamics. The *Sonderweg* thesis expresses a modernist-positivist approach in the sense that it contains the assumption that there is a "normal" or "standard" way of modernization to be followed (Blackbourn and Eley 1984). In this sense, the most important shortcoming of the *Sonderweg* approach is that it does not include the transformation of the relations of production. The thesis leaves in the shadow the social class conflicts and transformations in the modes of production. However, as claimed in this article, there is a direct and reciprocal relationship between state-building process and capitalization of relations of production. The mistake of seeing capitalism as the historical mission of the bourgeois class is frequently repeated in the literature (Gill 2008). It is important to remember that, while the transition to capitalism features a transformation in the relations of production, this process need not occur entirely (if at all) under the leadership of the bourgeoisie. Even in Britain, the first capitalist state, the capitalist transformation in the relations of production began with agricultural capitalism, followed by industrial capitalism (Blackbourn and Eley 1984). Capitalism indicates a social transformation in the relations of production, but the landed nobility can also be capitalist. In Germany, the Junker class - the old feudal landowners - became the capitalist producers and merchants of their time (Rosenberg 1958, Rosenberg 1969). The absence of a bourgeois revolution did not mean the absence of capitalist transformation.

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With a historical sociological background, an alternative approach to German history can rely upon two main pillars. First, internal social- developments play a key role in the German case. The formation of capitalism in various countries is closely linked to the previous social structures, i.e., the internal density and organization of the existing feudal economy. The analysis of class structures and property relations in the feudal period is thus important. In terms of different historical conditions, capitalist transformation followed a different path in Germany than in France or Britain. Because this dissimilarity resulted from different class structures and property relations during the feudal era, it is crucial to examine the feudal class structures and property. Different property systems give rise to different processes of political accumulation and in turn determine organization of the state. In this way, different transitions to capitalism in Europe can be explained.

Second, the absolutist state structure must also be examined as the political unit of the transition process. The Prussian Kingdom was the key political unit in German history during the dissolution phase of feudalism and the subsequent transition period to capitalism (Blanning 1986, Gillis 1968). As the historical social origins of the German Empire can be traced back to the east of Elbe River and Prussian Kingdom, in order to understand the authenticity of the Prussian absolutist state and its expansion, the feudal period that precedes this structure must also be considered. In this way, the formation, development, and mutual interaction of social classes in establishing the relations of production can be discovered.

Furthermore, external factors also play a significant role. Studying the historical social foundations of the first united German state also means examining the transformation process from feudalism to capitalism in the region as a whole. The establishment of German political unity can only be comprehended within the context of the developments in Western Europe during the same period, i.e., the transformation of relations of production. England's transition to capitalism, as the first capitalist state, was about internal pressures, namely class struggles and change in the modes of production. But the experience is different for the ones in the second wave transition to capitalism, including that which occurred in Germany. Military and commercial competition put pressure on each of these states after the mid-19th century, as the uneven and combined development model suggests (Teschke 2003). Because of the rapid capitalization of other economies external pressures- the transition to capitalism was achieved primarily by revolutions from above. In Germany, feudal social and production relations were replaced by the capitalist ones, not through class struggles but through the pressures of a capitalizing European economy guided (from above) by the hands of the ruling class (Mitchell 1977, Taylor 2001).

5. CONCLUSION

International historical sociology rejects approaches with single development models or a single social structure. Instead, it defines two main macro processes: state formation and capitalism. If we are to examine any social process, it should be examined in relation to these two macro processes. Relations of production and class structures play a very crucial role in explaining the transition from feudalism to capitalism and the construction of nation states. At the same time, these factors should be considered together with pressures imposed by the international system on each state to participate in the capitalist world economy. In this wise, it is possible to have a holistic explanation.

This research argues that historical sociology has contributed to the discipline of International Relations in many ways, but most importantly in putting social relations and transformations onto the research agenda. International historical sociology, by moving away from a static understanding of history and an unchanging international structure, has developed an international understanding based on social relations. Furthermore, key concepts of the discipline, such as state and states system, have been put in an historical context.

This research has shown the value of utilizing a historical sociological approach through the case study of German nation state building. The evaluation of the *Sonderweg* thesis points out the importance of this research method for the study of history. It is important to place the transformations in the production relations at the center of the analysis. In line with the transition debate, the German Empire can be considered more as a transformation than a structure established in January 1871. Political unification can be understood as the political reflection of the change or transformation in the modes of production. To understand the meaning of historical processes, it is necessary to place them in a long historical perspective. In the same way, to understand the German Union, it is suggested to look at the transformation between the two modes of production, namely from feudalism to capitalism. Nation state building processes, i.e., political transformation depends upon structural transformation in the economy.

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WHAT ARE THE FACTORS ASSOCIATED WITH POVERTY IN MAHARASHTRA AND WEST BENGAL: SCENARIO FROM NATIONAL FAMILY HEALTH SURVEY (2015-16)

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ABSTRACT
Poverty is a pronounced form of deprivation in well-being and comprises many dimensions. People lacking wealth or any assets may come under poverty, but unemployment-related poverty is most common form of poverty in the above two states. National Family Health Survey provides detailed data on poverty along with several associated factors. As level of education increase people are less likely to become poor. In both the states people are living with low academic level (<23 percent) and owing worse toilet facility. A household member attained higher education is less likely to become poor (0.5 times log value) in comparison to secondary level education. Poor household member reported 'not covered' by health schemes are more likely to occur (0.4 times log value), than member reported 'covered' by health schemes. Poverty prevails with low level of health and education, poor access to clean water and sanitation. Only (7 percent) poor are getting piped water into their dwelling. The above results also shows that only (6 percent) poor have flush to piped sewer. A total of (57 percent) people have agrarian land less than 5 hectares, such tiny land holdings are inadequate for growing crops for self-need and commercial purposes. Poverty among different caste or tribes consists of (68 percent) of poor people from scheduled tribes and (52 percent) poor people are from scheduled caste category. Most of the SC and ST belong to poor wealth index; they are the worst deprived group when we discuss development based on caste in India. Most of the poor are belong to (Other religion 73 percent) and some people from (Muslim 46 percent). In both the state majority of the poor (71 percent people) do not have any bank account. But (55 percent) of poor are having their livestock. Means that despite all the negative things, poor people from both the states have a common solution towards the end of poverty cycle, and that is ranching livestock.

Key words: Poverty, Education, Health, Agricultural land, Livestock, Bank account.

INTRODUCTION

Intergenerational poverty can alleviated through education. Poverty is associated with other disadvantages, such as caste, religion, and sanitation, affecting poor children's schooling and education (Tilak, 2000). In human capital theory years of schooling and labour market experience, tells us about relation between education and economic growth (Tsujita, 2012). School dropout problem is associated with low family income situation in India. Where poverty reinforces child labour (Nambissan, 2013). Education is depicted as the only pathway to overcome poverty. As poverty adversely affect the cognitive development. The involvement of poor children's in work is seen as a significant obstacle in their education (Chandra, 2020). Poverty and health has direct relationship. There exist a vicious cycle of poverty and ill health (Wagstaff, 2002). Health care provides different choices for poor and rich people, better-off can avail of pocket expenditure (80 percent in India) of specialised medication. Still, poor die earlier than to suffer morbidity like rich people (Wagstaff, 2002 & Daggal, 2007). Health insurance coverage is an essential factor because poor people in India are in poverty and lack of savings (Gupta, & Kumar, 2007). Poverty and migration interacts with health issues over the life course (Zulu, et.al. 2011), large proportion of informal labours restricts the coverage of health insurance like RSBY (Rashtriya Swasthya Bima Yojana) in India (Pinja, et.al. 2012).

India has highest number of people defecating in the open, whereas worldwide the number is 597 million (World Health Organization). In government schools of India 40% schools reported no toilet facilities (UNICEF). Under the Swatch Bharat Mission 110 million toilets has been constructed for poor people (Banerjee, 2016). Sanitation is linked with poverty because inadequate sanitation facilities put greater risk for preventable diseases, which ultimately intensifies poverty through out-of-pocket medical expenditures (Surya et.al. 2017). Urban slum areas disposal of human waste was unsafe, impacting economic growth through public health crisis (Manasi, 2017). Rural poverty is mainly because of small land holding; in such situation rearing of livestock generates income and employment to the rural poor people (Besley, 1999). Land reforms by different government help the poor own personal agricultural land, leading to poverty reduction (Upton, 2004). Livestock supplement a farmer's income when there is a crop failure due to severe climatic conditions, with minimum initial investment and low operational cost (Otte, 2005). Major products like milk, meat, egg are good for health

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and nutrition, whereas non-food based products like manure, wool, bone, and skin are commercially valuable (Ali, 2007). Credit provision based on livestock folk help the people to overcome poverty (Bettencourt, 2015).

RESULTS AND DISCUSSION:

Table 01: Analysis of Variance (ANOVA)

Number of observation=39224		R-squared=0.5359		Root MSE=0.59	
Adjusted R-squared=0.5353					
Source	**Partial SS**	**df**	**MS**	**F**	**Prob<F**
Model	16263.26	47	346.03	962.31	0.000
Highest educational level	1120.63	4	280.16	779.13	0.000
Covered by health scheme	2.71	2	1.36	3.77	0.023
Source of drinking water	1169.00	14	83.50	232.22	0.000
Type of toilet	4506.38	11	409.67	1139.31	0.000
Agricultural land	69.54	2	34.77	96.69	0.000
Owns livestock	116.07	1	116.07	322.78	0.000
Caste or tribe	255.14	4	63.78	177.38	0.000
Religion	64.77	9	7.20	20.01	0.000

**Sum of squares (SS), degrees of freedom (df), mean squares (MS), f ratio (F), p value (Probability)*

In table 1, we see that p-value is less than F. So, the differences between sums of the means are statistically significant. Because the p-value is (0.023) and (0.000), which is less than or equal to the significance level of (0.05), we reject the null hypothesis and conclude that not all population means are equal. Type of toilet has the highest partial sum of square value, which means kind of toilet facility and source of drinking water has more variability across poverty stricken peoples. Poor people are associated with low grade or no toilet facility and low quality drinking water. Whereas wealthy people have sophisticated toilet and good quality drinking water facilities. People cover under health scheme has the lowest partial sum of square value, which says in Maharashtra and West Bengal health schemes and poverty has low variability. In both the states people are living with low academic level and worse toilet facility, but they own good livestock. Religion and coverage of health schemes varies less among poor people. That means poor people are getting few advantages of the health schemes provided by the state and central governments. The F ratio value across all the factors is more than (1.0) that means variations among group means is more than we have expected. In these results, the factor explains (0.53 percent) of the variation in the response. As adjusted R^2 is (0.0006) bit less than R^2, which indicate that the model is little over-fit. The model with poverty has higher value than residuals, which means the residuals are randomly distributed and have constant variance.

DISCUSSION

Maharashtra and West Bengal both states are having metropolitan cities like Mumbai and Kolkata. Despite having several economic opportunities in secondary and tertiary sectors, many people are poverty-stricken. A considerable number of migrants went to Mumbai from West Bengal in search of employment; there is heavy interstate migration in Maharashtra. 'Dharavi' is the largest slum of Asia present in Mumbai; comprising lots of people in poverty trap. Sources of drinking water, tube well and unprotected springs are more likely to occur than other drinking water sources for poor people (Subbaraman, 2015). Type of toilet for poor, pit latrine, no facility and dry toilets are more likely to occur than other toilet facilities for poor people (Banerjee, 2017). Lack of knowledge due to no education, land and livestock ownership are other factors, where people do not aware about the facilities they should enjoy (Kapur, 2012). No agricultural land pushes them to migrate to different places to earn money; sometimes livestock ranching became the primary job for their making (Desai, 2017).

Table 02: Poverty and its associated factors

Highest educational level	Poor	Middle	Rich
No education	69.23	18.94	11.83
Primary	52.17	24.79	23.04
Secondary	27.77	25.60	46.64
Higher	5.62	10.26	84.12
Covered by health scheme	Poor	Middle	Rich
No	39.90	23.19	36.91
Yes	49.13	18.95	31.92
Source of drinking water	Poor	Middle	Rich

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Piped into dwelling	7.81	12.53	79.66
Piped to yard/plot	23.77	26.20	50.03
Public tap/standpipe	47.31	26.66	26.02
Tube well or borehole	62.18	20.48	17.34
Protected well	43.35	25.55	31.10
Unprotected well	62.05	23.02	14.93
Protected spring	29.89	38.01	32.10
Unprotected spring	62.66	26.97	10.37
River/dam/lake/ponds	57.27	25.45	17.27
Rainwater	44.83	17.24	37.93
Tanker truck	43.70	27.57	28.74
Cart with small tank	21.82	14.55	63.64
Bottled water	6.67	18.61	74.72
Community or plant	38.00	18.67	43.33
Other	44.87	21.79	33.33
Type of toilet	Poor	Middle	Rich
Flush to piped sewer	6.96	16.04	77.00
Flush to septic tank	15.34	23.31	61.35
Flush to pit latrine	40.54	31.80	27.66
Flush to somewhere el	21.93	27.69	50.39
Flush, don't know where	38.71	30.65	30.65
Ventilated improved pit	32.16	35.13	32.71
Pit latrine with slab	59.06	24.37	16.57
Pit latrine without slab	75.54	17.03	7.43
No facility/bush/field	76.70	18.59	4.71
Composting toilet	38.38	29.29	32.32
Dry toilet	87.32	10.56	2.11
Other	34.00	39.50	26.50
Agricultural land holding	Poor	Middle	Rich
< 5 hectares	57.13	25.07	17.81
5-10 hectares	40.87	28.75	30.38
>10 hectares	39.71	21.27	39.02
Ownership of livestock	Poor	Middle	Rich
No	32.43	20.64	46.93
Yes	55.76	24.68	19.56
Caste or tribe	Poor	Middle	Rich
Scheduled caste	52.63	21.46	25.91
Scheduled tribe	68.70	16.39	14.91
Other backward class	31.35	24.65	44.00
Religion	Poor	Middle	Rich
Hindu	41.23	22.09	36.68
Muslim	46.01	22.76	31.23
Christian	34.24	18.29	47.47
Sikh	14.00	12.00	74.00
Buddhist/Neo-Buddhist	38.27	25.39	36.34
Jain	2.45	13.50	84.05
Parsi/Zoroastrian	46.67	20.00	33.33
Other	73.48	15.19	11.33
Having bank account	Poor	Middle	Rich
No	71.77	17.37	10.87
Yes	37.51	22.97	39.51
Don't know	61.11	13.89	25.00

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The above table indicates the highest educational level among the poor, Middle and wealthy people. Among poor the highest academic level is significantly less it is about only (5 percent people) are attaining higher educational level, but overall (69 percent people) are not taking any education. Among (52 percent poor people) achieving primary academic level, only (27 percent) can take secondary education. If we compare these values with middle and rich people it seems to be significantly less. Poverty is one of the reasons behind this drop out from school (Tsujita, 2012). If we observe the health scheme cover in Maharashtra and West Bengal, it shows that (49 percent poor people) covered by heath scheme and (39 percent) not covered under any health scheme. If we compare it with the middle and rich people then health scheme cover is good among the wealthy than the poor and wealthy people. As imperfect people directly comes under the government schemes (Daggal, 2017).

We get to know about drinking water sources among poor, middle and wealthy people from the above table. There are various sources included in this analysis. The poor mainly have access to unprotected spring (62 percent), tube well or bore hole (62 percent), and unprotected well (62 percent), river/dam/lake/ponds. By observing this we can say that poor cannot gate safe source of drinking water. Only (7 percent) poor people are getting piped water into their dwelling. In the case of humans, drinking water plays a significant role in defining the poverty level in society. Not having safe source of drinking water causes health issues which further leads to the increase in the poverty level (Udmale, 2016). When we consider the type of toilet available for poor, middle and rich people (87 percent) poor are using dry toilets, (76 percent) of them are not having any toilet facility or using bush or open field, (75 percent) pit latrine without slab, only (59 percent) poor use pit latrine with slab and (40 percent) using flush to pit latrine. The above results show that only (6 percent) poor have flush to piped sewer. If we compare this with middle class people, (16 percent) having this facility and among rich (77 percent) having proper toilet facility. Sanitation is most important while dealing with poverty, especially in congested slum areas (Wankhade, 2015)

The above table indicates the percentage of agricultural land in hectors among poor. Only (39 percent) of poor people has more than 10 hectares agricultural land, but (57 percent) has agrarian land less than 5 hectares. Such tiny land holdings are inadequate for growing crops for self-need and commercial purposes (Desai, 2017 & Meizen, 2009). Land reform act by West Bengal government helps poor cultivators to achieve ownership of land, previously worked under Zamindars (Exujhvv, 1999). In the above table, (55 percent) of poor are having their livestock. This quantity is less in middle and rich people because they are mainly engaged in the secondary and tertiary activities. Livestock ranching is an essential source of income, for the low-income families (Utpon, 2004). Above table indicates poverty among different caste or tribes. (68 percent) of poor people are from scheduled tribes, (52 percent) poor are from scheduled caste category. While (24 percent) middle class belongs to other backward class and (44 percent) of the wealthy are from other backward classes. Most of the SC and ST belong to poor wealth index (Borooah, 2014). They are the worst deprived group when we discuss development based on caste in India (Thorat, 2015).

From the above table, we found that most of the poor are belong to either having no religion (50 percent) or other religion (73 percent) and some people from Muslim (46 percent), Hindu (41 percent), and Christian (34 percent) are come under poor wealth index. When we observe middle class people then among them (25 percent) people are from Buddhist/ Neo-Buddhist religion. Most of the rich people belong to Jewish (75 percent), Sikh (74 percent) and Christian (47 percent). If we consider the region a factor of poverty in India, then Hindu and Muslim ware the worst affected religious groups (Jayanarayan, 1999). The above table indicates the bank account holders among poor, middle and wealthy people. In which (71 percent) poor does not have any bank account, only (37 percent) poor are having bank account. Banking offers excellent options for poor people by facilitating a savings account (Bhandari, 2009). Bank account helps poor cultivators to apply for agricultural loans, both in showing and harvesting season (Mol, 2014). Further poor people deposit money, after selling crops in bank account and government schemes, beneficiary amounts directly reach the bank account of farmers (Iqbal, 2017).

CONCLUSION

To achieve sustainable development goal poverty is the main issue in developing country like India. The concept of poverty is related to the income poverty, but there are various factors associated with poverty. These factors like education, health scheme cover, land and livestock ownership, caste, religion, sanitation which we considered in this study mainly influence the fluctuations in poverty level. As the research has demonstrated, there is existed relationship between poverty and the above factors. It indicates that people attaining higher education level are less likely to become poor because higher education level increases the chances of getting better job opportunities and creating awareness among people. People covered by health scheme have higher chances of survival from disease, which also increases work efficiency. Land and livestock ownership provide

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better opportunities to fulfil basic needs. Sanitation and quality of drinking water facilities decreases the spread of disease and improves the human efficiency. In this study we mainly focuses on these factors and it shows the inverse relationship between poverty and level of education, health scheme cover, land and livestock ownership, sanitation and good quality drinking water facility it means if these factors increases then level of poverty deceases. There is a direct relationship between cast and religion with poverty like most of the SC/ ST that belongs to the poor wealth index, and people belong to Muslim and others with more poor populations. So it is clear that if we want to do poverty alleviation, we have to work on every factor associated with poverty. Only we can do sustainable development in true sense.

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COVID-19 AND MUTUAL FUND INDUSTRY

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ABSTRACT
Mutual fund (MF) investments are subject to market risks." Well, that's true. But if you make an informed investment decision, you can easily say "Mutual Funds Sahi Hai" (mutual funds are the right choice). As people understand more about this investment tool and its effectiveness in the medium-to-long-term, But, in the times of pandemic, organic growth in the mutual fund industry has continued the downtrend, despite sudden upside surprises in the overall market. The long-term picture looks under stress, too, from downward pressure on fees, reduced profit margins and changing investor preferences. And now there is new addition to the list too 'a pandemic', this adds to the already existing challenges for asset managers trying to remain competitive.

COVID-19 and its economic and social disruptions have given new challenges to mutual funds Industry. Overall trends expected from 2019 to 2025 are like slower growth and shrinking fees. These trends have all expediated, and mutual fund managers need to move even faster to maintain and improve their positions.

With the pandemic in mind, investors now are rethinking about forecasts and expectations for the near and mid-term future. But this isn't just about playing defensive There are steps one can take now to help combat the present adverse situation and to prosper over the next five years.

Key words: Mutual Fund, COVID-19, Financial Products, Challenges

1. INTRODUCTION
A bad investment in a bad economic situation is a very bad combination and can be avoided by reviewing your portfolio periodically, irrespective of the economic scenario. The effects of coronavirus pandemic on the economy could have long-term consequences. While the immediate ramifications are already being seen across the economy, but the footprints of the pandemic may very well remain for times to come. It needs to be seen how resilient our economy is and how quick the recovery happens across all the sectors.

After the second wave of Covid-19, India's overall growth forecast needs a re-think. Moody's Investors Service has recently severed India's growth forecast for the current financial year to 9.3 per cent citing that the second wave of coronavirus infections prevents economic recovery and enhances the risk of longer-term scarring. Even, India Ratings and Research (Ind-Ra) has also revised its GDP growth forecast for FY22 to 10.1% from earlier forecasted 10.4%. The revision estimates the second wave of Covid-19 to start recede after mid-May 2021 onwards.

Amidst the global liquidity crunch, the mutual funds market could also not remain immune against the COVID-19 pandemic. What was once perceived to be the safest form of investment, despite turbulent market conditions, no longer appears to remain the same.

So, what should an average normal mutual fund investor do amidst the prevailing economic scenario?

In general, a country's economic condition is a cyclical outcome, however, resilience is what makes economies bounce back faster than expected. The resilience of a country is going to be greater if some of the factors such as digitisation of the economy, relevant reforms in investment scene etc are present.

Further, a set of liquidity measures declared by the Reserve Bank of India, which among others, called for the funds to be availed by the banks under Targeted Long-Term Operations (TLTRO) to be devoted in grade bonds, commercial paper, and non-convertible debentures of NBFCs (with minimum 50 percent of the total amount availed allotted to small and mid-sized NBFCs and MFIs), is also going to help mollify the liquidity burden on the debt schemes of mutual funds.

2. RESEARCH METHODOLOGY
2.1 Aims and Objectives:
The aim of this project is to take a look at the overview of the Indian Mutual Funds industry in the light of pandemic as well as to analyse the key take away and solutions to combat the present dark scenario.

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2.2 Scope and Limitations:
The scope of this project is to study the latest developments and present position of the India's Mutual Fund industry and the ultimate effect of COVID-19 pandemic on it in the recent times. In this regard enumeration of any model has been sought to be avoided.

2.3 Method of Writing:
The researcher has attempted to adopt an analytical and descriptive approach. The method adopted is analytical in so far as it seeks to analyse with facts, the emergence and impact on Indian mutual fund industry.

2.4 Research Questions:
1. How to combat impact of COVID-19 on Mutual Fund industry and build a Future-fit Mutual Fund?
2. What are the general measures of sustainability for Mutual Fund industry in the coming future?

2.5 Sources of Data:
The researchers have relied upon secondary sources like journals, news reports, books, periodical materials and the internet. Several articles related to impact and effect owing to the COVID 19 pandemic on Indian Mutual Fund industry has been examined.

3. DISCUSSION
3.1 Building the Future-fit Mutual Fund
There are some tough times ahead, especially if your funds aren't particularly differentiated. But client needs are going to be same and even ever increasing. In such situations success could depend on how one position their firm, use technology, define their workforce and create value.

Tighter margins, digitization, consolidation and a changing workplace, these could be some strategies for the times ahead. Some of the other measures which can be tried are:

1. Strategic positioning
With this pressure, one has to give clear and consistent direction to the employees, investors and regulators. For many, this means questioning and redesigning the products on offer, which areas to compete, which distribution channels to use and how one tells their story.

Innovative products. As funds with less complex investment strategies shrink, we should look for ways to stand out with more differentiated products. Some of the most promising areas will likely include more exchange-traded funds (ETFs), smart-beta funds, periodically disclosed active ETFs, and ESG and outcome-oriented funds to name the few.

Not only Scale but also Niche. Large firms have the added benefit of scale, but bulking up indiscriminately isn't the only way to boost long-term business prospects for mutual fund products. One should turn to M&A more selectively by expanding relationships with investors, deepening niche product offerings, accessing technology and streamlining the operations. Depending on one's ability to position a product, smarter deals may lead to more growth than bigger deals.

Right-source Operations. What a firm actually need to get through these times is smart executives who can use combinations of outsourcing, insourcing and co-sourcing. Who don't just cut costs but also consider sourcing impacts, such as oversight risk controls and decision-making controls. Along with exploring options for non-core services like data management, accounting, compliance and tax, one should also try to hire executives who standardize processes, use data and technology, and bring expertise to the table.

Outsourcing activities can be Data management, Pre-trade compliance, Legal compliance Investment research Custody and asset servicing IT services etc.

Insourcing activities would include Investment management, Portfolio management, Product development, Trading and execution etc.

Co-sourcing includes Marketing intelligence, Fund distribution Risk management, Tax compliance etc.

2. TECHNOLOGY TRANSFORMATION
Modernizing the technology infrastructure is a basic necessity nowadays. That's because asset managers now depend on technology and high-quality reliable data to reduce costs, analyse and mitigate risks, make better investment decisions, deliver higher returns to investors and increase profits. Some of the key development areas can be:

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Business Continuity Plans, should be such that keep fund's technology infrastructure scalable and agile in period of crisis.

Vendor Assessments, including evaluation of external and internal controls, is also a basic requirement as a vendor's technology infrastructure is also a critical success factors for any group.

Total User involvement, including their total online experience, is gaining an importance as a way of holding customers, along with complete transparency.

Risk management technology solutions support to manage evolving compliances, regulatory changes and risk areas.

Indexing controls may help to provide insight into how can passive funds track indices as per planning.

Cloud technology keeps getting improved as a way to reduce physical infrastructure costs and ongoing maintenance costs.

However, it should be noted that tech transformation's success will likely depend on access to high-quality data. One needs to source and develop authentic, consistent and quality data — to support perfect analysis and decision-making, produce new revenue lines, drive M&A activity and align with third-party vendors to make sound right-sourcing decisions.

Lastly, as nowadays more and more FS work is done remotely, if you're not keeping pace with technology, it can be hard to succeed. This isn't just about execution of everyday jobs. One should go about digital upskilling, cybersecurity, feedback and other digital programs that are now a high priority for remote work.

3. WORKFORCE OF THE FUTURE

As that remote work could be with us for a long time, technology needs to be addressed but it's also time to identify and upgrade processes, job profiles and cultural changes that need to happen to make this shift work.

One has to consider broader trends. As automation techniques improves, we may need fewer back-office employees to cover key roles, and more employees skilled in data analytics, cybersecurity, vendor oversight, and productivity and wellness be needed.

Lastly, the type of the workforce in the mutual fund industry is still changing, regardless of the pandemic. Firms that are succeeding have a diverse nature of workforce that is basically capable of using the latest technology in almost all of the areas, such as data and analytics. In order to retain such valuable personnel, winning firms have had to change their culture to stay competitive in the talent race, such as by improving work-life balance and becoming more socially conscious in their approach towards investment.

4. VALUE FOR MONEY

Nowadays, investors expect it all: superior returns, excellent customer service and programs that are socially conscious. An investment product has to offer all this and much more as they crave for value for their hard-earned money in everything. Some of the changes can be:

Socially conscious products: While ESG (Environmental, Social and Governance) investing has existed from quite some time, it keeps gaining attraction with both existing and potential clients. It gets regulatory attention, too. As such, there are no standard definitions for ESG investing, but investors expect enough visibility to understand fund house's approach towards society in general.

Compassionate asset manager: The finance industry still suffers from a loss of trust due to 2007 financial crisis. And now, due to the pandemic, we're all confronting society's broader concerns and issues more directly. This is shaping up to be a major issue than lower returns, AUM growth and fee suppression. It's also a chance to change your offerings by redefining your firm's relationship with its employees, clients, boards and society at large, by:

Concentrating on financial wellness and outcomes

Enhancing diversity, inclusion and the well-being of employees

Moving priorities beyond financial performance

Protecting, caring for and helping to save the environment

Stimulating involvement in the communities in which the firm operates

Becoming agents of societal growth and elevating the moral cause of the industry.

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Competing based on purpose rather than on price has its own demands, but it may help your clients and society at large. Some fund houses' long-term survival may even depend on it.

Exclusive services: Investors understand the necessity to pay for services, but as many premium services are now available at low or no cost, the fund value proposition just isn't as reasonable to them. Fund manager has to consider how performance-linked and/or core fee structures could better align the managerial ability with investor value. One can also explore new ancillary services, such as electronic tax-benefit advisors, financial wellness tools and more complex analytical support. In addition to generating revenue, these services make firms embedding in the daily lives of their clients and increasing customer loyalty.

Data, a secret weapon: Good data is essential to identify and understand investor value, as well as a fund's ability to deliver it. Data can give valuable and useful insights into what investors want and need. It can even be monetized, creating new revenue sources, such as subscription services, and using data to identify ways and means to reduce costs.

In the year 2019-20, we saw that the mutual fund industry was hitting a road block, in 2020-21 COVID-19 created havoc. And now in 2021-22, COVID-19 is increasing and magnifying the challenges faced by the MF sector. Fee crunch and slower AUM growth can be still seen, but the compression is happening over a shorter timeline and with more serious results.

Mutual funds that want to be here for long and want to make it to the other side of this market crisis need to be future-fit, should be positioned to succeed in a market dominated by mega managers, should use state of art tech infrastructure that is suitable for what comes next, be supported by a remote workforce with the right blend of talent to meet their objectives and must provide real value to investors while also keeping sustainability promises.

It's obviously a tall order but very much necessary if fund wants to sustain clients, who are counting on them.

3.2 Some General Measures: What lies Ahead

In general, a country's economic situation is a cyclical outcome of its prevailing situation and policies to combat that adverse situation, however, resilience and determination is what helps economies bounce back faster than expected. The resilience of an economy is likely to be higher if some of the following factors are present:

Demographics of the country: Younger the population, lesser the commitments, greater risk-taking ability as well as greater chance to shine again.

FDI inflows of the country: FDI inflows is another area to mark recovery. as per a UN report, India accounted for 77% of the inward FDI flows in 2019 in South and South-West Asia at 51 out of 67 billion USD and in 2020 also the same trend continued.

Digitisation of the economy: During pandemic the digitisation was the need of the time and it increased at a rapid pace, even the majority of the FDI flows are in the ICT (Information and Communications Technology) sector. The Jan-Dhan Yojna, Aadhar Mobile trinity etc has led to massive financial inclusion across the country. India has truly become a Digital India.

Reform Agenda: There is lot of scope for India to initiate reforms. Reforms in economic and taxation rules and policies can do wonders to economy.

As per the same UN report, India could prove to be the most resilient country in South and South-West Asia. Therefore, one can say that a momentary downtrend in the Indian Economy is not here to stay for long and can be viewed as an opportunity to invest more, simply because of the country's ability to be resilient.

Apart from these, there are certain **investment rules or tips** that should be followed:

- A bad investment in a bad economic situation is a dangerous combination and can be avoided by periodically reviewing our portfolio, irrespective of the economic scene.
- An asset allocation review should also be done regularly. It is important to correct over allocation or under allocation in particular sector. Depending on that the portfolio may require rebalancing and reshuffling or selling of excess units.
- Once the mutual fund portfolio has been reviewed and streamlined, it is necessary that one should hold on to their investment decisions, even if the economy is showing downtrend. On the contrary, portfolio should be rebalanced with other asset class positions and/ or averaged out with fresh funds. A great benefit of

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staying invested in a promising mutual funds is that the market will also eventually identify these funds and ensure that there is sufficient cash flow to the fund manager to average out the costs of the holdings. Therefore, in times of market correction, it is advised to stay invested even if one does not invest fresh cash.

CONCLUSION

Economies around the globe have been hit due to the COVID-19 pandemic and its effect is going to last for a real long time even after the pandemic is over. Therefore, in the hindsight of experiences so far, asset management companies should revisit and redesign their investment strategies and stress testing policies to ensure that it is equipped to face any future contingencies that may arise due to illiquidity and instability in the market and/or increased redemption pressures. At the same time, the financial regulators should also make sure that their policy announcements are done in consultation with the industry and market as a whole, keeping in mind the significance of certainty in business operations and the importance of investor confidence.

At the same time, the investors should also not lose confidence in the mutual fund market due to this temporary phase or simply because may be if one asset management company could not endure the redemption pressure. They should continue to focus on their investment objectives and as far as possible avoid any premature mass redemptions.

Mutual fund AUM has witnessed a steady rise since Mar, 2012 and more than doubled to 23.80 lakh crores as of March, 2019 driven by improved market sentiment as well as initiatives to channelize household savings into MFs vis-à-vis traditional investment avenues such as gold. Many fund houses believe that the next wave of increase in mutual fund investments will come from rise in digitization, as well as the use of online platforms for investment by retail investors.

Further, India benefits from favourable demographics. With more than 50% of the population under 25 years of age, India's falling dependency ratio provides strong support for long-term growth. By 2021, 64% of India's total population will be in the working age group. Millennials are the largest and fastest-growing adult segment across the globe and represent the greatest opportunity for the asset management industry, as they are not only growing in number, but also accumulating assets at an impressive rate. Favourable demographics, rising income levels and a burgeoning affluent middle class will provide a strong customer base for the mutual fund sector.

Having said this, we can't deny that the industry's penetration in the country is close to 5 to 7 per cent only, which as compared to markets like the US and Europe is extremely poor. But the opportunity in the industry is so big that even unicorns like Paytm couldn't resist it. A lot of fintech companies have adopted the Robo advisory model to cater to retail investors. Hence it can easily be concluded that the opportunities of growth for players in this space are tremendous.

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A STUDY ON CONSUMER BEHAVIOUR TOWARDS OTT PLATFORMS IN INDIA DURING COVID ERA

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ABSTRACT
COVID-19 is an unpredictable global pandemic that changed the way audience consume media. A trend surfaced in this period– adoption of OTTs. There are many reports which point to the growing market and consumer appetite for content of choice available on OTT platforms. Over the top media platform is a streaming media service offered directly to viewers via the internet. Over-the-Top (OTT) video platforms, that was considered a luxury is today a commodity. In India, there has been unprecedented growth in the number of consumers adapting to it. While Indian streaming services like Hotstar and Jio Cinema has gained a stronger foothold, global players like Netflix and Amazon Prime has grown tremendously in India. It bypasses cable, broadcast, and satellite television platforms. The Indian OTT Video Services Market is forecast to reach USD5.12 billion by 2026. The data for this research paper has been collected through primary data as well as secondary data. For primary data, a structured questionnaire technique was used to collect the data. And for secondary data, research article, research reports etc. were used.

Keywords: Consumer Behaviour, OTT, Preference, Pandemic.

INTRODUCTION:

With enhanced networks, stronger internet connectivity and multimedia service-capable mobiles, the presence of Indian subscribers on over-the-top (OTT) platforms is increasing day by day.

With the rising demand, many media and entertainment channels have launched their own platforms or are trying to collaborate with other platforms to stream their content. In the next five years, the OTT industry is expected to escalate in India.

In India, at present the OTT user-base is dominated by Disney+ Hotstar, Amazon Prime Video and Netflix. However, there are several production house-backed local OTT players, such as SonyLIV, Voot, Zee5, ErosNow and ALTBalaji, which are competing with these global players and trying to make a mark in the market.

The COVID-19 pandemic and the resulting lockdown has caused people to stay at home, which has led to this rise in subscribers for these OTT platforms. In addition, as the coronavirus-led lockdown impeded the theatrical experience, filmmakers are taking new releases to OTT platforms.

The OTT sector in India witnessed a 30% rise in the number of paid subscribers, from 22.2 million to 29.0 million between March and July 2020.

As per a recent study, most Indian viewers prefer watching regional language content, especially in Hindi, on the OTT platforms. Another study revealed that ~90% consumers prefer watching video content in regional languages, and that only 7% of the total time spent on OTT platforms in India is on English content.

As the corona virus-led lockdown affected the consumer theatre experience, moviemakers are adding new releases to the OTT platforms.

Traffic by Geography, OTT Video Sector:

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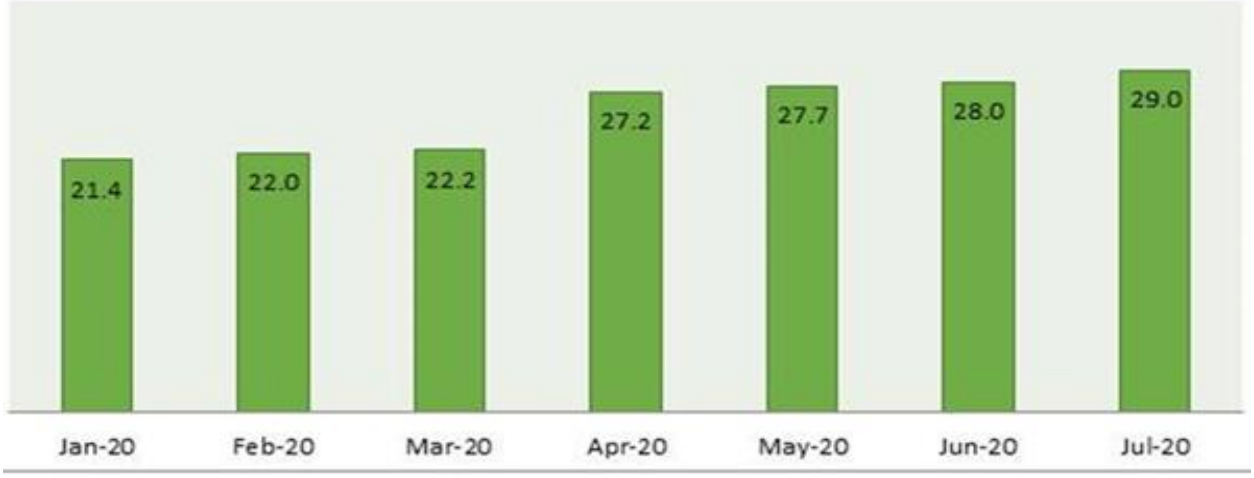
No. of Subscriptions, OTT Video Sector (In millions)



REVIEW OF LITERATURE:

ICFAI (2019) report on "Transition of Consumer towards Video Streaming Industry: A comparative analysis of Netflix and Amazon Prime." mentioned that Content is said to be the king when it comes to on-demand video streaming channels and Netflix has a slight edge over others in terms of content. Hotstar seems to be a considerable choice because of the content it offers at affordable prices.

Mann et al., (2015) in the report "Digital Video & the connected consumer" notified that with 50% of smartphone app users aged between 18-24 years, the OTT media platforms are targeting a younger demographic.

In the study "Understanding Adoption Factors of Over-the-top Video services among millennial consumers", researchers highlighted the four major factors that affect consumer adaptation towards different platforms. They are Convenience, Mobility, Content, and Cost. (Dasgupta & Grover, 2019)

Khanna (2016) in his report "A study on factors Affecting Subscription rates of Netflix in India: An Empirical Approach" stated that Indian consumers are more inclined to watch free content online rather than pay a fee for the same. Low subscription of Netflix is due to the non availability of regional and local TV shows and movies.

OBJECTIVE OF THE STUDY:

- Interpretation of upcoming trends of OTT platforms.
- Priorities while watching OTT platforms.
- Before subscribing any OTT platforms what type of factors audience see.
- Satisfaction Level of subscribers of OTT platforms.
- Average time peoples spend on OTT platforms.

RESEARCH METHODOLOGY

➢ **Research Design:**

- Research design is a detailed blue print used to guide the research study towards its objectives.
- The type of research is descriptive approach and pilot method which means asking questions to people who are believed to possess the desired information.

➢ **Type of Data:**

- Primary Data (Users of OTT Platform)
- 100 Responses

➢ **Data Analysis**

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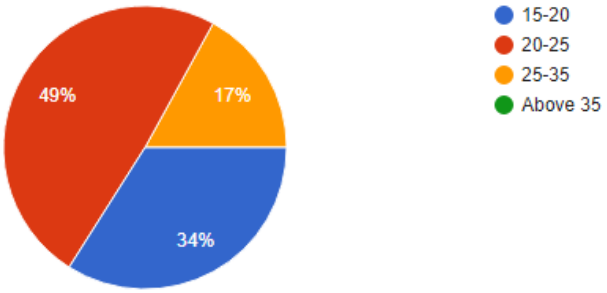
- Percentage Analysis
- Comparative Analysis

➢ **Tools of Data Analysis:**

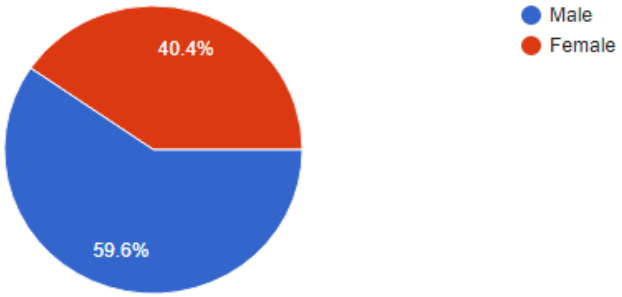
- SPSS

Data Analysis & Interpretation

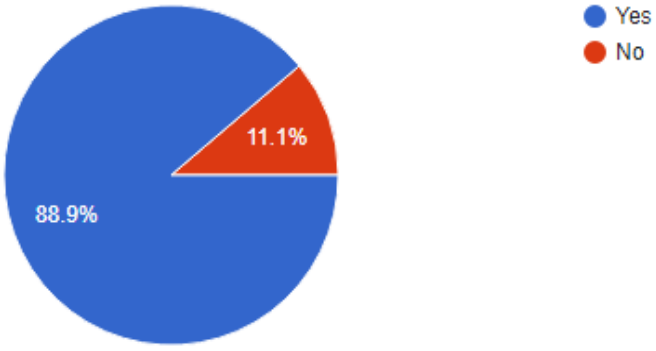
1. Age:



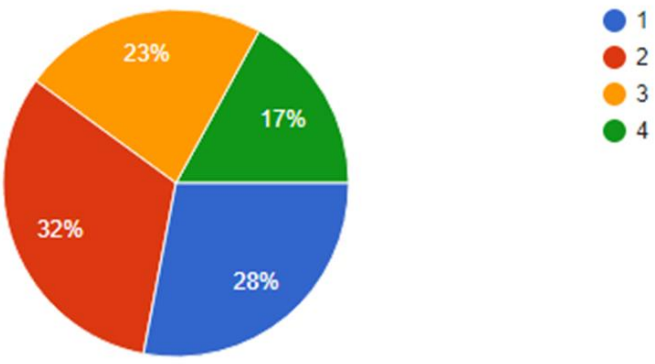
2. Gender:



3. Do you use any OTT platform in past?



4. How many OTT platforms do you use?



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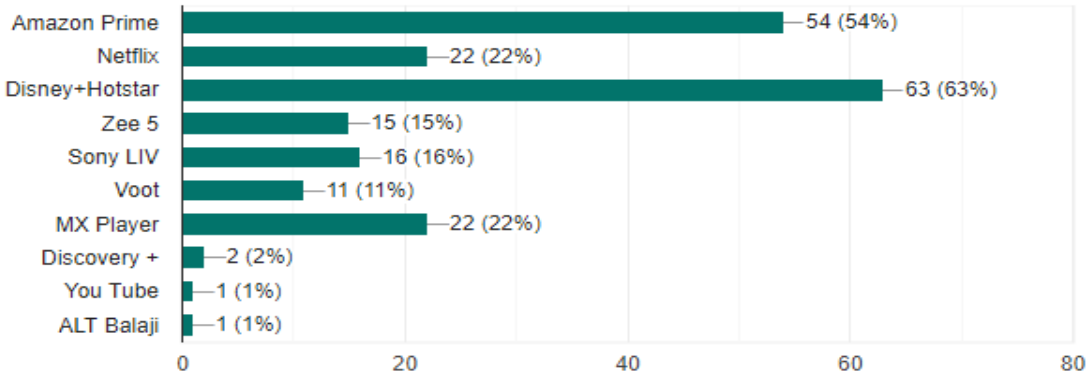
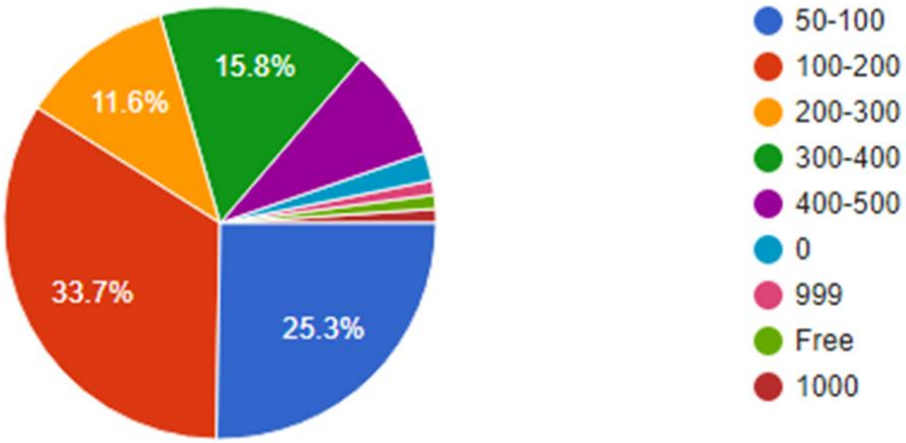
Interpretation:
60% of OTT subscribers use 1-2 OTT platforms & 40% subscribers use 3-4 OTT platforms.

5. Which OTT platform do you use?



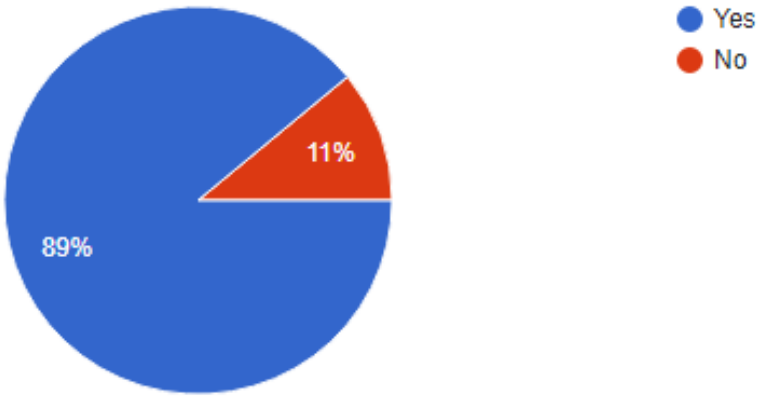
Interpretation:
Most of subscribers of OTT platform in India choose Disney+Hotstar & Amazon Prime as per this survey.

6. How much amount you spent for subscription of OTT platform per month?



Interpretation:
59% subscribers of OTT platforms are spending 50-200 Rs per month on OTT platforms, 27.4% subscribers of OTT platforms are spending 200-400Rs per month on OTT platforms, 8.4% subscribers of OTT platforms are spending 400-500 Rs per month on OTT platforms.

7. You are satisfied with your subscription of OTT platform?



Interpretation:
89% of subscribers are satisfied with his/her subscription and 11% aren't satisfy from his subscription.

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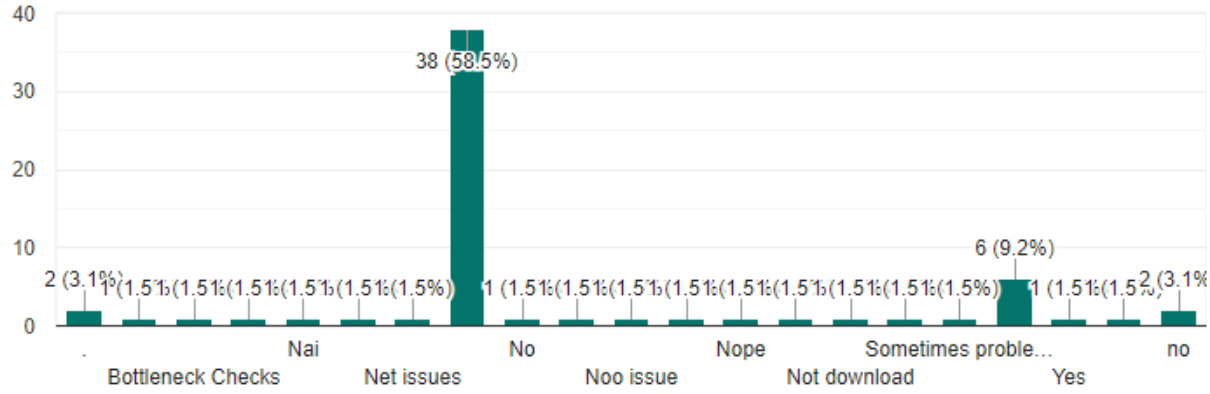
8. Do you face any problem in OTT platforms?



Interpretation:
Most of subscribers have no problem with his/her OTT platforms.

Finding:
- In recent 2 years subscription of OTT platforms was rise because of COVID.
- Most of subscribers use 1-2 OTT platforms.
- Average time people spent on OTT platforms is 1-7 hour per week.
- Major Audience spent 50-200 Rs. Per month on OTT platforms.
- Amazon prime and Disney+Hotstar is a favourite in OTT Subscribers of India.

Scope of the Study:
- Upcoming days huge opportunity for OTT platforms in India
- Peoples habituated to use OTT platforms

Limitation of the Study:
- All peoples can't afford all OTT platforms.
- Limited shows on OTT platforms.

Further Scope of the Research area/study:
- We can study with sampling another area audience.

CONCLUSION

After pandemic peoples are habituated to use OTT platforms because cinemas are closed, and peoples are subscribing various OTT platforms for entertainment and now they are habituated from OTT platforms. Some OTT platforms like Disney+Hotstar are specially subscribed for watching live sports events in India like IPL. Find many findings from this survey like peoples spend how many times & monies on OTT platforms, which platforms are most favourite in audience, which factors is affected to OTT platforms subscriptions in India. Etc.

So overall, it's a wonderful opportunity to make a small survey on OTT platforms in India.

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USAGE OF M-WALLETS WITH REFERENCE TO ULHASNAGAR CITY

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ABSTRACT
The last decade has seen tremendous growth in use of internet and mobile phone in India. Increasing use of internet, mobile penetration and government initiative such as Digital India are acting as catalyst which leads to exponential growth in use of digital payment. This transformation towards digital payments benefits in more transparency in transactions which empowers the country's economy. In recent days many changes took place in the payment system like digital wallets, UPI and BHIM apps for smooth shift to digital payments. The objective of this project report is to study the positive impact that Digitization of payment system and use of mobile wallets. It also focuses on the analysis of the adoption level of these digital payment systems by customers. The collected data through the questionnaire were analysed by bar diagram, pie charts.

Key Words: Digital payments, Demonetization, E-Payments, Online payments.

INTRODUCTION

In India, mobile payment services are growing significantly from the last few years, as it is convenient and easy to use. The mobile wallet generally refers to payment services operated under financial regulation and made through a mobile device. Instead of paying with cash, checks or credit cards, a consumer can use a mobile phone to pay for a wide range of products and services. M-wallet has become the most important contributor in the promotion of electronic transactions and without cash. The primary objective of this study is to study Usage of Plastic Money and Virtual Wallet as Modes of Payments in and around Ulhasnagar City but the same would have relevance in other parts of the country.

OBJECTIVES OF THE STUDY:

This main objective of this study was as to identifying the factors which influence the usage of m-wallet. The following objective were as secondary objective such as,

- To study the preference towards the usage of mobile wallet among the people of Ulhasnagar.
- To find out the impact of various demographic variables on the option regarding the future of mobile wallet.
- To examine the factors influencing adoption of mobile wallet.

HYPOTHESIS OF THE STUDY:

H1: There is no significant relationship between respondents' gender and the opinion regarding the future of mobile wallet.

H2: There is no significant relationship between respondents age and the opinion regarding the future of mobile wallet.

SELECTION & RELEVANCE OF THE PROBLEMS

Mobile wallets are changing the traditional ways of making and receiving problems during shopping, bills etc. Students belong to Generation F which wants fast food, fast fuel, face book. This generation has grown up in the world with technology, concerned with social media networks using their smart phones and tablets. This research study is a humble attempt in this direction to know the preference of m-wallet in area of Ulhasnagar.

SCOPE OF THE STUDY:

- The study is confined only to Credit Card, Debit Card and Virtual Wallet Services
- The study has taken into account both users and non-users of such modern banking gadgets.
- The users and non-users are randomly surveyed.
- Geographically the study is in and around Ulhasnagar city.

SAMPLE SIZE OF THE STUDY:

Sample size is a subset of the target population and it is used to represent the population under the study. This means that if the sample is carefully selected and if the sample is optimum to fulfil the requirements of

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efficiency, representative, reliability and flexibility then then the information gather from the sample can be used to generalize the general population. The sample size for the present study is 50 respondents from Ulhasnagar.

DATA COLLECTION:

Data was collected from both primary and secondary sources. Data on the use of plastic money and virtual wallet was done by two different questionnaires which are similar in nature and constitute the primary data source for this research. Pilot test was carried out using a set of questionnaires. The questionnaire is well structured and starts from collecting the user's demographics, then user usage and perception on plastic money and virtual wallet.

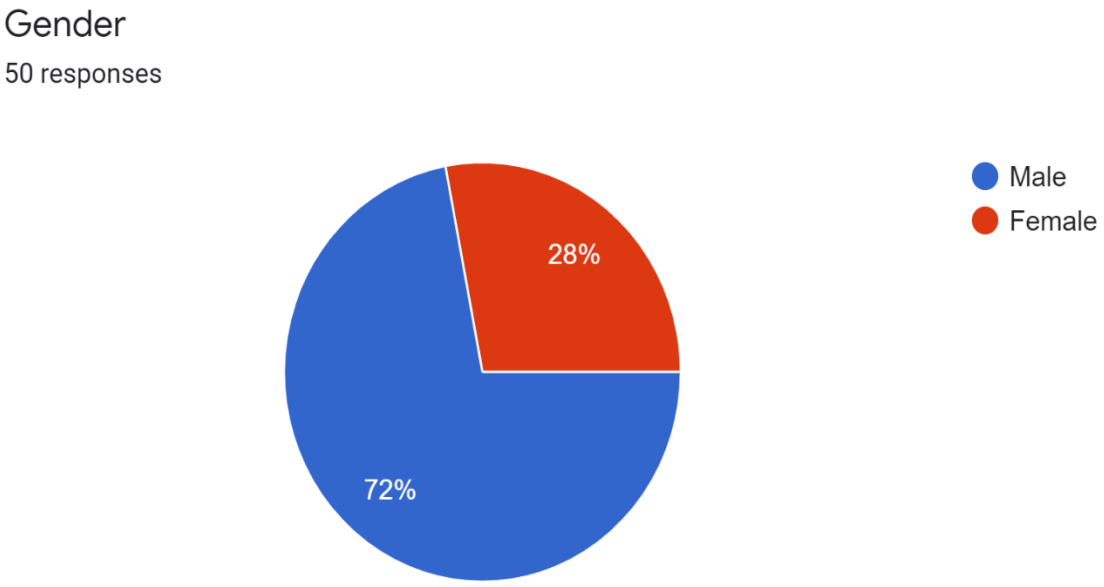
This research was basically based on primary data collected using a structured questionnaire administered to 50 respondents during a period of 1 month from 1st May to 31st May. Small amount of secondary data collected from various sources was also used.

STATISTICAL TOOLS USED FOR DATA PRESENTATION:

The main statistical tools used for the analyses of data in this project are:(1) Pie Charts, (2) Bar Diagram indicates the most possible combination of predictor variables that could contribute to the impact of dependent variables.

Preliminary Work / Survey

Gender	No. of Respondents
Male	36
Female	14
Grand Total	**50**



Interpretation:

From the data collected from sample size of 50 respondents.

Number of Male Respondents are 36 and number of Female Respondents are 14.

Age	No. of Respondents
18-25	43
25-35	06
35-50	01
50 & above	0
Grand Total	**50**

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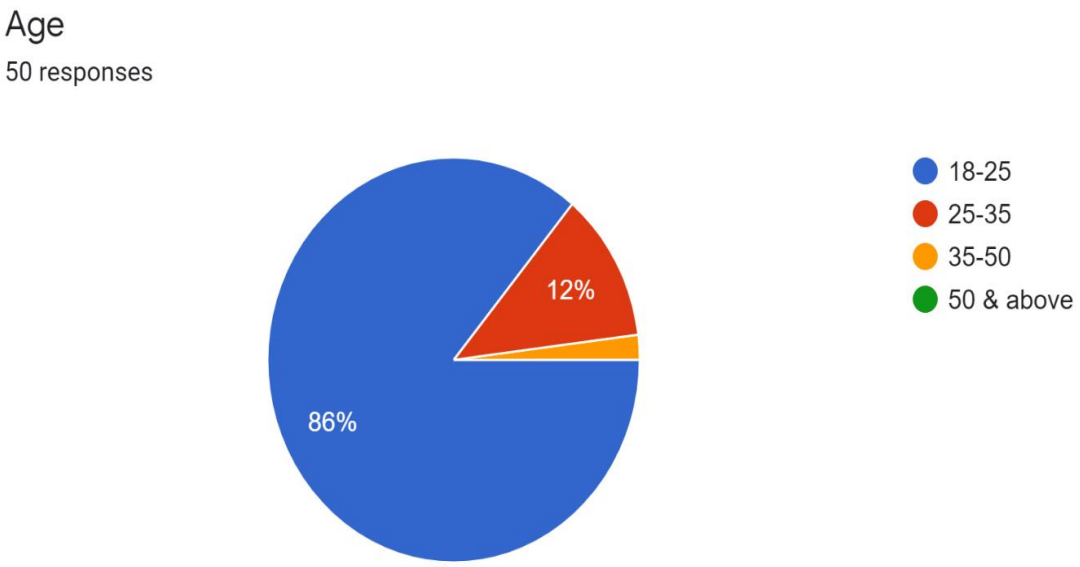
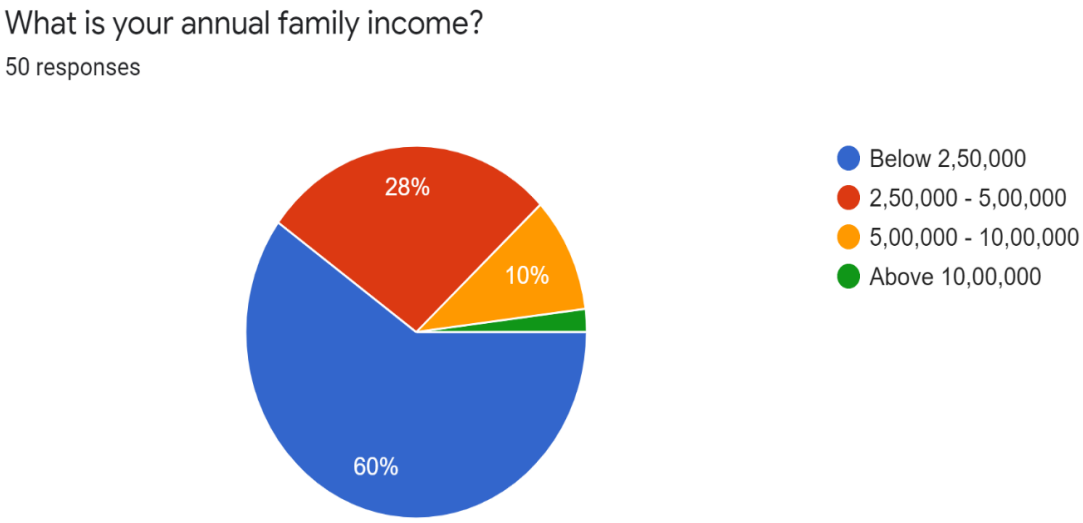


Interpretation:

From the data collected from sample size of 50 respondents.

Respondents from age group 18-25 years are 86%, respondents from age group 25-35 years are 12%, and respondents from age group 35-50 years are 2%.

Annual Family Income	**No. of Respondents**
Below 2,50,000	30
2,50,000 - 5,00,000	14
5,00,000 - 10,00,000	05
Above 10,00,000	01
Grand Total	**50**



Interpretation:

From the data collected from sample size of 65 respondents.

Respondents belonging to income group below 2,50,000 are 60%, respondents belonging to income group 2,50,000-5,00,000 are 28%, respondents belonging to income group 5,00,000-10,00,000 are 10%, and 2% respondents belong to the income group above 10,00,000.

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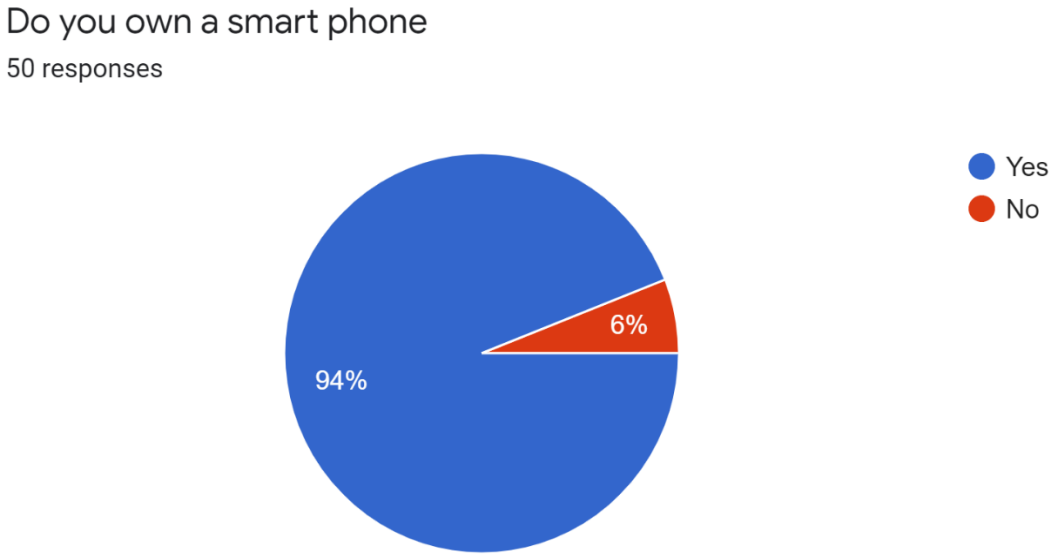
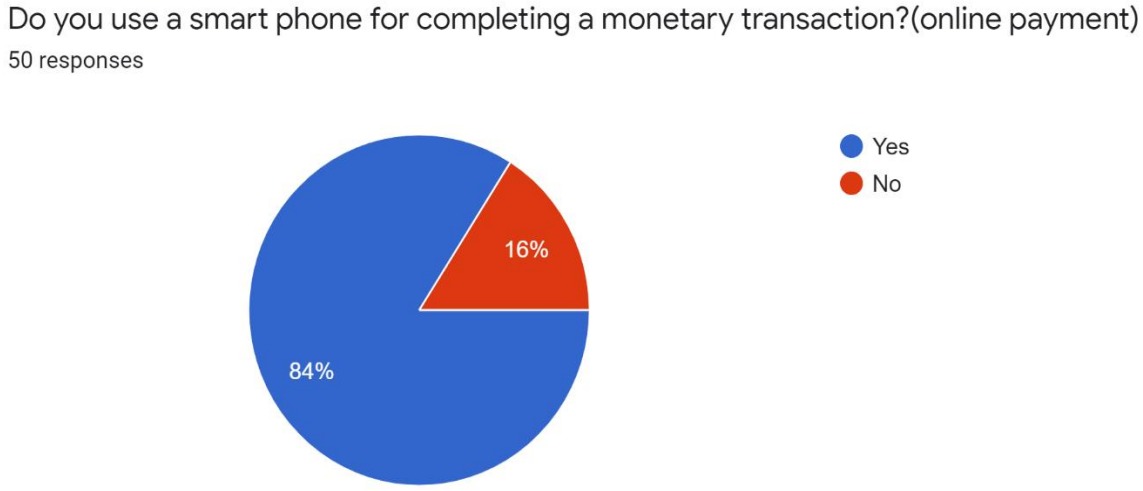


Interpretation:

From the data collected from sample size of 50 respondents.

Number of respondents who own smart phone are 47, whereas 3 respondents do not own smart phone.

It is seen that almost everyone is using smart phone at present situation.



Interpretation:

From the data collected from sample size of 50 respondents.

42 respondents said that they do monetary transactions via mobile phone. Whereas 8 respondents do not make any kind of monetary transactions via mobile phone.

From the survey, I can conclude that more than 84% people do monetary transactions on mobile phone. This may not be true in real sense due to limited sample size and restricted area.

Mode Of Payment	**No. Of Respondents**
Credit Card	02
Debit Card	15
Mobile Wallets	17
Any Other	16
Grand Total	**50**

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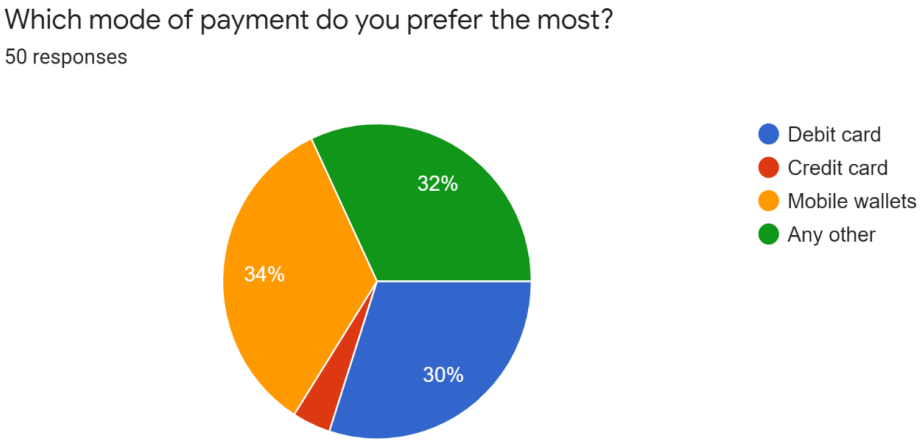
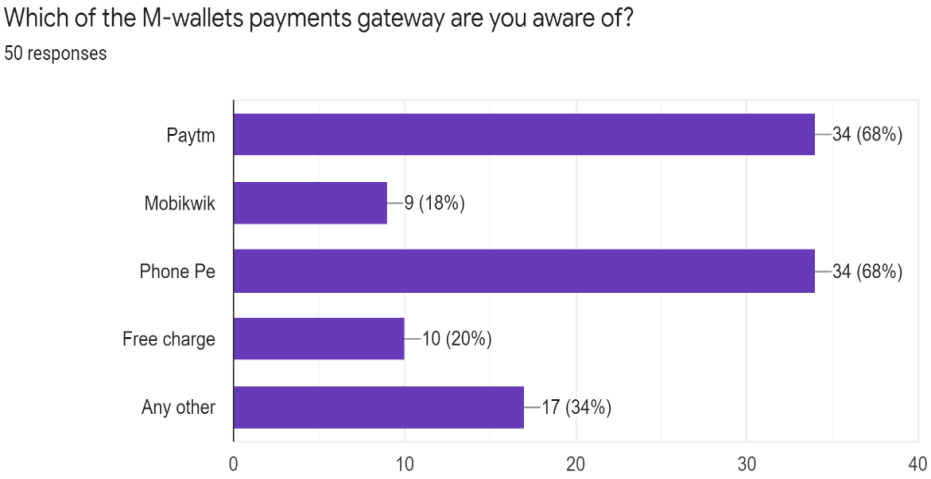


Interpretation:

From the data collected from sample size of 50 respondents.

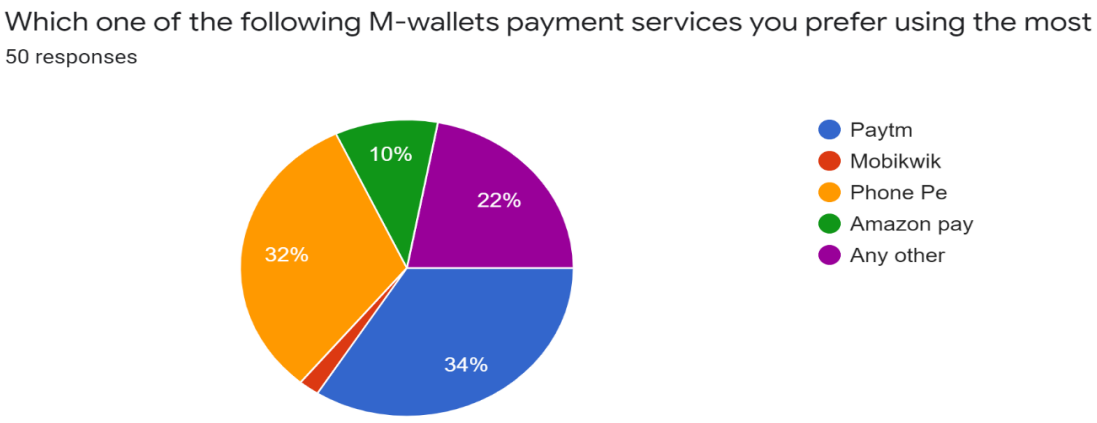
30 % respondents prefer payment through Debit Cards, 34 % respondents prefer payment through various M-wallets, 32% respondents prefer payment through Credit Cards, and 4% respondents prefer other mode of payment (like cash payments, cheque payments, bank transfers, etc.).



Interpretation:

From the data collected from sample size of 50 respondents.

68% respondents were aware of Paytm, 9% respondents were aware of Mobikwik, 68% respondents were aware of Phone Pe, 20% respondents were aware of Free charge, 34% respondents have awareness about other m-wallets (like google pay, airtel money, jio money, payzapp, amazon pay, etc.)



Interpretation:

From the data collected from sample size of 50 respondents.

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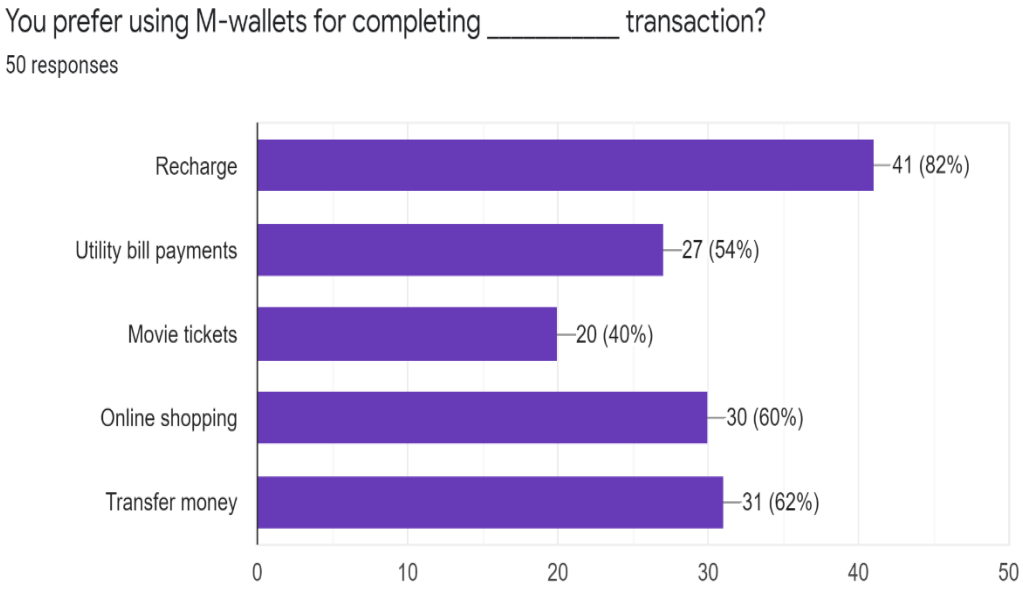
17 respondents prefer services offered by Paytm, 16 respondents prefer Phone Pe services, 10 people prefer Amazon pay, 2 people prefer Mobikwik, and 11 people prefer paying through other m-wallets.



Interpretation:

From the data collected from sample size of 50 respondents.

82% people use m-wallets for mobile recharge, 54% people use m-wallets for payment of utility bills, 40% people use m-wallets for booking movie tickets, 60% people use m-wallets for online shopping, 62% people use m-wallets for transfer money.

From the survey taken it was noted that many people use m-wallets for multiple transaction.

Majority people use M-wallets for recharge, online shopping and money transfers.

OUTCOMES:

1. Majority of the respondents use their smart phones for completing a monetary transaction.
2. Most of the respondents prefer using M-wallet. The respondent's awareness about mobile wallet payment gateway services is high.
3. Majority of the respondents are aware and prefer using Paytm followed by Phone pe.
4. The respondents prefer using M-wallets for Recharge purpose followed by Online Shopping and also for payment of utility bills.
5. The Availability, Convenience, Service acceptance, Security and Reward points are the major factors which influences most of the respondents to use M-wallets.
6. Majority of the respondents feel that M-wallet saves time and has made life easier.
7. Most of the respondents feel that M-wallet can be used as an alternative mode of payment which can substitute the physical payment system.
8. Majority of the respondents have reduced their traditional payment due to M-wallets.
9. Based on the age and gender of the respondents, Majority of the male and female respondents prefer using Paytm who fall into the age group of 18-25. M-wallet is affected by demographics as it has been seen in the study that are the factors which influence the preferences of the respondents

LIMITATIONS OF THE STUDY:

- Since it was based on the primary data collected from the respondents who were selected by using purposive sampling. As such the study suffers from all the limitations of sampling in general and purposive

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sampling in particular.

- Findings of the research study do not have universal applicability due to small size and non-inclusion of other institutions
- More in-depth comparative studies can be conducted on different cashless payment options. For drawing policy implications studies on the cost-benefit analysis of mobile wallet can also be conducted which this study is lacking.

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DESIGNING A SECURITY KEY WITH BIOMETRICS

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ABSTRACT
In this COVID environment, the online platforms and virtualization processes played a very important role for smoothing the lifestyle of human beings but there are some issues are also involved with these. The security of data is one of the most important issues. The current scenario of cryptography includes two types of key cryptography; Symmetric key cryptography and Asymmetric key cryptography. The disadvantage of these key cryptography is that if keys are shared with an individual who is not supposed to receive then the security will be compromised. The biometric data can be used with traditional cryptography to provide a secure environment and can resolve the security related issues. The basic aim of this research work is to attract the concentration of researchers of biometric field and cryptography field to bring together and work for the same direction. The idea proposed in this work illustrates the processes of binding secret keys with biometric templets.

Keywords: Biometrics; Key Generation; Cryptography; Biometric-key.

1. INTRODUCTION

In this digital transformation era, the trade of information using various communication channels as well as the amount of data storage is drastically increased. The current scenario also increases the importance of cryptography and network security in the field of this digital world. The overall objective of cryptography and network security is to provide a secure communication channel or medium on which users can trust and do all their information interchange without any hesitation. In traditional cryptography; basically two operations are performed i.e. Encryption and Decryption. These two operations are performed with the help of secret keys; known as encryption and decryption key. Providing security of these keys is the major concern, because the use and choose of keys are essential. One should take care that the keys are not designed and estimated easily. At this point biometric cryptosystems can provide the great convenience and security with the help of combining biometrics with cryptography. Cryptographic keys will be designed and produced dynamically with the combination of biometrics. The thing makes it so popular is that the biometric data cannot be stolen or lost.

There are a variety of biometric traits has been widely used in different applications such as fingerprint, palm print, hand geometry, face, iris, vein, retina etc. Depending on the requirements of used application, each biometric are independently bearing their own benefits and drawbacks. Following are some literature survey on key generation with biometric information:-

1. The very first and such kind of biometric-based encryption technique is proposed by Sahai and Waters in Eurocrypt 2005. They called their system as “Fuzzy Identity-Based Encryption (IBE): Privacy for the Unprepared” [1].
2. Uludag et al. [2] have determined the process of merging and creating a single entity with cryptographic security keys and biometric information. These biometric datasets are stored on a secure database. Their techniques do not allow cryptographic keys to be elicit unless an available biometric authentication is presented. In their study, they also handle assessment of key binding/generation algorithms using fingerprint biometric.
3. In [3], Lifang Wu et.al proposed a biometric cryptosystem using face biometrics. Firstly, at the time of encryption a 128- dimensional Principal Component Analysis feature vector is acquired through the face image. 128-bit binary vector is obtained by thresholding. After that the discernible bits were selected to generate bio-key. They also generated an error correcting code-using Reed –Solomon algorithm.
4. In [4], a proposal is presented to enable security of sensitive data stored in devices used in IoT by using fingerprint modality.
5. In [5]-[6] Soutar et al. studied on a key binding algorithm in an optical correlation-based fingerprint matching system. In their method, they produce a key using fingerprint images of user during enrolment. To retrieve the key, authentication should be successful.
6. In [8] Bansal et. al. focused on security problem while using the matrix to generate key in RSA. In their proposal, the matrix is forges using fingerprint and the matrix protection is provided using Fuzzy Vault.

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7. In [9], Lifang Wu et.al initially acquired Principal Component Analysis (PCA) feature vector with 128-dimensional from the face image at the time of encryption. Afterward 128-bit binary vector is acquired by thresholding. Then, to generate bio-key, the distinguishable bits were selected. An error correcting code also is generated using Reed –Solomon algorithm.

2. BIOMETRIC BASED CRYPTOLOGY

With the increasing use of developing technology and information in digital media, the methods used for the storage of information safely have also improved over time. This requirement brings together biometrics and cryptography. As known, biometrics is portrayed as recognition of personal with respect to their behavioral and biological characteristics. And cryptography is all the techniques used to transform readable information into unreadable form. While a cryptographic operation is run, the original data is encrypted and decrypted by using keys. There are basically two categories of cryptography based on the key used for encryption and decryption process; Symmetric key cryptography and asymmetric key cryptography.

In symmetric key cryptography, the encryption process takes place with the help of some special text or phrase; known as encryption key or secret key. The same key will be used for decryption process also. But in asymmetric key cryptography, the encryption and decryption process have need of different keys; known as public key and private key simultaneously. By combining these keys with biometric features, biometric cryptosystems have been exposed.

In biometric cryptosystems, information is assured by using biometric features. Biometric cryptosystems are analogous to key generation systems using password. It is because they were developed to provide cryptographic key secured by using biometrics or directly producing a key from biometrics [10].

Since the biometric indications, acquired during the registration and authentication, are different, so these features cannot be used to generate cryptographic key. The structures called as helper data or secure sketch are stored during registration to provide it. Accordingly, biometric cryptosystems are called helper data systems as well. Depending on how to obtain secure sketch or helper data, biometric cryptosystems are classified Key Binding Biometric cryptosystems and Key Generation Biometric cryptosystems.

2.1. Key creation with biometric

The creation with biometric shows the binding of biometric templets with cryptographic keys. The process of security key binding with biometric templets involves different phases which ensures that only an authenticated user can access to encrypted data.

Instead of generating the pair of security key based on an individual's biometric information; e.g., iris or retinal scan, we focus on fingerprints. In other words, we are going to use a biometric-key generator to generate the pair of security key (encryption/decryption key pair), and use this key to encrypt/decrypt the highly sensitive personal data. After doing so, we destroy the key generator as well as the encryption keys. For decryption process, we encode the decryption key using an individual's biometric information. The encrypted personal data and the encoded decryption key are given to the individual while the original decryption key will be kept in a separated place without the sensitive personal data. During the retrieval process, the data owner will use his/her biometric information given at the time of key generation to subtract from the encoded decryption key, and then use it to reconstruct the exact decryption key. This decryption key will be used to retrieve encrypted data.

2.2. Key generation with biometric cryptosystems

In key generation biometric cryptosystems, the secure sketch is reproduced from the template and the key is produced from helper data and user's biometric features. The stored secure sketch is used to revamp a key that is suspected to have been compromised.

To compare these two cryptosystems in terms of strengths and weakness, some basic considerations stand out [11]. In Key Binding Cryptosystems while the cryptographic keys are independent of biometric data, an adversary who knows the private key can capture the original biometric data from protected template. The biometric data is not stored directly in Key Generation Cryptosystems, so it is hard to recover biometric data from key string. But key generation designs which do not store helper data cannot provide retrievable keys and helper data based key generation designs using secure sketch are vulnerable to attack via registry multitude.

There are four types Key Binding Cryptosystem techniques: biometric encryption, fuzzy commitment scheme, fuzzy vault and shielding function [11]. Biometric encryption implements classic cryptography for generating secure biometric template. Fuzzy commitment uses error correcting techniques as well as cryptography. Fuzzy vault a set of biometric data disorderly to lock a private key in a vault. And shielding function produces a secure template from a random secret biometric data. Biometric encryption blocks to acquire secure template without

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algorithm and cryptographic key information [10]. In fuzzy commitment, the commitment is comprised from biometric data and private keys. It protects secure template and also protects key by hashing it [7].In fuzzy vault, the vault does not encode as long as the biometric data matches [8]. Looking at shielding function, the helper data protects the data and any biometric data cannot be obtained from secure template without private key information.

Key generation techniques are classified as private template schemes and quantization schemes [11].As the name suggests, biometric features are quantized in quantization schemes. And biometric keys are generated by helper data. In private template schemes, specific keys for users are acquired from reference biometric data directly [5].

3. COMPARISON OF BIOMETRIC TRAITS

There are different kinds of biometric information can be captured from an individual i.e. fingerprints, iris, face, voice and many more. All these may be used to design a security key with a cryptographic algorithms. Every biometric has their own advantage and disadvantage, so according to our need and application used, we can those one or more than one biometric. Many factors should be taken into account before choosing one. These factors are clearly and briefly discussed below:

1. **Acceptability:** There should be an acceptance that people are agree to give their biometric feature.
2. **Measurability:** The biometric trait should be received and measured in such a way that it may be converted into digital through appropriate devices.
3. **Performance:** Speed, accuracy and robustness are distinguishing factors for performance.
4. **Permanence:** The biometric trait should be invariant enough over a period in accordance with the matching algorithm.
5. **Uniqueness:** Biometric trait should differ adequately among individuals covering all users. In other way, this will result in undesirably high mismatch ratio (FAR or FPIR) for biometric system.
6. **Universality:** The application for each person should own the trait. The failure to enroll rate (FTE) of the biometrics is determined according to this factor

In the following Table.1, the comparison of commonly used biometric traits with the above-discussed factors are given.

Biometric Identifier	Acceptability	Measurability	Performance	Permanence	Uniqueness	Universality
Face	High	High	Low	Medium	Low	High
Fingerprint	Medium	Medium	High	High	High	Medium
Hand geometry	Medium	High	Medium	Medium	Medium	Medium
Hand/finger vein	Medium	Medium	Medium	Medium	Medium	Medium
İris	Low	Medium	High	High	High	High
Signature	High	High	Low	Low	Low	Low
Voice	High	Medium	Low	Low	Low	Medium

In the following table, we have compared single biometric system with multiple biometric system with different comparison parameters. Table.2 shows a comparison between single model and multi-model biometric systems [4].

Table.2. Comparison of models

Comparison Parameters	Single Biometric		Multiple biometric	
	Min	Max	Min	Max
Cost	√			√
Convenience		√	√	
Complexity	√			√
Flexibility	√			√
Recognition accuracy	√			√
Security	√			√

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CONCLUSION

The biometric information plays the most important role for any identity to recognize it and it can brilliantly work for any security system. Biometric system is a technique which identifies an individual using their own unique traits, that's why this technique is the most preferable technique for current researchers. There are much more processes exists for generation of security keys. Even there are different methods also for combining biometric information with cryptographic processes but our proposed system is simple and convenient for designing such type of security key. In future, new makes and methods will speed-up the development of biometric cryptographic systems. In this paper, we discussed the type of biometric cryptosystems, their advantages, and drawbacks also.

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DYNAMIC PRICING AND ITS FACTORS DYNAMIC PRICING AND ITS FACTORS

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ABSTRACT
Dynamic pricing is receiving a huge amount of attention in recent times, from various scientific communities. The determination of the proper price still remains a complex task that requires organization's knowledge not only about its operation expenditures but also about its possibilities to foresee products demand and their value with regard to a consumer. With the help of Internet technologies and electronic environment sales, we can easily access the consumer's information which determined interest in dynamic pricing researches and applications in various industry sectors and services. Research paper presents an overview of the dynamic pricing concept, various factors and discuss dynamic pricing in red bus.

Keywords: Dynamic Pricing (DP), demand, revenue management, strategic customer's behavior

I. INTRODUCTION

Dynamic pricing is also referred to as surge **pricing**, demand **pricing**, or time-based **pricing** is a **pricing** strategy in which businesses set flexible **prices** for products or services based on current market demands. The key competitive advantages may be provided by dynamic pricing policies by exploiting the knowledge contained in the data and applying, and also information on how this should be done is of high practical relevance and theoretical interest.

Objectives of the paper are

1. To study the dynamic pricing and various factors.
2. To discuss dynamic pricing in red bus.

II. LITERATURE REVIEW

One of the first and most cognize definitions of dynamic pricing was given by the company "American Airlines" which stated that DP is a tool to maximize revenue "selling a suitable product, to a suitable client, for a suitable price" [2]. Other researchers of dynamic pricing [3] stated that there is no competent definition of dynamic pricing which could be introduced as a standard in the research literature. DP focuses attention on rivals' actions and therefore the reaction of product supply and demand. Revenue management focuses attention only on models and trends, which are designed on the bottom of demand data.[4]. Similarly, in paper [5] DP compared revenue management and evaluate them as significantly different practices. The authors of the thesis highlighted that these conceptions should not be identified because dynamic pricing researches include the calculation of optimum product price evaluating supply/demand behaviour and the assessment of that reflecting indicators. According to research [6], dynamic pricing may be a new practice of old price discrimination. Dynamic pricing becomes useful by modern technologies made not only for different areas of industry/services but also for economics. The level of customer knowledge is one of the most important factors in modelling DP according to paper [7]. Another important customer characteristic is whether the population of potential customers is finite or endless. In the case of an endless population, the number of customers and their willingness to pay for purchases are not influenced by past demand data. That is also defined as the assumption of nondurable goods when a customer who has just bought desirables goods at once becomes part of the population of potential customers. [8].

In paper [9][10] Price fairness is defined as "consumer's evaluation and understanding whether the difference between seller's and other party's prices is cheap, acceptable or justifiable". The perception of price unfairness causes consumers' dissatisfaction, the spread of negative information, which damage sellers' reputation and encourage trust in them. According to research [11], it is conducted on the ground of this theory define fair justice distribution as "reward distribution according to individual contributions to goods-money relationship" and states that people obtain the perception of fairness when all parties involved in a goods-money relationship get the adequate reward. Properly projected DP models operating under the conditions of oligopoly can provide precious knowledge experimenting with DP application possibilities [12].

Product demand is one of the most important factors forming DP. However, such models have some restrictions like they are fully dependent on comprehensive demand parameters while pricing products; they do not include any repeated demand evaluation devices when in the event of the appearance of more information that

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determines product demand, product prices are repeatedly reconsidered [13]. Customers decide to wait until they get more necessary information especially when customers are not sure how they evaluate a certain product [14]. According to [15] researchers customers use prices as an indicator of perceptible product quality and as an indicator of perceptible costs which will be attracted during the purchase of a product. Besides, in the food industry, some goods are sold at a discount during holidays [16]. According to paper [17], the influence of seasonality on prices can be noticed within a week, for example, discounts for alcoholic drinks are often made on Fridays. There are two conclusions concerning price changes, there is no difference between durable and nondurable goods; the bigger (smaller) degree of competition is the bigger (smaller) price changes frequency [18]. As mention in paper [19], demand is more flexible (quickly adaptive) during the peak of demand, which brings them to the conclusion that optimal mark-ups are anti-cyclic. When customer's price sensitivity increases firms reduce prices holding down the market segment. The research [20] shows that during the periods of upper demand: prices are lower, the effect of substitutes is greater, profitability is smaller because prices decrease, whereas marginal costs remain unchanged; heavier expenses for the advertising of seasonal goods.

III. RESEARCH METHODOLOGY

Prices on red bus for each trip fluctuate depending on season and day-of-the-week effect. In this research paper we have taken a dummy dataset of one bus of red bus which runs through a particular source and destination on a particular departure time. In this we have considered two types of dataset one is when we didn't apply dynamic pricing and second one is when we have applied dynamic pricing fare for each trip. To check the dynamic pricing results we'll compare data of 2 weeks i.e.

1. Non-DP Week : In this week we have applied only static pricing (one fixed Fare)
2. DP Week: In this week we have applied dynamic pricing (Prices change according to the demand on advanced bookings.)

Note: Both the considered weeks are neutral weeks (no public holiday nor any occasion)

Dataset includes columns like DOJ (Date of Journey), Day (Day of week), Source, Destination, Seats sold, Total Seats, SD (Source-Destination), Revenue, Occupancy.

To check the result of dynamic pricing we have used excel because it will easy for reader to understand and analyze the data and report graphs. For analyzing of any data we first need to collect data. And, once we get our desired data we have to clean the data by applying filter or some formulas on which basis we want our data should be fit. After cleaning we'll start applying the formulas to get our output for analyzing the data. For analyzing the revenue of this 2 weeks of data first check the occupancy and revenue for each week. For occupancy we'll divide Sold Seats with total seat in bus. I.e. Occupancy = Sold seats / Total Seats. To calculate revenue, Revenue = Sold seats * Average seat price (ASP). By applying this two formulas we'll get occupancy and revenue which is main factors to compare two weeks with each other. First I have taken a data of Non-DP week (static fare):

DOJ	Day of week	Source	Destination	Seats Sold	Total Seats	ASP	SD-ID	Revenue	Occupancy
06-04-2021	Tuesday	Mumbai	Goa	32	36	₹ 550	Mumbai-Goa	₹ 17,600	89%
05-04-2021	Monday	Mumbai	Goa	36	36	₹ 550	Mumbai-Goa	₹ 19,800	100%
09-04-2021	Friday	Mumbai	Goa	23	36	₹ 550	Mumbai-Goa	₹ 12,650	64%
10-04-2021	Saturday	Mumbai	Goa	30	36	₹ 550	Mumbai-Goa	₹ 16,500	83%
08-04-2021	Thursday	Mumbai	Goa	27	36	₹ 550	Mumbai-Goa	₹ 14,850	75%
07-04-2021	Wednesday	Mumbai	Goa	28	36	₹ 550	Mumbai-Goa	₹ 15,400	78%
11-04-2021	Sunday	Mumbai	Goa	28	36	₹ 550	Mumbai-Goa	₹ 15,400	78%

Table 1.1: Non-DP Week Data set.

After getting revenue and occupancy we'll compare each day of week with each other by creating graph with the help of pivot table.

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Date of Journey	(Multiple Items)	
Non-DP Week		
Row Labels	Sum of Revenue	Average of ASP
Monday	₹ 19,800	550
Tuesday	₹ 17,600	550
Wednesday	₹ 15,400	550
Thursday	₹ 14,850	550
Friday	₹ 12,650	550
Saturday	₹ 16,500	550
Sunday	₹ 15,400	550
Grand Total	**₹ 1,12,200**	**550**

Table 1.2: Revenue for each day with static price.

In this table the average seat price is fixed for all days i.e. 550 Rs. By applying one static price for all days we have earn total 1,12,200 Rs of revenue.

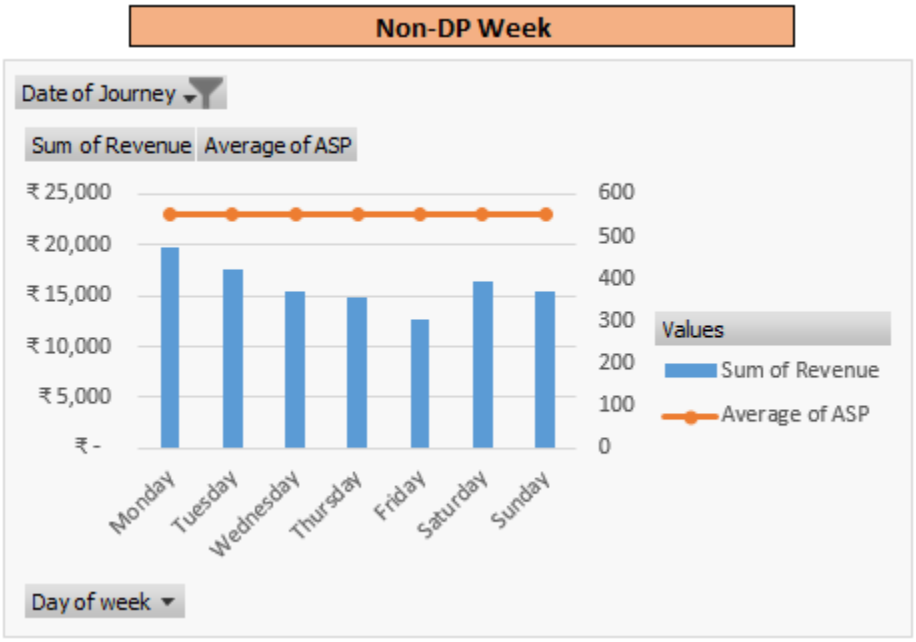

Figure 1.1: Non-DP performance for each day.

In this graph we can see that we are getting minimum difference of revenue for each day. Now second set of data i.e. DP Week (fares depend on dynamic pricing) is considered.

DOJ	Day of week	Source	Destination	Seats Sold	Total Seats	ASP	SD-ID	Revenue	Occupancy
13-04-2021	Tuesday	Mumbai	Goa	34	36	680	Mumbai-Goa	23120	94%
14-04-2021	Wednesday	Mumbai	Goa	29	36	660	Mumbai-Goa	19140	81%
12-04-2021	Monday	Mumbai	Goa	34	36	619	Mumbai-Goa	21046	94%
15-04-2021	Thursday	Mumbai	Goa	36	36	550	Mumbai-Goa	19800	100%
17-04-2021	Saturday	Mumbai	Goa	36	36	520	Mumbai-Goa	18720	100%
16-04-2021	Friday	Mumbai	Goa	35	36	590	Mumbai-Goa	20650	97%
18-04-2021	Sunday	Mumbai	Goa	33	36	650	Mumbai-Goa	21450	92%

Table 1.3: DP Week data set.

Here also same formulas for revenue and occupancy is applied.

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Date of Journey	(Multiple Items)	
DP Week		
Row Labels	Sum of Revenue	Average of ASP
Monday	₹ 21,046	619
Tuesday	₹ 23,120	680
Wednesday	₹ 19,140	660
Thursday	₹ 19,800	550
Friday	₹ 20,650	590
Saturday	₹ 18,720	520
Sunday	₹ 21,450	650
Grand Total	**₹ 1,43,926**	**610**

Table 1.4: Revenue for each day with DP.

We can see that there is different-different prices for each day. We are getting total 1,43,926 Rs of revenue by using dynamic pricing. Our lowest seat price is 520rs and highest seats price is 580 rs this is in the range of 500-700rs. Which is quite similar to the previous week seat price (Non-DP Week).

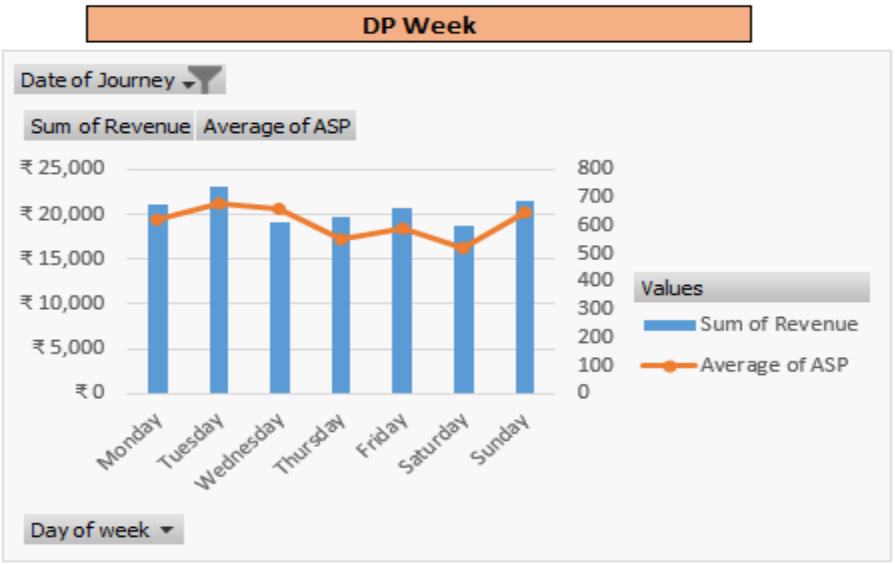

Figure 1.2: DP performance for each day

By seeing this graph we can say that we are earning good revenue for all day.

Week-Day	Non-DP	DP	Revenue Difference
Monday	₹ 19,800	₹ 21,046	₹ 1,246
Tuesday	₹ 17,600	₹ 23,120	₹ 5,520
Wednesday	₹ 15,400	₹ 19,140	₹ 3,740
Thursday	₹ 14,850	₹ 19,800	₹ 4,950
Friday	₹ 12,650	₹ 20,650	₹ 8,000
Saturday	₹ 16,500	₹ 18,720	₹ 2,220
Sunday	₹ 15,400	₹ 21,450	₹ 6,050
Grand Total	**₹ 1,12,200**	**₹ 1,43,926**	**₹ 31,726**

Table 1.5: Revenue difference in Non-DP and DP.

By looking at this table we can see the revenue difference for each day. And also we can say that by using DP have earned 31,736 Rs more revenue than Non-DP.

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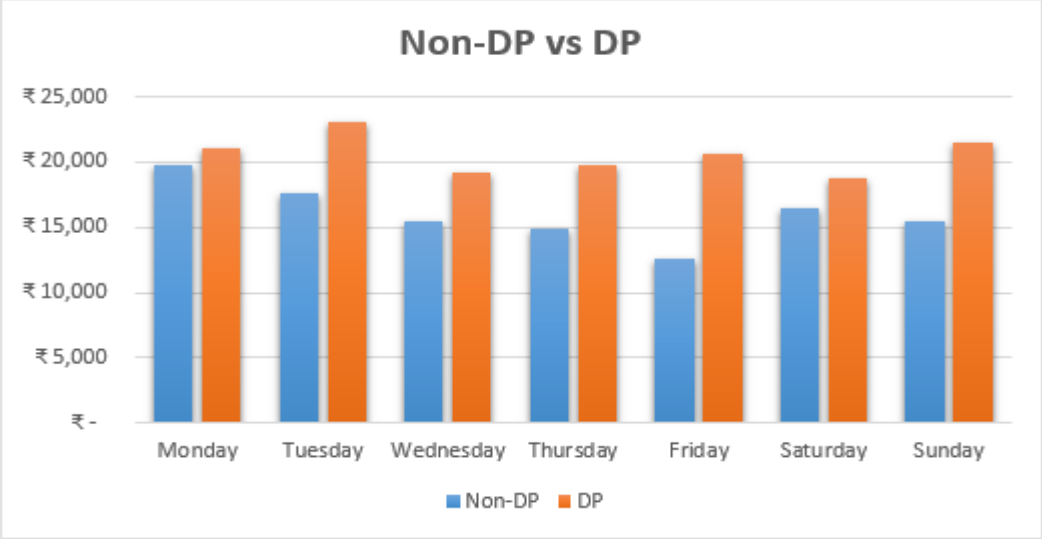

Figure 1.3: Revenue comparison.

CONCLUSION

Dynamic pricing is good method to provide a star match between the merchandise or services and its potential customers. It can scrutinize the most urgent demands, help the customers to find the desired products and solutions at the desired price and also offers the best benefits to the merchants to make optimal profits. It is a win-win game. Future development of the technologies will offer more opportunities for dynamic pricing.

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STOCK PRICE PREDICTION USING MACHINE LEARNING TECHNIQUES

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ABSTRACT
In finance world stock market is considered as stunning field for trading and it opens good investment option for investor but Predicting stock price is really tough and interesting because it depends on various factor such as current events, political upheaval, natural calamities and many. In this paper linear Regression, KNN and Decision tree algorithm is applied on stock dataset to predict its future value that will assist the investor to take accurate decision. This research paper highlights that the decision tree model performs well and has less error than combined as well as individual result of KNN and linear regression. The results are reasonable as predicted stock price was almost parallel to actual stock price.

Keywords: Linear Regression, k-nearest neighbor, Decision tree Regression, stock market prediction.

I. INTRODCUTION

Stock market is a major source for the company to generate the fund for their business. Stock market comprises of the seller and buyer where shares are sold and bought every seconds. Companies stocks prices increases when the demand of company's stock price goes higher and stock prices decrease when demand of stock goes down. Investor and industry always look for opportunity to invest money in the stock market and gain profits. Even if they have expertise in the stock market then also may not give accurate result because of its dynamic behavior.

The motivation to research in this is field is to study stock market and experimental analysis on it using machine learning algorithm. In this paper we have analyzed the Netflix stock price and predicted its future value using linear regression, K-nearest neighbor, decision tree regressor and identified which algorithm is providing accurate results. Along with this we have tested the combined the result of linear regression and KNN with decision tree model's result for performance analysis. For this we have taken the 5 years historical data of Netflix from yahoo finance.

The Objectives of research paper

1. To study the various machine learning algorithm
2. To get the accurate result in prediction of stock price.
3. To Identify algorithm performance
4. To compare the result of (KNN and decision tree regressor) with linear regression

II. LITERATURE SURVEY

Stock market is characterized as dynamic, unpredictable and non-linear in nature. Predicting stock prices is a challenging task as it depends on various factors including but not limited to political conditions, global economy, company's financial reports and performance etc. Thus, to maximize the profit and minimize the losses, techniques to predict values of the stock in advance by analyzing the trend over the last few years, could prove to be highly useful for making stock market movements [1] [2].

According to Arévalo et al., Stock market prediction has always caught the attention of many analysts and researchers. Predicting stock prices is a challenging problem in itself because of the number of variables which are involved. Application of machine learning techniques and other algorithms for stock price analysis and forecasting is an area that shows great promise. To invest in stocks and achieve high profits with low risks, investors have used these two major approaches to make decisions in financial markets. [3]

According to W. Huang, Y. Nakamoria and S. Wang, the most widely used predictive models are Decision trees, Regression (linear and logistic), Neural networks and Other classifiers are Time Series Algorithms, Clustering Algorithms, Outlier Detection Algorithms,Ensemble Models, Factor Analysis, Naïve Bayes, Support vector machines. Each classifier approaches data in a different way, therefore for organisations to get the results they need, they need to choose the right classifiers and models.[4]

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J. Gong and S. Sun have implemented stock prediction model using logistic regression considering feature index variables. They have mentioned that daily stock trading prediction with logistic regression out performs other methods such as RBF – ANN prediction model.[5]

Zhong and Enke (2017) describe group of statistical approaches which usually utilize multiple input variables, these include Linear Discriminant Analysis (LDA), Quadratic Discriminant Analysis (QDA), and regression algorithms.[6]

Simpler techniques such as the single decision tree, discriminant analysis, and naïve Bayes have been replaced by better-performing algorithms such as Random Forest, logistic regression, and neural networks (Ballings et al. 2015).[7]

Machine learning has been extensively studied for its potentials in the prediction of financial markets (Shen et al. 2012).[8] Machine learning tasks are broadly classified into supervised and unsupervised learning. The hybrid approach applies a combination of multiple different approaches for improved performance, for example, a hybrid of statistical and pattern recognition approaches, or a hybrid of statistical and machine learning approaches.

Brofos proposed an ensemble of random forest classifier, support vector machine and relevance vector machine classifiers, including an ensemble of k-nearest neighbor classifiers.[9]

Upadhaya et al. Categorizes stock performance in the stock market into three categories GOOD, average and poor using multi logistic regression. This model had been constructed using seven financial ratios, book value, paid/sales and earnings per share, percentage change in operating profit, percentage change in net sales, price to cash earning per shares, and price to book value. This model has shown promising 56% profit on Indian stock market.[10]

Chen et al. Examined different machine learning techniques for stock prediction, Logistic Regression, K-nearest neighbors algorithm, Linear Discriminant Analysis, Quadratic Discriminant Analysis, and Support Vector Machine for predicting S&P 500 index [11]. Logistic Regression was the best model among them.

To get better predictability to stock returns and find very modest predictability, Adaboost integration algorithm, which is a classic machine learning algorithm and can use multiple kinds of forecasting variables, is introduced to predict yearly stock returns of all the firms of A-Share market from 2011 to 2015. The predictability is considerably improved. The average yearly out-of-sample error rate from 2013 to 2015 is 22%. The average yearly out-of-sample error rate from 2011 to 2015 is 27%. By analyzing data of the five years authors found phenomena as following. First, the most important forecasting variable is different in each year when the market index shows different trend. Second, industry category plays very important role in every year. Meanwhile, other important forecasting variables of the five years include trade volume, full shares and tradable shares, Price Book Ratio and net asset per share, which represent market, size, valuation and fundamental respectively. (Zhang Guoying, Chen Ping, 2017).[12]

III. METHODOLOGY

For this research paper we have taken open dataset of Netflix which consist of number of features (Date, Open, High, Low, Close).To predict the future stock price we need Close price feature from the dataset, so this is our dependent variable (feature) which depends on independent variable.

Date: Date on which trade occurs

Open: It is a price at which stock started trading

High: Highest price of stock traded between traders

Low: Lowest price at which traded

Close: Last price traded between two traders on that day.

To implement the algorithm we have used Jupiter notebook because it is open source and provides the platform where you can run, debug code and visualize data. It includes the various methodologies for data cleaning, statistical modeling, machine learning, library such pandas, numpy and many more. Anaconda which is a prepackaged python distribution that contains python modules and different packages is used. After that we launch the jupyter notebook from anaconda navigator and load the .CSV file data into the python file. Based on the objective of this research paper we analyses, visualize data and prepare model for stock prediction. Here I

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have implemented linear regression, decision tree regression and K-nearest neighbor algorithm .Based on the result of prediction we will decide which is performing well with less error.

IV. DATA VISUALIZATION

	Date	Open	High	Low	Close	Adj Close	Volume
0	2016-04-25	95.699997	95.750000	92.800003	93.559998	93.559998	14985400
1	2016-04-26	93.500000	93.550003	91.250000	92.430000	92.430000	15330900
2	2016-04-27	92.180000	92.500000	90.209999	91.040001	91.040001	12218900
3	2016-04-28	91.500000	92.669998	90.089996	90.279999	90.279999	11474900
4	2016-04-29	90.500000	90.559998	88.209999	90.029999	90.029999	13968000

Figure 1: In figure1 top 5 record of dataset is displayed.

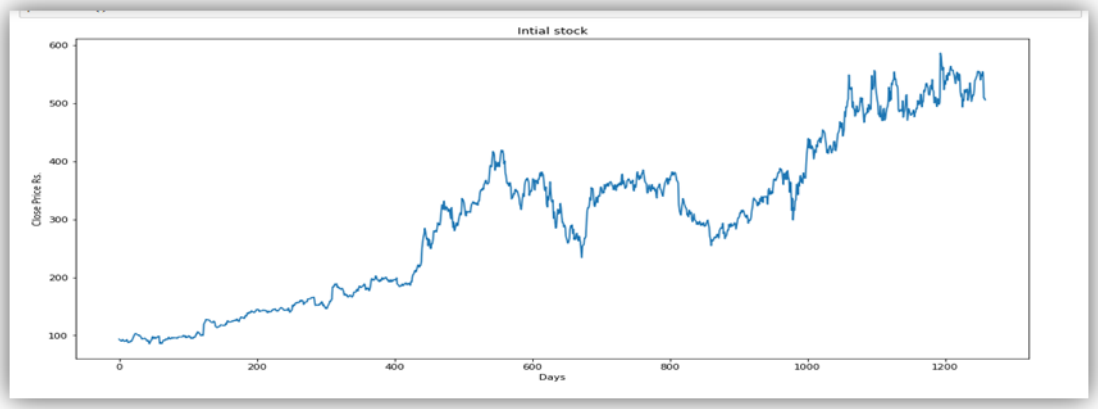

Figure2: Visualization of closing price of Netflix data set visualized in graph

```
#split the data into 75% traing and 25% testing
x_train,x_test,y_train,y_test=train_test_split(X,Y,test_size=0.25)
```

Figure3: In figure 3 Splitting dataset into 75% training and 25% testing

]:

	Orig_Close_Price	Predict_By_Decision	Predict_By_KNN	Predict_By_linear
297	153.410004	153.410004	152.885002	152.670370
534	361.399994	361.399994	362.727501	360.200059
506	311.760010	311.760010	311.252502	309.556984
466	290.390015	290.390015	287.022499	287.791084
668	270.940002	265.070007	266.659996	273.681633

Figure 4: In figure 4 we compared the predicted closing prices with actual closing price

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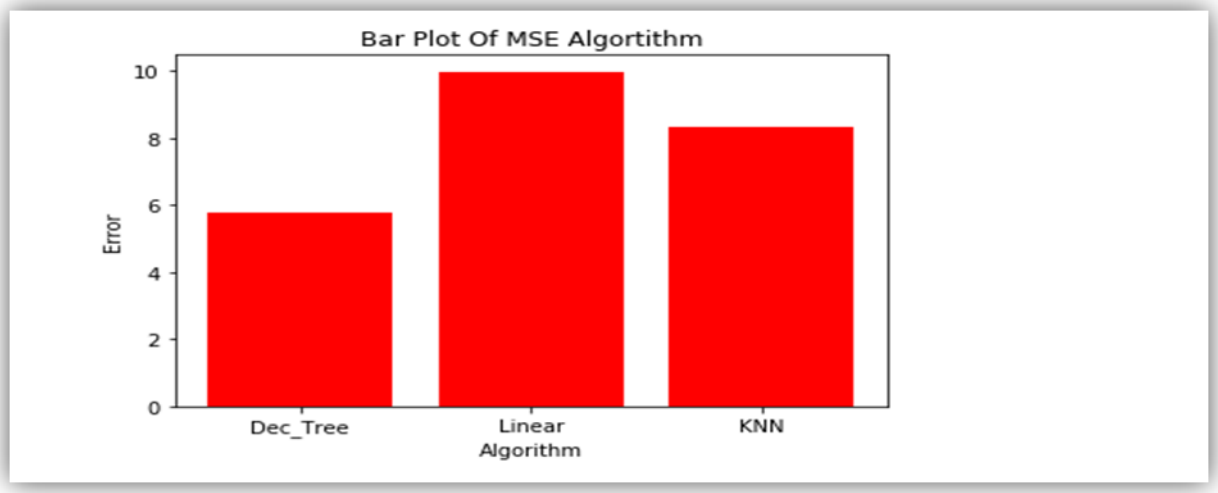

Figure 5: In figure 5 MSE (mean squared error) of algorithm is displayed.

```
#Combining Linear and KNN
result4=(result1+result2)/2
print("Lin+KNN MSE: ",mean_squared_error(y_test, result4))
print('Dec_tree:',Dec_MSE)

('Lin+KNN MSE: ', 7.855014463679856)
('Dec_tree:', 5.785028098827798)
```

Figure 6: Comparing the MSE error of Decision tree with MSE of combined result of Linear and KNN algorithm result in Figure 6.

V. CONCLUSION

In this paper, three algorithm used to identify the trend in stock market. After applying these three model individually, we came to know that decision tree model performs better than linear regression and K-nearest neighbor so we can say that decision tree model can be applied on stock prediction to get more accurate result. Along with this we combined the result of linear regression and KNN algorithm to compare with decision tree's result. After combining the result, we got less MSE (Figure 6), the prediction was improved and approximate nearest to decision tree model's result.

Here the main motive is to make the investor confident that they will get positive returns from stock market. We can also implement other machine learning algorithms and combined their results to improve the model accuracy on this dataset.

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DEEP LEARNING APPROACH FOR COVID DETECTION

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ABSTRACT
Artificial intelligence (AI) has lately been included extensively for the advancement of scientific research. AI was used in several uses, like image recognition, text categorization, segmentation techniques, through deep learning techniques. A broad number of respiratory infections diseases caused by Coronavirus which is an RNA-type viral that can affect both animal and human organisms. In humans, it also induces pneumonia. As the disease gets to the lungs, person affected by COVID-19 can suffer from pneumonia. The pneumonia radiographs were categorized by previous research using various deep neural networks, such as the fine-tuned prototype, the system lacking fine-tuning, and the scratch-trained model. AL algorithms were useful in the medical sciences for effective research. The Coronavirus identification that used a deep learning method, which would be a semi-branch of AI, is examined throughout this report. For detection of disease, AI has to distinguish between coronavirus, pneumonia, and regular X-ray imagery. Nevertheless, no scientifically validated drug or vaccination is sufficient to cure the COVID-19 epidemic, so that other non-clinical or clinical and non-clinical therapeutic techniques, like Data Mining (DM) methods, Machine Learning (ML) and optimization techniques, amongst many other Artificial Neural Networks (ANN), are urgently required to control and avoid further outbreaks of the COVID-19 disease epidemic.

Keywords: Artificial Intelligence, Covid, Detection, Deep Learning, Pandemic

I. INTRODUCTION
Early detection of COVID-19 can help to formulate an effective methodology and conclusions on disease management. In this review, we illustrates the deep learning methods to identify COVID-19 utilizing images from the three most widely used X-Ray, Ultrasound, and CT scan types of medical imaging[1]. The very first step is to prepare the data required for data processing during data comprehension, processing of big data. The data under consideration here consists of health information which can be translated into information that can be interpreted by a computer, like clinical notes, documents, photographs or images and other different related data. Approach to data collection goals have included

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understanding of the data attributes and the recognition of main characteristics including the amount of data as well as the total variables [2]. Data preprocessing, which would be the process by which original data is processed and transformed, comes before visualization and interpretation. In other words, it is a method of reformatting, fixing and merging data into enriched data. This data ends with the compilation, analysis, and leverage of data such as customer, patient, physical, and clinical data. As part in ML techniques, human intervention takes place at this point and specialists analyze and examine the images to obtain the data with both the best structures, correlations and functionality.

The involvement of humanity at this point is significant since their expertise and resources really aren't accessible to an ML solution that, without humans, can deal with massive data sets well beyond the degree to which humans can simultaneously handle or observe [3]. In addition, Deep Learning (DL) techniques may be used in situations where ML or conventional methods of data acquisition are confronted by enormous or complicated data processing. DL approaches are not based on human involvement. DL includes a variety layer of parameters as a subclass of ML, which has a different understanding of the knowledge it feeds on. A main strategy for effective control of this epidemic is early diagnosis, isolation and treatment for patients. Among the most widely used and available techniques for rapid analysis of lung diseases is chest X ray (CXR) radiography. CXR features are taken for study by radiologists almost instantly [4]. Mostly during latest COVID-19 disease outbreak, the development of CXR radiography enabled one of the first treatment technologies to be used. In comparison, the radiology departments in Italy and the U.K. were using the quick CXR turnover. To treat patients non-COVID-19 pneumonia clinicians in order to better distribute hospital resources. Nevertheless, among medical data of COVID-19 and pneumonia induced by certain bacterial diseases like common flu, there

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are several common characteristics. The clinical manifestations of COVID-19 cases by specialist radiologists allows this correlation challenging [5,6]. A stable automatic COVID-19 and non-COVID-19 CXR picture classification model will accelerate the triage phase of non-COVID-19 cases and optimize the assignment of health facilities to COVID-19 cases. "*Fig.1"* displays the diagnostic systems for COVID-19 utilizing deep learning.

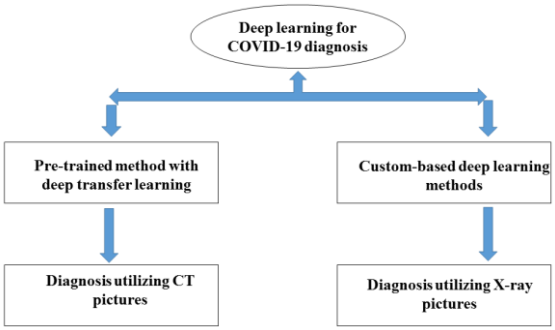

Figure1.COVID-19 identification systems utilizing deep learning

In the accurate medical image analysis, ML based approaches have already shown unprecedented progress. In medical practice, ML-based methods are modular, automated, and easy to achieve. The grouping of objects with extremely similar characteristics is a typical uses of ML-based image processing [7]. This methodology is focused on the differentiation of the area of interest for the study, the detection of efficient feature characteristics determined from the differentiated area in the spatial or national framework, and the production of an optimal classification algorithm based on ML to allocate input images appropriately to a target groups. Typically, the solution to dimension reduction is to produce a model via an optimized set of artificial characteristics that can differentiate COVID-19 to non-COVID-19 instances with full precision [8,9]. A separate model includes the description and convergence of the global digital images calculated without lesion classification from the entire CXR image, which allows a new comparative statistical marker to be produced to estimate the likelihood of a case study being COVID-19. This latest feature-based approach to a global X-ray image not just to prevents lesion segmentation, and moreover eliminates the need for massive training datasets, and so is the case for both the traditional deep learning model. This provides strong evidence of the idea that simple ML-based classification can be effectively applied as an addition to other measures to promote the treatment plan of COVID-19 patients with CXR images [10]. This method can be easily applied for both the rapid identification of CXR objects in either potential flu pandemic.

There is really, nevertheless, no scientifically validated drug or vaccination for treating the COVID-19 epidemic, so certain non-clinical or nonmedical treatment options, like DM methods, ML and optimization techniques, amongst many other AI methods, are desperately required to control and avoid further outbreaks of the COVID-19 disease outbreak. DM is also an efficient method of AI used to discover novel, valuable and true underlying knowledge or dataset knowledge [11]. In multiple or single databases, the methodology exposes associations and information or patterns amongst these dataset. This was broadly utilized in the diagnosis and prediction of numerous disorders, like Coronavirus Severe Acute Respiratory Syndrome (SARS-CoV) and Coronavirus Middle East Respiratory Syndrome (MERS-CoV), which was previously identified in 2003 and 2012, respectively. A treasured asset to be extracted and examined for valuable, legitimate, and newly information extracted for superior decision-making to containing the epidemic of the COVID-19 disease outbreak is a large data set created worldwide relevant to the 2019-nCoV disease outbreak every day[12]. Data gathering has been commonly used in several various applications in the healthcare industry, like forecasting health outcomes, modeling clinical outcomes, rating hospitals, and evaluating the efficacy of therapy and infection prevention, efficiency, and recovery. In disease detection and forecast, ML algorithms play a prominent part [13,14]. ML methods help to identify the disease trends in the face of large disease data so that early action could be planned to avoid the spread of the disease.

II. RELATED WORKS

Digital innovations have played a crucial role in significant health sector issues, like preventing disease, from the last decade, and the new global medical crisis is also pursuing technical assistance to resolve COVID-2019. In this paper, the authors illustrated the promising possibilities of emerging new technologies like the Internet of Things (IoT), big data analytics, AI, deep learning and cryptocurrency to develop disease tracking, identification and effective strategies, as well as to recognize the effect of the disease on the health sector [15]. An Auto Regressive Integrated Moving Average (ARIMA) model was proposed by the researchers in [16] to

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forecast the distribution of COVID-2019. Based on the observation of the prevalence rate of COVID-2019, they estimated the different parameters during the next 2 days. The correlogram and ARIMA forecast chart are also demonstrated in this academic research is the e frequency and occurrence of an outbreak. A series data approach to examine the occurrence pattern and the approximate number of reproductions of COVID-19 outbreaks was proposed [17]. To investigate the patterns of the epidemic, they conducted statistical analysis to illustrate the current observational stage of an area so that different policies can be established to resolve the COVID-19 epidemic cited in different countries. As per the current situation, in order to prepare and monitor successful protection steps, it is crucial to understand the earlier spreading patterns of a disease. In this regard, [18] proposed a theoretical model for the vital transmission of SARS-CoV-2 by using various datasets to analyze the outbreak of COVID-19 within and outside Wuhan. With this, the potential dissemination of the global pandemic from outside Wuhan was discussed.

Several research on the observational studies out-break of COVID-19 have recently been carried out by using Exploratory Data Analysis (EDA) depending on multiple accessible datasets. For good understanding a potential threats and corresponding preparation of mitigation operations, the researchers based primarily on the incidence of confirmed, fatal and retrieved incidents in Wuhan and the remainder of the world [19]. They [20] have raised the question of the criticality of an incubation time for COVID-19 in their research. They analyzed 181 cases reported and found that an incubation period would range from 5 to 14 days, and it is possible to schedule better prevention and monitoring operations on the basis of this. Data from 25 contaminated counties were analyzed in recent academic research to meet short-term projections more about COVID 2019 epidemic. The research illustrates either that stable or exponential power-law development with different spreading derivations follows a location-specific burden of disease spread. With this interpretation, the authors studied in diverse areas of the worldwide the effect of lockdown [21].

Engineers and clinicians has come a very longer route in supporting society in these emergency times by engaging in experimental methods of detecting the virus within humans via ML and DL algorithms technologies. A variety of traditional picture evaluation and ML or DL methods has recently been utilized to mechanically grouping disorders by digitized X-ray images of the chest. Coronavirus infection class decomposition-2019 (COVID-19) with X-ray scanners in non-COVID and COVID bacterial illness is considered one of the important subjects for concern for the diagnosis of this extremely contagious disease. Fast detection of COVID-19 will help regulate the spread of diseases and will help track the development of infectious diseases. Pertaining to [22], Chest CT tends to become more likely to be diagnosed with COVID-19 to an initial reverse transcriptase polymerase chain reaction (RT-PCR) that was obtained from clinical specimens collected and recorded 97.3% accuracy to identify highly contagious virulence factors with COVID-19.

Among the most important approaches that have demonstrated high accuracy throughout the capability to understand the COVID-19 category with therapeutic data such as X-rays or CT pictures is Convolution Neural Network (CNN) [23] suggested a COVID-19 classifier model with 453 Computed Tomography (CT) pictures by applying CNNs dependent in Inception Net and over pathogen-confirmed COVID-19, and recorded a reliability of 82.9 percent. [24] A multi-class disease detection classification was introduced utilizing CT images using a customized form of the pre-trained DRE-Net ResNet-50 system and registered a reliability of 86% for microbial and viral pneumonia. In another analysis, chest x-ray photographs was utilized detect COVID bacterial contagion, first of all to remove feature representations using CNN centered on pre-trained ImageNET, and then to identify it with the last layer of SVM[25]. In comparison, over 16,756 chest medical imaging images were examined by 13,645 patients to identify COVID-19 and non-COVID even by a healthy and microbial diseased individual [26] by multiclass classification, deep convolutionary neural network design identified as COVID-Net. [27] To recognize pneumonia data, the Backpropagation Neural Network and Competitive Neural Network frameworks were used. They set 30 percent of the dataset for test data utilizing pneumonia and regular chest X-ray images and contrasted the suggested solution with the current CNNs. They received a category success of 89.57 percent [28] suggested a deep learning method for classifying data on pneumonia by scratch to practice the data. Their concept consists of several layers of matrix multiplication, thick blocks and sheets of flattening. The model's number of input was 200x200 dimensions to evaluate the classification possibility that use the sigmoid function. The rate of success for pneumonia from X - rays was 93.73 percent [29] identified photographs of pneumonia utilizing deep learning techniques, three dataset classes: regular, pneumonia virus, and photos of microbial pneumonia. They performed a series of data pre - processing techniques to eliminate noise from of the photos in the first example. They then added each picture to the technique measures and utilized a transfer learning approach to training examples. The overall precision of the category was 96.39 percent. DM is an efficient type of AI employed to discover new, valuable and true

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underlying knowledge or dataset knowledge [29]. In multiple or single databases, the methodology exposes relationships and information or patterns between the data set [30]. The models will predict if patients infected with COVID-19 will be healed and recovered from exclusion centers and also patients who may not have been healed and lose their survives due to the COVID-19 epidemic. The prototypes assist healthcare professionals in assessing the rehabilitation and stabilization of disease outbreak COVID-19 freshly infected patients. The models are generated with both the data set collected from the Korea Centers for Disease and Prevention (KCDC), mortality and rehabilitation reports of a contaminated 2019-nCoV disease outbreak was regarded as data set incidents. In order to build the prototypes, DM algorithms like Decision Tree, Support Vector Machine, Naive Bayes, Logistic Regression, Random Forest, and K-Nearest Neighbor were explicitly executed on an image utilizing python programming language.

III. DM METHODS

A. Logistic Regression (LR):

The relation among categorical selected variables is calculated using LR [31]. LR has been used when there are two values for the predictor variables, like 0 and 1, yes and no or true and false, so it is named binary logistic regression [32]. Even so, multinomial logistic regression can be used when the response variable has much more than two possible values. To forecast a transition of the response variable, a numerical simulation of a series of response variable for LR is used. Numerically, the LR conversion is described as: Let's presume that the dependent quantities are fundamental features of 1 and 0, where 0 is a -ve value and 1 is a positive value as a random vector. Consequently, the ratio of positive values would be the average of the binary variable. If p is the percentage of experiments with a result of 1, then $1 - p$ is the likelihood of a result of 0. The $p/(1 - p)$ ratio is also known as odds, and the LG seems to be the odds logarithm or only log odds.

B. Support Vector Machine (SVM):

SVM is among the procedures for deep categorization used during identification and regression [33]. The SVM classification role requires testing and testing dataset comprising those data instances [34]. Each example includes one or more numerical value throughout the training dataset; thus, the primary objective of SVM was to generate a prototype which predicts the target numbers [35]. SVM introduced an implementation of substitute lack functions for regression that could be linear or nonlinear.

C. Decision Tree (DT):

Owing to its capacity to manage both categorical and numerical knowledge, accessibility and understandability, DT can be utilized for image grouping in DM and effective technology. DT generates the tree through stages, respectively, development and pruning stages. In the first point, once each subset is simple, a tree is created by splitting data it into shorter collection, but the break group of a data depends solely mostly on data type [36]. For the mathematical attribute C, the splits form a number of $(C) \leq y$, where y is a value in the C domain. The values of (D), BG, where G is a subset of the domain (D) [37], are used to break a categorical D. The fruiting strategy is used to reduce the background in the dataset to have the final tree constructed when it becomes fully grown [38]. That being said, the growth process is more costly in terms of measurement than the decision tree pruning phase [39].

D. Naive Bayes (NB):

NB is one form of algorithm for grouping of DM that is being used to discriminate cases of datasets based on defined characteristics or attributes [40]. NB is a classification algorithm for image classification and using the Bayes theorem [41].

E. Random Forest (RF):

The RF algorithm is an aggregate learning system used to identify and regress DM tasks. At training phase and performance time, the method creates a multitude of decision trees [42]. With overloading to its training dataset, the RF data gathering algorithm was its best to use for every decision tree [43].

F. K-Nearest Neighbor (K-NN):

K-NN is a data gathering classifier that is non-parametric and monitored, employed for categorization and regression difficulties tasks [44]. For both tasks, input parameters comprise of a training database K closes throughout the domain of the function. In order to learn a function, K-NN relies on labeled input information in order to generate adequate performance when unlabeled data is input [45]. The outcome is a class membership throughout the K-NN classification wherein data instances are categorized by a plurality vote of their neighbors, by a data point being allocated to some of the more basic category of its K-nearest neighbors, whereas the output is really the possessions number of a data point in the K-NN regression, but this value seems to be the average value of a K-nearest neighbors [46]. The Python programming language was utilized for substantial in

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DM. Python is a very popular standard based and interactive language of programming used in various fields like DM, ML, and the Internet of Things. With the assistance of special-purpose modules, DM methods are based using python. Using fivefold cross-validation, the prototypes were produced.

In the decision tree, the results reveal that the first separating attribute tended to become the number of days an attribute that represents the most significant attribute. The model estimated that the number of days for COVID-19 clinicians to rebound from a disease outbreak viral will be a minimal of 5 days and a maximum of 35 days. The template has also shown that another significant attribute is used to predict restoration age is a characteristic of COVID-19 patients [47]. Patients around 65-85 years old are at significant risk of not recovering from the COVID-19 disease outbreak, clinicians between 26-64 years of age are able to return, and victims around 1-24 years of age are capable to reappearance from the COVID-19 disease outbreak rapidly. Old people are at increased risk of acquiring COVID-19 problems from the prototype, which can lead to death.

IV. PERFORMANCE ASSESSMENT OF PROTOTYPE

In order to assess their reliability, data gathering algorithms are trained using assessment methods [48]. The strategies use DM or machine learning techniques to assess the effectiveness and efficiency of the prototype. Specificity, responsiveness, and precision provide those key performance assessment strategies for the deep learning model. To assess the established model, only precision is required. The proportion of a datasets dictates precision properly categorized cases for the method designed by an algorithm for DM, communicated with:

$$Acc = \frac{(TP + TN)}{(TP + FP + TN + FN)}$$

Where, TP = True Positive, TN = true -ve, FP = false +ve, FN = false negative.

Depending on the above literature, it is clear that sample work can be done on data exploration to reflect the existing pattern of the outbreak, but there are still a range of scopes to build and evaluate efficient predictive model based on machine learning such that proactive strategies can be established to meet basic needs.

V. CHALLENGES AND UPCOMING TRENDS

The use of deep learning methods and techniques for the identification of novel coronaviruses (COVID-19) has many particular challenges. Although deep learning methods are largely automated, the creation of a comprehensive framework for diagnostic purposes involves a broad data collection. As COVID-19 is very new to science, the absence of standard data is a significant diagnostic problem. From the other hand, the image evidence collected for COVID-19 patients are, in some instances, imperfect, chaotic, vague and unreliable labels. It is very difficult to train a deep learning approach for such large and varied data sets, and a number of issues such as data replication, sparsity and missing values have to be addressed. For the trial, nearly all the examined programmer used multiple data sets. Using measurement metrics, the built systems gathered data from online sources, designed the data in their very own way, and eventually analyzed their programs. For this purpose, it is very hard to ascertain unequivocally which method for COVID-19 identification produces the best outcome.

The disparity in the dataset specimens is an additional problem for the COVID-19 detection methods. It is a vital concern since both CT and X-ray may be a few COVID-19 specimens, while pneumonia and regular instances contain a large amount of samples relative to COVID-19 cases. Quite frequently, the disparity of data raises bias and during deep learning methodology learning process. With the smaller set of successful samples, the targeted population has become more impossible to balance out. The absence of a normal distribution is another problem observed in COVID-19 diagnostic systems focused on deep learning. Deep learning design includes the output as trust in estimation, while the output predictor of a specific neuron is called a single likelihood. The loss of normal distribution over a forecast value is generally not suitable for COVID-19 diagnosis.

Research is required to explore developing customized deep learning algorithms which can easily cope with such a limited amount of data in order to solve these difficulties. To address the shortcomings of a small dataset, a shallow long short-term memory (LSTM) is utilized. Using a latest deep learning architecture as function extractors, throughout the presence of large-scale testing datasets, and then doing further learning on those enabling routes. Freezing is a strategy that helps the capabilities in deep learning architecture to minimize the amount of variables where the decreased parameters are recruited from some other network equipped for exactly that purpose. If the number of parameters will decrease, a limited number of COVID-19 cases could cause good output to be obtained. In the sense of a limited volume of data, clustering algorithms and multi-task training are more appropriate for COVID-19 diagnosis. Throughout the case of supervised methods, rather than

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a single network, different architectures are built and, ultimately, the outputs of each system are integrated. Diverse tasks are mixed in the multi-task structure to take from one another and the facility of database annotations.

VI. CONCLUSION

The propagation of COVID-19 has taken the environment to the verge of losses of life, which is why it is of paramount significance to evaluate the development of distribution at the latest and estimate the capacity for transmission. Computer equations like Support Vector Regression (SVR), Polynomial Regression (PR) and Deep Learning Regression Prototypes including a regular Deep Neural Network (DNN) and Recurrent Neural Networks (RNN) utilizing Long-Term Short-Term Memory (LSTM) cells are implemented with this purpose. Using the python libraries "\sklearn", "\tensorflow", "\pytorch" and "\keras" respectively, ML and DL techniques were applied to estimate the total number of actual, recovered, and fatal accidents nationwide. The forecast would allow the required decisions based on transmitting growth to be made, like raising the lockdown time, enforcing the sanitation mechanism, providing regular services, etc. The planet is under the influence of the SARS-CoV2 virus (COVID-19). In ongoing studies, in accordance with the viewpoints of COVID-19 experts, deep learning-based analysis will be performed utilizing data images of many other influenced the development by the virus. To boost the databases, we expect to build a potential methodology using various structuring strategies. Because data on the factors affecting the virus are accessible in human chemistry, we can use AI to generate a solution-oriented study. Early propagation forecast will assist in taking the appropriate steps. As seen from China, by lowering the amount of susceptible people from the infectious individuals, this growth of the COVID-19 can be decreased and satiated. By being unsocial and pursuing the lockout initiative with consistency, this is possible. By using python programming, the DM methods containing DT, SVM, NB, LR, RF and K-NN was straightly exposed to a database. The research can be further expanded to allow use of other models of machine and deep learning.

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PROGNOSIS :GENERAL DISEASE PREDICTOR USING MACHINE LEARNING

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ABSTRACT
In this challenging time, the world has faced different problems where health care has taken the majority of the lives of people. Due to certain symptoms, people fear the worst, which leads them to take up wrong medication without any doctor consultation. To overcome this situation, it is important to predict disease at an initial stage. So the most challenging part is the precision of the predicted disease. Machine Learning has made it easy to study any random data and produce efficient output. From all over the world so much medical data is produced every year. An increasing amount of medical data from earlier history has benefited the accuracy of the analysis. Hidden patterns are discovered using these historical records with the help of ML. The proposed project is based on general disease symptoms. In "Prognosis" we use Naive Baye's, Decision Tree Mapping, and Random Forest Machine Learning algorithm for precise results. We have used a Dataset including various types of symptoms corresponding to their disease. Living habits and checkup information are key points for accurate prediction. Accurate results of this "Prognosis" using Naive Baye's, Decision Tree Mapping, and Random Forest Machine Learning algorithm 81.26%.This system gives close prediction to the actual disease.

Keywords— Prognosis, Naive Baye's, Decision Tree Mapping, and Random Forest Machine Learning

I. INTRODUCTION

Health care has taken up a major role in human lives. In these tragic times, when doctors cannot give personal attention and care to the patients, for the general diseases which are 20%-30% cause of the deaths or leads to major health issues. These general diseases need to be cured in the initial stages. Hence we have introduced Prognosis, online assistance to doctor as well as the patient. This system provides you with various symptoms which can accurately confirm the disease. This application is built in such a manner that when a patient selects the symptoms, the disease is predicted. Patients can also provide their history at the time of consultation with a doctor. The use of various algorithms in Machine Learning has made it easy to predict the root cause of the disease. Also, it has become a lot easier to communicate with certified doctors and get proper opinions about any health-related issues. For Prognosis, we have using Machine Learning algorithms to predict the accuracy of the disease. It also helps to understand the eating habits of the patients. For this system, there is no use of virtual doctors but the predictor itself guides the patient. Prognosis Application applies data mining with Naive Baye's, Decision Tree Mapping, and Random Forest Algorithm. Using Prognosis doctors can get to know the pattern and range of the disease in the body. The system uses the dataset and is trained with Machine Learning and Data Mining. Several datasets and algorithms were used to build predictors based on factors like age, gender, symptoms, eating habits, etc. As the data is processed, the input parameters of the dataset are supplied to every model, and the disease was received as an output with dissimilar accuracy levels. Compared to several typical calculating algorithms, the scheming accuracy of our proposed algorithm reaches 81.26% with a regular speed which is quicker than that of the uni modal disease risk prediction algorithm and produces a report. Division of the paper is made that first section is about Introduction. Section second consists of studying an existing system and a Machine learning brief. The third section is about the detailed implementation of the Prognosis. Section fourth is about results obtained after the use of various algorithms. And lastly, we will brief the summary and the future scope for the system.

II. LITERATURE REVIEW

Literature survey is elaborated considering the existing projects which are in working state right now. They are an inspiration to improve the existing system by going ahead with the problem statement. We are more focused on increasing the accuracy levels by decreasing the complexity of the algorithms.

II.I. EXISTING SYSTEM

The project developers have taken into consideration the original idea and researched with different combinations. Comparison of various algorithms like Decision Tree Mapping, Naïve Bayes, Random Forest using performance measures like MAE in WEKA, statistical analysis KAPPA, etc. comparing the classifiers based on accuracy measures. Decision Tree Mapping and Naïve Bayes were considered with minority percentage difference while Random Forest was more accurate to predict for Allergist, Immunologist and Dermatologist dataset used in the project. Also for the prediction of disease-related to Orthopedic and Rheumatology used the analysis of different Machine Learning Algorithms of Decision Tree for better prediction. The accuracy level has been more. Analysis of Bayes Net using WEKA Tools for various disease

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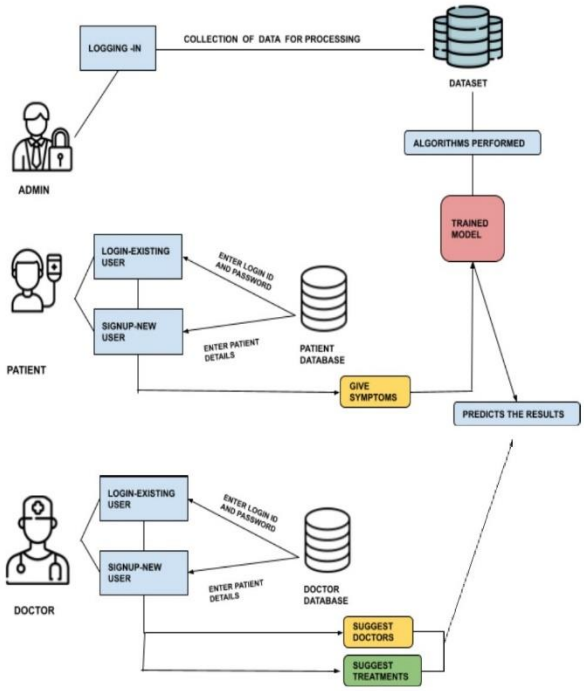
predictions for different datasets. The performance is acquired by the combination of results of measures such as ROC and AUC curve values. Bayes network along with SMO shows optimum results than others. For a disease like peptic ulcer, we used Multilayer neural networks which provided 87% accurate prediction. Observation concluded that C5.0 and Fuzzy C-means provide the highest and lowest accuracy which is from 34% - 80%. With all over results and prediction it is likely to conclude that classification algorithms provide better accuracy over clustering algorithms.

III. SYSTEM ARCHITECTURE

The disease predictor system analyses disease based on the probability percent of different symptoms. Other factors like age, gender, eating habits are also taken into consideration while consultation. During these consultations, doctors counsel precautionary measures required for treatment of predicted disease. In the early stage, the application is presented with various sources i.e. patient data. The raw data is then processed using the data mining algorithms which produce the prediction based on high accuracy. The diagnosis is then sent to both the doctor and the patient. Based on the disease the specialist can be consulted and the treatment can be recommended.



\Fig -1: System Flow Diagram for Prognosis

The system is built as Admin module, Doctor module and Patient module. Admin module helps to keep up with the training dataset and regulates the disease predictor. While the doctor module has the part of consultation after logging in to system and creating the portfolio. Patient module can redirect to symptoms after filling up the necessary detail once logged in, and gets the consultation after the results are diagnosed about disease predicted.

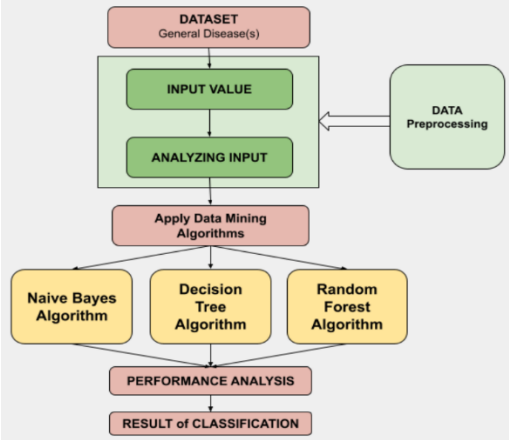


Fig -2: Block Diagram for Prognosis

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IV. IMPLEMENTATION

Prognosis is implemented as :

1) **Admin**
2) **Doctor**
3) **Patient**

4.1 Admin

Once after SignIn the application following are the set of rules to be implemented by Admin :

I. **Preprocessing the extracted data**

II. **Transformation of the raw data.**

III. **Retrieving data out of data sources for feature selection.**

IV. **Implementation of Random Forest,Naive Baye's and Decision Tree Mapping for the prediction accuracy.**

V. **Designing Framework according to the Algorithm.**

Step I: Preprocessing the extracted data

Data set used for the study of Prognosis is obtained from Kaggle.com and and different health websites with inital size 132 types of different symptoms and their 40 class of general disease.

itching	skin_rash	nodal_ski	continuou	shivering	chills	joint_pair	stomach_	acidity	ulcers_on	muscle_w	vomiting	burning_r	spotting_	fatigue	prognosis
1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0 Fungal infection
0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0 Allergy
0	0	0	0	0	0	0	1	1	1	0	1	0	0	0	0 GERD
1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0 Chronic cholestasis
1	1	0	0	0	0	0	1	0	0	0	0	1	1	0	0 Drug Reaction
0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0 Peptic ulcer diseae
0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0 AIDS
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1 Diabetes
0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0 Gastroenteritis
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1 Bronchial Asthma
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 Hypertension
0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0 Migraine
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 Cervical spondylosis
0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0 Paralysis (brain hemorrhage)
1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1 Jaundice
0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0 Malaria
1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1 Chicken pox
0	1	0	0	0	1	1	0	0	0	0	1	0	0	0	1 Dengue
0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	1 Typhoid

Fig -3: Extracted Data

Step II: Transformation of the raw data

The dataset taking into consideration is raw.

This data is further modified by bifurcating by selecting required inputs.

Required inputs are then transformed in high level language.

Step III: Retrieving data out of data sources for feature selection

Here, we take only the necessary information (symptoms ONLY) which is essential for predicting the disease.

All the other information of patient which are not required for prediction is omitted and to make system more fluidic, we generalize the steps into proper sequential manner for better human understanding.

Step IV: Implementation of Random Forest, Naive Baye's and Decision Tree Mapping for the prediction accuracy

A) Naive Bayes classification algorithm

In this system we have used Naive Bayes algorithm for classification purpose and to predict that classification is predictor independent.

It assumes that Naive Bayes classifier predicts that the presence of a particular feature in a class is unrelated to the presence of any other feature.

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Sophisticated classification can be best performed by Naive Bayes with end result as peak level .

Subsequent probability an be outperformed by Naive Bayes theorem.

P(a|b) from P(a), P(b) and P(a|b).

Look at the equation below:

P(a/b)=(P(b/a)P(a))/P(b)

where,

- P(a|b) is the subsequent probability of class (a, view) given predictor (b, parameters).
- P(a) is the prior possibility group.
- P(b|a) is the likelihood possibility of disease predictor given group.
- P(b) is the prior probability of disease predictor set.

B) Random Forest Algorithm

The extracted data is used for classifier models.

Used simple preset probability to choose the relevant data attribute.

RF algorithm uses sample data and to construct multiple decision trees by mapping random sample of feature subspaces

The RF algorithm associated with a set of training datasets D and Nt attributes can be described as follows:

I Pre Stage:

D1, D2 ….DK sampled by predetermined probability with replacement.

II Post Stage:

For each dataset DK construct a decision tree model. The training datasets are randomly sampled using its subspace of m-th dimension from the available attributes.

Calculate all possible probability based on the m-th features. Data split is properly described in the tree structure nodal format. The process will be on going till it reaches the threshold limits criteria.

Combine the P number of unpruned trees h1(A1), h2(A2),…….. Into a random forest ensemble and use the high probability value for classification decision.

Pseudo code:

1. Randomly select “x” attributes from total “y” attributes ,where x < < y.
2. Among the “x” attributes, calculate the node “x” using the best split point.
3. Categorize the node into daughter nodes using the best split.
4. Repeat 1 to 3 steps until “z” number of nodes has been reached.
5. Build forest by repeating steps 1 to 4 for “x” number times to create “x” number of trees.

StepV. Designing Framework according to the Algorithm.

Prognosis is ready to use as “trained model” is completed.

4.2 Doctor

Once after Sign-Up or LogIn the application following are the set of rules to be implemented by Doctors :

I. Check the Profile of Patient

II. View Consult History

III. Consult patient regarding the treatment

I. Check the Profile of Patient

- Doctors could check the profile based on the predicted disease

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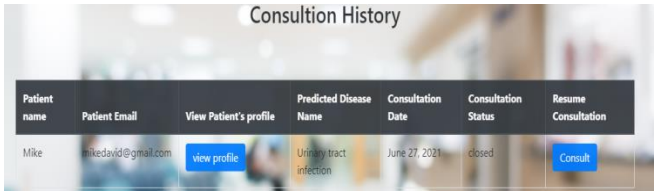
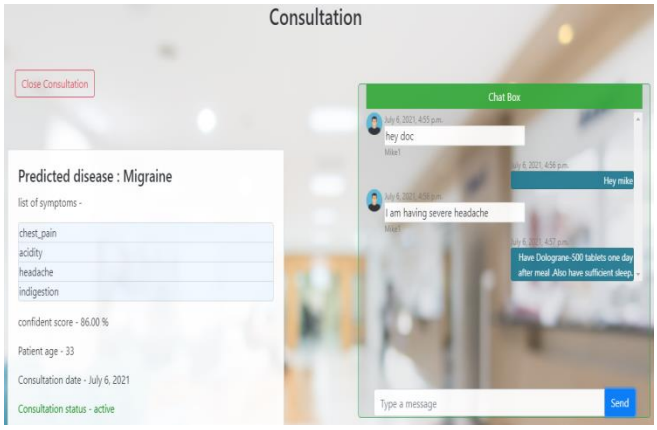
II. View Consult History

- History consultation works like the past records of the patients and the reference to the doctors



III. **Consult patient regarding the treatment**

- Predicted results are seen to both the patient and the specialist doctors.
- This helps it to be easier way of consultation.



4.3 Patient

I. Add symptoms for disease prediction

II. Consult doctor

III. View Consultation History

IV. Rate the Doctor

I. Add symptoms for disease prediction

- Patients can add the symptoms according to their needs in order to get a desired prediction.

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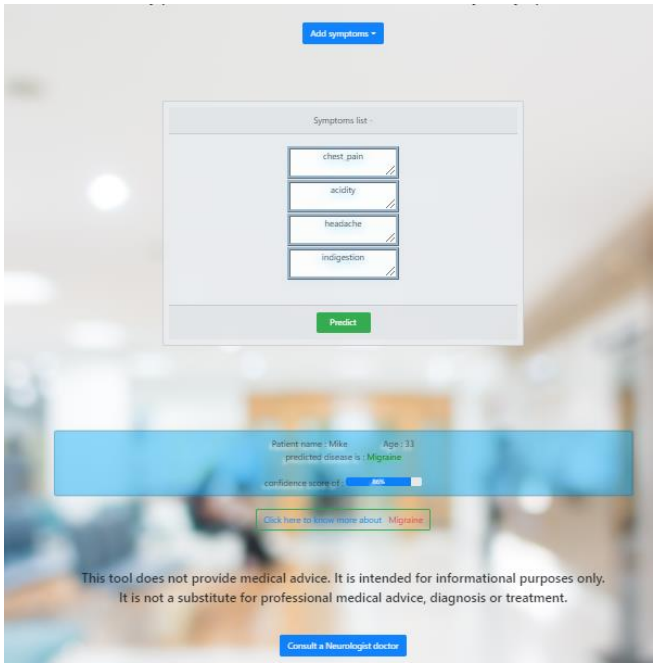
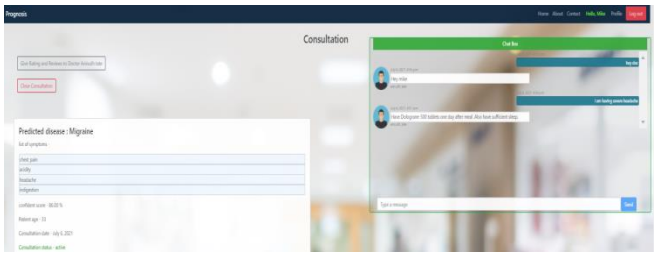


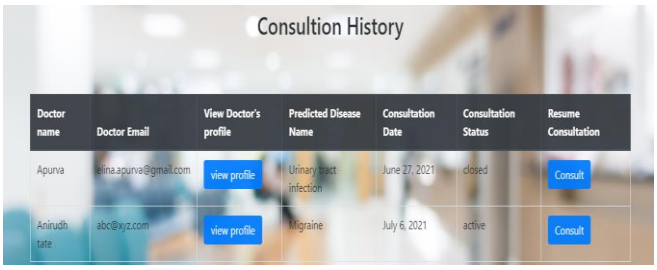
II. Consult doctor

- After getting the results of predicted disease the patient can consult specialist doctor for further treatment and medication.



III. View Consultation History

- Patient can view the consultation history with the doctors.



IV. Rate the Doctor

- Based on the performance and the consultation doctor can be rated by patient.

Ratings and Reviews

PATIENT NAME	RATINGS	REVIEWS
Mike	5/5	
Mike	1/5	
Mike	5/5	Best Doctor

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V. RESULTS AND CONCLUSION

Confusion Matrix

- Confusion Matrix briefed us about the error that is caused by the system with prediction, which lead us to know how the algorithm is working with different set of parameters.

Disease	Classification	Precision	Recall	Predictive	Score	Classifier Area
Migraine	Naïve Baye's with 10 parameters	0.71	0.77	0.77	0.7	0.695
	Random Forest(Decision Tree Mapping) with 10 parameters	0.86	0.86	0.86	0.86	0.86
Urinary tract infection	Naïve Baye's with 10 parameters	0.41	0.37	0.366	0.4	0.4
	Random Forest(Decision Tree Mapping) with 10 parameters	0.37	0.37	0.37		0.37
Malaria	Naïve Baye's with 10 parameters	0.55	0.6	0.54	0.67	0.67
	Random Forest(Decision Tree Mapping) with 10 parameters	0.7	0.71	0.71	0.71	0.71

Fig -4: Confusion Matrix of Sample Data

The Prognosis is the application created from the systems with newly combining the Machine Learning Algorithms such as Random Forest with Decision Tree Mapping

And Naïve Baye's.

The system accuracy is as 81.26 % correct prediction.

There are two different algorithms used and most precise prediction is given by Random Forest using decision tree with approx. 78.2% and for the acute diseases Naïve Baye's with approx. 82.66%.

There are some drawbacks which when debugged the system will start running smoothly.

The following are the drawbacks of the Prognosis:

1) Working through with algorithms for better prediction.
2) Since system has limited doctors concept of virtual doctors can be used as future scope.
3) The precision of medical history need to be cumulative in order to make Prognosis work efficiently.

The following are the advantages of Prognosis:

1) The system can be used for private clinics
2) Online consultation becomes easier for the old aged patients and also for regular in pandemic times.
3) System can be also used as an second opinion for the patients.
4) Doctors and Patients both get advantage of the system with various features like, Consultation history, profile of Doctor and Patient.
5) This system can be used efficiently in remote areas Swith less medical facilities, to predict the case.

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CLOUD COMPUTING-THE BUSINESS PERSPECTIVE

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ABSTRACT:

- *The evolution of cloud computing over the past few years is potentially one of the major advances in the history of computing. However, if cloud computing is to achieve its potential, there needs to be a clear understanding of the various issues involved, both from the perspectives of the providers and the consumers of the technology.*
- *While a lot of research is currently taking place in the technology itself, there is an equally urgent need for understanding the business-related issues surrounding cloud computing.*
- *In this article, we identify the strengths, weaknesses, opportunities and threats for the cloud computing industry. We then identify the various issues that will affect the different stakeholders of cloud computing. We also issue a set of recommendations for the practitioners who will provide and manage this technology.*

Implement:

- *IaaS replaces physical hardware like in-house web hosting servers. By providing things like virtual servers or virtual machines, IaaS helps businesses take advantage of a range of configurations to handle different workload needs. Two of the key players in this field are Amazon Web Services and Microsoft Azure.*
- *IaaS allows businesses to start with and maintain lower infrastructure costs. By using IaaS, not only does a business not need to invest initial capital in creating servers, hardware, and storage infrastructure from the start, IaaS also reduces maintenance fees and IT services.*
- *IaaS makes the IT hardware infrastructure, such as servers, storage devices, computing power, available to end users through the Internet. Users of IaaS are charged for the amount of the actual use of the resources. Technically, IaaS systems, via Internet protocol, manage large amount of computing resources and use virtual technology to segment, dynamically reconfigure or change specifications to meet users' needs for custom software in the context of unique computing environment.*

Keywords: Cloud Computing , stakeholders , Infrastructure , Evolution , Business , IAAS , Virtual Server , Virtual Machine , AWS ,Microsoft Azure.

INTRODUCTION:

- We have always been storing the programs and data that we need onto our computer's hard disk and accessing it whenever required. This is computing. But now technology has taken over and the need to store everything on your physical hard disk is no longer there. Here, Cloud Computing comes into picture.
- Cloud Computing is the method of computing in which the data and programs are stored over the Internet and not on your hard disk.
- Creating a physical infrastructure to store and install all these would be time consuming and expensive. Instead, if you get a share of what is already installed over the Internet for use, it is cost effective and meets your needs as well. So Cloud computing is mainly based on sharing the computing resources.
- Most companies recognize IT as a strategically crucial resource. However, due to the growing amount of investment, management wants to see tangible, quantifiable benefits of an IT investment to justify the investment. Although many research reports and white papers claim that cloud computing can bring substantial benefits, such as reducing costs and flexible deployment, questions regarding how to realize such benefits and what contextual factors may impact the benefit remain unanswered.
- With Cloud Computing becoming the trend and the new way to do business, organizations are opting for the cloud model to work
- The main factor in favor of cloud computing is the reduced cost of infrastructure and applications. Added to that, the lower or no costs for support and maintenance is another important aspect promoting the acceptance of cloud computing.
- The technicalities of a cloud computing depend on several aspects, like, the business requirement, cloud deployment model, and the data.

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LITERATURE REVIEW:

- **Startups and small companies** may prefer IaaS to avoid spending time and money on purchasing and creating hardware and software.
- **Larger companies** may prefer to retain complete control over their applications and infrastructure, but they want to purchase only what they actually consume or need.
- **Companies experiencing rapid growth** like the scalability of IaaS, and they can change out specific hardware and software easily as their needs evolve. Anytime you are unsure of a new application's demands, IaaS offers plenty of flexibility and scalability.

Popular examples of IaaS include:

Digital Ocean :

People who often deal with website hosting are aware of Digital Ocean. It is one of the well-known IaaS and other cloud-related service providers. Though Digital Ocean extensively focuses on website application and website hosting deployment, their fine understanding of IaaS services has made them a leading service provider and one of the best IaaS examples in the world.

With some ground already covered, Digital Ocean uses the piecemeal allocation for most of its infrastructure resources. This helps the company to customize the cloud computing services according to the customer's unique requirements.

LINODE:

Linode is a fine example that also accounts for the IaaS example of web hosting industries. Talking about the concept adopted by this brand, it is almost identical to what Digital Ocean has adopted, but there are still a lot of dissimilarities. Linode has chosen to bring forward the user-friendly aspect of working on the cloud.

SERVER CENTRAL:

Another brand that enjoys providing top-notch IaaS and other services of cloud computing is Server Central. This brand is relatively fresh and small compared to the others in the race, but with some of its unique tricks and offerings, it bridges the gap between itself and the big guns.

Server Central has taken the cloud services a notch-up by integrating the on-premises infrastructure in the setup. It offers a hybrid platform that gives a smooth and great IaaS to its customers. This is what differentiates it from the others and makes it one of the best cloud service examples in the world.

OBJECTIVE:

If we take Banking as business then we get following issues:

In other cases, banks and credit unions use cloud services to offload risk management processing of large portfolios. First National Technology Solutions offers IaaS to financial institutions for application development, testing, disaster recovery, failover, and data storage.

- Provide Higher Security:
- Enhance Customer Experience:
- Useability:
- Functionality:
- Integration:
- Bandwidth Cost:

Model Framework:

- **Enhance Customer Experience:** Banks can now use third party applications and services to enhance customer experience. From providing solutions straight to WhatsApp, to providing customers with instant solutions on their phone; banking as a service will become highly customized with this digital revolution. Cloud enables banks to build an enhanced marketplace for customers one where they can leverage new technology services and data to build a more wholesome experience for simplifying and enhancing each financial transaction.
- **Provide Higher Security**:- Cloud deployment offers great choice in choosing the management required and level of security, and hence is suitable for almost any business.

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In an IaaS cloud environment (for brevity, this article will combine IaaS and PaaS into one group), the vendor provides core infrastructure. In general, this means basic networking, processing and storage services. The customer is responsible for granular network administration, server administration and data storage administration. Control for the majority of security considerations rests primarily in the customer's hands

Customer responsibilities include:

- Controlling network access (opening and closing of ports and protocols).
- Granting or denial of access at the server and service layer (the customer is responsible for the server and service configuration).
- Designing, implementing, maintaining and inspecting access control within the application
- Implementing failover and other redundancy solutions.
- Securing an IaaS environment can be a challenge, but the high level of control the customer enjoys enables you to design and implement.
- However, in the cloud, the data will be distributed over the network through individual computers regardless of where the repository of data is ultimately stored. Industrious hackers can invade virtually at any server, and there are the statistics show that one-third of breaches result from Internet, with nearly 16 percent due to insider stealing.
- stolen or lost laptops and other devices and from employees' accidentally exposing data on the

➢ **Useability:-**

- Usability is an essential characteristic for both administrators and users. It's paramount that your admin operates with products that stay compatible with the latest releases of hardware, operating systems and related software applications that are dependent on your business. IaaS user interfaces should be logically and intuitively designed so it's easy for users to interact with products.

➢ **Integration:**

- When choosing a cloud, think about how your IaaS offering will be incorporated into workflows now and in the future.
- If your IaaS solution requires you to use different databases or different administration tools with inconsistent user interfaces, it's not well integrated. Ideally, you want a product that has one single credential that will enable your admin to deal with all aspects of the product suite.

➢ **Functionality:**

- you'll want to make sure your cloud infrastructure has basic compute and storage support, as well as support for public, private and hybrid cloud delivery models. This is a must have for an IaaS solution. Cloud providers with greater functionality offer consulting services to help migrate and run enterprise workloads, along with development tools that enable quick delivery of applications and services.

➢ **Bandwidth Cost:**

- Cloud computing offered companies, can save money on hardware and software; however they
- could incur higher network bandwidth charges. Bandwidth cost may be low for smaller Internet-
- based applications, which are not data intensive, but could significantly, grow for data-intensive
- applications.

SUGGESTION:

➢ Cloud Computing offers an opportunity like no other system does, with cloud operators providing a range of cloud services the banking industry is only going to accelerate the switch in their infrastructure, and the future of banking will be paved with a hyper personalized and automated route.

➢ Cloud computing is a modern technology trend that allows the companies to take over the market. Cloud computing is considered as an innovative and enhanced technology to run business organization. Most of businesses now-a-days are running all kinds of applications in the cloud like accounting, Custom built, communication, application development, productivity etc. Cloud based services are easy to afford for any kind of business as the customer need to pay only as per use.

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DEVELOPMENT OF AN ALGORITHM FOR ANALYSIS AND COMPUTATION OF FLOW RATE AND WATER QUALITY ALONG RIVER STRETCHES

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ABSTRACT
This research paper presents a computational approach for assessment of water quality prediction and management along multi-industrial outfall river stretches with modular approach. A computer algorithm 'WaterQAP' provides an automatic system for finding the cross-sectional area of the river stretches with dimensional and velocity variations measures. This algorithm integrates modules of different operations such as velocity estimation, calculation of flow rate for the analysis and computation of water quality of the river system. All modules are integrated to each other and inherit data in other module to calculate the essential parameters for water quality prediction using this algorithm. This algorithm provides an effective and optimal solution for measuring the river water quality analysis and prediction through suitable mitigative measures of river water pollution assessment, protection and their management using mathematical modeling and computer simulation of river quality management information system.

Keywords: River water quality management; mathematical modeling; multi criteria decision analysis; water quality prediction; multi-industrial outfalls; computer algorithm;

1. INTRODUCTION
The river water is used for drinking, cooking, bathing, irrigation, coal washery and industrial purpose. Many industries nearby river discharge their wastewater & effluents in river which makes the major reason for water pollution. Alright, most of the industries are responsible for degrading the river water quality and polluting the water environment. Generally, industries are situated nearby river side for releasing wastewater and effluents into river water. A good river quality management should ensure the quality of river water at any point along with river stretch [1]. Water quality prediction model can be applied to any river water system which is being utilized for different purposes. This model describes the river water quality processes and typically requires the essential inputs with water flow rate and pollution load. The analysis and prediction of water quality parameters is performed by different application programs or software which is either limited with some operations or more expensive in terms of cost. Thus, in this work, 'WaterQAP' algorithm of RQMIS provides an effective solution with exact velocity along the cross-sectional area in terms of costless and effective efficiency using stepwise computational models. These models have been developed with many assumptions with the aim to simplify the governing equations into the standard form of differential equations, which can easily be solved through analytical methods [7]. This computer algorithm integrates all modules and executes the analysis of these modules to predict the flow rate and water quality along multi-industrial wastewater outfall river system with effective and optimal output. This algorithm is developed for better river water quality prediction and management along river system.

2. METHODOLOGY
Mathematical modelling is a relatively young branch of science, therefore, not so long ago a specific mathematical model for each stream was prepared individually to achieve environmental objectives of this type, which was very labour-intensive and expensive [1]. In the last thirty years a rapid development of mathematical modeling of water resources quality has been observed [1]. Computer modeling and simulation of intensity of problems and water quality prediction requires an integrated methods and expressions with use of computer simulation are applied simultaneously in the river system. The role of mathematical modeling and computer simulation is very important for any system. The assessment of river water quality prediction using mathematical modeling provides an optimal solution of the concerned problems related to water pollution and quality to its reality. And also computer simulation gives the effective presentation of stepwise system processing in order to model view. It is not possible to access the account of more water parameters of the real surface, but we make an effort to getting more accuracy for parameters of water quality prediction with a single computer algorithm development by using mathematical equations and modeling. Really, mathematical and computational modeling impose a systematically flow of computation and best model for accessing an optimal result in any river system with good presentation chart of the flow rate, velocity and water quality with real coordinate points and provide a real time monitoring data of multi-industrial outfall stretches of the river system. The water quality prediction is of great significance to the planning and control of water quality [2].

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Therefore, an appropriate model would be selected on the basis of these criteria after a complete review on the existing models for analysis and prediction of river water quality. This model has been adopted for the proposed work through development of an algorithm which would help a computer scientist or software developer concern with water pollution to the river system model development.

3. COMPUTER ALGORITHM

A computer algorithm represents a systematic processing of modules in the river system. This algorithm finds the cross-sectional area of the river stretches with dimensional and velocity variations measures and also establish a well integration for velocity estimation, calculation of flow rate for the analysis and computation of water quality of the river system. The entire mathematical modeling and computer simulation approach has been put together in the computer algorithm "WaterQAP", developed by Satrughan Kumar Singh, which provides an effective and optimal solution for computation of water quality.

// Algorithm : WaterQAP

Step-1: input 'distance to the point where the velocity measured from the river's bank'; d_a
input 'distance to the river's bank from the point where maximum velocity occurs'; d_b
input 'measured stream velocity'; s_v
input 'maximum depth of the river'; D_{max}

Step-2: estimate to find 'maximum velocity at top point of river where maximum depth occurs'; V_{max}

$$V_{max} = \frac{s_v * (d_a)^2}{(d_b)^2 - (d_a)^2}$$

Step-3: input 'depth of the river'; D // Ref: step-1; D_{max}
input 'maximum velocity at top point of the river'; V_{max} // Ref: step-2; V_{max}
input 'width of the river in x-axis (+ve side)'; d_b // Ref: step-1; d_b
input 'width of the river in x-axis (-ve side)'; d_c

Step-4: Difference the width of -ve side and +ve side cross-section and then divide by δx dimension

$$x = \frac{1}{\delta x}(d_{c-}d_b)$$

and divide depth of the river by δy dimension

$$y = \frac{1}{\delta y}(D)$$

Step-5: FR = 0

Step-6: for $i = 0$ to y

$$p_1 = \frac{1}{D}(D - y)$$

$$m = d_b * \sqrt{p_1}$$

$$d_{am} = |\pm m|$$

Step-7: for $j = 0$ to d_{am}

// find velocity of cross-section between two depth (yδy) and ((y − 1)δy)

$$v(j,i) = [V_{max}(0,0) * \left(\frac{D-y}{D}\right) - (\frac{1}{d_{am}} * j)^2]$$ // corner point of top-left side

$$v(j+\delta x,i) = [V_{max}(0,0) * \left(\frac{D-y}{D}\right) - (\frac{1}{d_{am}}(j+\delta x))^2]$$ // corner point of top-right side

$$v(j,i-\delta y) = [V_{max}(0,0) * \left(\frac{D-(i-\delta y)}{D}\right) - (\frac{1}{d_{am}} * j)^2]$$ // corner point of bottom-left side

$$v(j+\delta x,i-\delta y) = [V_{max}(0,0) * \left(\frac{D-(y-\delta y)}{D}\right) - (\frac{1}{d_{am}}(j+\delta x))^2]$$ // corner point of bottom-right side

// find sum of average velocity of cross-section

$$V_{sum} = [v(j,i) + v(j+\delta x,i) + v(j,i-\delta y) + v(j+\delta x,i-\delta y)]$$

// find average velocity of cross-section

$$V_{avg} = \frac{1}{4} * V_{sum}$$

// find average flow rate of the river

$$F = (V_{avg} * \delta x * \delta y)$$

// find flow rate

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$FR = FR + F$

Step-8: next // $j = j + 1$ and GOTO step -7

Step-9: // find cross-sectional area

$a_1 = D * (d_b - d_c)$

$$a_2 = \frac{D * (d_b + d_c) * ((d_b)^2 - (d_c)^2)}{2 * d_b * d_c}$$

$$= \frac{D * (d_b + d_c)^2 * (d_b - d_c)}{2 * d_b * d_c}$$

$$a_3 = \frac{D * ((d_b)^3 - (d_c)^3)}{3 * d_b * d_c}$$

$$= \frac{D * (d_b - d_c) * ((d_b)^2 + (d_b * d_c) + (d_c)^2)}{3 * d_b * d_c}$$

Step-10: // find total cross-sectional area

$CSA = a_1 + a_2 + a_3$

Step-11: next // $i = i + 1$ and GOTO step -6

Step-12: if $d_b == d_c$ then

// find total flow rate

$$TF = 2 * FR$$

else

$$F_1 = F$$

$$p_2 = \frac{1}{D}(D - y)$$

$$d_{am} = |\pm(d_c * \sqrt{p_2})|$$

$$TF = F_1 + F$$

end if

Step-13: input 'maximum velocity'; V_{max} // Ref: step-2; V_{max}

input 'length of unit distance (in meter)'; l_u

input 'upstream river flow'; TF // Ref: step-12; TF

input 'total cross-sectional area of the river'; CSA // Ref: step-10; CSA

input 'target distance from the last outfall point for water quality prediction'; d_t

input 'number of outfalls'; N_o

Step-14: $d = 0$

Step-15: for $i = 0$ to N_o

input 'sampling code of the outfall point'; S(i)

input 'x-coordinate (in 1st quadrant)'; a(i)

input 'x-coordinate (in 2nd quadrant)'; b(i)

input 'maximum average depth of river'; D(i)

input 'distance of prev. outfall point'; x(i)

input 'mixing distance'; $d_m(i)$

input '% of bioflocculate particulate matter'; bpm(i)

input 'settling coefficient of bioflocculate particulate matter'; sc(i)

input 'settling velocity of bioflocculate particulate matter'; sv(i)

input 'quantity of river water (pumped out)'; qw(i)

input 'dispersion coefficient for water quality'; dc(i)

input 'concentration of parameter in river water before outfall point'; co(i)

input 'concentration of parameter in river outfall point before mixing point'; cm(i)

Step-16: // assign distance of prev. outfall, x(i) to $d_z(i)$

$d_z(i) = x(i)$

$d_z(i) = d_z(i) + d$

Step-17: if $i == 0$ then

$a(i) = TF - qw(i)$

else

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$$a(i) = d_z(i) - qw(i)$$

end if

Step-18: $\mathbf{c(i)} = \mathbf{a(i)} + \mathbf{b(i)}$

$\mathbf{TF(i)} = \mathbf{c(i)}$

Step-19: $\mathbf{CC1} = (\mathbf{co(i)} * \mathbf{a(i)})$

$\mathbf{CC2} = (\mathbf{cm(i)} * \mathbf{b(i)})$

$\mathbf{CC3} = (\mathbf{co(i)} + \mathbf{cm(i)})$

// find concentration of parameter next to critical mixing point in river system

$$\mathbf{CC(i)} = \frac{(\mathbf{CC1} + \mathbf{CC2})}{\mathbf{CC3}}$$

Step-20: // computation of cross-section area

$\mathbf{a_4} = \mathbf{D} * (\mathbf{co(i)} - \mathbf{cm(i)})$

$$a_5 = \frac{D * (co(i) + cm(i)) * ((co(i))^2 - (cm(i))^2)}{2 * co(i) * cm(i)}$$
$$= \frac{D * (co(i) + cm(i))^2 * (co(i) - cm(i))}{2 * co(i) * cm(i)}$$

$$a_6 = \frac{D * ((co(i))^3 - (cm(i))^3)}{3 * co(i) * cm(i)}$$
$$= \frac{D * (co(i) - cm(i)) * ((co(i))^2 + (co(i) * cm(i)) + (cm(i))^2)}{3 * co(i) * cm(i)}$$

// find cross-section area

$\mathbf{CSA(i)} = \mathbf{a_4} + \mathbf{a_5} + \mathbf{a_6}$

Step-21: // computation of the river velocity

$$R_{vel}(i) = \left(\frac{(CSA * TF(i))}{CSA(i) * TF}\right) * V_{max}$$

Step-22: $\mathbf{TF} = \mathbf{TF(i)}$

Step-23: next // $i = i + 1$ and GOTO step $-$ 15

Step-24: input 'enter stretch code which you want to predict?'; **scode**

Step-25: input 'type of stream'; $\mathbf{x_p}, \mathbf{y_p}$

Step-26: $\mathbf{u} = \mathbf{0}, \mathbf{v} = \mathbf{0}$

Step-27: for $k = 0$ to scode

$scode = scode - 1$

$k = (int)(k(scode1) + u$

if $x_p >= 0$ *then*

$$s_v(x_p, y_p, k) = R_{vel}(i) * \left[\left(\frac{D(i) - y_p}{D(i)}\right) - \left(\frac{x_p}{co(i)}\right)^2\right]$$

else

$$s_v(x_p, y_p, k) = R_{vel}(i) * \left[\left(\frac{D(i) - y_p}{D(i)}\right) - \left(\frac{x_p}{cm(i)}\right)^2\right]$$

end if

$$C_{var1} = \left(\frac{sv(i) * s_v(x_p, y_p, k)}{D(i) * \exp(sc(i))}\right)$$

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$$C_{var2} = \left(\frac{k}{s_v(x_p, y_p, k)}\right)$$

$$\mathbf{C_{var3} = (1 - (C_{var1} * C_{var2}))}$$

$$\mathbf{c(k) = \left(\frac{bpm(i) * s_v(x_p, y_p, k) * c(i) * C_{var3}}{R_{vel}(i)}\right)}$$

$\mathbf{predic = l_u * k}$
// open a file to store the value of 'predic' variable with computational point
$\mathbf{fptr = fopen('fname', 'mode')}$ // fname is a filename with append 'a' mode
$\mathbf{fprintf(fptr, \$predic, \$c(k), '\backslash n')}$ // write value in file
$\mathbf{fclose(fptr)}$ // close connection

Step-28: next // $k = k + 1$ and GOTO step $- 27$

Step-29: input 'do you want to continue water quality prediction process? (Y/N)'; $option

Step-30:
if $option = = 'y' || $option = = 'Y' then
GOTO step - 24
else if $option = = 'n' || $option = = 'N' then
exit
else
msgbox ('Invalid selection')
GOTO step - 29
end if

Step-31:
// display the output
msgbox ('Water Quality Prediction has been successfully completed')

Step-32: fptr = fopen('fname', 'mode') // open a file in read 'r' mode

Step-33:
while (fscanf(fptr, $predic, $c(k)) ! = EOF
// water quality prediction chart
plot line to draw x and y coordinates with context of $predic and $c(k)

Step-34: fclose(fptr) // close connection

Step-35: exit

4. DISCUSSION

Most of the computer modeling software has been designed which are either costlier or limitations. The river system is rarely analyze and monitored with real data and actual coordinate points. So, a predictive model is to be required for river transport modelling. Although, this survey shows this matching especially in river system along multi-industrial outfall river stretches. So, this model of river system has been developed with many essential assumptions to achieving the goals easily with mathematical models and expressions as well as computer simulation. It provides simple and easiest way to simplify the intensity of problems and water quality prediction using mathematical and analytical methods. The flow rate will caused by cross-section and velocity of the river system. This model works with multi-dimensional scenario. So, it is necessary for development of effective and suitable model. Newer models consider the effects of low flow augmentation from reservoirs and the problems of heat discharges [6]. A research program has been carried out to study the prediction of stream re-aeration rates of Chattanooga in Tennessee Valley Authority [3]. This model computes more parameters for water quality than older models with more flexibility and accuracy. The BOD measurement contributed by bioflocculated particulate matters is also accounted with other parameters in this research work. The most rapid assimilation of biological oxygen demand (BOD) in Ganga and Yamuna river has been studied through prediction modeling [4]. In recent period, no model is available for accessing the accurate flow rate of the river system. No doubt, the flow rate is very important for river water quality prediction. The existing model facilitate the overall rough estimation and doesn't predict accurate output with real coordinate points using mathematical equations and expressions which are used in similar fashion. Water quality models of the river system receiving

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pollutant discharges from industrial and domestic point that require those pollutant loadings as input data. Water quality models can be applied to river water system. This model describes the water quality processes and typically requires the water flow or volumes, velocity and pollutant loadings along with exact coordinate points as input data. The plotting of time series analysis and imported rating curve form upstream to downstream boundary of the river are shown in **Fig.1** and **Fig.2**. Therefore, an appropriate mathematical model has been selected for computing exact flow rate, velocity variations over cross-section and water quality along river stretches nearby industrial and domestic complexes with exact coordinate points.

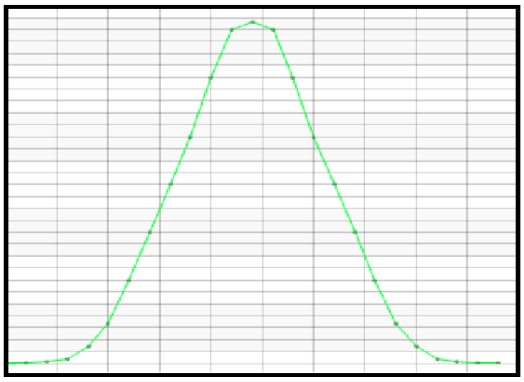

Fig.1: Time series analysis

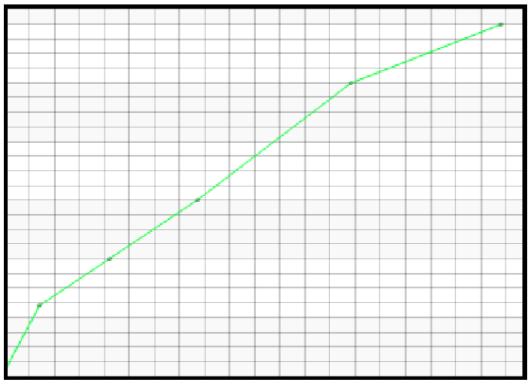

Fig.2: Imported rating curve

5. CONCLUSION

The water quality parameters and intensity of water problems can be studied through proper modeling iteration process that present an algorithm to quantify the issues related to environmental damages in and around multi-industrial zones of coal washeries, coal industries and other plants. The estimation of water pollution load in the river is possible by an effective use of river water quality prediction model. All stepwise modules of RQMIS will be effective for prediction of water quality along river stretches with exact outfall points of domestic and multi-industrial wastewater or effluents. The RQMIS provide an optimal result for river quality management through prediction of water quality and pollution load of river water for various purpose viz., drinking, pisciculture, bathing, cooking, irrigation and industrial plant use towards the downstream of the river. It also facilitates policies for water protection and management. Many industrial, domestic and other operations along the bank of river system cause an intensity of water problems and water pollution load which are necessary for proper auditing of river water pollution and management using river water quality management system.

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SCHWARZSCHILD METRIC TENSOR AND EINSTEIN EQUATIONS OF THE CHRISTOFFEL SYMBOLS

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ABSTRACT
In the present work, we introduce Schwarzschild metric tensor and Einstein equations of Christoffel symbols varies from its original rectangular, polar, cylindrical, circular, and other coordinates in this article. We study Christoffel symbol of metric tensor with the special case.

2010 subject classification: 83C15, 83C57, 53B50.

Keywords and phrases: Metric, Schwarzschild metric, Einstein equations, Ricci solution, Christoffel symbols, Riemannian tensor, λ-tensor.

1. INTRODUCTION

We define the arc length ds is $ds^2 = dx^2 + dy^2 + dz^2$. By converting to general curvilinear coordinates in the space that the metric form specifies

$$ds^2 = \sum_{p=1}^{n}\sum_{q=1}^{n} g_{pq} dx^p dx^q \tag{1.1}$$

The quantities g_{pq} are the components of a covariant tensor of rank 2 called the metric tensor. Further the cases of 2 and 3-dim for metric solution are discussed as

$$(ds)^2 = (dr)^2 + r^2(d\theta)^2 + (dz)^2 \tag{1.2}$$

$$(ds)^2 = -dt^2 + dx^2 + dy^2 + dz^2 \tag{1.3}$$

$$ds^2 = -dt^2 + dr^2 + r^2 d\theta^2 + r^2 \sin^2\theta d\phi^2 \tag{1.4}$$

$$ds^2 = \left(\frac{r^2}{r^2 - 2mr}\right) dr^2 + r^2 d\theta^2 + r^2 \sin^2\theta d\phi^2 - \left(\frac{r^2}{r^2 - 2mr}\right)^{-1} dt^2 \tag{1.5}$$

The corresponding solution for a charged, spherical, non-rotating body, the Reissner Nordstr$\ddot{o}$m metric is

$$ds^2 = \left(\frac{r^2}{r^2 + e^2 - 2mr}\right) dr^2 + r^2 d\theta^2 + r^2 \sin^2\theta d\phi^2 - \left(\frac{r^2}{r^2 + e^2 - 2mr}\right)^{-1} dt^2 \tag{1.6}$$

in 1982, Hamilton [5] introduced.

$$\frac{\partial g_{pq}}{\partial t} = 2R_{pq} \tag{1.7}$$

Ricci flow is the analysis of compact three-manifolds with positive Ricci tensor, which he calls the evolution equation (1.7). The Ricci tensor (M, g_{ij}) is satisfy the equation

$$G_{pq} = R_{pq} - \frac{1}{2} L_{\xi} g_{pq} = 8\pi g_{pq} \tag{1.8}$$

Here k is a constant and R_{pq} is the Ricci tensor for metric g_{pq}. The solution is gradient if $\xi = \nabla\phi$, for some function ϕ and steady if $k = 0$. If $k < 0$, it is expander and if $k > 0$, it is a shirker. Ali and Ahsan [2] studied the Ricci solution for Lorentzian signature and looked into the case of the Riesner-Nordstrom metric as a solution. Then in (1.8) as

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$$ds^2 = -\left(\frac{r^2-2mr}{r^2}\right)^{\sqrt{2}} dt^2 + dr^2 + (r^2-2mr)(d\theta^2 + \sin^2\theta d\phi^2) \qquad (1.9)$$

λ-tensor (i.e. $R_{AB} - \lambda g_{AB}$) has a canonical symbols of the system.

2. EINSTEIN EQUATION AND SCHWARZSCHILD METRIC

By using (1.8) R is a Ricci tensor defined the 2nd kind of Christoffel symbol as

$$R_{pq} = \partial_\lambda \begin{Bmatrix} \lambda \\ pq \end{Bmatrix} - \partial_q \begin{Bmatrix} \lambda \\ \lambda p \end{Bmatrix} + \begin{Bmatrix} \lambda \\ \lambda r \end{Bmatrix}\begin{Bmatrix} r \\ pq \end{Bmatrix} - \begin{Bmatrix} \lambda \\ rq \end{Bmatrix}\begin{Bmatrix} r \\ \lambda p \end{Bmatrix} \qquad (2.1)$$

$$\begin{Bmatrix} \lambda \\ pq \end{Bmatrix} = \frac{1}{2} g^{\lambda r}(\partial_p g_{qr} + \partial_q g_{pr} - \partial_r g_{pq}) \qquad (2.2)$$

Now the non-trivial case in the structure r, θ, ϕ the introduced as the change of variables in spherical coordinates. Applying (1.3) an (1.4) we get the generalization of the line element is

$$ds^2 = -C^{2F(r)}dt^2 + C^{2Hr}dr^2 + r^2 d\theta^2 + r^2 \sin^2\theta d\phi^2 \qquad (2.3)$$

Where $F(r)$ and $H(r)$ are two functions to be determined Einstein equations. The metric and inverse metric tensor from the line element defined as

$$[g_{pq}] = \begin{bmatrix} -e^{2F} & 0 & 0 & 0 \\ 0 & e^{2H} & 0 & 0 \\ 0 & 0 & r^2 & 0 \\ 0 & 0 & 0 & r^2\sin^2\theta \end{bmatrix} \text{ and } \quad [g^{pq}] = \begin{bmatrix} -e^{-2F} & 0 & 0 & 0 \\ 0 & e^{-2H} & 0 & 0 \\ 0 & 0 & \frac{1}{r^2} & 0 \\ 0 & 0 & 0 & \frac{1}{r^2\sin^2\theta} \end{bmatrix} \qquad (2.4)$$

Now calculating (3), then the non-zero symbols are

$$\begin{Bmatrix} t \\ tr \end{Bmatrix} = F', \quad \begin{Bmatrix} r \\ tt \end{Bmatrix} = F'e^{2F-2H}, \quad \begin{Bmatrix} r \\ rr \end{Bmatrix} = H,$$

$$\begin{Bmatrix} r \\ \theta\theta \end{Bmatrix} = -re^{-2H}, \quad \begin{Bmatrix} r \\ \phi\phi \end{Bmatrix} = -r\sin^2\theta e^{-2H}, \quad \begin{Bmatrix} \theta \\ r\theta \end{Bmatrix} = \frac{1}{r},$$

$$\begin{Bmatrix} \theta \\ \phi\phi \end{Bmatrix} = -\sin\theta\cos\theta, \quad \begin{Bmatrix} \phi \\ r\phi \end{Bmatrix} = \frac{1}{r}, \quad \begin{Bmatrix} \phi \\ \theta\phi \end{Bmatrix} = \cot\theta. \qquad (2.5)$$

From (1.1), we have

$$ds^2 = g_{11}(x)(dx^1)^2 + g_{12}(x)dx^1dx^2 + \ldots\ldots\ldots + g_{nn}(x)(dx^n)^2 \qquad (2.6)$$

The matrix with element is called metric tensor. The absolute value of the Jacobeans tensor is

$$|I| = \left|\det\left[\frac{\partial x^p}{\partial x^q}\right]\right| = \frac{\sqrt{g}}{\sqrt{g'}}, \qquad \text{where } g = \det g_{pq} \text{ and } g' = \det g_{p'q'} \qquad (2.7)$$

If $I = \det\left[\frac{\partial p'}{\partial q}\right] \neq 0$, then the determinant of the metric tensor is

$$\det g_{pq}(x) \neq 0 \qquad g_{pq}g^{q\eta} = \delta_p^\eta = \begin{cases} 1 & ,\eta = p \\ 0 & ,\eta \neq p. \end{cases} \qquad (2.8)$$

From (2.1), we construct the Ricci tensor by using all above properties of the Christoffel symbols, as define

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$$R_{tt} = e^{2F-2H}(F'' + F'^2 - F'H' + \frac{2}{r}F') \qquad R_{rr} = -(F'' + F'^2 - F'H' - \frac{2}{r}H')$$

$$R_{\theta\theta} = 1 - e^{-2H}(1 + rF' - rH') \qquad R_{\phi\phi} = R_{\theta\theta}\sin^2\theta \qquad (2.9)$$

Finally, the metric tensor equipped with Einstein Tensor defined similarly, as

$$G_{tt} = -\frac{1}{r^2}e^{2F-2H}(1 - rH - e^{-2H}) \qquad G_{rr} = \frac{1}{r^2}(1 + 2rF' - e^{-2H})$$

$$G_{\theta\theta} = r^2 e^{-2H}\left[F'' + \left(F' + \frac{1}{r}\right)(F' - H')\right] \qquad G_{\phi\phi} = G_{\theta\theta}\sin^2\theta \qquad (2.10)$$

Thus, Einstein tensor can be defined as

$$G_{tt} = \frac{1}{r^2}e^{2F}\frac{d}{dr}\left[r(1 - e^{-2H})\right] \qquad (2.11)$$

3. SCHWARZSCHILD METRIC TENSOR OF CHRISTOFFEL SYMBOLS

$$[pq,k] = \frac{1}{2}\left[\frac{\partial g_{qk}}{\partial x^p} + \frac{\partial g_{pk}}{\partial x^q} - \frac{\partial g_{pq}}{\partial x^k}\right] \qquad (3.1)$$

$$\begin{Bmatrix} k \\ pq \end{Bmatrix} = g_{kl}[pq,l] \qquad (3.2)$$

The Schwarzschild metric tensor in cylindrical coordinates in (1.2) is

$$g = \begin{vmatrix} 1 & 0 & 0 \\ 0 & r^2 & 0 \\ 0 & 0 & 1 \end{vmatrix} = r^2, \quad g_{11} = 1, \quad g_{22} = \frac{1}{r^2}, \quad g_{33} = 1 \qquad (3.3)$$

The Christiffel symbols of the 1st kind from equation (1.1) are

$$[22,1] = -r, \quad [33,1] = [13,3] = [23,3] = 0 \qquad (3.4)$$

The Christiffel symbols of the 2nd kind from equation (2.2) are

$$\begin{Bmatrix} 1 \\ 22 \end{Bmatrix} = -r, \qquad \begin{Bmatrix} 1 \\ 33 \end{Bmatrix} = \begin{Bmatrix} 3 \\ 13 \end{Bmatrix} = \begin{Bmatrix} 3 \\ 23 \end{Bmatrix} = 0 \qquad (3.5)$$

Applying (1.3), we have

$$g = \begin{vmatrix} r^2 & 0 \\ 0 & r^2\sin^2\theta \end{vmatrix} = r^4\sin^2\theta \quad \text{or} \quad g_{11} = \frac{1}{r^2}, \quad g_{22} = \frac{1}{r^2\sin^2\theta} \qquad (3.6)$$

The Christiffel symbols of the 1st kind from equation (3.1) are

$$[22,1] = r^2\sin\theta\cos\theta, \qquad [12,2] = r^2\sin\theta\cos\theta \qquad (3.7)$$

The Christiffel symbols of the second kind from equation (3.2) are

$$\begin{Bmatrix} 1 \\ 22 \end{Bmatrix} = -\sin\theta\cos\theta, \qquad \begin{Bmatrix} 2 \\ 12 \end{Bmatrix} = r^4\sin\theta\cos\theta \qquad (3.8)$$

Also using (1.4), we have

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$$g=\begin{bmatrix}1 & 0 & 0\\ 0 & r^2 & 0\\ 0 & 0 & r^2\sin^2\theta\end{bmatrix}=r^4\sin^2\theta \text{ and } g_{11}=1,\ g_{22}=\frac{1}{r^2},\ g_{33}=\frac{1}{r^2\sin^2\theta} \qquad (3.9)$$

The Christiffel symbols of the 1st kind from (3.1) are

$$[22,1]=-r,\ [33,1]=-r\sin^2\theta,\ [13,3]=r\sin^2\theta,\ [23,3]=r^2\sin\theta\cos\theta \qquad (3.10)$$

The Christiffel symbols of the 2nd kind from (3.2) are

$$\begin{Bmatrix}1\\22\end{Bmatrix}=-2,\qquad \begin{Bmatrix}1\\33\end{Bmatrix}=-r\sin^2\theta,\qquad \begin{Bmatrix}3\\13\end{Bmatrix}=\frac{1}{r},\qquad \begin{Bmatrix}3\\23\end{Bmatrix}=\cot\theta \qquad (3.11)$$

Similarly**,** Schwarzschild metric (1.9) can be written as

$$ds^2=dr^2+(r^2-2mr)(d\theta^2+\sin^2\theta d\phi^2)-\left(\frac{r^2-2mr}{r^2}\right)^{\sqrt{2}}dt^2 \qquad (3.12)$$

In spherical coordinates, the components of the gravitational potential or the metric tensor for metric solution (3.12) in $x^\alpha\equiv(r,\theta,\phi,t)$ are

$$g_{pq}(\alpha)=\begin{pmatrix}1 & 0 & 0 & 0\\ 0 & r^2-2mr & 0 & 0\\ 0 & 0 & (r^2-2mr)\sin^2\theta & 0\\ 0 & 0 & 0 & -\left(\frac{r^2-2mr}{r^2}\right)^{\sqrt{2}}\end{pmatrix} \qquad (3.13)$$

or

$$g_{11}=1, g_{22}=(r^2-2mr), g_{33}=(r^2-2mr)\sin^2\theta, g_{44}=-\left(\frac{r^2-2mr}{r^2}\right)^{\sqrt{2}} \qquad (3.14)$$

Christoffel symbols can be calculated from (1.1) and (1.5), we have

$$\begin{Bmatrix}p\\qk\end{Bmatrix}=g^{pl}[qk,l]=\frac{1}{2}g^{pl}\left(\frac{\partial g_{pl}}{\partial x^k}-\frac{\partial g_{qk}}{\partial x^l}+\frac{\partial g_{kl}}{\partial x^q}\right) \qquad (3.15)$$

Thus non-zero components of Christoffel symbols for Schwarzschild metric (2.12), by (2.15) are

$$\begin{Bmatrix}1\\22\end{Bmatrix}=(m-r), \qquad \begin{Bmatrix}1\\33\end{Bmatrix}=(m-r)\sin^2\theta$$

$$\begin{Bmatrix}1\\44\end{Bmatrix}=\frac{\sqrt{2m}}{r^2-2mr}\left(\frac{r^2-2mr}{r^2}\right)^{\sqrt{2}},\qquad \begin{Bmatrix}2\\12\end{Bmatrix}=\begin{Bmatrix}2\\21\end{Bmatrix}=\frac{r-m}{r^2-2mr}$$

$$\begin{Bmatrix}2\\33\end{Bmatrix}=-\sin\theta\cos\theta, \qquad \begin{Bmatrix}3\\13\end{Bmatrix}=\begin{Bmatrix}3\\31\end{Bmatrix}=\frac{r-m}{r^2-2mr}$$

$$\begin{Bmatrix}3\\23\end{Bmatrix}=\begin{Bmatrix}3\\32\end{Bmatrix}=\cot\theta, \qquad \begin{Bmatrix}4\\14\end{Bmatrix}=\begin{Bmatrix}4\\41\end{Bmatrix}=\frac{\sqrt{2m}}{r^2-2mr}. \qquad (3.16)$$

While Riemann tensor for the Schwarzschild solution (1.8) can be

$$R_{pqkl}=\frac{1}{2}\left(\frac{\partial^2 g_{pl}}{\partial x^q\partial x^k}+\frac{\partial^2 g_{qk}}{\partial x^p\partial x^l}-\frac{\partial^2 g_{pk}}{\partial x^q\partial x^l}-\frac{\partial^2 g_{ql}}{\partial x^p\partial x^k}\right)+g_{mn}\left(\begin{Bmatrix}m\\qk\end{Bmatrix}\begin{Bmatrix}n\\pl\end{Bmatrix}-\begin{Bmatrix}m\\ql\end{Bmatrix}\begin{Bmatrix}n\\pk\end{Bmatrix}\right) \qquad (3.17)$$

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And the non-zero components of Riemann tensor, by using (3.15) are

$$R_{1212}=\frac{m^2}{r^2-2mr},\qquad R_{1414}=\frac{2m}{\left(r^2-2mr\right)^2}\left(\frac{r^2-2mr}{r^2}\right)^{\sqrt{2}}[m+\sqrt{2(m-r)}]$$

$$R_{2323}=-m^2\sin^2\theta,\qquad R_{2424}=\frac{-\sqrt{2m(m-r)}}{(r^2-2mr)}\left(\frac{r^2-2mr}{r^2}\right)^{\sqrt{2}}$$

$$R_{3131}=\frac{m^2\sin^2\theta}{r^2-2mr},\qquad R_{3434}=\frac{-\sqrt{2}m(m-rs)\sin^2\theta}{\left(r^2-2mr\right)}\left(\frac{r^2-2mr}{r^2}\right)^{\sqrt{2}}\qquad(3.18)$$

By use 6-dim formalism in the pseudo-Euclidean space $\Re^6$ by making the identification [4]

pq : 23 31 12 14 24 34

A: 1 2 3 4 5 6 (2.19)

We also make use of the identification as

$$g_{pk}g_{ql}-g_{pl}g_{qk}=g_{pqkl}\rightarrow g_{AB}\qquad(3.20)$$

Where $A,B=1,2,3,4,5,6$ and g_{ij} are the components of the metric tensor at an arbitrary point (x^α),whose metric is given by (3.13). The new metric tensor $g_{AB}(A,B=1,2,3,4,5,6)$ is symmetric and non-singular. The non-zero components of the metric tensor $g_{AB}(A,B=1,2,3,4,5,6)$ for (3.13) in 6-dim formalism, by using formulation (3.20) are as

$$g_{11}(x^\alpha)=\left(r^2-2mr\right)^2\sin^2\theta,\qquad g_{22}(x^\alpha)=\left(r^2-2mr\right)\sin^2\theta$$

$$g_{33}(x^\alpha)=\left(r^2-2mr\right),\qquad g_{44}(x^\alpha)=\left(\frac{r^2-2mr}{r^2}\right)^{\sqrt{2}}$$

$$g_{55}(x^\alpha)=-\left(r^2-2mr\right)\left(\frac{r^2-2mr}{r^2}\right)^{\sqrt{2}},\ g_{66}(x^\alpha)=-\left(r^2-2mr\right)\sin^2\theta\left(\frac{r^2-2mr}{r^2}\right)^{\sqrt{2}}\qquad(3.21)$$

Similarly, $R_{pqkl}\rightarrow R_{AB}$. Thus, for example, the Riemann R_{1212} can be written as R_{33} .The non-zero components of the tensor R_{AB} under the identification (3.21) are

$$R_{11}(x^\alpha)=-m^2\sin^2\theta,\qquad R_{22}(x^\alpha)=\frac{m^2\sin^2\theta}{r^2-2mr}$$

$$R_{33}(x^\alpha)=\frac{m^2}{r^2-2mr},\qquad R_{44}(x^\alpha)=\frac{2m}{\left(r^2-2mr\right)^2}\left(\frac{r^2-2mr}{r^2}\right)^{\sqrt{2}}[m+\sqrt{2}(m-r)]$$

$$R_{55}(x^\alpha)=\frac{-\sqrt{2}m}{\left(r^2-2mr\right)^2}\left(\frac{r^2-2mr}{r^2}\right)^{\sqrt{2}},\ R_{66}(x^\alpha)=\frac{-\sqrt{2}m(m-r)\sin^2\theta}{\left(r^2-2mr\right)^2}\left(\frac{r^2-2mr}{r^2}\right)^{\sqrt{2}}\qquad(3.22)$$

Further we use of the $\lambda-$tensor $R_{AB}-\lambda g_{AB}$. Next, we will be Eigen values for the metric solution (1.5) that is the solution of the characteristic equation $\left|R_{AB}-\lambda g_{AB}\right|=0$. By using equations (3.21) and (3.22) easily are

$$\lambda_1(r)=\frac{m^2}{\left(r^2-2mr\right)^2},\qquad \lambda_2(r)=\frac{m^2}{\left(r^2-2mr\right)^2}=\lambda_3(r)$$

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$$\lambda_4(r)=\frac{-2m}{\left(r^2-2mr\right)^2}[m+\sqrt{2}(m-r)],\qquad \lambda_5(r)=\frac{-\sqrt{2}m(m-r)}{\left(r^2-2mr\right)^2}=\lambda_6(r) \tag{3.23}$$

$\lambda_i, p=1,2,3,4,5,6$ are the solution of the character equation $\left|R_{AB}-\lambda g_{AB}\right|=0$ which depend on m and r. In other words we can say that for $\lambda_i, p=1,2,3,4,5,6$ [equation 2.26], the determinant of $\lambda-$tensor $R_{AB}-\lambda g_{AB}$ is zero. Thus we can transform the system in canonical form for values of $\lambda_i, p=1,2,3,4,5,6$ as

$$g_{A'B'}=\begin{pmatrix}1&0&0&0&0&0\\0&1&0&0&0&0\\0&0&1&0&0&0\\0&0&0&-1&0&0\\0&0&0&0&-1&0\\0&0&0&0&0&-1\end{pmatrix}\quad\text{and}\quad R_{A'B'}=\begin{pmatrix}\lambda_1(\mathrm{r})&0&0&0&0&0\\0&\lambda_2(\mathrm{r})&0&0&0&0\\0&0&\lambda_3(\mathrm{r})&0&0&0\\0&0&0&-\lambda_4(\mathrm{r})&0&0\\0&0&0&0&-\lambda_5(\mathrm{r})&0\\0&0&0&0&0&-\lambda_6(\mathrm{r})\end{pmatrix} \tag{3.24}$$

Thus it is to determined by $\lambda-$tensor is of the type G_1 [(1)(1)(11)(11)] in Segre symbols. From equation (2.27), we note that even if mass $m=0$, the metric is flat.

Case I- $\theta=0$ or $\theta=\pi$

When taking $\theta=0$ or $\theta=\pi$ that is $d\theta=0$ Schwarzschild metric, given by equation (3.13), reduces

$$^{*}ds^2=dr^2-\left(\frac{r^2-2mr}{r^2}\right)^{\sqrt{2}}dt^2 \tag{3.25}$$

Now equation (3.25) is a 2-dimensional surface now. The metric tensor $*g$ in coordinates $x^{\alpha}\equiv(r,t)$ is given

$$g_{pq}(x^{\beta})=\begin{bmatrix}1&0\\0&-\left(\frac{\mathrm{r}^2-2mr}{r^2}\right)^{\sqrt{2}}\end{bmatrix} \tag{3.26}$$

here $p,q=1,4$. Thus the hyper-surface for $\theta=0$ or $\theta=\pi$ (i.e., $*H_0$ or $*H_{\pi}$) degenerates to two dimensional surface. The non-zero component of Riemann curvature tensor for equation (3.25) is unique and given by

$$*R_{1414}(x^{\beta})=\frac{2m}{\left(r^2-2mr\right)^2}\left(\frac{r^2-2mr}{r^2}\right)^{\sqrt{2}}[m+\sqrt{2}(m-r)] \tag{3.27}$$

So the Gaussian curvature $*K$ for surface $*H_0$ or $*H_{\pi}$ is

$$*K(x^{\beta})=\frac{2m}{r^2-2mr}[m+\sqrt{2}(m-r)]. \tag{3.28}$$

Equations (3.24) and (3.28) show that curvature of the 2-dimensional surface of the metric is related to the Eigen value $\lambda_4(r)$.

Case II- $2m<r<\infty, 0<\theta<\pi$ and $\phi=0$

For this case, equation (2.15) reduces to

$$ds^2=dr^2+(r^2-2mr)d\theta^2-\left(\frac{r^2-2mr}{r^2}\right)^{\sqrt{2}}dt^2 \tag{3.29}$$

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The metric tensor $**g_{pq}$ for (3.29) in coordinate $x^{\gamma} \equiv (r, \theta, t)$ is

$$**g_{pq}(x^{\gamma}) = \begin{bmatrix} 1 & 0 & 0 \\ 0 & (r^2 - 2mr) & 0 \\ 0 & 0 & -\left(\frac{r^2 - 2mr}{r^2}\right)^{\sqrt{2}} \end{bmatrix} \qquad (3.30)$$

Riemann curvature tensor of (3.29) is

$$R_{1212}(x^{\gamma}) = \frac{m^2}{r^2 - 2mr}, \qquad R_{1414}(x^{\gamma}) = \frac{2m}{\left(r^2 - 2mr\right)^2}\left(\frac{r^2 - 2mr}{r^2}\right)^{\sqrt{2}}[m + \sqrt{2}(m - r)] \qquad (3.31)$$

So for 3-dimensional space (3.31), the Gaussian curvature at each point $x^{\gamma} \equiv (r, \theta, t)$ is the three physical quantities

$$**K_1(x^{\gamma}) = \frac{**R_{2424}(x^{\gamma})}{|**g_{24}|} = \frac{-\sqrt{2}m}{\left(r^2 - 2mr\right)^2}$$

$$**K_2(x^{\gamma}) = \frac{**R_{1414}(x^{\gamma})}{|**g_{14}|} = \frac{-2m}{\left(r^2 - 2mr\right)^2}[m + \sqrt{2}(m - r)],$$

$$**K_4(x^{\gamma}) = \frac{**R_{1212}(x^{\gamma})}{|**g_{12}|} = \frac{m^2}{\left(r^2 - 2mr\right)^2}. \qquad (3.32)$$

Here $**g_{24}$ denotes the sub-matrix of $**g_{pq}$ corresponding to $x^1 = r$. It is clear from equations (3.10) and (3.19) that are the curvature of the 3-dimensional space of metric solution can be expressed in terms of a $\lambda -$ tensor which happens to be the solutions (Eigen-values) of the characteristic equation $|R_{AB} - \lambda g_{AB}| = 0$.

DISCUSSION

The key point of this paper is the concept of Metric tensor and Einstein equations which is the backbone of manifold and also observed that we worked out on Schwarzschild metric tensor and Einstein equations of Christoffel symbols by using characteristic of $\lambda -$ tensor $R_{AB} - \lambda g_{AB}$ we have also discussed 2 and 3-dimensional cases with Schwarzschild metric tensor and Einstein Tensor. Ricci tensor differs with that of metric and also the dependence on Eigen values of $\lambda -$ tensor $R_{AB} - \lambda g_{AB}$ is not similar. Thus the deformation in metric of space-time is cause for change in space.

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A DETAILED STUDY ON TALENT MANAGEMENT PRACTICES FOLLOWED BY PUBLIC AND PRIVATE SECTOR BANKS OF RAIPUR DISTRICT

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ABSTRACT
The supply of financial capital has long been recognized as an important driver of a company's performance. Importance of human management and allocation, however, work is widely recognized. But a new Mckinsey Global Survey results prove, 1) According to Person's Effective performance Talent-Management Program. 2) Compared to other companies that have better performance of competition with organization & between the publicly owned company is Better Opportunity The share market is likely to beat the return to shareholders. There is no one-size-fits-all approach to effective management of human capital within company or outside of company both. The result found in this survey is three common practices that have outsize effect and efficient on the overall impact of talent management as well as company and workers performance: rapidly distribute of talent, increase of positive experience of the employees, and then partnership of human resource function. Strategically, the results of the Human Resource Team Survey also point to the underlying action in the organization. With all the culture and thus improve its talent management strategy increase organization performance and turnover ratio within company In order to present, to easily understand the present and development of a global background about the talent management, we analyze that relationship here This relationship is present between the employer and the employee, understand the evolution and analyze of human resource practices.

Keyword: *Financial Capital, Human Management, Talent-Management Strategy, Human Resource Strategies.*

INTRODUCTION
Human resource management is the most important for any organization to make the organization run smoothly. It is difficult & expensive for the company to develop the internal talent while it is cheaper to take the external talent., companies can hire from outside, in the company can bear time & cost for internal employee's for training & development While the company will have to save both time and cost in recruit the most talented employees. Thus, building or purchasing the solution, and training people as needed and to hire the experienced skills from the inside of market.

THE IMPORTANCE OF TALENT MANAGEMENT
The simple answer is because talented employees are called asset of your company. Talent management helps you optimize the benchmark of employee talent management is very effective and efficiency processes of all when combine three factors: rapid talent acquisition, employee satisfaction and use best practice through human resource team.

1. It allows companies to stay competitive in marketplaces
By talent acquisition, talent retention, hiring, engage and developing talented employees, your organization becomes stronger, consistency, smooth functioning and better prepared to face changes and risks in present & future both.

2. It drives skills and innovation
With the new technology, there is a lot of change in everything in the industry the old scene is hit and the talented employee searches for a worthy route which is Tools and Problem Solving with original idea.

3. It helps form productive teams within organization
Appropriate talent management strategy that helps and allows increasing the most talented employee which is the most important and useful for organization Talent is generated in the bunch of creative and talent people in your organization than increase of employee and employer turnover.

4. It decreases turnover
When Employees are feeling Imported and valued in a Company Which increases the scope for the employee and gives a lot of opportunity to grow in the business.

5. It leads and make to strong employer branding
Talent Management gives your company a brand name as an employer; it helps you to attract the best candidates in the future.

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6. It inspiring others to grow
Having skillful candidates in your team will inspire other candidates and bring some new ideas Due to which lack of knowledge, the person will be able to increase his ability.

REVIEW OF LITERATURE

Pfeffer (1998) all the literature recognizes Along with talent, management is also necessary in all the companies. The company benefits from competition and competition is the source of all company's profit. This is very important for human resources. Worth the knowledge and time of the organization and manager need of Talent Management in Banking Sector

Creelman (2004) Cheloah (2005)it determines the strategy by which data collection can be done easily for the employee and they fulfill their objective and emphasis on the development of Employee & Researcher. One mindset from TAM is to achieve effective planning of organization and to have potential in three levels of organization of employee.

L. Donnells (2008) through this study, the article author has explained Employee says that learning is not just effective for the job. It is also necessary for the personality development of the employee In a study it is reported that based on 1950 employee survey, the author found that 57% of the employees were interested in deaf activities, Talented employees will continue to be in the company for a long time, which leads the author to conclude-There will be a direct impact on hidden talent of employees and increase efficiency Then he was more motivated, and would feel more empowered. K. In this study, the author has focused on the author states that, unlocking hidden talent of trained employee and to ensure that employees meet their business objectives, Hidden talent and training programs related. Has expanded this relationship The writer is of the opinion that exploiting the hidden talent of the employee is necessary to increase the business of the employer, Rather it is necessary to increase the efficiency of the employee.

Kumudha& Kumar, (2012) in this study, the author has tried to understand the utility and strategy of talent management in two private banks. In this paper, the discovery and practices of Most Talented Employee are explained. Employee promotion, training and development etc. is available. This provides an opportunity for employee development.

Rawashdeh, (2018) when a tough situation occurs within the organization, the organization should hire talented people. So that it is both reactive and responsive to a turbulent business environment.

RESEARCH METHODOLOGY

Research Methodology is a way to problem solving in the research problem. it is systematically way. It may be identify as a science of studying how research is done scientifically and systemically both.

RESEARCH PROBLEM

This study aims to find out the talent management strategies. The study was conducted in korba city of Chhattisgarh. Thus the problem statement is defined as “talent management strategies in private banks in korba district an empirical study”.

OBJECTIVES OF STUDY

• To study the talent management practices followed by public & private sector bank.

HYPOTHESIS

H1: Performance Management has a significant impact on talent retention & talent acquisition.

SAMPLE SIZE

Among the population total 300 respondents from public & private banks were selected for the purpose of the study.

LIMITATIONS OF THE STUDY

- Time constraint along with limitations in budget is the major limitations in this research work.
- The sample size is limited to 200 respondents which may provide a biased result as the actual population is large and unknown.
- There is possibility of occurring errors in selection of sample, collecting responses from respondents and interpretation of the collected responses.
- Time is always a limit.
- Study is limited to public & private sector Banks of Raipur.

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DATA ANALYSIS

To test the hypothesis, "If we replace the b values in the equation, we will define the model as follows:"

Model Summary

Mode 1	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.703a	.562	.554	.37000

a. Predictors: (Constant), Employee Retention, Talent

Acquisition

In the above table, it is found that Adjusted R Square of current model is 0.554 and R-square

is 0.562, that means the linear regression explains only 56.2% of variance of data. The factor Employee retention, Talent Acquisition and Performance Management is having R value of 0.703 and hence it indicates that predictors and dependent variable show 70.3% relation.

ANOVAa

Model		Sum of Square	df	Mean Square	F	Sig.
1	Regression	5.220	2	2.610	19.065	.000b
	Residual	26.969	197	.137		
	Total	32.189	199			

a. Dependent Variable: Performance Management

b. Predictors: (Constant), Employee Retention, Talent Acquisition

In the table above, F value is high so that there is a chance to reject a null hypothesis and accept the alternate hypothesis. Here, the null hypothesis is "performance management has no significant impact on talent retention talent acquisition" but here alternate hypothesis is accepted which is, "Performance management has a significant impact on talent retention & talent acquisition."

CONCLUSION

Talent management is the core functional unit of an organization, and In order to enhance the productive performance of employees, talent management uses human resource planning to achieve this goal. To make them a part of talent management and strategic workforce planning, efforts have been made to retain, develop, attract, and reward employees. Talent management can lead to higher level performance and satisfaction of employees' instead of being a process of hiring; reinforcing and evaluating the aptitude.

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- Talent Management: Meaning, Features, Process and Models Article Shared by Vishakha B.

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Fox, S. (1984). Empowerment as a catalyst for change: an example for the food industry. *Supply Chain Management*, *2*(3), 29–33.

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- **Multiple author journal article:**

Khan, M. R., Islam, A. F. M. M., & Das, D. (1886). A Factor Analytic Study on the Validity of a Union Commitment Scale. *Journal of Applied Psychology*, *12*(1), 129-136.

Liu, W.B, Wongcha A, & Peng, K.C. (2012), "Adopting Super-Efficiency And Tobit Model On Analyzing the Efficiency of Teacher's Colleges In Thailand", International Journal on New Trends In Education and Their Implications, Vol.3.3, 108 – 114.

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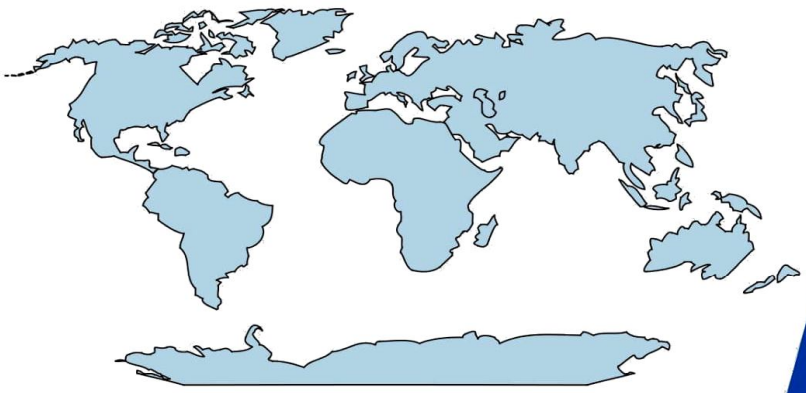

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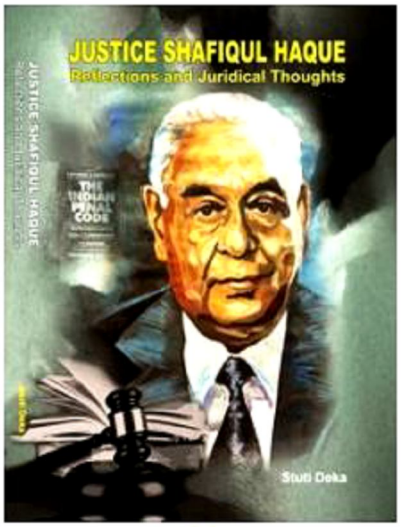

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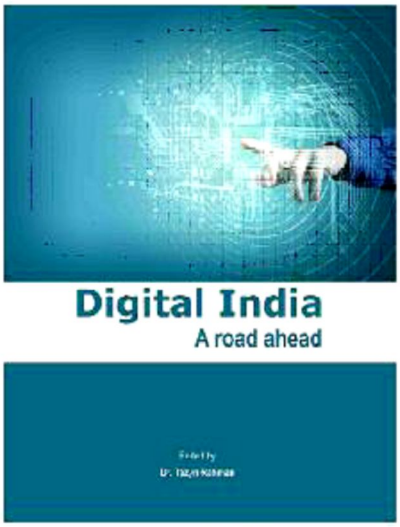

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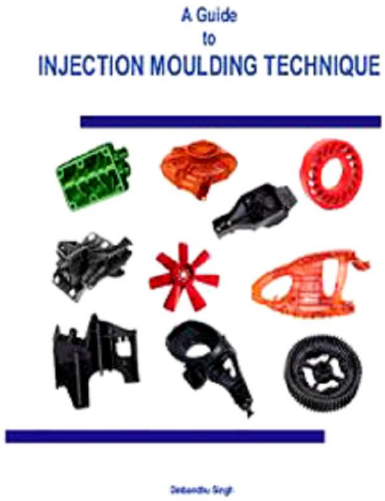

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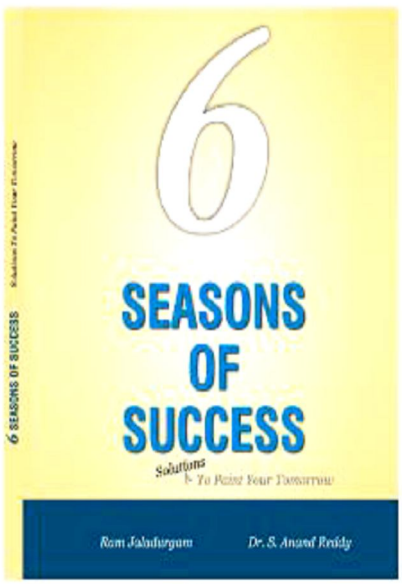

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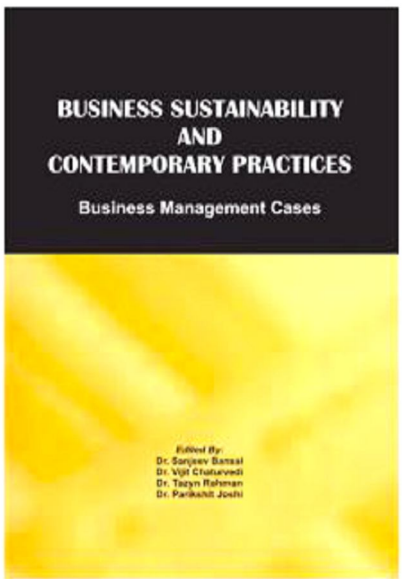

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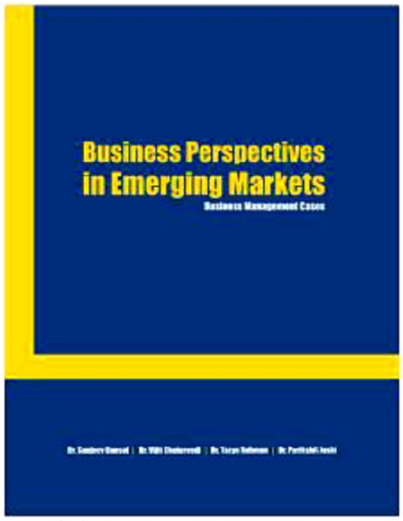

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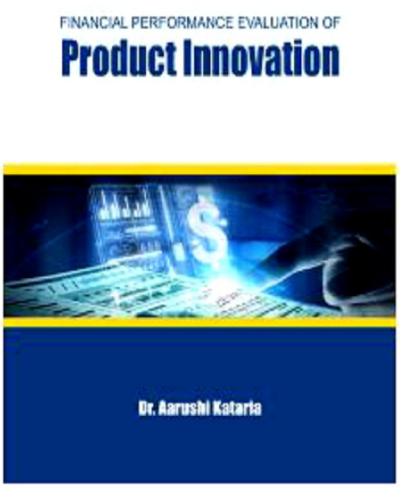

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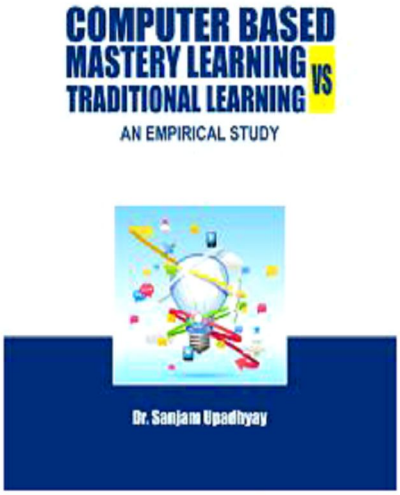

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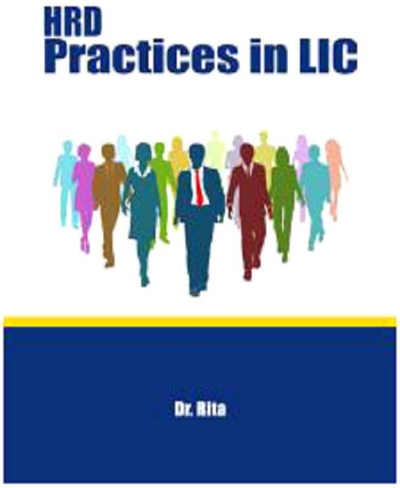

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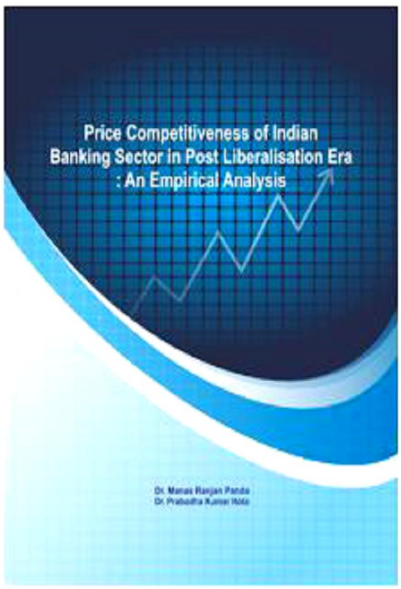

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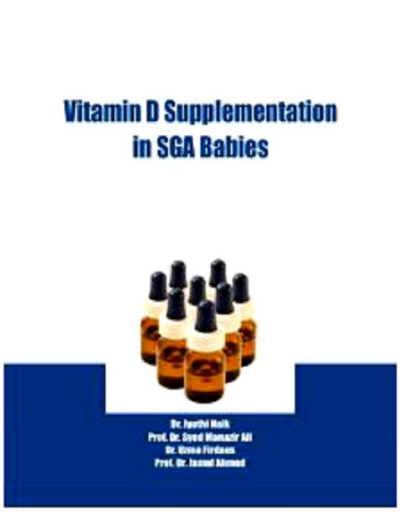

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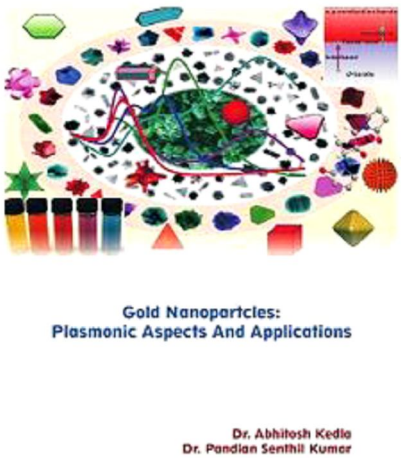

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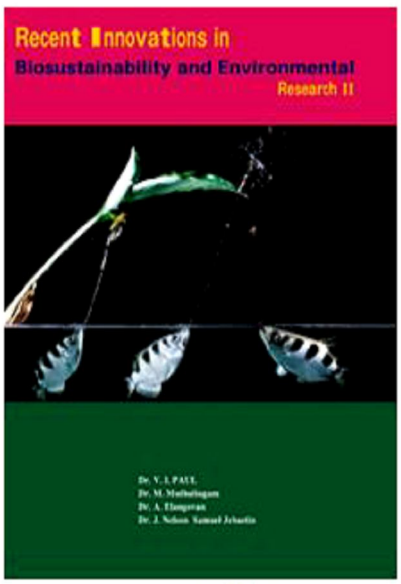

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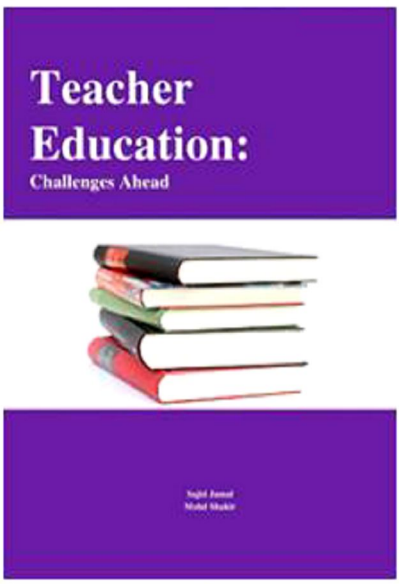

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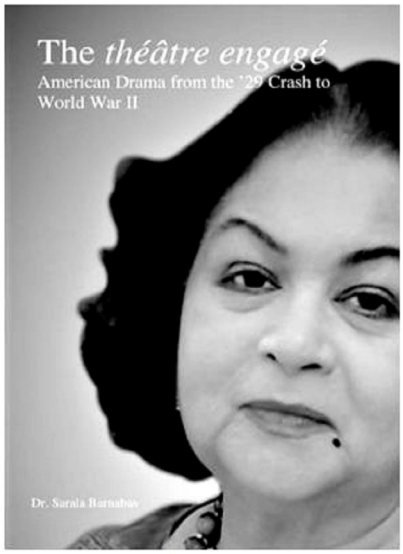

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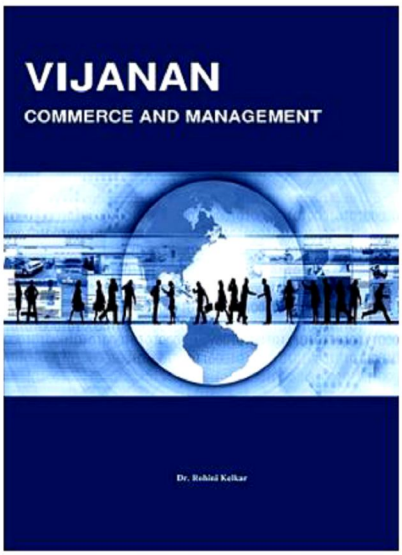

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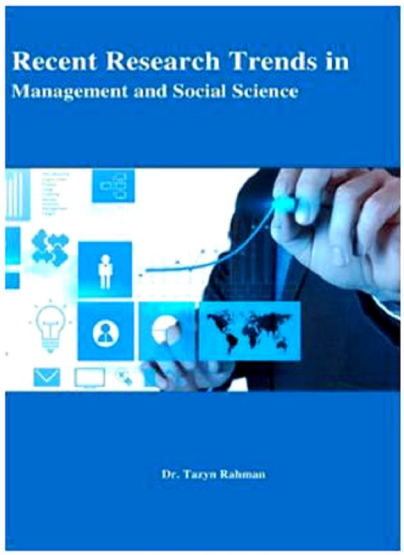

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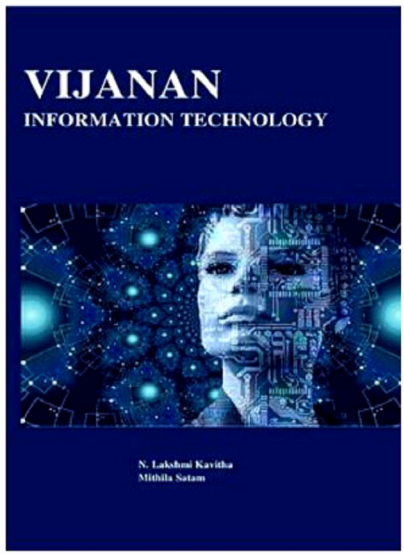

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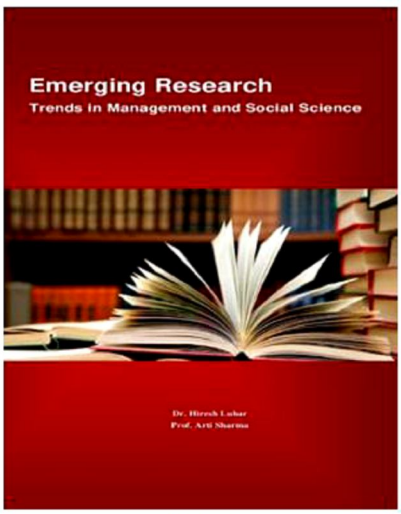

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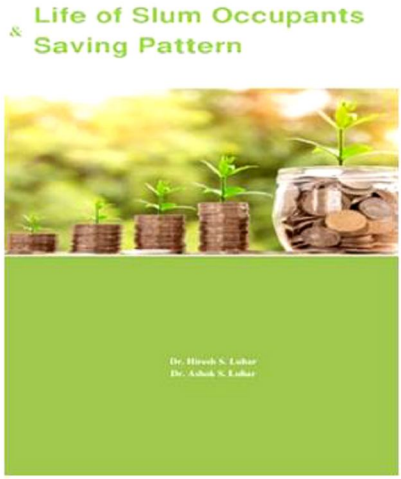

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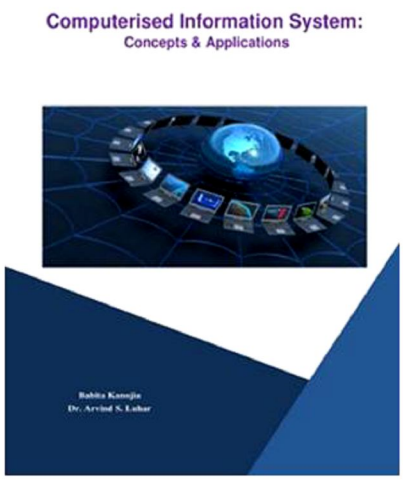

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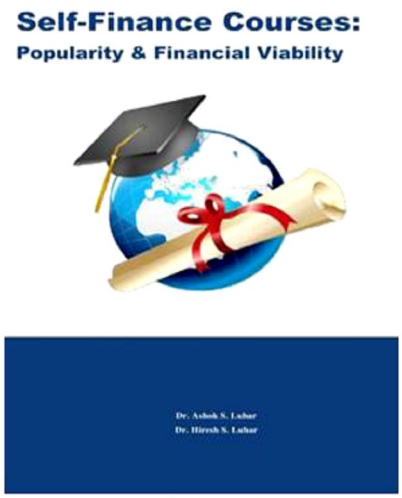

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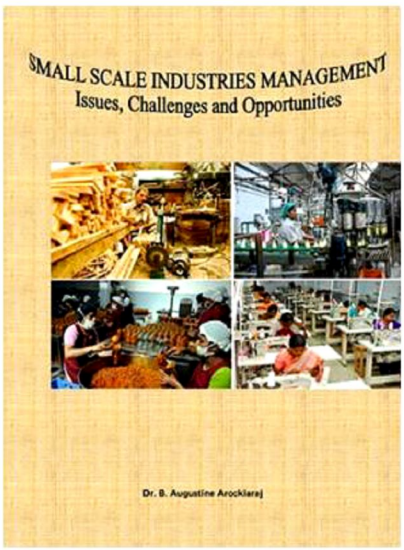

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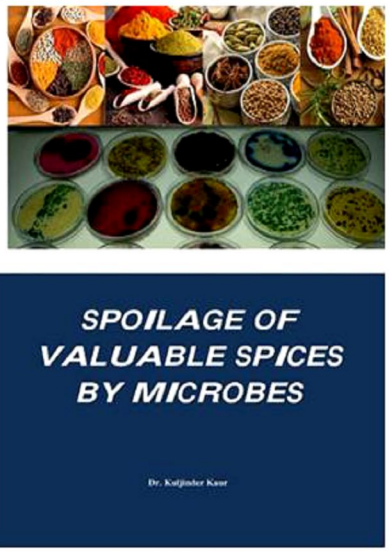

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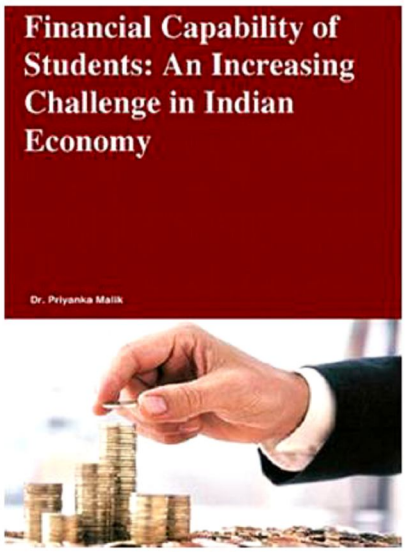

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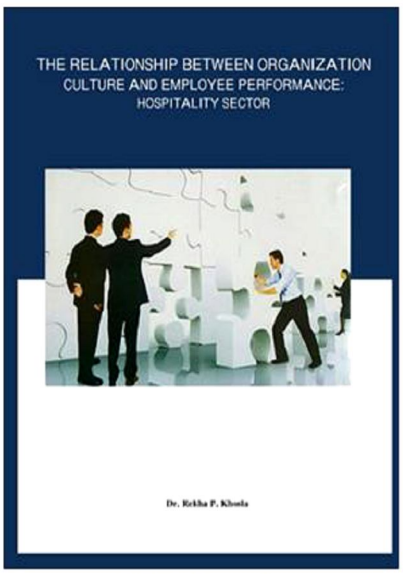

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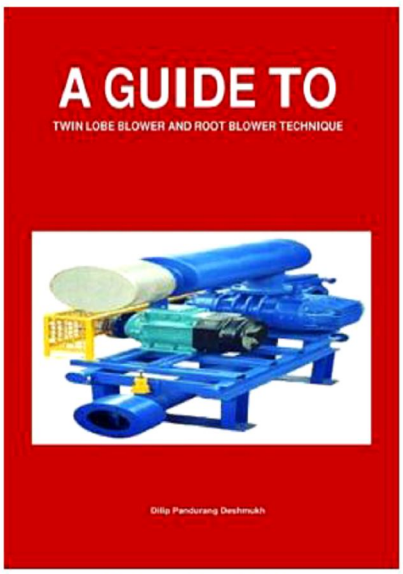

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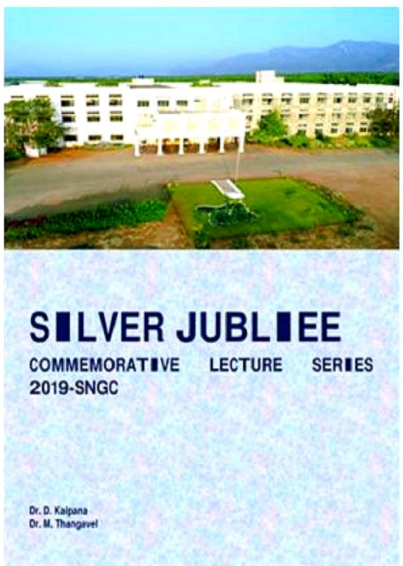

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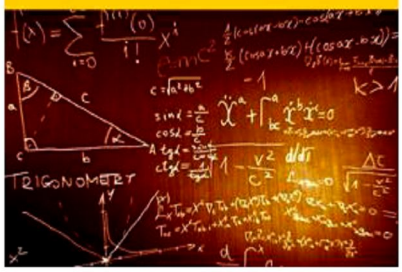

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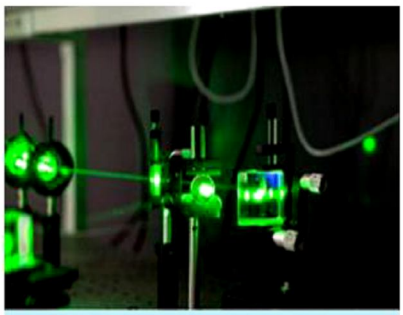

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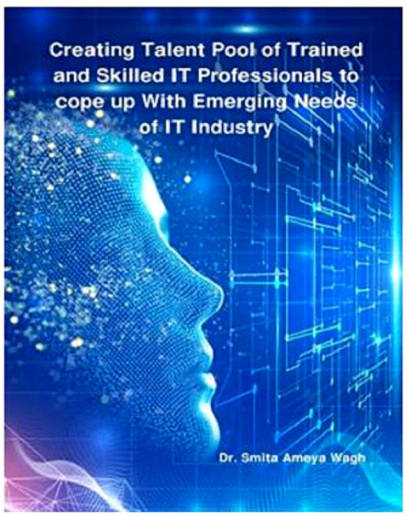

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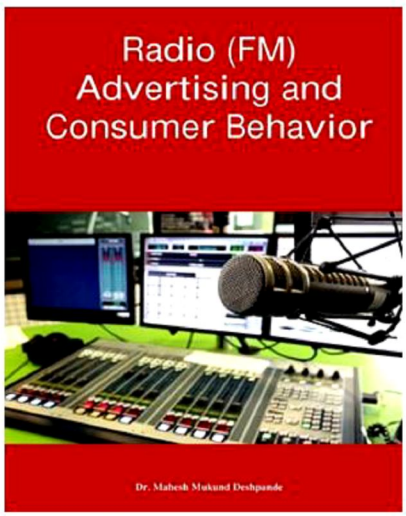

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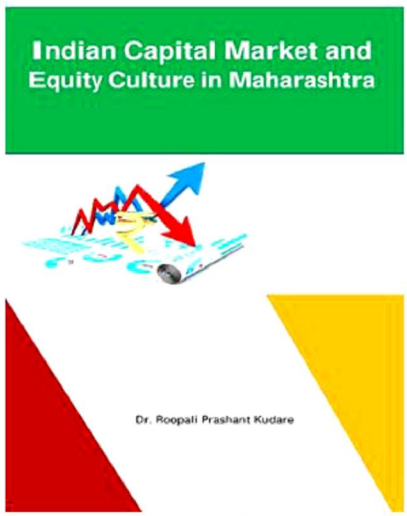

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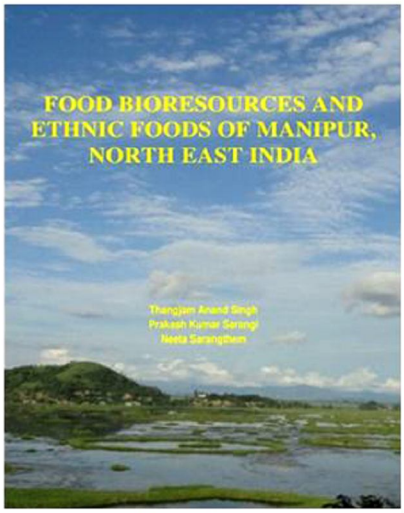

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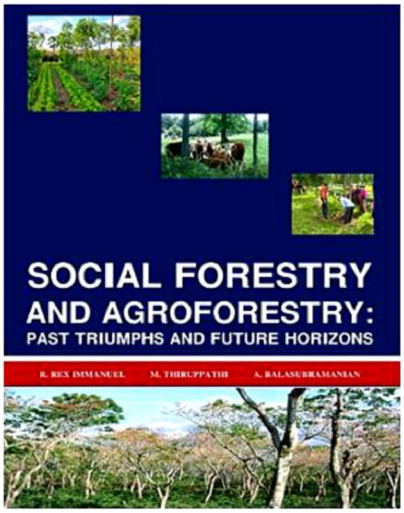

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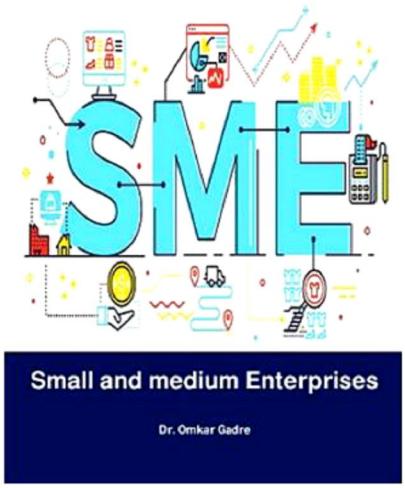

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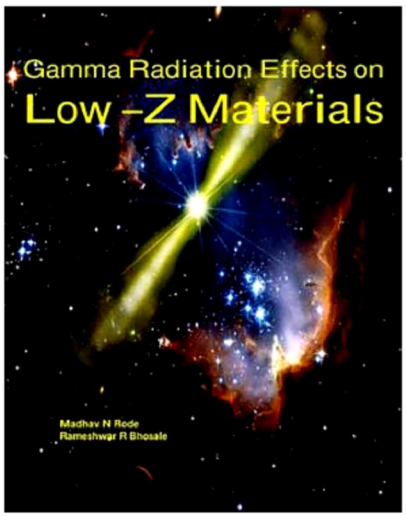

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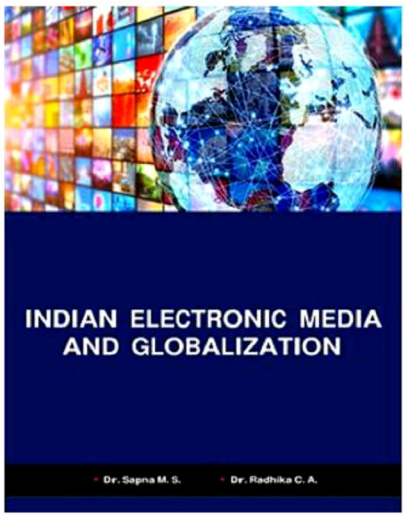

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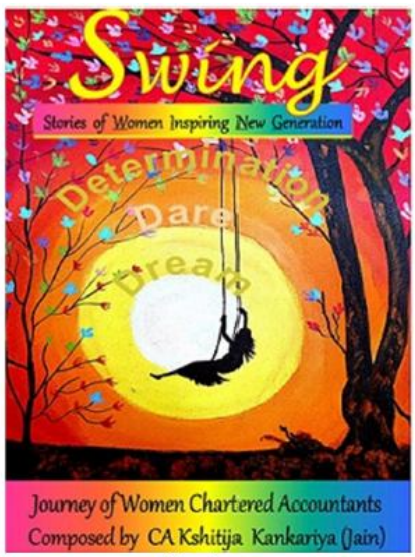

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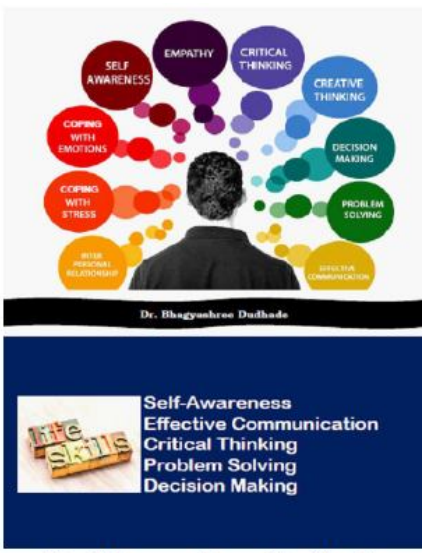

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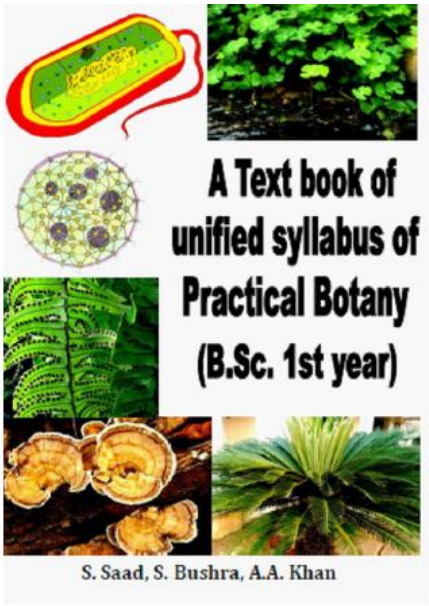

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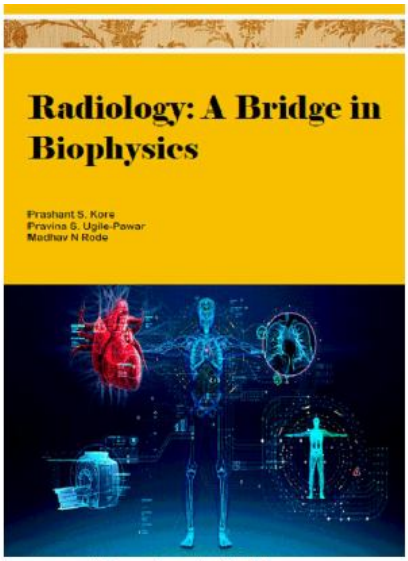

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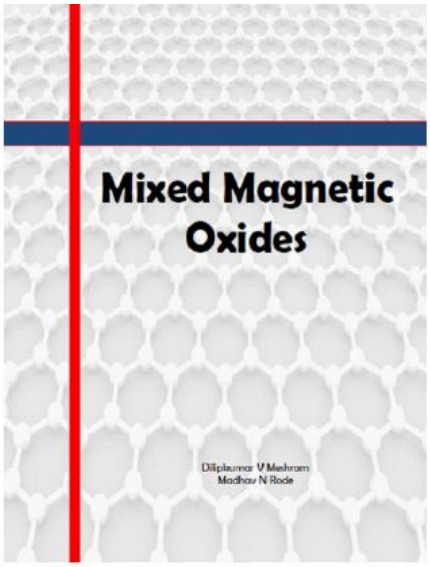

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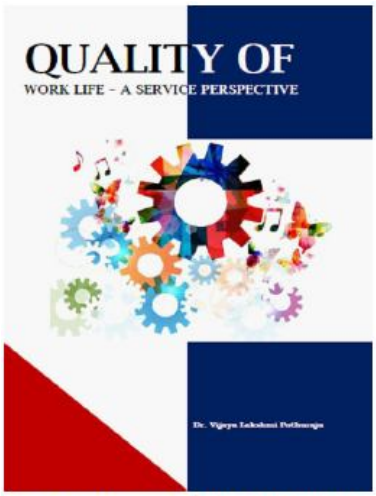

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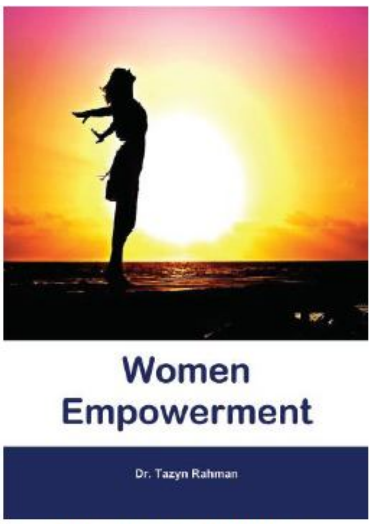

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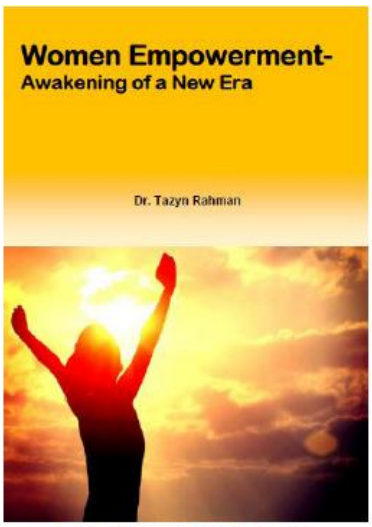

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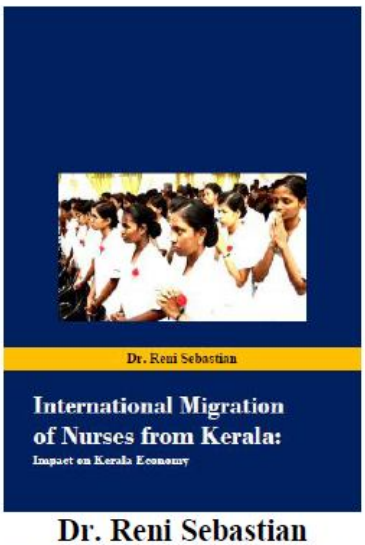

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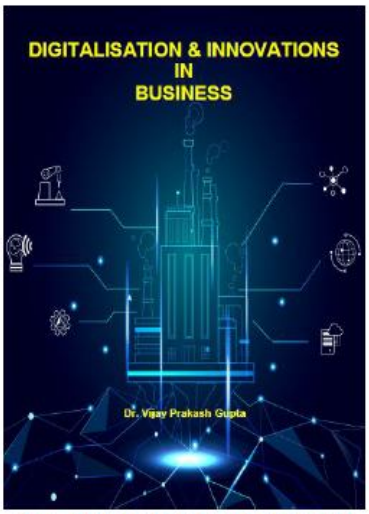

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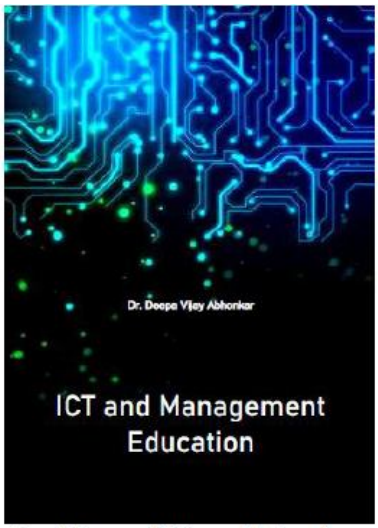

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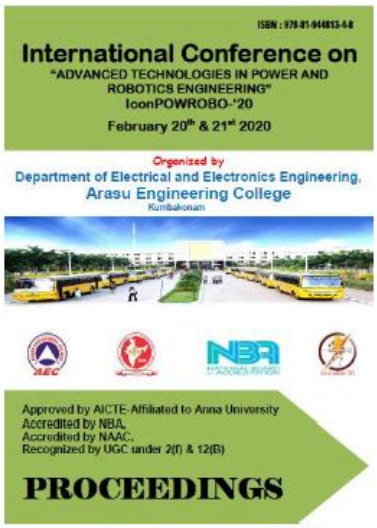

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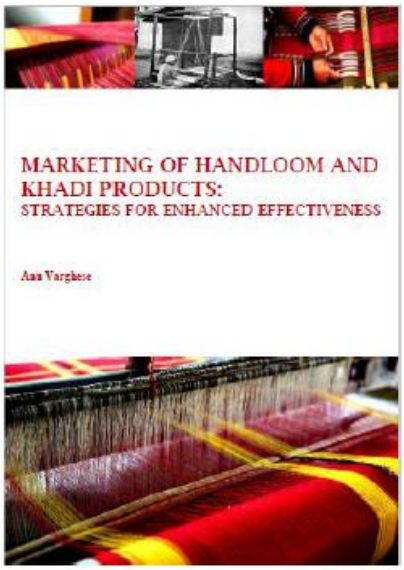

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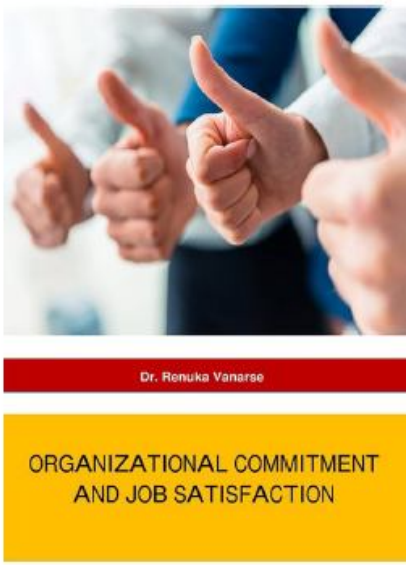

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