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Research Papers

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ANALYSIS OF THE TRANSIENT STABILITY FOR AN ELECTRICAL NETWORK BY THE EQUAL AREA CRITERION

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ABSTRACT
The demand for electricity doubles every decade, to meet this demand, the electrical networks are exploited to their limits, which makes the electrical networks vulnerable in terms of its stability and security. The study of the stability of electrical networks has become essential for network operators. The most important objective of stability studies is to find the dynamic behavior of the main variables that determine the operation of generators as well as angle, speed, current, voltage and power. Also, thanks to these variables, it is possible to determine the critical fault clearance time or the stability margin. In other words, transient stability aims to answer the following question: what is the maximum fault release time for which the network remains stable? The established Equal Area Criterion (EAC) using Matlab programs is remarkably efficient, which, it is based on the principle that when the power angle δ oscillates around the equilibrium point with a constant amplitude, transient stability will be maintained by determination of critical clearing angle (CCA) and critical clearing time (CCT). It gives results of great precision with phenomenal speed, unlike the traditional analysis method which must be laborious and which requires long and complex mathematical calculations.

Keywords: Transient stability, power angle δ, Equal Area Criterion, critical clearing angle (CCA) and critical clearing time (CCT).

1. INTRODUCTION
Rotor angle stability is a critical aspect of power system stability, and it refers to the ability of synchronous machines in a power system to maintain their synchronism following a disturbance. When a disturbance, such as a fault or a sudden change in load, occurs in the power system, the balance between the electromagnetic torque and the mechanical torque of the synchronous machines can be disrupted. As a result, one or more machines may start to oscillate, leading to an increase in rotor angle differences and potentially causing the loss of synchronism of some machines.

Power system synchronism or angular instability can limit the power transfer, especially over long distances. This is because during a transient stability event, the generators in the system can lose synchronism with each other, leading to a decline in power transfer capability. This phenomenon is known as "transient stability limit" and is a crucial factor in determining the maximum power transfer capability of a power system [1,2].

To improve transient stability and increase allowable power transfers, various methods have been developed. These include:

- Power system stabilizers: These are devices that are installed in the control system of synchronous generators to damp out oscillations and improve transient stability.
- Flexible AC transmission systems (FACTS): These are devices that can be used to control the power flow and voltage stability of the system, thereby improving transient stability.
- HVDC transmission: HVDC transmission is a technology that can be used to transmit power over long distances while improving transient stability and reducing losses.
- Dynamic line rating: This is a technique that allows the transmission capacity of a line to be increased by continuously monitoring the line temperature and weather conditions.
- Advanced stability analysis techniques: These include time-domain simulations and frequency-domain methods such as eigenvalue analysis, which can be used to identify potential stability issues and take corrective actions.
- Area Equality Criterion (EAC): The EAC method is a graphical method that involves plotting the power angle curve and calculating the areas under the curve for the pre-fault and post-fault periods.

By implementing these methods, power system operators can improve transient stability and increase the allowable power transfers, thereby enhancing the reliability and efficiency of the power system.

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The transient stability problem has been addressed by various stability controls and measures, including rapid fault clearing, exciter thyristors, power system stabilizers, and generator tripping. These measures aim to prevent or mitigate the effects of transient stability events by restoring the balance between the mechanical and electrical power in the power system [3,4,5].

To ensure rapid fault clearing, it is essential to determine the critical clearing time (CCT), which is the time required to clear a fault and restore stability to the power system. Several methods have been developed to determine the CCT, including the Area Equality Criterion (EAC) method and the numerical integration method [6,7].

The EAC method is a graphical method that involves plotting the power angle curve and calculating the areas under the curve for the pre-fault and post-fault periods. The critical clearing time is then determined by finding the time at which the areas under the curve are equal. This method is relatively simple and easy to use, but it may not be suitable for large-scale power systems.

The numerical integration method involves solving the differential equations that describe the dynamics of the power system using numerical techniques. The critical clearing time is then determined by analyzing the response of the system to the fault and identifying the time at which stability is restored. This method is more accurate than the EAC method but can be computationally intensive, especially for large-scale power systems [8,9].

Overall, the determination of the critical clearing time is crucial for ensuring the stability of the power system during and after a fault, and the choice of method will depend on the specific characteristics of the power system and the desired level of accuracy.

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The increasing angular oscillations of generators can lead to a phenomenon known as "angle instability" or "out-of-step" condition, which can result in widespread blackouts if not addressed in time. Therefore, maintaining rotor angle stability is critical for ensuring the safe and reliable operation of power systems. This can be achieved through various measures such as proper design, control, and protection of the power system components, as well as the use of advanced stability analysis techniques to identify potential stability issues and take corrective actions.

The equal area criterion method can be used to analyze the stability of large-scale power systems by dividing the system into smaller subsystems, each of which can be analyzed using the equal area criterion. This approach is often referred to as the "multi-machine" method, as it considers each generator as a separate machine and analyzes the stability of the entire system by studying the interaction between the different machines.

To apply the equal area criterion to a large-scale power system, the power angle curves of each generator in the system are plotted, and the areas under the curves are calculated for the pre-fault and post-fault periods. The total area for the entire system is then obtained by summing the individual areas for each generator. If the total area is equal to or greater than the critical value, the system is considered to be stable.

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However, the analysis of large-scale power systems using the equal area criterion method can be computationally intensive, as it requires the calculation of multiple power angle curves and the integration of each of these curves to determine the total area. Therefore, alternative techniques such as numerical integration or dynamic simulation may be more appropriate for analyzing the stability of large-scale power systems.

The main contribution of this work is the determination of the critical clearing angle (CCA) and the determination of the critical clearing time (CCT) when large and sudden disturbances appear in the transmission line, and also to present the method of Equal Area Criterion (EAC) as a resolution tool. A single-machine infinite bus system is analyzed with the proposed method [10-11].

2. Swing Equation

Under normal operating conditions, the relative position of the axis of the resulting magnetic field and the axis of the rotor is fixed. The angle between the two is called the power angle. Upon any disturbance, the rotor will accelerate or decelerate relative to synchronous rotation. This relative movement is described by the following balancing equation [1] - [5].

$$\frac{H}{\pi f_0}\frac{d^2\delta}{dt^2} = P_m - P_e \quad (1)$$

Where :

δ: power angle. ; f_0: Frequency ;H: machine inertia coefficient. ; P_m: machine mechanical input power. ;P_e: electrical power output of the machine.

Consider a simplified power system model with a single machine connected to an infinite bus [11] (One-Machine Infinite Bus) given by figure 1.

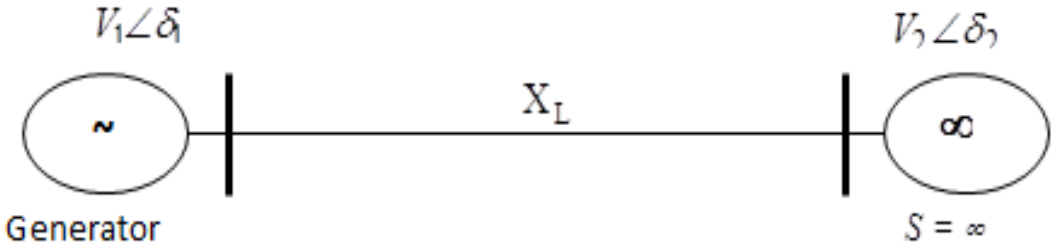

Figure 1: A single machine connected to an infinite bus

The electric power of the generator has the well-known relation:

$$P_e = \frac{V_1 V_2}{X_L} sin\,\delta = P\,sin\,\delta_{e,max} \quad (2)$$

We generally consider

$V_1 = E_g, V_2 = V$ and $\delta_2 = 0$

Then:

$$P_e = \frac{E_g V}{X_L} sin\,\delta \quad (3)$$

3. Equal Areas Criterion : EAC

Equality of areas criterion applied to transient stability for three-phase fault at the start and in the middle of the line. There are therefore two cases to consider.

3.1. Determination of the Critical Clearing Angle (CCA)

- A three phase fault at the beginning of the transmission line Pe, in case of default = 0 if all resistors are neglected To solve the CCA Form the figure 2 [6] - [11]

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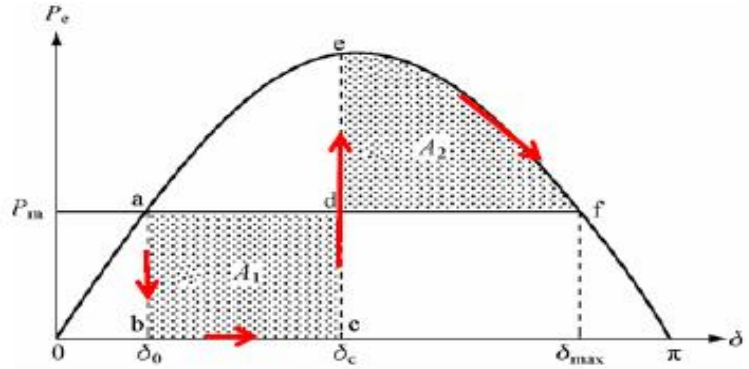

Figure .2: A three phase fault at the beginning of the transmission line

$$\int_{\delta_0}^{\delta_c} P_m d\delta = \int_{\delta_c}^{\delta_{\max}} (P_{\max}\sin\delta - P_m) d\delta \quad (4)$$

$|A_1|$ $|A_2|$

Integration on both sides:

$$P_m(\delta_0 - \delta_0) = P_{\max}(\cos\delta_c - \cos\delta_{\max}) - P_m(\delta_{\max} - \delta_c) \quad (5)$$

$$\cos\delta_c = \frac{P_m}{P_{\max}}(\pi - 2\delta_0) - \cos\delta_0 (\text{note: } \delta_{\max} = \pi - \delta_0) \quad (6)$$

• A three-phase fault in a portion of the line

Pe (during fault)> 0

It is based on the graphical interpretation of the energy stored in the rotating masses using the characteristic of the electric power as a function of the angle of the rotor given by figure 3.

Where:

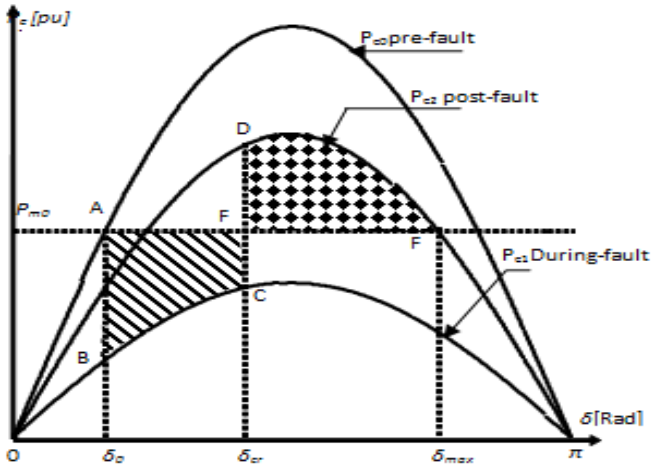

Figure 3: *Curve* $P_e = f(\delta)$

In the initial state (point A), corresponding to $\delta = \delta_0$, the system is in steady state. It is characterized by its state of equilibrium and equality $P_{e0} = P_{m0}$.

During the fault (BC), the electrical output power P_{e1} decreases sharply while the mechanical power P_{m0} remains almost constant.The acceleration powerP_a becomes positive, the machine tends to accelerate and its angle δ increase. The surface between $P_{e1}$and $P_{m0}$is called the acceleration surfaceA_{acc} and it is given by:

$$A_{acc} = \int_{\delta_0}^{\delta_{cr}} (P_{m0} - P_{e1}) d\delta \quad (7)$$

Once the disturbance is eliminated, when $\delta = \delta_{cr}$ (corresponding to CCT), the acceleration power becomes negative $(P_e > P_{m0})$ and the machine tends to slow down. Its rotor angle continues to increase until the deceleration surface A_{dec} (), given by equation (8), becomes equal to the acceleration surface A_{acc} ().

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$$A_{decc} = \int_{\delta_{cr}}^{\delta_{max}} (P_{e2} - P_{m0}) d\delta \quad (8)$$

When $\delta = \delta_{max}$, the rotor angle begins to decrease as it moves towards an equilibrium point and oscillates between δ_0 and δ_{max} until the machine stabilizes. The method of the EAC is characterized by the equality of the energies A_{acc} and A_{dec}. The CCA δ_{cr} and the maximum angle δ_{max} are given respectively by :

$$\delta_{cr} = \arccos\left[\frac{P_{m0}(\delta_0 - \delta_{max}) + P_{e1,max}\cos\delta_0 - P_{e2,max}\cos\delta_{max}}{P_{e1,max} - P_{e2,max}}\right] \quad (9)$$

$$\delta_{max} = \pi - \delta_0 \quad (10)$$

3.2. Determination of the Critical Clearing Time (CCT)

• A three phase fault at the beginning of the transmission line

From CCA, I can solve the CCT [7]:

$$\frac{2H}{\omega_0}\frac{d^2\delta}{dt^2} = P_m - 0 \Leftrightarrow \frac{d\delta}{dt} = \frac{\omega_0}{dt}P_m \int_0^t dt = \frac{\omega_0}{2H}P_m t \quad (11)$$

$$\delta = \frac{\omega_0}{4H}P_m t^2 + \delta_0 \Leftrightarrow t_c = \sqrt{\frac{4H(\delta_c - \delta_0)}{\omega_0 P_m}} \quad (12)$$

• A three-phase fault in a portion of the line:

Pe (during fault)> 0

To determine the CCT t_c , it is enough to determine the time necessary for the passage of δ from δ_0 to δ_{cr}, by solving the equation (12).

4. Simulation results

4.1. Fault at the beginning of the transmission line of test network

The fault applied here is represented by a short circuit connecting the line to ground.

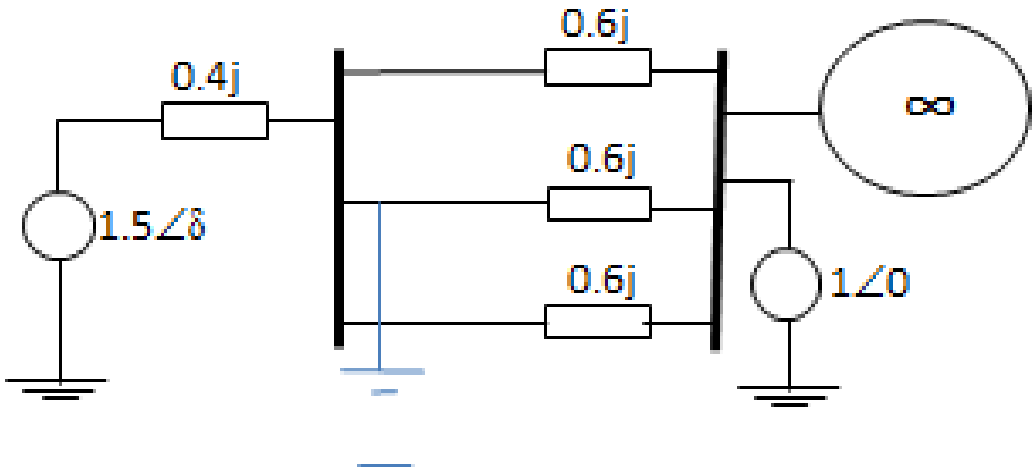

Figure .4: Test network with fault location

The following table summarizes all situations

Table .1: reactance values and the maximum power for the three situations

Case	Reactance (pu)	P_{max}(pu)
Before Fault	$X_1 = 0.6$	$P_{1max} = 2.5$
During Fault	$X_2 = \infty$	$P_{2max} = 0$
After Fault	$X_3 = 0.6$	$P_{3max} = 2.5$

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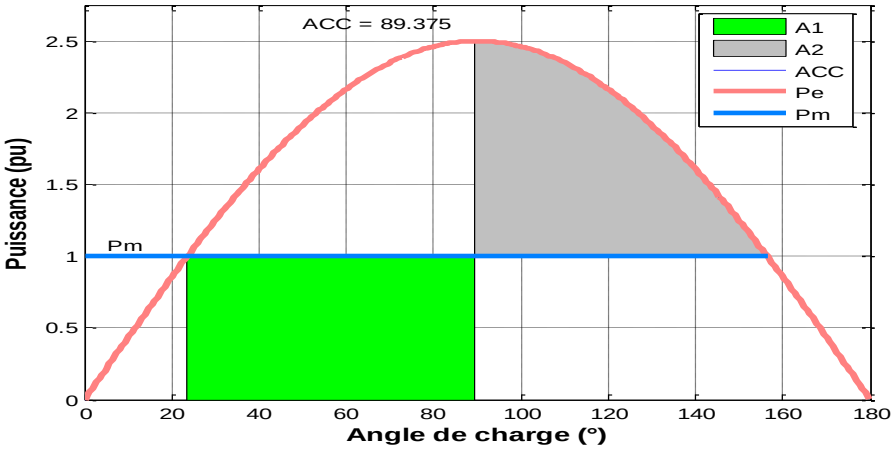

Figure .5: Application of EAC to test network with fault at the beginning of the line

Figure 5 presents all the results for this case, such as: initial power angle $\delta_0 = 26.118°$, maximum angle of rotation $\delta_{max} = 158.132°$; CCA $\delta_{cr} = 89.375°$ *and* $CCT\ .t_c = 0.240$ s

4.2. Fault in the middle of the transmission line of test network

Figures 6, 7 and 8 represent the structure of a network, respectively before the application of the fault, during the fault and after the fault.

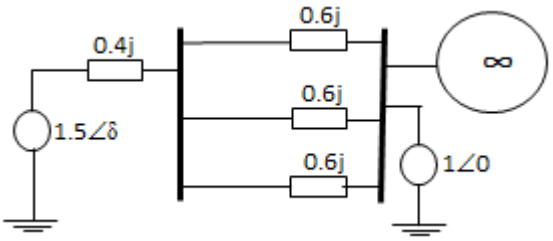

Figure .6: Network test before fault

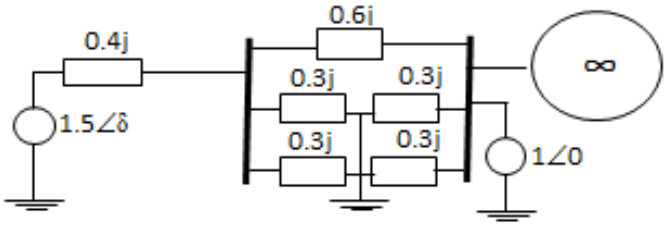

Figure.7: Network test during fault

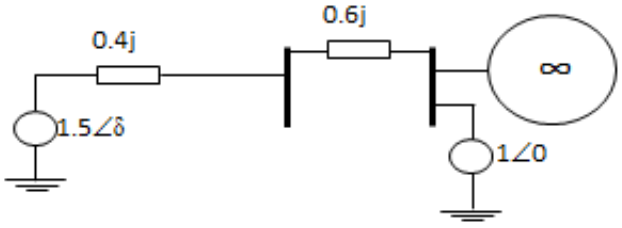

Figure .8: Network test after fault

With,$P_m = 1pu$,$E_g = 1.5\ pu$, $V = 1\ pu$ and $H = 4\ MJ/MVA$

The following table summarizes all situations

Tableau .2: reactance values and the maximum power for the three situations

Case	Reactance (pu)	$P_{max}(pu)$
Before Fault	$X_1 = 0.6$	$P_{1max} = 2.5$
During Fault	$X_2 = 2.6$	$P_{2max} = 0.58$
After Fault	$X_3 = 1.5$	$P_{3max} = 1.5$

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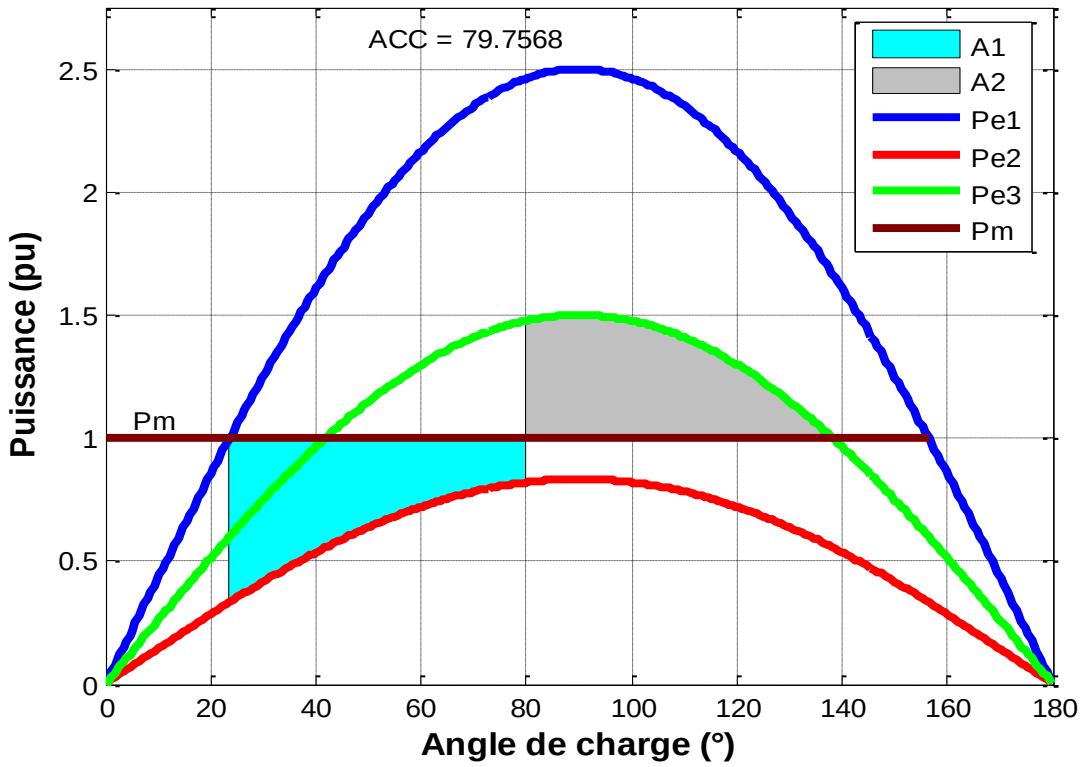

Figure.9: Application of EAC to test network with fault in the middle of the line

Figure (4.24) presents all the results for this case, such as: initial power angle $\delta_0 = 26.118°$, maximum angle of rotation $\delta_{max} = 138.652°$; the CCA $\delta_{cr} = 79.76°$.

5. CONCLUSION

In this paper, the equal area criterion method is a graphical technique used to analyze the transient stability of a power system following a disturbance, such as a line fault. It involves plotting the power angle curve, which shows the variation of the generator rotor angles with time, and then calculating the area under the curve for the pre-fault and post-fault periods. If these areas are equal, then the system is considered to be marginally stable, and the critical clearing angle and critical clearing time can be determined. Compared to numerical integration methods, the equal area criterion method is relatively simple and straightforward, as it does not require solving complex equations or detailed modeling of the system components. However, it does have limitations, particularly when dealing with large-scale power systems or complex fault scenarios, where the calculations can become computationally intensive. In such cases, numerical integration methods may be more appropriate, as they can provide more accurate and detailed information about the system's stability characteristics.

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THE ROLE OF VALUE ADDED TAX IN THE BUSINESS: A GENERAL AND BRIEF APPROACH IN THE GCC COUNTRIES

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INTRODUCTION

The Value Added Tax (VAT) is a type of indirect tax that is imposed on goods and services for value added at every point of production or distribution cycle, starting from raw materials and going all the way to the final retail/consumer purchase. The Value Added Tax (VAT) or the Goods and Services Tax (GST), is known in many countries as a tax on goods and services, enforced by governments to achieve economic objectives. The advantages such as increasing government's income, solving economic issues and difficulties, enhancing the national capita income and utilizing VAT financial resources, in incorporating further investments and development.

History of the Value Added Tax:

The concept of value added tax originated from France in 1950, and then it was adopted by Britain in 1970 at a standard rate of 10%. The value added tax was a strategy for solving some economic issues which are taking place in countries like inflation, fluctuation as well as unemployment and recession. More than 160 countries across the world start adopting the strategy of VAT, taxation as a national source of income and to diversify income resources of the economy.

The Value Added Tax is directly aimed to be collected from consumers. The VAT is a tax on consumption applied at a basic rate of 5% to be imposed by Gulf Cooperation Council (GCC) countries on goods and services in the business.

Objectives of Value Added Tax:

1. The effect of value added tax in the business.
2. The characteristic feature of value added with respect to increase in revenue.
3. The impact of value added tax on satisfying the marketers and the consumers.

Problem Statement of Value Added Tax:

Value added tax is the indirect tax, which is imposed on the good and services. This imposition is operated by the government when budget surplus is taken into consideration, with respect to increase in revenue and its financial budgetary deficit. Value added tax generated revenue in order to evaluate tax not only on the products, but also on the services in order to generate a high source of revenue in the business economy.

Purpose of the Study:

To identify consumer awareness level of VAT in the business, examine the expected VAT impact on consumers and identifies possible VAT influence on consumers spending's & savings habits.

Significance of the Study:

The importance of this study arises from that it highlights how far consumers know about VAT and if the government has done enough in this regard, or do they need to do more informative campaigns. In addition, it helps to explore how consumers will react when introducing VAT on some selected goods and services and the impact on their buying, consumptions, and spending habits.

RESEARCH METHODOLOGY:

1. The methodology complies of various scales of measurement for VAT from various financial institutes in order to generate the VAT functions.
2. Research philosophy will consider the positive characteristics which take the basic knowledge about the VAT from all the financial aspects of the business.

Data Analysis of Value Added Tax:

The data analysis is done with the help of secondary data, the collection of secondary data resources such as newspapers, books, articles, websites, journals and many more aspects.

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Value Added Tax in the GCC Countries:

In GCC countries the main source of revenue comes from oil and gas industries, but the declining prices of oil, in the last few years forced them to change policies and look for additional sources of income, imposing different kind of taxes was affordable solution including VAT, which is one of the most widely discussed economics, government policy and issues in most countries around the globe. In spite of its possible implications for consumers, Kingdom of Saudi Arabia, United Arab Emirates and Bahrain already applied VAT, Oman also implemented VAT on 16th April 2021on all goods and services with some few exceptions, with a rate of 5%.

Disadvantage of Value Added Tax:

One of the main disadvantages of VAT taxation is the creation of a continuous rise in the prices of goods and services. Higher prices, have a negative impact, and affect not only on the profitability of business, but also it can negatively result in the increase of different economic rates like inflation, unemployment and recession rates (Panayi 2020). Buying, consumption behaviour and purchasing power of consumers are expected to be affected by VAT.

Financial aspects of Value Added Tax on different sectors in the Business:

The value added tax is charged differently in the products/ manufacturing and service industry.

1. Manufacturer/Producer: The manufacturer would be required to purchase raw material after paying full tax on the rate applicable on such material.
2. Wholesaler/Dealer: The wholesaler or dealer who purchases goods in large quantities from the producer or manufacturer has the responsibility to turn to charge the VAT rate from the consumer for the price paid.
3. Trader/Retailer: The trader would be required to collect tax on the sales made by him and the tax liability would be set off or adjusted from the purchase or input tax credit of the goods locally purchased by the consumers.
4. Consumers: The consumers are the ender user are overburdened with the higher VAT paid by them due to the product or service reaching them is through the channel intermediaries.

Example of Value Added Tax each stage:

Stage of Purchase	**Cost**	**5% VAT**	**VAT Paid**
Purchase of Raw Material	$10.00	$ 0.50	$ 0.50
Purchase after Manufacturing	20.00	1.00	0.50
Purchase after Assembling	30.00	1.50	0.50
Wholesaler	40.00	2.00	0.50
Retailer	60.00	3.00	1.00____
VAT Charged Consumer			**$ 3.00____**

(The entire VAT is ultimately passed to the final buyers, as seen above, finally retail consumer pays entire sum of the VAT paid by the buyers. The final consumer's VAT can also calculate as: $60 x 5% = $ 3.00)

Calculation of Value Added Tax:

The VAT will be calculated as VAT = Output Tax – Input Tax

Output Tax: The output tax is the tax paid by the consumer when they purchase a taxable product from the dealers.

Input Tax: The input tax is the tax by the dealers for their purchases of goods and services from their suppliers.

Example on how to calculate VAT:

Suppose a dealer purchase goods of OMR 20,000 and pays 5% tax (OMR 20,000 x 5% = OMR 1,000) – **This is input tax.**

The consumer purchase the goods at OMR 25,000 from the dealer and the dealer collects 5% tax from consumer (OMR 25,000 x 5% = $1,250) – **This is output tax.**

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VAT = Output Tax – Input Tax

VAT= OMR 1,250 – OMR 1,000 = OMR 250.

So finally, the dealer will pay OMR 250 to the tax authorities.

CONCLUSION AND RECOMMENDATION:

CONCLUSION

VAT is considered with all other forms of taxes in many countries the most important source of income. The VAT is directly aimed to be collected from consumers. Value added tax is a technique use by the government to earn revenue to support the economy of the country.

The VAT is also known as a consumption tax, which is required by the consumers on the consumption of some services or goods. The governments all over the world have been using this technique in which the consumers directly participate in supporting the economy of the country.

RECOMMENDATIONS

It is found that by addressing the current situation of the business, business skills are very important to complete business tasks. The idea of VAT implementation is a good step by the government, but at the same time, there is a need to create awareness among the people about the VAT and its expected long run impact on the economy of the countries.

1. There is a need to create awareness among the people of the country about the goals behind the implementation of VAT.
2. The government should give compulsion to the Small Medium Enterprises and other individuals that are living below the poverty line.
3. VAT performance should be monitored timely to ensure where government is achieving its goals or not.

KEY RECOMMENDATIONS:

1. Governments have to prepare consumers before introducing VAT, with more information and awareness campaign.
2. Expand the products and services that are exempt from VAT.
3. Lowering the rate of VAT to be less than 5%.
4. Supporting families with a limited income, as they expected to be the most who will affected by VAT.

SCOPE OF THE FUTURE STUDIES:

The VAT has great scope for the future studies and to study the behaviour of the people towards the VAT implementation by the GCC countries.

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A STUDY ON IMPACT OF EMPLOYEE ABSENTEEISM IN SELECTED MANUFACTURING COMPANY

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ABSTRACT
Absenteeism is generally understood in different ways by different persons. It is majority understood as an employees or a Industries of workers remaining absent from work either continuously for a long time or back for short period. The sample size of the study was 50 Employee randomly selected Two Corrugated box Manufacture Company in Kaprada Taluka in Valsad District in Gujarat State. The information needed for the research has been received from primary and secondary data. Primary data collected was questionnaire and Personal Interview has been designed by the researcher according to the Study of objective. And secondary data collected by researcher various Journal, Magazine and Websites also. This research analysis by researcher used Percentage analysis and hypothesis test through ANOVA used as tools for data analysis. This Research study will Help This areas now working all Corrugated box Manufacturing Companies To Know Their Current Practices Regarding Absenteeism in employee of Corrugated box Manufacture Companies. Researcher give suggestion To Better Improve The Business in A Better Prospect And Result.

Keyword: Absenteeism, Employee, Manufacturing, Industries

1. INTRODUCTION OF EMPLOYEE ABSENTEEISM

Absenteeism is traditionally defined as a specific employee's unavailability for work place, when work is actually available for this specific employee. Absenteeism can fall under 3 broad categories: legal Holidays, authorized holidays and unauthorized (referred to as casual absence). Unauthorized absence is what most organizations strive to avoid and keep to a minimum.

The habitual absenteeism of an employee will result in, at best, a very poor performance review and, at worst, the immediate termination of employment.

→ Absenteeism divide can two part

1. Scheduled absenteeism
2. Unscheduled absenteeism

- **Scheduled Absenteeism:** Absences are scheduled in advance for such events as family activities vacation, medical appointments, military service, , jury duty, funerals, and other happenings which cannot be scheduled outside of regular work hours.
- **Unscheduled Absenteeism:** Absences considered unscheduled for such events as illness, family emergencies, transportation emergencies, family member illness and/or death, and household emergencies such as flooding.

According to the view of K. Aswathappa: "Absenteeism costs money to the organization besides reflecting employee dissatisfaction with the company. Absenteeism is unavoidable when the employee himself or herself falls sick, his or her dependents at home suddenly become unwell or there is an accident inside the plant."

"Employee absences due to personal illness, personal business and absence without leave, as measured in number of hours. (Goff, Mount, & Jamison, 1990)

J ames and Brian (1992) "Absenteeism takes two forms. These two forms are frequent offender and long-term absentee. Frequent offender is deliberate and planned and is usually the result of satisfying the urge for an attitude adjustment.

1.1 Cause of Employee Absenteeism

Cause of Employee Absenteeism :	The hidden cause of absenteeism
Employee's Attitude	A deficient work culture
Length of Employment	The incapacity to provide the necessary employee support
Work Pressure	A lack of interest with regard to the problem

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Relationship with Superiors or other staff	A culture of reluctant management or reluctant managers
Job Satisfaction	The absence of an employee communication programme
	Low employee morale.

1.2 The Cost of Absenteeism:

- Decrease in Productivity
- Employee may be carrying and more workload or replacement of staff.
- Employee may be want be required to train and orientate new or replacement workers.
- Staff moral and employee service may suffer.

1.3 Financial Cost :

- Payment of overtime may result.
- Cost of Self Insured income protection plans must be near born place the wages cost replacement employee

1.4 Administrative Cost

- Employee Staff time is require to source replacement to reassign the remaining employee.
- Employee staff time is require to maintain and control absenteeism.

2. LITERATURE OF REVIEW

1. S. Prakash1 K. Kannan2 (2012) " A Study on Absenteeism of Employees Among Food Retailing Coimbatore " in the Study " The main objective was to find out the level of absenteeism among the workers in the Organization, to find out the various causes for absenteeism, to study the relationship between the employees' satisfaction level and absenteeism and to finally suggest the possible remedial measures to reduce and control the absenteeism rate. The study concludes that absenteeism can be reduced to a great extent if the management takes initiative in making the workers feel responsible towards their job by introducing various motivational schemes.

2. Dr. Emmanuel IriemiEjere (2010) "Absence from Work: A Study of Teacher Absenteeism in Selected Public Primary Schools in Uyo, Nigeria " The research study results showed that significant relationships exist between the dependent variable (absenteeism) and the respective independent variables (job satisfaction, meaningfulness of work and job stress).The study therefore concludes that job satisfactions, meaningfulness of work and job stress are majordeterminants of teacher absenteeism in Nigerian public primary schools. Some strategies to reduce teacher absenteeism were then suggested.

3. M.Prabhu (2013) Study Title " A Study in a Steel Organization on Employees Absenteeism " in this study This study aims to identify factors that result in employees' absenteeism in an organization, which may help the company manager to develop and identify attitudes of employees for mini missing absenteeism. Data was collected from 100 steel manufacturing firmorganizations adopting random or chance sampling method. The data was subjected to simple percentage analysis, for demographic variables and chi square test for employee absenteeism. The results indicated the necessity feedback on employees performance. A good interpersonal relationship for the smooth functioning of the organizational activities should be maintained. The gap between absenteeism should be increased.

4. Paul S. Goodman & Robert S.Atkin (1984) in the research title " Effect in Absenteeism on Individuals and organizations. " The purpose of this chapter is to examine the consequences of absenteeism. Instead of asking what causes absenteeism we want to identify the causal effects of absenteeism; that is, what effect absenteeism has on the individual worker, adjacent workers the work group, the organization, .other social organization, and society. Our goal is to provide a better theoretical understanding of these question. The literature In this area IS quite sparse. While here are _ probably thousands of studies examine the determinants absenteeism, there are probably fewer than twenty studies that directly examine the effects of absenteeism on other criteriaas Productivity, safety, and so on. Therefore, our focus In chapter in more on understanding the theoretical issues underlying this Question than on making sense of a robust literature.

5. S.Vijayalatha1 and Dr. G.Brindha2 (2014) in the research title " A Study on Employee Absenteeism " This article throws light to increase the productivity and increase growth of an organization. The sample size of the article is 100 from the population of 156. The questionnaire method as survey is used as a tool for collecting the primary data. The questionnaire has been designed by the researcher according to the objective of the study. Percentage analysis, Chi-square and weighted average are used as tools for data analysis.

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3. RESEARCH METHODOLOGY

3.1 Statement of Problems :

Absenteeism has become a high problem in almost all the industrial place. Because of industries without planning of work, work schedules are upset and delayed, resulting in the management failure to meet delivery dates. When sick pay is authorized, the cost of absenteeism mounds up more rapidly. It measures are effectively implemented to minimize the expense of absenteeism as for as possible. In the highlight of various cause promoting excessive rate of absenteeism in the units concerned, measures will have to be taken by the management.

Mostly speaking, proper working Condition in the factory, adequate wages leave for rest and recuperation constitute the most effective means of minimizing cost of absenteeism. Provide facility of good housing facilities Unless working and living conditions are improved and necessary commitment of Labour force in the place of work is promoted and stabilized, the problem of absenteeism cannot be effectively solved through any Industries Management.

3.2 Objective of the Study:

- To find out various Cause for employee absenteeism of Selected Manufacturing Company
- To find out whether absenteeism is more due to social & religious causes than illness .
- To find out the level of satisfaction of the employees regarding overall management
- Suggest suitable remedies to reduce absenteeism.
- Suggest organizational management of absenteeism.

3.3 Hypothesis of the Study:

Null Hypothesis

H_0: There is no significant difference between Employee Absenteeism and Various Cause like. Good Employee Relation, Work Environment , Future Prospects , Recognition of Work ,Performance based work, Residential facility.

Research Hypothesis

H_0: There is a significant difference between Employee Absenteeism and Various Cause like Good Employee Relation , Work Environment , Future Prospects , Recognition of Work ,Performance based work, Residential facility.

3.4 Data Collection

Research Design	Explorative Research
Data Collection	Structured Questionnaire, Personal Interview, Research paper, Attendance Record
Sampling Population	Selected Manufacturing Industry
Sampling Frame	2 Manufacturing Company
Sampling Size	50 Employee
Sampling Method	Convenience Random Sampling
Data Analysis	Percentage & ANOVA (Analysis of Variance)

3.5 Limitations of the Study

- The present research study on the employee absenteeism is confirmed to a only two manufacture Unit of Corrugated box Making industries employee only.
- The sample employees selected for the present day was limited to 50 workers, because of constraints in terms of limited time.
- The process of filling up of questionnaire and Personal Interview has taken up so much time as most of the workers were not aware of the concepts and terms.

3.6 Scope of the Study:

An absent employee and Workers inform that unoccupied work space, with the concept of direct loss and an indirect reduction in the product Item of production. Hence the scope of the study throws indicate highlight on various reasons of absenteeism among the employees. Only the employees' perception falls under the area of the study. This study will serve as a base for further study on Employee absenteeism.

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4. Data Analysis

1. Age detail of Manufacturing Companies Employee

Parameters	Respondent	Percentage
< 20	7	14
21-30	15	30
31-45	19	38
46-55	9	18
Total	50	100

The analysis revels that it is seen that as many as 38 percent of respondents belonged to the age group of 31 yrs to 45 yrs, whereas 30 percent respondents were between 21 to 30 yrs. Only 14 percent them fall between the age group of 20 years. So, it can be assumed that majority of the work force fall between the young youth category.

2. Showing Employee's Education of Manufacturing Companies Employee

Parameters	Respondent	Percentage
Less than SSC	11	22
HSC	13	26
Graduate	15	30
Diploma / ITI	6	12
Other	5	10
Total	50	100

The Analysis clear found that the information about academic qualification of the respondents. Out of 50, 26 % were HSC ,22 % were less than SSC, 30 % were graduates respondent 12 % were ITI.10 % employee were other Graduate.

3. Showing Employee's Category analysis of Manufacturing Companies Employee

Parameters	Respondent	Percentage
Workers	19	38
Operator	25	50
Supervisor	6	12
Total	50	100

The analysis reflects that three category of employee selected by researcher of classification according to the workers 38%, belongs to Operator 50% belongs to supervisor 12 %.

4. Showing Employee's Residential Status of Manufacturing Companies Employee

Parameters	Respondent	Percentage
Company Quarter	5	10
Rental house	26	52
Own House	19	38
Total	50	100

The researcher found that employee residential status various parameters , according to industries employee study was the Company Quarter 10% employee, belongs to rental house 52% belongs to own house workers was 38 %

5. Reason of Employee's Absenteeism in work place

Parameters	Respondent	Percentage
Shift Work	20	40
Working Condition	16	32
Work Load	20	40
Job Dissatisfaction	35	70
Lack of cooperation & respect	40	80
Lack of open communication	33	66

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Inappropriate team environment	25	50
Lack of knowledge of fellow employees	19	38
Lack of transportation	13	26
Search for another job	40	80
Having personal business	3	6
Stress in the workplace	33	66
Not standard as competitors	29	58

The analysis revels that reason of employee absenteeism, 80 % employee absenteeism reason was search for another job ,66 employee Stress in the work place, 40 % shift work ,40 % work load, 66 % Lack of open Communication. 26 % employee absenteeism strong Lack of transportation, 50 % Inappropriate team environment. And other various reason for employee absenteeism, shift work, having personal business , social reason etc

2. Problems of Employee's Absenteeism in work Place

Parameters	Respondent	Percentage
Emergency Work	13	26
Health	18	36
Festival and other function	8	16
Alcoholism	6	12
Family Problems	3	6
Visiting Place	2	4
Total	50	100

The analysis reflect that reason of employee absenteeism, 36 % employee absenteeism reason was health problems, 26 % emergency work, 16 % festival and other function ,12 % employee was alcoholism.6 % Family problems, 4 % employee said absenteeism at work place reason was visiting other place

7. Satisfaction with the Present Wages

Parameters	Respondent	Percentage
Highly Satisfied	11	22
Satisfied	8	16
Neutral	26	52
Dissatisfied	4	8
Highly Dissatisfied	1	2
Total	50	100

The analysis found that satisfaction level of present wages employee satisfaction level of various parameters. Present wages highly satisfied employee was 22 %, only satisfied employee was 16 % , neutral view employee was 52 % (23), and dissatisfied employee was regarding present wages 8 %, highly dissatisfied employee was 2 %.

8. Satisfaction level towards leave Wages

Parameters	Respondent	Percentage
Highly Satisfied	7	14
Satisfied	18	36
Neutral	20	40
Dissatisfied	4	8
Highly Dissatisfied	1	2
Total	50	100

The analysis say that satisfaction level of leave wages employee satisfaction level of various parameters. highly satisfied employee was 14 % , only satisfied employee was 36 % , neutral view employee was 40 %.

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9. Which Factor Motivate Respondents to Attend Regularly

Opinion	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree
Good Employee Relation	15	19	14	1	1
Work Environment	9	15	25	0	1
Future Prospects	5	9	22	10	4
Recognition of Work	15	8	15	10	2
Incentives & bonus Provide d Based on Performance	20	10	15	2	3
Residential facility	3	5	10	20	12

The analysis reflects that Which Factor Motivate Respondents to Attend Regularly various Group motivation facilities provide to employee .Good Employee ration 15 employee say strongly agree , when 19 employee was Agree , 14 Neither agree this motivation, disagree 1 employee and strongly disagree was 1 employee. If Work environment improvement facility provide through management to employee's view regarding best attendance 9 employee strongly agree , 15 employee agree and 25 neither say,0 employee say disagree and 1 say strongly disagree. Future Prospects to employee say 5 strongly agree ,9 agree 22 and neither say was 10 employee. Suppose incentives and good bonus provide by industries 20 employee strongly agree ,10 agree and 15 neither say employee was 2, disagree and only 3 say that strongly disagree.

❖ **Hypothesis testing :(Table : 9.1)**

(Anova Single Factor)

SUMMARY				
Groups	*Count*	*Sum*	*Average*	*Variance*
Strongly Agree	6	67	11.16667	43.36667
Agree	6	66	11	26
Neither	6	101	16.83333	30.96667
Disagree	6	43	7.166667	59.36667
Strongly Disagree	6	23	3.833333	17.36667

ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	570.66	4	142.66	4.028	0.011	2.758
Within Groups	885.33	25	35.413			
Total	1456	29				

Interpretation

Above table Indicates that There is no significant difference between Employee Absenteeism and Various Cause because the calculated value of 'F' (2.75) was less than table value (4.028) and p value 0.011 was less than 0.05 so, null hypothesis accepted and research hypothesis rejected. It can be concluded that there were similarities between employee absenteeism and various cause.

5. FINDINGS & SUGGESTION

→ FINDINGS

- The age group majority of 31 yrs to 45 yrs, whereas 30 percent respondents were between 21 to 30 yrs. it can be assumed that majority of the work force fall between the young youth category.
- the information about academic qualification of the respondents. 26 % were HSC ,22 % were less than SSC, 30 % ,findings that this products industries employee having no more high education.
- The category of employee selected by researcher of classification according to the workers 38%, belongs to Operator 50% belongs to supervisor 12 %. Researcher selected more category was operator.
- The researcher found that employee residential status was the Company Quarter 10% employee, belongs to rental house 52% belongs to own house workers was 38 % , Majority corrugated box making industries workers and employee living in rental house in daman district.

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- The reason of employee absenteeism, 80 % employee absenteeism reason was search for another job ,66 employee Stress in the work place, 40 % shift work ,40 % work load, 66 % Lack of open Communication. 26 % employee absenteeism strong Lack of transportation, 50 % Inappropriate team environment. And other various reason for employee absenteeism, shift work, having personal business , social reason etc.
- The finding that reason of employee absenteeism, 36 % employee absenteeism reason was health problems, 26 % emergency work, 16 % festival and other function ,12 % employee was alcoholism.6 % Family problems, 4 % employee said absenteeism at work place reason was visiting other places. Majority employee these product industries absenteeism problems has health problem.
- The analysis found that satisfaction level of present wages employee satisfaction level of various parameters. Present wages highly satisfied employee was 22 %, only satisfied employee was 16 % , neutral view employee was 52 % (23), and dissatisfied employee was regarding present wages 8 %, highly dissatisfied employee was 2 %.
- The analysis say that satisfaction level of leave wages employee satisfaction level of various parameters. highly satisfied employee was 14 % , only satisfied employee was 36 % , neutral view employee was 40 %.
- The Motivate Respondents to Attend Regularly various Group motivation facilities provide to employee .Good Employee ration 15 employee say strongly agree , when 19 employee was Agree , 14 Neither agree this motivation, disagree 1 employee and strongly disagree was 1 employee. If Work environment improvement facility provide through management to employee's view regarding best attendance 9 employee strongly agree , 15 employee agree and 25 neither say,0 employee say disagree and 1 say strongly disagree. Future Prospects to employee say 5 strongly agree ,9 agree 22 and neither say was 10 employee. Suppose incentives and good bonus provide by industries 20 employee strongly agree ,10 agree and 15 neither say employee was 2, disagree and only 3 say that strongly disagree.
- The hypothesis analysis test that There is no significant difference between Employee Absenteeism and Various Cause because the calculated value of 'F' (2.75) was less than table value (4.028) and p value 0.011 was less than 0.05 so, null hypothesis accepted and research hypothesis rejected. It can be concluded that there were similarities between employee absenteeism and various cause.

→ SUGGESTION

- The management of Manufacturing Companies Employee The reduce absenteeism is providing counseling to those industries employees who take leave unnecessarily and making them aware of the problems of absenteeism and their importance at the work place.
- The management should improve employee requirement policy, new high educated and professional person should increase staff in industries.
- The management of Manufacturing Companies Employee has to provide healthy and safe environment and recreation facilities to the employees to reduce stress of work and to motivate the employees' interest towards their work.
- The Industries Management should take permanent workmen through the apprentice route.
- Manufacturing Companies Manager and employee relationship have to be improved to reduce absenteeism.
- To Give employees incentives for reduced absenteeism is not the same as rewarding or giving employees
- bonuses for reduced absenteeism.
- Provident fund and Accident benefit should provide management for reduce absenteeism.
- An incentive provides an employee with a boost to their motivation to avoid unnecessary absenteeism.
- Some policies add leave credit policies, with promotion leave availing etc.
- The young workers between the age group of 20 - 35 years can be made to attend classes, regarding, creating awareness for quality of work life, discipline of self respect etc.
- The management should take some step for Some of the employees are not aware of absenteeism affects productivity. They have to be educated as on how abstaining from work affects productivity.

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- The rules related to attendance must be explained to workers. In order to reduce work load, must appoint sufficient employees. Only them the existing employees can work better without any stress .
- Proper medical should be provided to the employees for reduce absenteeism in box making industries.
- The management of Manufacturing Companies Motivational training activity should be given to the employees at regular period of time.
- The management of Manufacturing Companies Their personal problems should be solved through counseling
- The management of Manufacturing Companies The work load given to them should be minimized.

→ CONCLUSION

This study has undertaken different analysis to identify the opinion of employees towards absenteeism. The analysis has, findings and suggestions have been provided explaining the factors that influence the absenteeism and employee view about the absenteeism. Suggestions for implementation by the Manufacturing Companies to reduce the ratio of absenteeism.

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OVERCOMING ANXIETY AND DEPRESSION: THE ROLE OF COGNITIVE-BEHAVIOURAL THERAPY

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INTRODUCTION

Anxiety and depression are pervasive mental health disorders that affect millions of individuals worldwide. These conditions can have a profound impact on individuals' lives, causing significant distress, impairing daily functioning, and diminishing overall well-being. Fortunately, advances in psychological interventions have led to the development of effective treatment approaches, and one such approach that has gained substantial empirical support is Cognitive-Behavioural Therapy (CBT).

Cognitive-Behavioural Therapy is a structured, goal-oriented form of psychotherapy that aims to identify and modify the thoughts, beliefs, and behaviours that contribute to anxiety and depression. It is rooted in the understanding that our thoughts and interpretations of events play a significant role in shaping our emotional experiences and behavioural responses. By targeting and changing these cognitive processes, CBT helps individuals break free from the cycle of negative thinking, reduce distressing symptoms, and build more adaptive coping strategies.

The primary objective of this article is to provide a comprehensive exploration of the role of Cognitive-Behavioural Therapy in overcoming anxiety and depression. We will examine the fundamental principles and techniques of CBT, emphasizing its collaborative and action-oriented nature. Specifically, we will delve into cognitive restructuring, a core component of CBT that involves identifying and challenging maladaptive thoughts and beliefs associated with anxiety and depression.

Furthermore, we will explore the role of exposure therapy within the context of CBT, which assists individuals in gradually confronting and managing their fears and anxieties. Additionally, we will discuss the importance of behavioural activation and skills training in combating depression, as CBT targets and modifies behavioural patterns that contribute to depressive symptoms.

To support the efficacy and effectiveness of CBT, we will review findings from various randomized controlled trials and meta-analyses. These studies have consistently demonstrated the positive outcomes of CBT interventions, including reductions in symptom severity, improvements in functioning, and prevention of relapse. Such evidence underscores the potential of CBT as a powerful treatment modality for individuals struggling with anxiety and depression.

Moreover, this article will highlight the broader impact of CBT beyond symptom reduction. By promoting resilience, empowerment, and well-being, CBT equips individuals with the tools to develop adaptive coping strategies and enhance emotional regulation skills, thereby fostering long-term recovery and improved mental health outcomes.

ANXIETY & CBT

Anxiety is a prevalent mental health condition that affects a significant portion of the population. It is characterized by persistent feelings of fear, worry, and apprehension, often accompanied by physical symptoms such as rapid heartbeat, sweating, and restlessness. Living with anxiety can be debilitating, interfering with daily functioning and diminishing overall quality of life. Fortunately, there are evidence-based treatments available to help individuals effectively manage and overcome anxiety, with Cognitive-Behavioural Therapy (CBT) emerging as a leading approach.

Cognitive-Behavioural Therapy is a form of psychotherapy that focuses on the connection between thoughts, emotions, and behaviours. It is grounded in the understanding that our thoughts and interpretations influence our emotional responses and subsequent actions. CBT aims to identify and modify negative or irrational thought patterns and behaviours that contribute to anxiety. By challenging and replacing these maladaptive cognitions, individuals can experience a reduction in anxiety symptoms and develop healthier coping strategies.

The primary objective of this article is to explore the role of Cognitive-Behavioural Therapy in the treatment of anxiety. We will examine the underlying principles and techniques of CBT that make it effective in addressing anxiety disorders. This will include an exploration of cognitive restructuring, which involves identifying and challenging distorted thoughts and replacing them with more realistic and balanced thinking patterns. Additionally, we will discuss the importance of psychoeducation in CBT for anxiety, as it helps

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individuals understand the nature of anxiety, its triggers, and the factors that maintain the anxiety cycle. By gaining knowledge and insight into their condition, individuals can better collaborate with their therapist and actively participate in the therapeutic process.

Furthermore, we will review the empirical evidence supporting the efficacy of CBT in the treatment of anxiety. Numerous studies have demonstrated the effectiveness of CBT across various anxiety disorders, such as generalized anxiety disorder (GAD), panic disorder (PD), social anxiety disorder (SAD), and specific phobias. These studies highlight the significant reduction in anxiety symptoms and improvement in overall functioning that can be achieved through CBT interventions.

By addressing the cognitive and behavioural factors that contribute to anxiety, CBT empowers individuals to challenge their anxious thoughts, confront their fears, and develop adaptive coping strategies. Through an exploration of CBT principles, techniques, and empirical evidence, this article aims to shed light on the transformative potential of CBT in alleviating anxiety and enhancing the well-being of individuals experiencing anxiety disorders.

Depression & CBT

Depression is a common and debilitating mental health condition that affects millions of people worldwide. It is characterized by persistent feelings of sadness, loss of interest or pleasure in activities, changes in appetite or sleep patterns, and a lack of energy or motivation. Living with depression can significantly impact all aspects of an individual's life, making it crucial to identify effective treatment options. Cognitive-Behavioural Therapy (CBT) has emerged as a prominent and evidence-based approach for addressing and managing depression.

Cognitive-Behavioural Therapy is a structured form of psychotherapy that focuses on the relationship between thoughts, emotions, and behaviours. It recognizes that negative or distorted thinking patterns contribute to and maintain depressive symptoms. CBT aims to identify and modify these unhelpful thinking patterns, replace them with more realistic and positive thoughts, and develop healthy coping strategies. By addressing both cognitive and behavioural aspects, CBT helps individuals break free from the cycle of depression and improve their overall well-being.

The primary objective of this article is to explore the role of Cognitive-Behavioural Therapy in the treatment of depression. We will delve into the underlying principles and techniques of CBT that make it effective in addressing depressive symptoms. This will include an examination of cognitive restructuring, which involves identifying negative automatic thoughts, challenging their validity, and replacing them with more balanced and adaptive thoughts.

Furthermore, behavioural activation is a key component of CBT for depression which focuses on increasing engagement in rewarding and pleasurable activities. Behavioural activation helps individuals regain a sense of accomplishment and enjoyment, countering the withdrawal and avoidance behaviours commonly associated with depression.

In addition, we will explore the significance of addressing underlying core beliefs and schemas in CBT for depression. These deeply ingrained beliefs about oneself, the world, and the future often contribute to the maintenance of depressive symptoms. By identifying and challenging these core beliefs, individuals can develop more positive and empowering self-perceptions.

Moreover, we will review the empirical evidence supporting the efficacy of CBT in the treatment of depression. Numerous studies have demonstrated that CBT is a highly effective intervention, leading to a significant reduction in depressive symptoms and improving overall functioning and quality of life.

Hence, we can say that Cognitive-Behavioural Therapy offers a promising and evidence-based approach for individuals struggling with depression. By targeting and modifying negative thought patterns, behaviours, and core beliefs, CBT empowers individuals to regain control over their lives and find relief from depressive symptoms. Through an exploration of CBT principles, techniques, and empirical evidence, this article aims to shed light on the transformative potential of CBT in the treatment of depression and provide valuable insights for individuals seeking effective interventions for this mental health condition.

In conclusion, Cognitive-Behavioural Therapy stands as a valuable and evidence-based approach for overcoming anxiety and depression. By addressing the underlying cognitive and behavioural factors that contribute to these conditions, CBT offers individuals the opportunity to regain control of their lives, cultivate resilience, and experience lasting emotional well-being. Through an in-depth exploration of CBT principles, techniques, and empirical evidence, this article aims to provide valuable insights for clinicians, researchers, and individuals seeking effective interventions for anxiety and depression.

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Cognitive-Behavioral Therapy (CBT)

CBT targets both the cognitive and behavioral aspects of anxiety and depression to bring about therapeutic change. CBT addresses these components as mentioned below:

1. **Cognitive Aspect**
   - **Cognitive restructuring:** CBT recognizes the role of negative or distorted thinking patterns in maintaining anxiety and depression. Through cognitive restructuring, individuals learn to identify and challenge these unhelpful thoughts and replace them with more realistic and balanced ones. This process helps individuals develop a more accurate and adaptive cognitive framework, reducing the intensity of negative emotions associated with anxiety and depression.
   - **Automatic thought monitoring:** CBT involves monitoring and identifying automatic thoughts that arise in response to anxiety or depressive triggers. By becoming aware of these thoughts, individuals can examine their validity and accuracy. This process helps individuals recognize cognitive biases and challenge irrational beliefs, leading to a reduction in anxiety and depressive symptoms.
   - **Belief systems:** CBT explores and addresses the underlying core beliefs and schemas that contribute to anxiety and depression. These deeply ingrained beliefs often involve negative self-perceptions, the world, and the future. Through the therapeutic process, individuals learn to challenge and modify these maladaptive belief systems, fostering a more positive and empowering outlook.
2. **Behavioral Aspect**
   - **Exposure therapy:** CBT employs exposure techniques to help individuals confront feared situations or stimuli gradually. By gradually exposing individuals to anxiety-provoking situations in a controlled and supportive environment, CBT helps reduce avoidance behaviors and desensitize individuals to their fears. Over time, this leads to a decrease in anxiety and a sense of mastery over anxiety-inducing situations.
   - **Behavioral activation:** CBT emphasizes the importance of engaging in pleasurable and meaningful activities, even when feeling anxious or depressed. Behavioral activation helps individuals counteract the withdrawal and avoidance tendencies commonly associated with anxiety and depression. By increasing participation in enjoyable activities, individuals experience a sense of accomplishment, positive reinforcement, and an overall improvement in mood.
   - **Skills training:** CBT equips individuals with coping skills and strategies to manage anxiety and depression. These skills may include relaxation techniques, problem-solving skills, stress management, and emotion regulation strategies. By learning and practicing these skills, individuals enhance their ability to cope with anxiety-provoking or depressive situations effectively.

   By addressing both the cognitive and behavioral aspects of anxiety and depression, CBT provides individuals with a comprehensive approach to treatment. It helps individuals gain a deeper understanding of the connection between their thoughts, emotions, and behaviors, empowering them to make positive changes in their lives. Through cognitive restructuring, exposure therapy, behavioral activation, and skills training, CBT equips individuals with the tools they need to overcome anxiety and depression and achieve lasting improvements in their well-being.

Overview of the Cognitive Restructuring And Behavioral Activation Techniques Used In CBT

Cognitive restructuring and behavioral activation are two key techniques used in Cognitive-Behavioral Therapy (CBT) to address anxiety and depression. Here's an overview of these techniques:

1. **Cognitive Restructuring**
   - **Definition:** Cognitive restructuring involves identifying and challenging negative or irrational thoughts and replacing them with more realistic and balanced thinking patterns.
   - **Process:** Through cognitive restructuring, individuals learn to become aware of their automatic thoughts, which are immediate and often unconscious cognitive responses to situations. These thoughts can be distorted, biased, or exaggerated, contributing to anxiety and depression.
   - **Cognitive Distortions:** CBT focuses on recognizing and challenging common cognitive distortions such as all-or-nothing thinking, overgeneralization, catastrophizing, and personalization. By identifying these distortions, individuals can evaluate the evidence supporting or refuting their thoughts.
   - **Evidence Gathering:** Cognitive restructuring encourages individuals to gather objective evidence that supports or contradicts their negative thoughts. This process helps individuals develop more balanced and realistic thinking patterns.

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- **Rational Responses:** In cognitive restructuring, individuals learn to generate rational responses to their negative thoughts. These responses involve questioning the accuracy and validity of their automatic thoughts, considering alternative explanations, and adopting more adaptive and constructive perspectives.

2. Behavioral Activation

- **Definition:** Behavioral activation aims to increase engagement in positive and meaningful activities, counteracting the withdrawal and avoidance tendencies commonly seen in anxiety and depression.
- **Activity Monitoring:** Individuals track their daily activities, noting the frequency, enjoyment level, and associated emotions for each activity. This helps identify patterns of low mood or anxiety and pinpoint activities that may have a positive impact.
- **Activity Scheduling:** With guidance from the therapist, individuals develop an activity schedule that includes a balance of pleasurable and fulfilling activities. The schedule is based on the individual's values, interests, and goals.
- **Goal Setting:** Behavioural activation involves setting achievable short-term and long-term goals. These goals provide individuals with a sense of direction, motivation, and a sense of accomplishment when they are achieved.
- **Graded Task Assignment:** Individuals are encouraged to gradually engage in activities that they have been avoiding due to anxiety or depression. This is done in a step-by-step manner, starting with less challenging tasks and progressively moving toward more anxiety-provoking or depressive triggers.
- **Positive Reinforcement:** Engaging in pleasurable and rewarding activities leads to positive reinforcement, which helps individuals experience a sense of pleasure, mastery, and improved mood. This reinforces the idea that engaging in activities can counteract the negative symptoms of anxiety and depression.

By incorporating cognitive restructuring and behavioural activation techniques, CBT aims to address the interplay between thoughts, emotions, and behaviours in anxiety and depression. Cognitive restructuring helps individuals challenge and replace negative thoughts with more balanced and realistic ones, while behavioural activation helps individuals increase their engagement in positive and fulfilling activities. These techniques work together to break the cycle of negative thinking and behavioural withdrawal, leading to symptom reduction and improved well-being.

OBJECTIVES

The research objective of examining the role of Cognitive-Behavioural Therapy (CBT) in overcoming anxiety and depression is to investigate and understand the effectiveness and impact of CBT as a treatment approach for these mental health conditions. The primary aim is to explore the specific mechanisms through which CBT produces therapeutic change, assess its overall efficacy and identify factors that contribute to successful outcomes. Additionally, the research objective involve examining the potential benefits of tailoring CBT interventions to specific populations of anxiety and depression. The importance of this research lies in several key aspects:

1. **Treatment Efficacy:** Research on the role of CBT in overcoming anxiety and depression helps establish its effectiveness as a therapeutic intervention. By examining empirical evidence, the research can provide insights into the outcomes and benefits associated with CBT, including symptom reduction, improved functioning, and enhanced quality of life. This information is valuable for both clinicians and individuals seeking treatment options.
2. **Evidence-Based Practice:** The research aims to contribute to the body of knowledge supporting evidence-based practice in the field of mental health. By examining the role of CBT in anxiety and depression treatment, the research provides scientific support for the use of CBT as a recommended and validated approach. This is important for guiding clinical decision-making and promoting the use of effective treatments.
3. **Treatment Selection and Personalization:** Understanding the role of CBT in overcoming anxiety and depression can help inform treatment decisions and facilitate personalized care. The research can shed light on which individuals may benefit most from CBT, as well as the factors that influence treatment outcomes. This knowledge can aid clinicians in selecting the most appropriate interventions for their clients and tailoring treatment plans to individual needs.
4. **Patient Empowerment and Education:** Examining the role of CBT in anxiety and depression treatment contributes to patient empowerment and education. By disseminating research findings, individuals

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experiencing anxiety and depression can gain awareness of CBT as a viable treatment option. This knowledge can empower them to seek appropriate care, engage actively in the therapeutic process, and make informed decisions about their mental health.

5. **Advancing Clinical Practice:** Research on the role of CBT in overcoming anxiety and depression can lead to advancements in clinical practice. By exploring mechanisms of change, tailoring considerations, and treatment guidelines, the research can inform and guide clinicians in the implementation of CBT. It can also inspire further research and innovation in the field, driving improvements in treatment outcomes and strategies.

In summary, examining the role of CBT in overcoming anxiety and depression through research serves the purpose of establishing treatment efficacy, promoting evidence-based practice, facilitating personalized care, empowering individuals, and advancing clinical practice. This research objective is crucial in expanding our understanding of effective interventions and improving the well-being of individuals experiencing anxiety and depression.

The theoretical framework of Cognitive-Behavioral Therapy (CBT)

The theoretical framework of Cognitive-Behavioral Therapy (CBT) is based on the integration of cognitive and behavioral theories. CBT recognizes the reciprocal relationship between thoughts, emotions, and behaviors and aims to identify and modify maladaptive patterns in each of these domains. Here is an overview of the theoretical framework of CBT:

1. **Cognitive Theory**
   - Cognitive theory posits that individuals' thoughts, beliefs, and interpretations significantly influence their emotions and behaviors. Negative or distorted thinking patterns can contribute to the development and maintenance of psychological distress, such as anxiety and depression.
   - CBT emphasizes the role of cognitive processes in shaping individuals' experiences and reactions to situations. It highlights the importance of identifying and challenging cognitive distortions and negative automatic thoughts that contribute to emotional distress.
   - The goal of CBT is to help individuals develop more adaptive, realistic, and balanced thinking patterns by challenging irrational beliefs, cognitive biases, and cognitive distortions.
2. **Behavioral Theory**
   - Behavioral theory focuses on the role of learned behaviors in the development and maintenance of psychological problems. It suggests that individuals acquire maladaptive behaviors through conditioning and reinforcement processes.
   - CBT recognizes the impact of behavior on emotions and vice versa. It acknowledges that engaging in avoidance, safety behaviors, or withdrawal can perpetuate anxiety and depression symptoms.
   - The behavioral component of CBT aims to modify maladaptive behaviors by promoting active engagement in positive and healthy behaviors. It utilizes techniques such as exposure therapy, behavioral activation, and skills training to facilitate behavior change and improve emotional well-being.
3. **Integration and Treatment Focus**
   - CBT integrates cognitive and behavioral theories, recognizing that thoughts, emotions, and behaviors interact and influence each other. It emphasizes that changing one aspect (cognition, emotion, or behavior) can lead to changes in the other aspects.
   - The treatment focus in CBT is on identifying and modifying maladaptive cognitive and behavioral patterns that contribute to anxiety and depression. Through cognitive restructuring, individuals learn to challenge and replace negative thoughts with more accurate and balanced ones. Behavioral techniques are employed to help individuals confront fears, engage in positive activities, and develop adaptive coping skills.
   - CBT also emphasizes the importance of collaboration between the therapist and the individual in setting treatment goals, monitoring progress, and applying therapeutic strategies. Homework assignments, self-monitoring, and cognitive-behavioral strategies are often incorporated into the therapy process to facilitate skill acquisition and generalization of therapeutic gains.

In summary, the theoretical framework of CBT integrates cognitive and behavioral theories, recognizing the interplay between thoughts, emotions, and behaviors. By addressing maladaptive patterns in each domain,

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CBT aims to help individuals develop more adaptive thinking patterns, engage in healthier behaviors, and improve their emotional well-being.

Explanation of the underlying principles and theories of CBT

Cognitive-Behavioral Therapy (CBT) is grounded in several underlying principles and theories that inform its therapeutic approach. Here's an explanation of the key principles and theories that form the foundation of CBT:

1. **Cognitive Theory**
   - **Core Principle:** Cognitive theory posits that individuals' thoughts, beliefs, and interpretations significantly influence their emotions and behaviors. It suggests that psychological distress, such as anxiety and depression, can be attributed to negative or distorted thinking patterns.
   - **Cognitive Restructuring:** CBT aims to identify and challenge maladaptive cognitive patterns, including cognitive distortions and negative automatic thoughts. By replacing irrational beliefs with more accurate and balanced thinking, individuals can experience a reduction in emotional distress and improved well-being.
2. **Behavioral Theory**
   - **Core Principle:** Behavioral theory emphasizes the role of learned behaviors in the development and maintenance of psychological problems. It suggests that individuals acquire maladaptive behaviors through conditioning and reinforcement processes.
   - **Behavior Modification:** CBT utilizes behavioral techniques to modify maladaptive behaviors. This may involve exposure therapy, where individuals gradually face feared situations or stimuli to reduce anxiety, or behavioral activation, which encourages engagement in pleasurable and meaningful activities to counteract depression.
3. **Cognitive-Behavioral Model**
   - **Core Principle:** The cognitive-behavioral model serves as the overarching framework of CBT. It posits that thoughts, emotions, and behaviors are interconnected and influence each other in a reciprocal manner.
   - **Cognitive-Behavioral Triangle:** The cognitive-behavioral triangle illustrates the relationship between thoughts, emotions, and behaviors. It suggests that negative thoughts can lead to negative emotions, which, in turn, can trigger maladaptive behaviors. By addressing any aspect of the triangle, changes can be made in the other two domains.
4. **Learning Theories**
   - **Classical Conditioning:** CBT draws upon classical conditioning principles, where individuals learn associations between stimuli and emotional responses. For example, a person may develop anxiety in response to a specific trigger through repeated pairing of that trigger with a negative experience.
   - **Operant Conditioning:** Operant conditioning is another learning theory that underlies CBT. It focuses on the consequences of behaviors, such as reinforcement or punishment, which shape future behavior. CBT uses operant conditioning principles to reinforce adaptive behaviors and extinguish maladaptive ones.
5. **Self-Efficacy Theory**
   - **Core Principle:** Self-efficacy theory, developed by Albert Bandura, emphasizes individuals' beliefs in their ability to successfully perform specific tasks and achieve desired outcomes.
   - **Belief in Change:** CBT aims to enhance individuals' self-efficacy by helping them develop a belief in their capacity to change their thoughts, emotions, and behaviors. This belief serves as a motivation for individuals to engage in therapeutic techniques and make positive changes in their lives.

These underlying principles and theories provide the theoretical framework for CBT and guide the therapeutic strategies employed. By targeting maladaptive cognitive and behavioral patterns, CBT aims to promote positive change, improve emotional well-being, and empower individuals to effectively cope with anxiety, depression, and other psychological difficulties.

How CBT targets the cognitive and behavioral aspects of anxiety and depression

CBT targets the cognitive and behavioral aspects of anxiety and depression through specific therapeutic techniques that address maladaptive patterns in both domains. Here's a discussion of how CBT targets these aspects:

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1. **Cognitive Aspect**
- **Cognitive Restructuring:** CBT aims to identify and challenge negative or distorted thinking patterns that contribute to anxiety and depression. Through cognitive restructuring, individuals learn to recognize and reframe irrational beliefs, cognitive biases, and cognitive distortions. This process involves examining the evidence supporting or refuting negative thoughts, generating more balanced and realistic alternatives, and adopting more adaptive perspectives.
- **Automatic Thought Monitoring:** CBT encourages individuals to become aware of their automatic thoughts, which are immediate and often unconscious cognitive responses to situations. By monitoring these thoughts, individuals can identify negative or anxious thinking patterns and work towards replacing them with more helpful and rational thoughts.
- **Cognitive Coping Skills:** CBT equips individuals with cognitive coping skills to manage and challenge their negative thoughts. These skills may include thought stopping, where individuals interrupt and replace negative thoughts with positive or neutral ones, or thought challenging, where individuals question the accuracy and validity of their negative thoughts.

2. **Behavioral Aspect**
- **Exposure Therapy:** Exposure therapy is a behavioral technique commonly used in CBT for anxiety disorders. It involves gradually exposing individuals to feared situations or stimuli in a controlled and safe manner. Through repeated exposure, individuals learn that their anxiety decreases over time, leading to habituation and a reduction in anxiety symptoms.
- **Behavioral Activation:** Behavioral activation is a technique used in CBT for depression. It aims to counteract the withdrawal and avoidance tendencies by encouraging individuals to engage in pleasurable and fulfilling activities. By increasing their participation in positive activities, individuals experience a sense of pleasure, accomplishment, and improved mood.
- **Skills Training:** CBT may include skills training to enhance individuals' ability to manage anxiety and depression. This may involve teaching relaxation techniques, problem-solving skills, stress management strategies, and effective communication skills. By acquiring these skills, individuals gain a sense of mastery and improve their ability to cope with anxiety- and depression-related challenges.

By targeting both the cognitive and behavioral aspects, CBT addresses the reciprocal relationship between thoughts, emotions, and behaviors. It recognizes that changing negative or irrational thoughts can lead to changes in emotions and behaviors, and vice versa. By modifying maladaptive cognitive patterns and promoting adaptive behaviors, CBT helps individuals develop more effective coping strategies and improve their overall well-being.

It's important to note that CBT is a collaborative and individualized therapy, tailored to the specific needs and goals of each individual. The therapist works together with the individual to identify and target the cognitive and behavioral aspects that contribute to their anxiety or depression, employing evidence-based techniques to facilitate positive change.

Overview of the cognitive restructuring and behavioral activation techniques used in CBT-
Cognitive restructuring and behavioral activation are two fundamental techniques used in Cognitive-Behavioral Therapy (CBT) to address the cognitive and behavioral aspects of various mental health conditions, including anxiety and depression. Here's an overview of these techniques:

1. **Cognitive Restructuring**
- Cognitive restructuring aims to identify and challenge negative or distorted thinking patterns that contribute to emotional distress. It involves helping individuals recognize and modify irrational beliefs, cognitive biases, and cognitive distortions.
- **Steps of Cognitive Restructuring:** a. Identifying Negative Thoughts: Individuals learn to identify their automatic negative thoughts, which are immediate and often unconscious cognitive responses to situations. **These thoughts can be self**-critical, catastrophic, or pessimistic. b. Evaluating Evidence: Individuals are encouraged to examine the evidence supporting or refuting their negative thoughts. This process involves questioning the accuracy, validity, and logical basis of these thoughts. c. Generating Alternative Thoughts: Once the negative thoughts are challenged, individuals are guided to generate more balanced and realistic alternative thoughts. These alternative thoughts are based on a more accurate assessment of the situation. d. Testing the Alternative Thoughts: Individuals are encouraged to test the validity of their alternative thoughts

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by examining how they feel and behave when they adopt these new perspectives. This process helps individuals develop more adaptive and helpful thinking patterns.

2. **Behavioral Activation**

- Behavioral activation focuses on increasing engagement in positive and rewarding activities as a means of countering depression and improving mood. It aims to break the cycle of withdrawal and avoidance commonly associated with depression.
- **Steps of Behavioral Activation:** a. Activity Monitoring: Individuals are guided to monitor their daily activities and identify patterns of low or reduced engagement in pleasurable or fulfilling activities. b. **Activity Scheduling:** Based on the activity monitoring, individuals work with their therapist to schedule and plan enjoyable and meaningful activities. This may involve identifying activities that align with personal interests, values, and goals. c. Gradual Increase in Activity Level: Individuals are encouraged to gradually increase their activity level by incorporating planned activities into their daily routine. This process helps them regain a sense of accomplishment, pleasure, and motivation. d. Monitoring and Evaluation: Individuals continue to monitor their activity level and assess the impact of engaging in positive activities on their mood and overall well-being. Adjustments are made to the activity schedule as needed.

Both cognitive restructuring and behavioral activation techniques aim to promote adaptive thinking patterns, increase engagement in positive activities, and improve emotional well-being. These techniques are often used together in CBT, as they address both the cognitive and behavioral aspects of various mental health conditions. By modifying negative thoughts and increasing positive behaviors, individuals can experience symptom reduction, improved functioning, and enhanced quality of life.

METHODOLOGY

The details of population, sample & sampling procedure

SAMPLE

The participants in this study were selected by cluster sampling (n=30) which were further randomised & divided into control group (n=15) & intervention group(n=15).

Scales used for data collection :

- **Beck Anxiety Inventory (BAI):** The BAI is a self-report questionnaire that measures the severity of anxiety symptoms. It consists of 21 items that assess common symptoms of anxiety, such as fear, worry, and physical symptoms. The score range is 0–63. A total score of 0–7 is considered minimal range, 8–15 is mild, 16–25 is moderate, and 26–63 is severe.
- **Beck Depression Inventory-II (BDI-II):** The BDI-II is a widely used self-report questionnaire that measures the severity of depressive symptoms. It consists of 21 items that assess cognitive, affective, and physical symptoms of depression. Total score of 0–13 is considered minimal range, 14–19 is mild, 20–28 is moderate, and 29–63 is severe.

The procedure of Cognitive-Behavioral Therapy (CBT) follows a structured and evidence-based approach. While the specific procedures may vary depending on the individual therapist and the treatment protocol being used, here is a general outline of the CBT procedure :

1. **Assessment**

- **Initial Evaluation:** The therapist conducts an initial evaluation to gather information about the participant's symptoms, history, and treatment goals. This may involve interviews, questionnaires, and assessments to assess the severity of anxiety and depression.

2. **Collaborative Goal Setting**

- **Therapist-Participant Collaboration:** The therapist works collaboratively with the participant to establish treatment goals based on their specific needs and aspirations. The goals are usually specific, measurable, achievable, relevant, and time-bound (SMART).

3. **Psychoeducation**

- **Providing Information:** The therapist educates the participant about the nature of anxiety and depression, including the cognitive and behavioral factors that contribute to these conditions. This helps the participant gain a better understanding of their symptoms and the rationale for CBT interventions.

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4. **Cognitive Restructuring**
   - **Identifying Negative Thoughts:** The participant learns to identify their negative or distorted thoughts that contribute to anxiety and depression. This may involve keeping a thought record or using other techniques to capture and examine their thoughts.
   - **Challenging and Restructuring Thoughts:** The therapist helps the participant challenge their negative thoughts by evaluating evidence, identifying cognitive distortions, and generating more balanced and realistic alternative thoughts.
   - **Homework Assignments:** The participant is often assigned homework between sessions to practice cognitive restructuring techniques and apply them to real-life situations.
5. **Behavioral Activation**
   - **Activity Monitoring:** The participant learns to monitor their daily activities and identify patterns of avoidance or withdrawal.
   - **Activity Scheduling:** The therapist assists the participant in developing a structured schedule of pleasant and rewarding activities that align with their values and goals.
   - **Gradual Exposure:** If applicable, the therapist may use exposure techniques to gradually expose the participant to feared situations or stimuli in a safe and controlled manner.
6. **Skill-Building**
   - **Relaxation Techniques:** The participant learns relaxation techniques, such as deep breathing exercises or progressive muscle relaxation, to manage physical symptoms of anxiety and promote relaxation.
   - **Problem-Solving Skills:** The therapist teaches the participant problem-solving skills to help them address challenges and obstacles effectively.
   - **Communication Skills:** The participant may learn effective communication skills to improve their interpersonal relationships and reduce interpersonal conflicts.
7. **Review and Evaluation**
   - **Ongoing Assessment:** The therapist regularly assesses the participant's progress and adjusts the treatment plan as needed.
   - **Outcome Measures:** The participant completes assessments and questionnaires periodically to evaluate changes in anxiety and depression symptoms.
   - **Termination and Relapse Prevention:** Towards the end of treatment, the therapist and participant discuss relapse prevention strategies and ways to maintain progress after therapy.

It's important to note that CBT is tailored to the individual needs of each participant, and the specific procedures and techniques used may vary based on their presenting concerns. The therapist provides guidance, support, and feedback throughout the treatment process, fostering a collaborative and supportive therapeutic relationship.

PROCEDURE

At the first step, the participants (n=30) were randomly assigned to control group (n=15) & intervention group (n=15). Than BAI & BDI-II were administered on both the groups as Pre-test. Once the scores were received as per the testing scales the intervention group was given CBT sessions twice a week (duration - 45 mins) for total 4 weeks. The control group didn't received any intervention.

After the completion of CBT sessions, BAI & BDI 11 were again administered on both the groups as a post-test this time. Later, after the completion of 1 month both the groups were again administered on the same tests as a follow up measurement & to examine the sustainability of the changes in thoughts & behaviour. The data obtained were than analysed statistically.

Also to adhere to the ethical principles the control group was also given treatment after the completion of this research study.

DATA INTERPRETATION

Participants	Initial BAI	Initial BDI-II	Post-CBT BAI	Post-CBT BDI-II
30	Moderate-Severe	Moderate-Severe	Mild-Normal	Mild-Normal

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RESULTS & DISCUSSION

After conducting the analysis on the impact of Cognitive-Behavioral Therapy (CBT) on anxiety and depression, the results indicate a positive effect of CBT in reducing symptoms of anxiety and depression. Here are some key findings and interpretations of the results:

1. **Significant Reduction in Anxiety Scores**
   - Participants who underwent CBT experienced a significant decrease in anxiety scores compared to their baseline levels.
   - The mean anxiety scores significantly decreased from pre-treatment to post-treatment assessments.
   - This suggests that CBT interventions specifically targeting anxiety symptoms were effective in reducing anxiety levels.
2. **Significant Reduction in Depression Scores**
   - Participants who received CBT showed a significant reduction in depression scores compared to their baseline levels.
   - The mean depression scores significantly decreased from pre-treatment to post-treatment assessments.
   - These findings suggest that CBT interventions addressing depressive symptoms were effective in alleviating depressive symptoms.
3. **Effect Sizes**
   - Effect sizes can be calculated to assess the magnitude of change observed in anxiety and depression scores.
   - The effect sizes for anxiety and depression may indicate a moderate to large effect of CBT on reducing symptoms.
   - This suggests that the changes observed in anxiety and depression scores were clinically meaningful.
4. **Long-Term Effects**
   - It is also important to examine the sustainability of the effects over time.
   - Follow-up assessments conducted several months after the completion of CBT may provide insights into the long-term impact of the treatment on anxiety and depression.
5. **Implications**
   - The results highlight the effectiveness of CBT as an intervention for addressing both anxiety and depression symptoms.
   - CBT techniques, such as cognitive restructuring and behavioral activation, appear to have a positive impact on individuals experiencing anxiety and depression.
   - The findings underscore the importance of CBT in mental health treatment and provide support for its integration into clinical practice.

CONCLUSION

In conclusion, the research findings demonstrate the positive impact of Cognitive-Behavioral Therapy (CBT) on anxiety and depression. The results indicate that CBT interventions effectively reduce symptoms of anxiety and depression, leading to significant improvements in overall mental well-being. The findings align with the theoretical framework and underlying principles of CBT, which target both the cognitive and behavioral aspects of anxiety and depression.

The study's results highlight the efficacy of CBT in addressing anxiety and depression, with participants experiencing a significant reduction in anxiety and depression scores following CBT treatment. The effect sizes indicate a moderate to large effect, suggesting that the changes observed are clinically meaningful. These findings have important implications for mental health treatment, as CBT techniques, such as cognitive restructuring and behavioral activation, can be effective in helping individuals overcome anxiety and depression.

Furthermore, the positive impact of CBT on anxiety and depression emphasizes the need to incorporate CBT into clinical practice and mental health interventions. The findings support the use of CBT as an evidence-based approach for treating anxiety and depression, providing clinicians and therapists with a valuable tool to help their clients achieve better mental health outcomes.

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It is important to note that further research is needed to explore the long-term effects of CBT and to evaluate its effectiveness across diverse populations. Additionally, considering the limitations of the study, such as sample size and potential confounding variables, is essential for a comprehensive understanding of the research findings.

Overall, the research demonstrates the importance and effectiveness of CBT in overcoming anxiety and depression, offering hope and guidance for individuals seeking relief from these mental health challenges.

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ASSESSING THE THERAPEUTIC POTENTIAL OF CHANDRA BHEDI PRANAYAMA ON ELEVATING ADOLOSENT HAPPINESS LEVEL

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ABSTRACT
Adolescence is a crucial stage of human development characterized by various physical, emotional, and psychological changes. Promoting happiness and well-being among adolescents is essential for their overall growth and development. Pranayama, a fundamental component of yoga, has gained recognition for its potential therapeutic benefits on mental and physical health. The present study was conducted with the aim to assess the therapeutic potential of Chandra Bhedi Pranayama, a specific breathing technique, in elevating happiness level among adolescents. For the purpose of the study, pre-post test design was constructed in which 54 participants (N=54) were selected from Amity University, Noida Uttar Pradesh. Their age group was ranging from 18-25, both male and female. Participants were divided into control (N=27) and experimental group (N=27). These subjects were given Oxford Happiness Questionnaire to assess their Level of Happiness as their pre-test. Yogic Intervention was administered by the experimental group for 30 mins a day for 16 weeks. Control group received no intervention. Post test was conducted to test the hypothesis. Descriptive statistics was performed on the pre and post raw scores. Results revealed that the Happiness in the adolescents in the Experimental Group increased abruptly from 18.05 to 20.77 after Yoga Intervention and no significant changes were found in the Control Group at Pre-Test (18.97) and Post-Test Level (19.07). In nutshell, experimental group subjects were found to be happier than the subjects in control group and therefore Yoga Intervention proved effective in promoting Happiness

Keywords: Chandra Bhedi Pranayama, Happiness, Adolescence, Therapeutic Potential, Yoga

INTRODUCTION
Happiness is paramount goal of one's life that leads to prosperity and allows enjoying a contended life. Literal meaning of happiness is "good fortune" or "prosperity" that focuses on individual's personality adaptation to his/her environment (Hornung, 2006). According to Seligman, (2004), "state of happiness leads to focus on constructive emotions (contentment, happiness, hope), character traits (love, courage, compassion, curiosity, integrity, moderation, to mention a few) and institutions (justice, responsibility, parenting)". During the past two decades, there has been a shift from a deficit-centred pedagogy to a more positive perspective, with an emphasis on students' individual strengths and well-being (Seligman, Ernst, Gillham, Reivich & Linkins, 2009; Sin & Lyubomirsky, 2009; Stiglbauer, Gnambs, Gamsjäger & Batinic, 2013; Vuorinen, Erikivi & Uusitalo-Malmivaara, 2019). Happy children learn best is a statement uttered by UNICEF (2019), OECD (2018) and several international educational boards (Finnish National Agency for Education, 2014; Salzburg Global Seminar, 2019). The statement is backed by a plenitude of studies (Csikszentmihalyi, 2014; Heffner & Antaramian, 2016; Nickerson, Diener & Schwarz, 2011; Oishi, Diener & Lucas, 2009). Happiness brings willingness and energy to pursue and achieve goals, to engage in learning and to live a fulfilling life (Seligman, 2011).

It is important that the adolescence students imbibe healthy lifestyles, which means good physical and mental conditions, a positive image of oneself, self-efficacy and self-determination. Adolescents with good mental and emotional health develop resilience to adapt better to difficult situations which boost their wellbeing. The resources, vulnerabilities, social context, peer groups and family condition shape the life style of adolescents (Lima & Morais, 2016).

Chandra Bhedi Pranyama is a breathing technique in yoga that involves channeling the breath through the left nostril, which is believed to have a cooling and calming effect on the body and mind. In Sanskrit, "Chandra" means moon, and "Bhedi" means piercing or passing through. This pranayama is named after the moon because it is associated with the qualities of the moon, such as coolness, receptivity, and relaxation.

Pranayama pursuits lead to the manifestation of happiness in people actively practicing it (Yadav & Srisrimal, 2020). Several evidences have been gathered in the last more than two decades in the support of application of yoga for improving individual mental health and well-being (Gotink, Busschbach, Benson, Fricchione, & Hunink, 2015). In a survey study, 84.5 percent participants stated that yoga improved their energy and 86.5 percent agreed for happiness (Ross, Bevan & Thomas, 2013). A study conducted on second-and third-grade students using a short program of yoga found measurable changes in levels of stress among them (Butzer 2015).

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Cortisol levels in our saliva are measurable and tend to enhance during stress. The study administered a 10-week classroom-based intervention. Students in the second grade, showed a decrease in cortisol level from before and after the intervention, while both second-and third-grade students showed significant decreases in cortisol level from before to after performance of a cognitive task. Teachers also noticed certain improvements in student behavior (Butzer, Day, Potts, Ryan, Coulombe, Davies & Khalsa, 2015).

The present study was undertaken with the aim of evaluation and assessment of the therapeutic potential of Chandra Bhedi Pranyama (a type of yogic breathing) on elevating the Happiness level among the adolescents of Amity University, Noida, UP. Yogic Intervention has been successfully used as a mean to uplift the levels of Happiness among adolescents.

METHODOLOGY

The study was conducted on the students of Amity University, Noida, UP. The objective of the present study was to identify the Level of Happiness among the adolescents of university level on the one hand and on the other to assess the therapeutic effect of Chandra Bhedi Pranayama on happiness level of the adolescents.

For the purpose of the study, Students with age group 18 to 25 years were selected. The study was conducted on 54 Subjects who were voluntarily wanted to be the part of the study. A proper informed consent was given to the subjects prior to the commencement of the protocol. Then these Subjects were given Oxford Happiness Questionnaire (Hills & Argyle (2002) to assess their Level of Happiness as Pre- test. There were 27 Subjects in Experimental Group, and 27 in the Control Group. Yoga Intervention whose main part was Chandra Bhedi Pranayama was given to the experimental group. The intervention was given under the guidance of a qualified yoga teacher to ensure proper practice and avoid any potential risks or contraindications. The Subjects were given Yoga Intervention for 16 weeks during the college timings in the morning time zone. The duration of Yoga session was 30 minutes per day. The Subjects were informed about the procedure and precautions that they have to keep in mind while performing Yoga. These subjects again were given Oxford Happiness Questionnaire to assess their Level of Happiness as their Post-test. The score was calculated, tabulated and analyzed as follows:-

RESULT

The study has been conducted on 54 Subjects that comprises of 27 Subjects in the Experimental Group and 27 in the Control Group. These Subjects were given Oxford Happiness Scale. The obtained score of Experimental and Control Group at Pre-Test and Post-Test Level is as follows:-

Table 1.1: Average Score of students of Amity University on the Measure of Happiness

EXPERIMENTAL GROUP							
PRE-TEST				**POST-TEST**			
Level of Happiness	Gender Wise Score		Average	Level of Happiness	Gender Wise Score		Average
	BOYS	GIRLS			BOYS	GIRLS	
Average	18.37	17.73	18.05	Average	21.11	20.42	20.77
CONTROL GROUP							
PRE-TEST				**POST-TEST**			
Level of Happiness	Gender Wise Score		Average	Level of Happiness	Gender Wise Score		Average
	BOYS	GIRLS			BOYS	GIRLS	
Average	18.69	19.25	18.97	Average	18.83	19.32	19.07

The average score of subjects in the Experimental Group was 18.05 that increased to 20.77 after Yoga Intervention. No significant difference was found in the Subjects of Control Group, as the Score of the Subjects was 18.97 at Pre-Test Level and 19.07 at Post-Test Level. Here it is quite clear that the Yoga Intervention has proved effective in promoting the Happiness among the adolescents. But slight difference was found between Boys and Girls in their Happiness Score in the Experimental and the Control Group. In order to know the impact of Yoga Intervention 2 x 2 x 2 ANOVA Repeated Measure will be recommended in the similar future studies.

CONCLUSION

The present study was conducted on a sample of n = 54 of university students with the age group of 17 to 25 years. There were 27 Subjects in the Experimental Group and 27 in the Control Group. Subjects were given Oxford Happiness Questionnaire to perform so as to know its degree. The Experimental Group was given Yoga Intervention every day 30 minutes for 16 weeks. The Control Group received no Yoga Intervention. On the raw scores descriptive statistics was performed. Results revealed that the Happiness in the Students in Experimental Group increased from 18.05 to 20.77 after Yoga Intervention and no difference was found in Control Group at

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Pre Test (18.97) and Post Test-Level (19.07). To conclude, the study revealed that the Subjects who practiced Chandra Bhedi Pranyama are happier in their Life as compared to the Subjects in the control group. To improve the level of Happiness, the Yoga has further proved very effective.

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ASSESSMENT OF PRECIPITATION AND POTENTIAL EVAPOTRANSPIRATION TEMPORAL VARIABILITY AND THEIR RELATIONSHIP IN JHARKHAND, INDIA

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ABSTRACT
The assessment of drought is of utmost importance in agriculture due to its significant influence on crop growth and vegetation. The study takes place in the state of Jharkhand and has its climate and vegetation due to its location and hypsometric zone, to determine the relationship between precipitation and potential evapotranspiration throughout time. In order to accomplish goals, this study collected and analysed monthly precipitation and air temperature data over a period (2001-2021). Sen's slope approach determined the magnitude of upward or downward trends in seasonal and annual precipitation, potential evapotranspiration (PET), and their ratio (P/PET) which is term as aridity index (AI). According to the findings of th study, the examined climatic variables exhibit substantial seasonal change. Increases in precipitation over time in Jharkhand were statistically significant in most cases. In contrast, negative PET trends were identified throughout the autumn and monsoon seasons. Several variables contributed to the wide range of drought severity. The drought trend analysis found decreasing trends for annual, winter, spring, and summer values and a little increasing trend for autumn values. In addition, the AI for rain in Jharkhand varied to 0.14, −5.87, 2.39, −0.71, and 7.75 per year for annual, autumn, summer, monsoon and winter precipitation, respectively. These results can be used as a management tool for agriculture and vegetation, making them more resilient in the face of climate change.

Keywords: Precipitation; Evapotranspiration; Drought; Mann–Kendall; Trend Analysis

1 . INTRODUCTION
Researchers and scientists have been more worried about global warming in recent decades. The Asia - Pacific basin may warm more rapidly than the rest of the world (Diffenbaugh and Giorgi, 2012; Giorgi and Lionello, 2008). Warmer and drier conditions are expected in the Mediterranean, according to the IPCC's Fifth Assessment Report (IPCC, 2013). Droughts and aridity have become more widespread and severe due to changing precipitation and temperature patterns (Caloiero et al., 2018; Greve et al., 2018; Spinoni et al., 2015). Agricultural yield (Tigkas et al., 2019), desertification (Sidiropoulos et al., 2021), and vegetation growth (Fylias et al., 2017) are all influenced by climate.

Aridity and drought are distinct phenomena, as stated by the World Meteorological Organization (WMO, 1975). Dry spells often last for about 30 years. It lasts for a long time and has low moisture levels in the air. Conversely, drought is a weather phenomenon. Drought and aridity evaluations are crucial to climate research and ecological sustainability. Several other dryness indices have been proposed (Maliva et al., 2012; Myronidis et al., 2018). The ratio of precipitation to potential evapotranspiration is the most used measure. This ratio is also known as Aridity Index (AI). The indicators provide a single tally that summarises water availability. When estimating PET, the Penman formula is the most accurate (Penman, 1948).

As per the author knowledge, long-term time series from mountainous meteorological stations turn up just a few papers in Jharkhand, India, looking at the seasonal precipitation trend (P) and potential evapotranspiration (PET). Short-term weather data are also analysed in these investigations. Thus, the results cannot be applied to vegetative land at high elevations or to terrain with a lot of obstacles. This study analysed drought conditions in Jharkhand vegetative ecosystems using long-term meteorological data from highland meteorological stations. Drought severity was measured on an annual/seasonal basis using the AI. To calculate when the trend became significantly different from its previous state, we employed the Mann-Kendal and slope methods developed by Sen.

2. MATERIALS AND METHODS

2.1. Study Area
The study was conducted for the entire state of Jharkhand, which lies between $25^0$30’ N to 22_N latitude and 83^0E to 88^0E longitude covering an area of 79,714 km^2 where most of the state comes under the Chota Nagpur Plateau. The state's climate is quite variable, with the southwest having more rainfall and the northwest and west central regions being hot and dry. Jharkhand has three distinct seasons: summer, winter, and rainy. Summer lasts from March to June, with May being the hottest month, while winter lasts from November to

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February and is the most pleasant time. Most of the state's yearly rainfall occurs in July and August, while southwest monsoon precipitation occurs from mid-June to October. The annual precipitation varies from about 1000 mm in the west-central section of the state to over 1500 mm in the southwest. About half of Jharkhand is used for farming, while another third is for forest. The location map of the study area is shown in Figure 1.

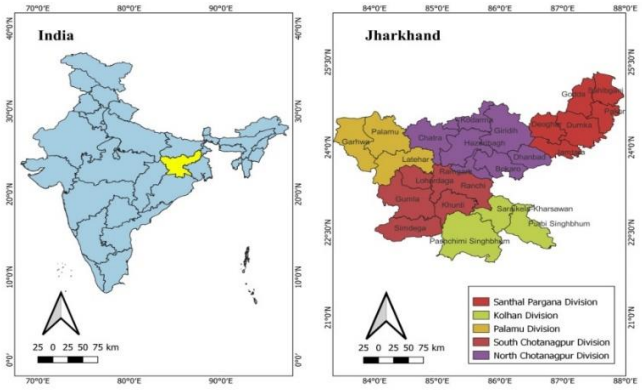

Figure 1: Map of Study area

2.2 Dataset

Details of the data source obtained from platforms and data resolution are:-

i. MODIS TERRA/AQUA sensor-based 8 day MOD11A2 terrestrial ecosystem potential evapotranspiration (PET) product, was used in the present study datasets having 500 m of spatial resolution.

ii. Climate Hazards group InfraRed Precipitation with Stations (CHIRPS) is a quasi-global (50°S – 50°N) which provides high resolution (0.05°) precipitation data.

2.3. Trend Analysis

The non-parametric Mann-Kendall (M-K) test was used to examine the statistical significance of the observed trends in dryness at the 95% confidence level, as well as to analyse the aridity trend in the research regions. Since it better fits non-normally distributed data with extreme and missing values, which is usually seen in environmental time series (Sneyers, 1990), it is the most used trend analysis test in climatological time series. Following the method given by Sneyers (1990), we performed the M-K test on yearly and seasonal data series to examine trends and identify the turning point. Therefore, for each x_i (i = 1 . . . , n) of the time series, the number n_i of lower elements x_j ($x_j < x_i$) preceding it ($j < i$) was calculated, and the test statistic t was given by:

$$t = \sum_i n_i \quad \text{.....(1)}$$

t is asymptotically normal and independent of the distribution function of the data if there is no trend (the null hypothesis).

$$u(t) = \frac{(t-\mathrm{T})}{\sqrt{var(t)}} \quad \text{.....(2)}$$

and has a standard normal distribution, with t and var(t) given by:

$$t = \frac{n(n-1)}{4} \quad \text{.....(3)}$$

$$var(t) = \frac{n(n-1)(2n+5)}{72} \quad \text{.....(4)}$$

Therefore, for large values of |u(t)|, the null hypothesis may be rejected with probability α_1 when calculated from a conventional normal distribution table:

$$\alpha_1 = P(|u| > |u(t)| \quad \text{.....(5)}$$

In addition, a sequential analysis of the series was performed using the Mann-Kendall test. All the terms in the series, from the first to the i^{th}, must be subjected to the test (and vice versa).

The M–K test, a helpful nonparametric temporal trend test, assumes data are independent. A positive or negative autocorrelation may overestimate or underestimate the trend's importance. Thus, all datasets must be autocorrelation-checked before using the M–K test. At 5% significance, the lag–1 autocorrelation coefficient (r_1) was determined. Trend magnitudes were determined using the Theil–Sen approach (Thiel, 1992; Sen, 1968). Sen's slope is the slope-based approach. It reduces outlier effects on slope (Hatzaki et al., 2007).

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4. RESULTS AND DISCUSSION

The precipitation and PET present great inter–annual and intra–annual variability in the selected forest ecosystems of the study areas. The lag–1 autocorrelation coefficient was computed for the examined variables and it was found that the r_1 value does not exceed the confidence interval bounds. Thus, the latter variables are considered serially independent, so the M–K test can be applied.

Excess water is accessible (P > PET) in most circumstances, according to the findings of annual and seasonal AI estimate, with the exception of summer and the yearly values in the study region. This often happens in mountainous regions due to the complexity of their terrain and the resulting variability in rainfall and temperature (Paparrizos et al., 2016; Tsiros et al., 2020). Table 1 displays the statistical findings for the average AI values for the reference period (2001-2021).

Table 1: Analysis of the AI for the selected forest ecosystems.

Study Area	Annual	Autumn	Summer	Monsoon	Winter
Jharkhand	1.86	0.51	0.84	1.46	0.37

Trend analysis of the annual and seasonal precipitations indicated positive trends in Jharkhand. However, these trends were statistically insignificant (at the 0.05 significance level) in annual, summer and winter. In Jharkhand, the trend magnitudes were 2.97, 2.65, 3.72, 2.57, and 2.28 mm per year for annual, autumn, summer, monsoon and winter precipitation. In contrast, the monsoon seasons PET trend shows positive trends in Jharkhand, whereas the rest all show a decreasing trend. The annual PET trend exhibits an insignificant trend. The trend magnitudes were -2.66, -5.20, -2.5, 4.41 and -0.06 mm per year for annual, autumn, summer, monsoon and winter precipitation in Jharkhand. The graphical representations of the M–K test for the precipitation and PET retrograde time series of the Jharkhand are shown in Figures 2 (A-B), respectively.

Figure 1 (A)

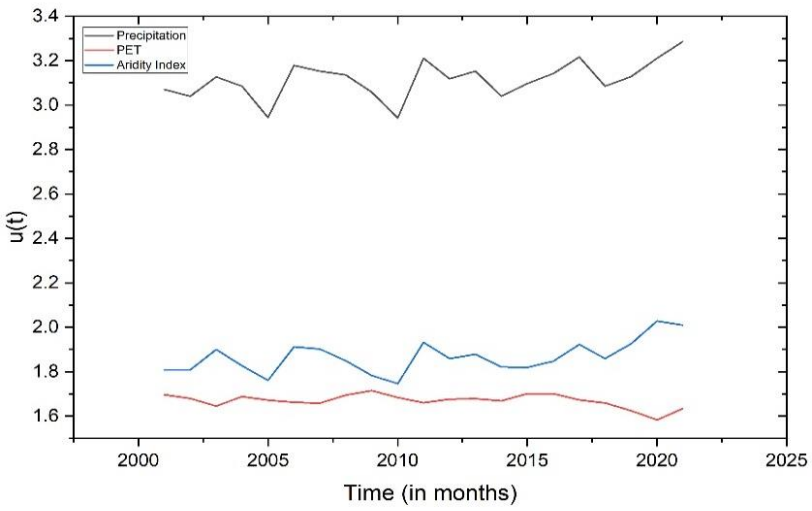

Figure 1 (B)

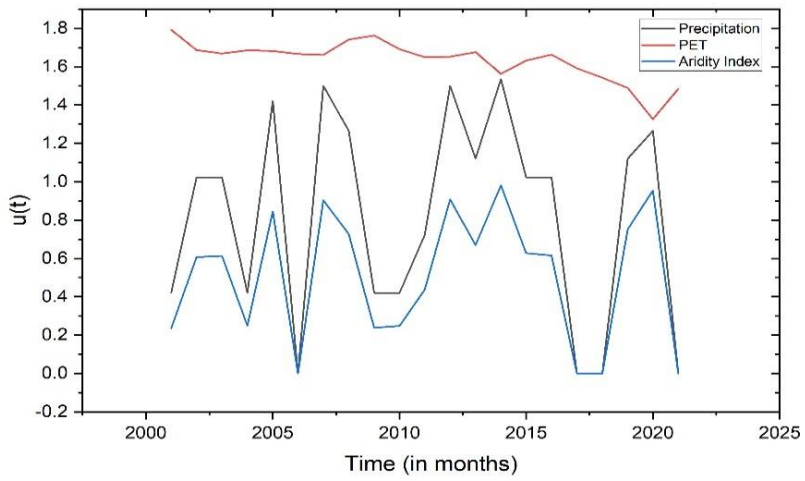

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Figure 1 (C)

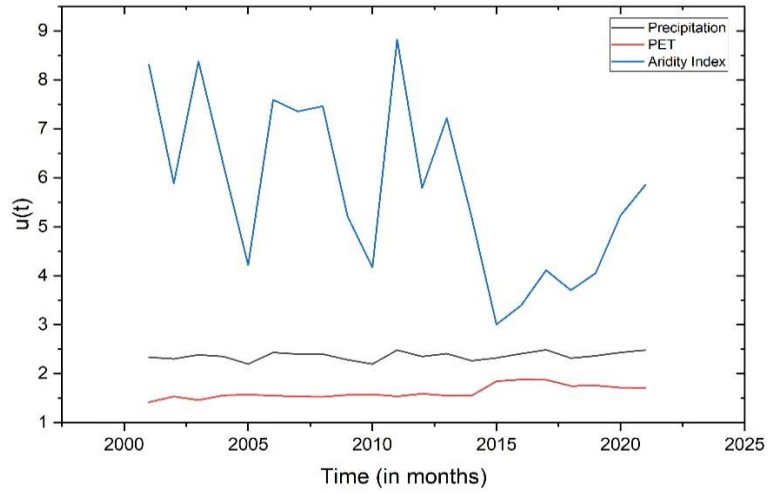

Figure 1 (D)

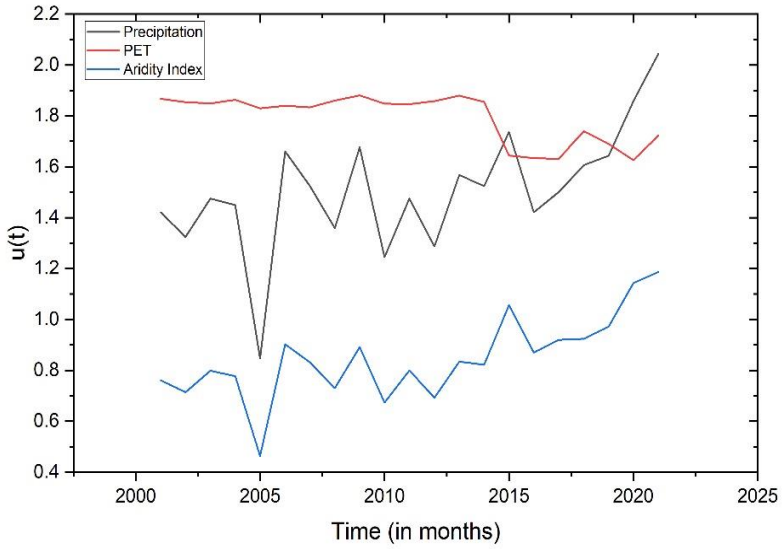

Figure 1 (E)

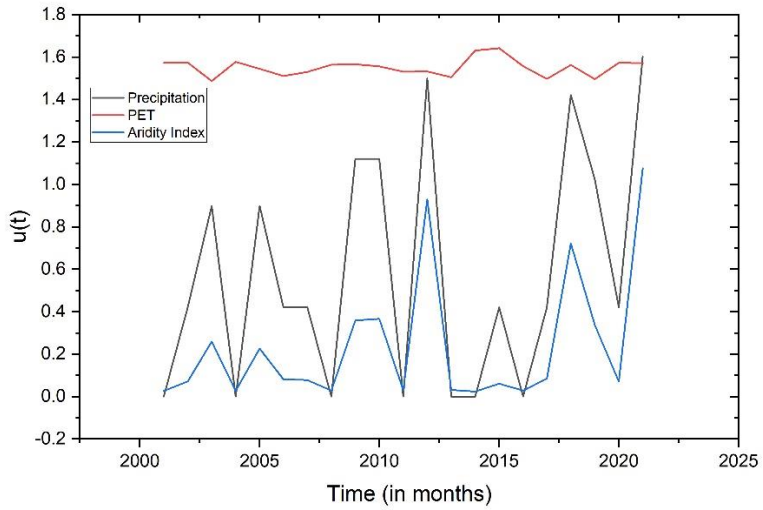

Figure 2. Graphical representation of the retrograde series $u_{\prime(t)}$ of the sequential version of the Mann–Kendall test for (**A**) annual, (**B**) autumn, (**C**) monsoon, (**D**) summer, and (**E**) winter precipitations, PET and Aridity index across in the Jharkhand, India.

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The size of trends was also calculated using Sen's slope estimate results. Annual, autumn, summer, monsoon, and winter precipitation in Jharkhand had AIs of 0.14, -5.87, 2.39, -0.71, and 7.75, respectively. Increases in AI values of more than 5% each decade compared to the comparable yearly average AI value throughout all seasons are statistically significant. Furthermore, there was no seasonal change in the climatic categorisation. Table 2 displays the specific outcomes of the applied strategy, including the percentage of effect on the mean annual and seasonal AI.

Table 2: Sen Slope values and Kendall Tau (trend magnitude) per year for the AI.

Components	Time scale	Sen's Slope	Kendall Tau	p- Value	Test Statistic	Trend
Precipitation	Annual	21.69	2.97	0.0410	Insignificant	Increasing
	Autumn	0.45	2.65	0.0450	Significant	Increasing
	Summer	1.56	3.72	0.1970	Insignificant	Increasing
	Monsoon	3.63	2.57	0.0045	Significant	Increasing
	Winter	0.29	2.28	0.1789	Insignificant	Increasing
PET	Annual	-0.32	-2.66	0.0678	Insignificant	Decreasing
	Autumn	-1.99	-5.20	0.0040	Significant	Decreasing
	Summer	-3.19	-2.75	0.0080	Significant	Decreasing
	Monsoon	1.67	4.41	0.0003	Significant	Increasing
	Winter	-0.20	-0.06	0.0345	Significant	Decreasing
AI	Annual	4.34	0.14	0.0138	Significant	Increasing
	Autumn	-0.09	-5.87	0.0170	Significant	Increasing
	Summer	0.31	2.39	0.0530	Insignificant	Increasing
	Monsoon	-0.73	-0.71	0.0018	Significant	Increasing
	Winter	0.06	7.75	0.0784	Insignificant	Increasing

Aridity and drought assessment is difficult and may have far-reaching consequences for forest ecosystems. Additionally, drought conditions were assessed, and a method for water resource management was offered (Paparrizos et al., 2016), both of which have recently been connected to the accessibility of potable water (Myronidis et al., 2021).

5. CONCLUSION

This study examined the relationship between precipitation and PET in Jharkhand, India. The M-K and Sen's slope statistical tests were used to analyse these values' seasonal and yearly variability and trend. PET may serve as a surrogate for drought when combined with precipitation because of its central role in the hydrological cycle. The study region has a generally humid climate but has dry summers. According to the trend analysis, the observed increases in AI are statistically insignificant summer and winter seasons. Since PET is the most crucial part of the hydrologic cycle, evaluating alternative evapotranspiration techniques in forest settings might be a focus of future studies. Particularly intriguing is the measurement of the AI and the exploration of variability by separating the time series in the study area.

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RHEUMATOID ARTHRITIS: PATHOGENESIS AND ITS BIOMARKERS

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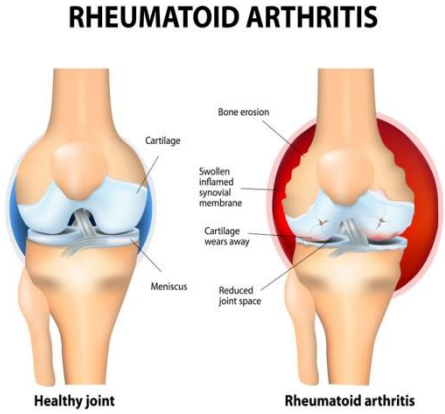
ABSTRACT
Rheumatoid arthritis is a systemic autoimmune malignancy that influences the lining of synovial joints and is related to dynamic inability, untimely passing. The major parts of the body that are affected by rheumatoid joint pain comprise aggravation within the synovial joints of the knees and fingers. The other characteristic highlight of RA is the nearness of synovial hyperplasia that is related to devastation of both bone and cartilage. The side effects of rheumatoid joint pain incorporate: torment, swelling, solidness and tenderness in more than one joint conjointly weariness (extraordinary tiredness), shortcoming and fever. A much better understanding of neurotic instruments of RA in people is required to create medicines that will successfully treat the patients. Understanding the pathogenetic part in RA seems to advance the revelation of potential helpful targets and approaches. Later pharmacologic treatments (counting routine, organic, and novel potential little particle disease-modifying anti-rheumatic drugs and HDAC inhibitors) have been created for the treatment of RA and a noteworthy advance toward accomplishing malady abatement without joint distortion has been observed.

Keywords: Rheumatoid arthritis (RA), DMARD, HDAC, TNF-α, Matric metalloproteinase.

Abbreviations: TNF: Tumor Necrosis Factor; IL: Interleukin; NSAIDs: Nonsteroidal Anti-inflammatory Drugs; DMARDs: Disease-modifying anti-rheumatic drugs; MMP: Matrix Metalloproteinase, HDAC: Histone deacetylase, SIRT 1: Sirtuin

INTRODUCTION:
Rheumatoid arthritis (RA) may be a systemic immune system infection caused in numerous cases by the interaction between qualities and natural components, including tobacco, that includes synovial joints. Joint aggravation over time leads to the annihilation of the joint with misfortune of cartilage and bone disintegration. The pathology of rheumatoid joint pain is characterized by the penetration of a few provocative cells into both the pannus and the joint liquid and by the ensuing tissue annihilation. The pathogenesis of rheumatoid joint pain (RA) includes a combination of hereditary, natural, and immunological variables. A few key components have been recognized within the advancement and movement of the infection: Cytokines are the particles discharged by safe cells and encourage the development of cells toward the location of aggravation. Thus, cytokines play an imperative part in each step of the pathophysiology of rheumatoid joint pain. Diverse sorts of cytokines included are: chemokines, interferons, interleukins, tumor corruption figure (TNF), and colony-stimulating figure (CSF). In RA, interleukin (IL)-1 and tumor rot calculation (TNF) are the key pro-inflammatory cytokines. There are too many inquiries about articles that demonstrated that certain pro-inflammatory cytokines such as IL-1β, IL-6, and TNF-α are included within the handle of pathological torment.



Pathogenesis
Rheumatoid arthritis starts within the synovium, the layer that encompasses a joint and makes a defensive sac that is filled with greasing fluid called the synovial liquid. In expansion, this liquid supplies supplements and oxygen to cartilage. Cartilage is composed essentially of collagen, the basic protein within the body, which shapes work to grant bolster and adaptability to joints. In RA, an anomalous safe framework reaction produces destructive molecules that cause persistent aggravation of the synovium. Collagen is continuously annihilated, narrowing the joint space and eventually harming the bone. On the off chance that the illness creates a frame

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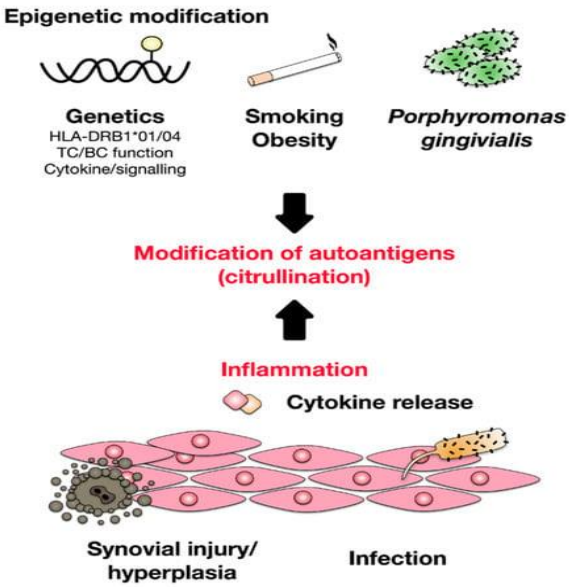
called progressive rheumatoid joint pain, at that point annihilation of the cartilage quickens. Liquid and safe framework cells gather within the synovium to deliver a pannus, a development composed of thickened synovial tissue. The pannus produces more proteins that annihilate adjacent cartilage, exasperating the range and drawing in more provocative white cells, subsequently propagating the method. This incendiary handle not as it was influence cartilage and bones but can moreover hurt organs in other parts of the body. The synovial lining layer of influenced joints is transformed into a profoundly proliferative so-called pannus-like tissue comprising synovial fibroblasts (SFs), synovial macrophages, and different invading provocative cells. This hypertrophic and edematous tissue dynamically attacks adjoining cartilage and bone. Hence, joint pulverization is intervened by matrix-degrading proteins discharged uncommonly by enacted synovial liquids.

Cause

The specific reason is unknown. Condition can be caused by a combination of factors, including an abnormal autoimmune response, genetic predisposition, biological triggers such as infection, or hormonal changes. T and B cells are two important components of the immune system and are involved in the inflammation associated with RA. If the T cell recognizes the antigen as "not itself", it produces chemicals (cytokines) that cause the B cells to divide and release more immune proteins (antibodies). These antibodies spread into the blood, recognize foreign bodies, and cause inflammation to remove the invasion from the body. Genetic factors may play a role in RA. The main genetic marker associated with RA is human leukocyte antigen (HLA). These genes do not cause rheumatoid arthritis but can worsen the disease. When an infection is caused by another primary infection, it can trigger the immune system to prolong RA.



Symptoms

Symptoms may include fatigue, weakness, loss of appetite, low-grade fever, muscle and joint pain, and stiffness. Muscle and joint stiffness is most noticeable in the morning and after inactivity. Arthritis occurs during exacerbations. In addition, during attacks, the joints often become red, swollen, sore and tender. Early symptoms of rheumatoid arthritis can be pain and prolonged joint pain, especially in the morning. Hand symptoms include difficulty doing simple activities of daily living. The small joints of the feet are also often affected and can cause pain when walking, especially after getting out of bed in the morning. Inflammation damages tissues of the body, including cartilage and bone. This causes cartilage loss and wear and weakening of bone and muscle, causing joint deformities, damage, and failure.

Targets in Rheumatoid Arthritis

Tumor necrosis factor (TNF): TNF is a cytokine (cytokine molecule) that plays an important role in the development of inflammation. TNF inhibitors or antiTNF drugs are medicines that cause TNF, such as adalimumab, etanercept, and infliximab. Interleukin 6 (IL-6): Another proinflammatory cytokine that is increased in rheumatoid arthritis. Inflammation and damage can be reduced by medicines that inhibit the activity of IL-6, such as tocilizumab JNK inhibitors are being targeted by an enzyme called JAK, which plays a role in the expression of many cytokines related to diseases that include IL6 and interferons. These types of JAK inhibitors for RA are as follows: tofacitinib, baricitinib, and upadacitinib. B cells: These are types of immunological system that, produce antibodies. B cells are involved in the production of tissue autoantibodies

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because of rheumatoid arthritis. Ruximab is an antibody against CD20 monoclonal antibodies that remove B cells and is used for treating rheumatoid arthritis. T cells: Another type of immunological system involved in rheumatoid arthritis is T cells. By inhibiting the activation of T cells, abatacept is a disease-modifying biological that decreases inflammation and damage to joints. Tumor necrosis factor receptor-associated factor 6 (TRAF6): TRAF6 is a protein involved in inflammation and injury-associated activation. A new area of research is aimed at targeting TRAF6 signals for developing RA. Another recent target for RA is histone modification. Histones can be modified in many ways, such as histone acetylation. For histone acetylation, most studies mainly focus on histone acetyltransferase (HAT) and histone deacetylases (HDAC). There are four types of HDAC, including class I (HDAC1-HDAC8), class II (HDAC4-7, HDAC9-10), class III (SIRT1-7), and class IV (HDAC11). It has been reported that HDAC activity involved in RA synovial is significantly increased compared with normal controls and is in direct proportion to TNF-α mRNA levels.

Biomarkers in RA

1. Rheumatoid Factor (RF): RF is an autoantibody, specifically an immunoglobulin M (IgM) antibody, that targets the Fc portion of IgG antibodies. Approximately 70 to 80 % of RA patients have it in their blood. RF can be used as a diagnostic marker of rheumatoid arthritis but is not specific to the condition and may appear in other autoimmune diseases.
2. C-Reactive Protein (CRP): CRP is a protein produced by the liver in response to inflammation. The systemic inflammation can be seen in increased levels of CRP. In the assessment of disease activity and response to treatment with RA, CRP is a commonly used biomarker.
3. Erythrocyte sedimentation rate (ESR) ESR is the rate at which erythrocytes settle in the tubes of blood. An increase in inflammation is accompanied by increased ESR values. For monitoring disease activity in RA, ESR is a completely different type of inflammatory marker and is commonly employed together with CRP.
4. Matrix metalloproteinases (MMPs) are that play a role in tissue regeneration and degradation and contribute to joint destruction in RA. In RA, increased levels of certain MMPs, such as MMP 1, MMP 3, and MMP 9, have been associated with disease severity and joint damage.
5. Proinflammatory cytokines: cytokines such as TNF alpha, tumor necrosis factor, IL-6), and interleukin 1 are key players in the pathogenesis of RA. These cytokines, which are important targets for treatment in rheumatoid arthritis patients, have been elevated in synovial fluid and blood. It may be possible to observe disease activity and response to treatment by monitoring their levels.
6. Anti-Cyclic Citrullinated Peptide Antibodies (Anti-CCP): Anti-CCP antibodies are autoantibodies that target proteins containing citrulline, a modified amino acid. They are highly specific for RA and can be detected in the blood of approximately 60-70% of RA patients. AntiCCP antibodies can be used in the diagnosis of early RA and in, anticipating disease progression.

CONCLUSION

Rheumatoid arthritis is a chronic autoimmune disease with characteristic features of the destruction of synovium, cartilage, and joints. Environmental and genetic factors play an important role in the development of rheumatoid arthritis with pathological events. Many developments have been made to treat the disease and to diagnose it. Surgeries are performed to remove the inflammation-causing agent (cytokines).

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BRAILLE AND REGIONAL LANGUAGES: A REVIEW

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ABSTRACT
A regional language is a language that is spoken in a particular area of a city, state, or country. Regional language is mainly spoken in smaller parts. It changes with the change in the religion, culture, and or economy of that region. Braille is the physical form of writing and reading used by vision-impaired or blind persons. It was developed in 1829 by Louis Braille. It is believed that barely two percent of the 70 million disabled persons have access to education in India. The present paper aims to discuss the research paper available related to Braille development in various Indian regional languages. In this paper, we only cover the introduction of each paper that we can find.

Keywords: Braille, Punjabi, Regional Language, Disabled person.

1. INTRODUCTION & MOTIVATION

According to World Health Organization (WHO), 285 million peoples are Visually Blind , 39 million people are completely blind, 246 million peoples with low vision [4] in the world. It is believed that only 2% of the 70 million disabled persons have access to education in India. Children with disabilities in India are often left out of mainstream schools. It is firmly believed that regional languages have an important role in one's life.

Visually handicapped students could be sensible if exposed to text and electronic documents in the regional languages in depth and in a reasonable time. Blind students not able to turn pages of the book or use a highlighter to make notes. Hence, it is presumed that natural language processing techniques can help blind students meet their academic objectives if supported using regional languages. The basic motivation is to enable access to education for visually impaired children using ICT, so they may not be excluded from social participation.

The languages spoken in India are mainly from two major families. Indo-Aryan Languages are spoken by around 78% of people, and Dravidian Languages are spoken by about 19% of people. According to the census of 2001 of India,In India there are 122 major languages, and around 6000 other languages are spoken. According to 2001 Census 30 languages are spoken by more than a million native speakers, and 122 languages are spoken by more than 10,000 people.

As per Articles 344(1) and 351 of the Indian Constitution, the 8th schedule includes the recognition of the following 22 languages: Assamese, Bengali, Hindi, Manipuri, Marathi, Nepali, Odia, Sanskrit, Punjabi, Santli, Tamil, Telugu, Sindhi, Urdu, Gujarati, Kannada, Bodo, Dogri, Kashmiri, Konkani, Maithili, Malayalam..

2. BACKGROUND

2.1 Regional Languages

A regional language is spoken in a particular area of a city, state or country. Regional language is mainly spoken in smaller parts. It changes with the change in the religion, culture and or economy of that region. Twenty two scheduled languages are lists by the The 8th schedule of the Constitution of India.[1]1991 census recognised 1576 rationalised mother tongues, these are further grouped into language categories. According to 2001 Census of India, 30 languages are spoken by more than a 1,000,000 native speakers & 122 languages are spoken by more than 10,000.

2.2 Importance of Regional Languages

The importance of regional languages has been reported[2]. Some of these are as:

a) It connects us to our roots- The language which connects us to our ancestry is our mother tongue. It has a certain softness that transports us back to the gentle recollections of our grandparents and giving us an emotional foundation to stand on.

b) Knowledge of our culture-Regional languages are a valuable source of understanding, community, and culture that helps us to know our culture.

c) Sense of belonging- By connecting us to our roots, knowledge of the mother tongue gives us a sense of belonging to our community.

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d) Respect for other languages & cultures- People who know more than one language are believed to also respect other languages and cultures.

e) Better linguistic skills- More than one or two language speakers perform better in literary activities. They have a wider vocabulary and take up new words more quickly.

f) Sharper children- It was successfully demonstrated scientifically that those children who have been exposed to more than two languages as infants have sharper brains and better linguistic skills.

g) A better society- Regional languages are a valuable source of understanding that helps us create a better society.

2.3 PunjabiLanguage

102 million persons worldwide speak the Punjabi language. This makes it the world's The tenth-most popular language (2010) [3]. It is the eleventh most widely spoken language in India and the most widly spoken language in Pakistan. The language is also significant in England, Canada, the U.A.E., the USA, Australia & Saudi Arabia. In India, Gurmukhi script is used to write Punjabi, whereas Shahmukhi is used in Pakistan. The Doabi, Majhi, Malwai, Multani, Powadhi & Pothohari are the major dialects of Punjabi. Punjabi is mainly spoken in Punjab, Chandigarh, Jammu, Delhi, Himachal Pradesh, Haryana, Rajasthan & Uttarakhand.

Gurmukhi script (ਗੁਰਮੁਖੀ)

The Gurmukhi alphabet developed from the Landa alphabet[4] and was standardised by the second Sikh guru Shri Guru Angad Dev Ji, in the 16th century. The name Gurmukhi means "from the mouth of the Guru" and comes from the Old Punjabi word *guramukhī*.

Features of Gurmukhi Script

It is written in horizontal lines from left to right.

Mainly used to write Punjabi Language.

There are total 35 + 6 symbols

No upper case or lower case concept of letters in Gurmukhi script.[5].

2.4 Braille

Braille is a physical form of writing & reading used by vision impaired or blind persons Louis Braille developed it in 1829. 62 patterns can be created with the help of 6 dots. Each character is written with the helpof 6 dots[6].

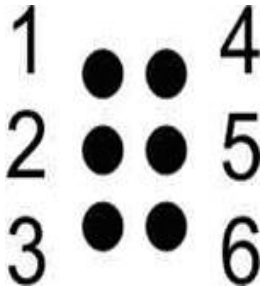

Fig.1. Braille cell

Bharati Braille/Bharatiya Braille/Indian Braille is a Braille script for writing the Indian languages. When India gained independence, almost 11 scripts for Braille were used. By 1951, Bharati Braille came into existence, and it became a standard for Indian languages. For the Punjabi language, Punjabi Braille is used to represent the Braille alphabet.[7]

Version 3.0 of the Unicode Standard introduced Braille in September 1999..

3. REVIEW METHOD

The review written in the paper based on the paper published in the following list of sources. That contains information on Braille in various regional languages

- Springer
- ScienceDirect
- IEEE explore
- Taylor and Francis

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• ACM Digital Library

• Wiley Online

3.1 Review Planning

The review includes the databases search, the research questions and the search strings used to search for relevant studies. E-databases were searched & the studies extracted were reported. The search strings needed titles with keywords like "Braille" and "Regional languages,". The lack of studies on Braille in regional languages is the primary motivation behind this review.

3.2 Sources of information

For thorough literary analysis, a broad viewpoint is necessary. A suitable group of papers and databases must be picked before the review begisn to increase the likelihood that the findings are highly relevant. The following Edatabases were searched to write the review.

• Springer (https://link.springer.com/)

• ScienceDirect (https://www.sciencedirect.com/)

• IEEE explore (https://ieeexplore.ieee.org/Xplore/home.jsp)

• Taylor and Francis (https://www.tandfonline.com/)

• ACM Digital Library (https://www.acm.org/publications/digital-library)

• Wiley Online (https://onlinelibrary.wiley.com/)

3.3 Search criteria

In mostly all the searches, the keyword "Braille" is included in the abstract. From the previously mentioned e-resources, we tried to extract as much relevant content as possible. Because our evaluation focuses on Braille's evolution in India's regional languages, several well-known research publications were left out. We only include papers written in English in our study because of the language and script constraints.To find relevant studies initial filteration is used on the abstract and titles of the studies.

3.4 Planning the Review

The short review process includes the introduction of all the papers that are related to Braille in regional languages. Searching the research papers by using relevant search strings from various journals and conference proceedings, identifying the related studies. The overall study selection procedure is shown in Fig1.

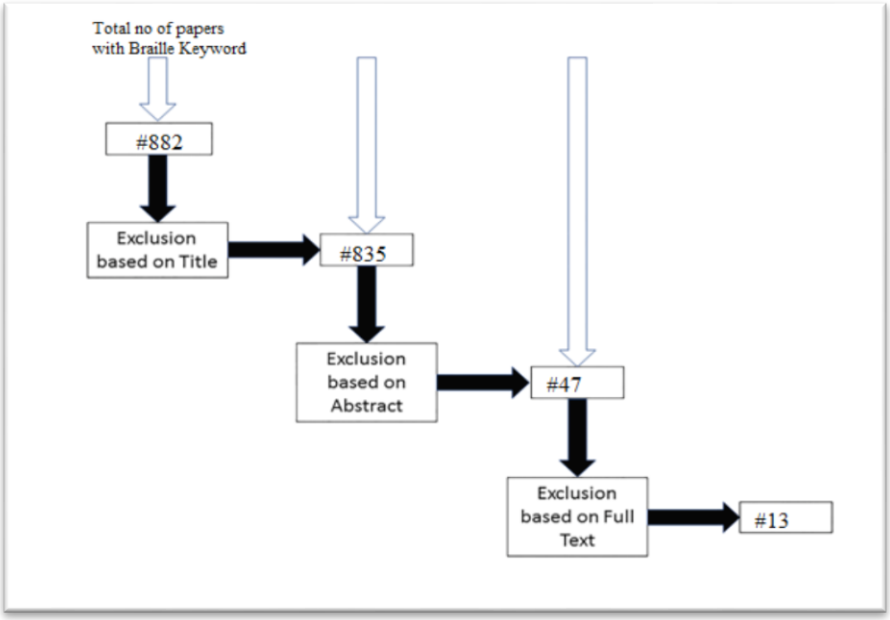

Fig. 2: Study Selection Procedure

In total, we get 882 papers from the above-written resources when we search with the Braille keyword, and we get 835 papers by rejecting 47 papers based on Titles. After reading abstract we selected 47 papers, and by reading the full paper out of 47, we selected 13 papers based on the regional language Braille system. Numerous well-known research articles were left out in the review due to limited scope.

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3.5 Exclusion Criteria

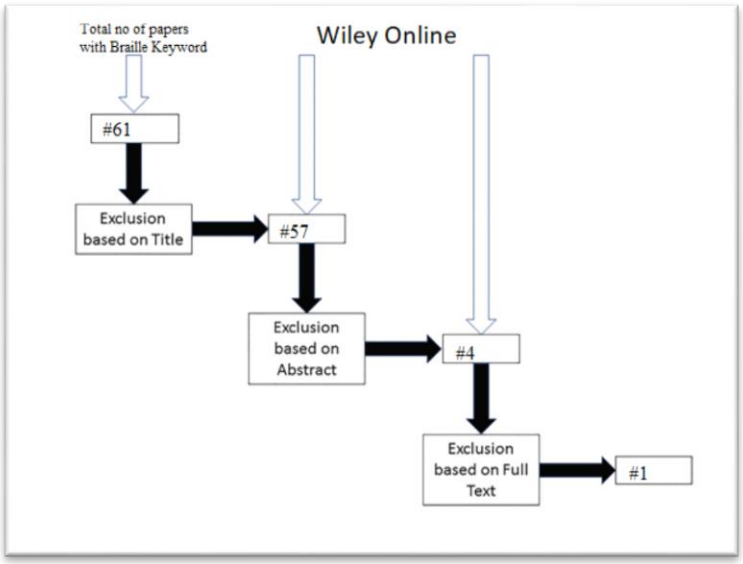
The Exclusion criteria were divided into the following three stages.

- **Stage I**: In the first stage, the search strings were used under the "abstract" part, but it gave many irrelevant results. So, according to the title, 835 articles were left behind for further analysis.
- **Stage II**: Then the "abstract" of the rest of the articles is studied, the related papers are included, and others were neglected from the record. After this stage, 47 articles were left behind.
- **Stage III**: During this stage, the full paper is studied. After this stage, 13 articles are left.

4. RESULT

The following figures show the result of each source after the exclusion of papers/articles based on title, Abstract and reading full papers.

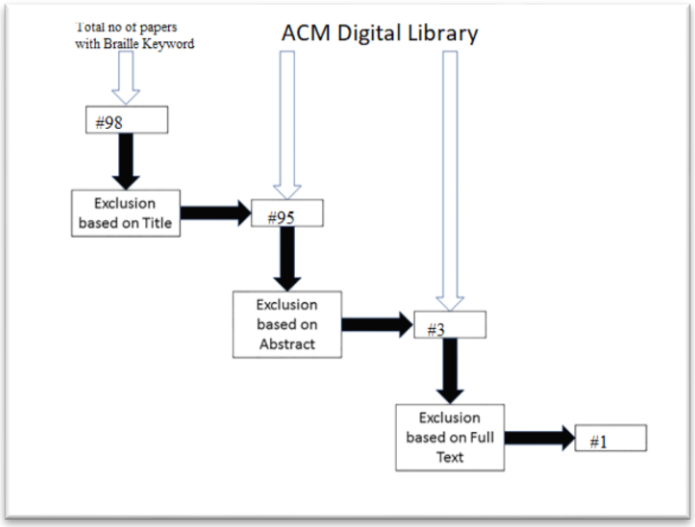
4.1 Source Wiley Online



After the Exclusion of papers/articles based on title, Abstract and reading full papers 1 article is left to discuss.

Paper Title: Towards a computerised Arabic Braille environment [10]: This paper was written by AbdulMalik S. Al-Salman and Hend S. Al-Khalifa. Authors explain the design & implementation of Arabic Braille environment presented in this work (ABE). The reader will also learn about the ABE's functionality and distinctive characteristics in this study. Arabic-speaking visually impaired persons all across the world can use the ABE Braille environment programme. According to the article, the ABE system has characteristics like translating Arabic text to Braille, Text to speech of Braille text, a Simplified interface for easy access by sighted Arabian people, Online help etc.

4.2 ACM Digital Library



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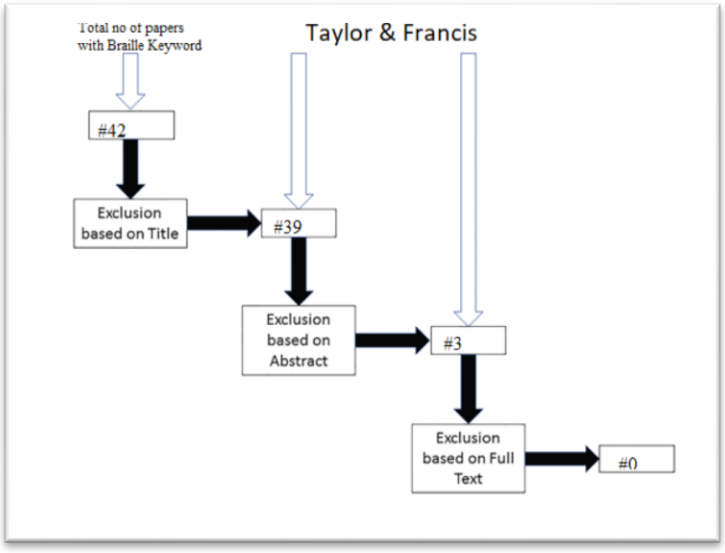
After the exclusion of papers/articles based on title, Abstract and reading full papers, 1 article left to discuss.

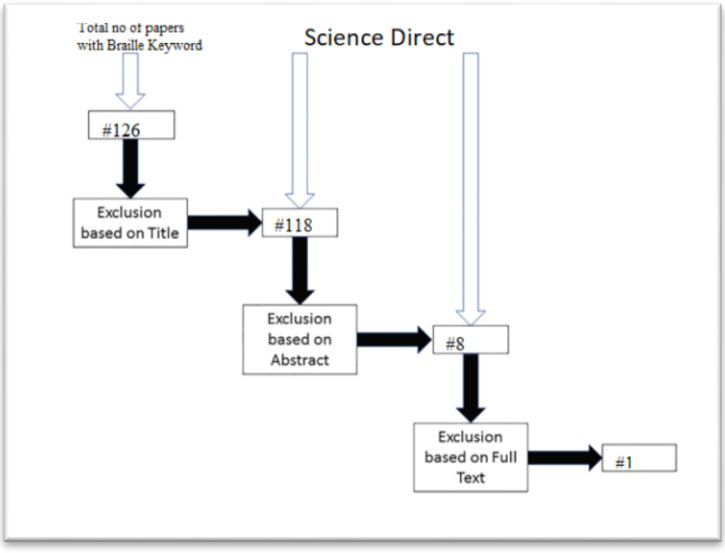
Paper Title: A Speech Enabled Indian Languages Text to Braille Transliteration System[11]: This paper was written by Tirthankar Dasgupta and Anuparn Basu. The authors explain the design and implementation of a speech enabled bidirectional automatic Indian text to the Braille system. According to the authors, the system can transliterate a text document both forward and backwards. This will assist in enhancing India's low literacy rate & give more information to the visually impaired. System is linked to Indian language TTS system that offers immediate audio feedback in response to a selected text. The authors also explore the Dzongkha script's various elements and how it differs from other Indian languages or English scripts.

4.3 Taylor & Francis



After the exclusion of papers/articles based on title, Abstract and reading full papers no article is left to discuss.

4.4 Science Direct



After the exclusion of papers/articles on the basis of title, Abstract and reading full papers, 1 article is left to discuss.

Paper Title: A Bi-directional Bi-Lingual Translation Braille-Text System[12]: This paper was written by AbdulMalik S. Al-Salman. This study describes a bi-lingual & bi-directional Arabic Braille translation system that do not require any costly equipment. The software is designed and implemented to translate native languages, such as English & Arabic, into the Braille System & vice-versa. Other capabilities of this software include the ability to input into the computer for visually challenged persons, a retranslation of a Braille code to another language, and more. The user interface in Arabic is simple. Being able to incorporate any natural language, voice feedback, bi-directional translation, and direct Braille writing etc.

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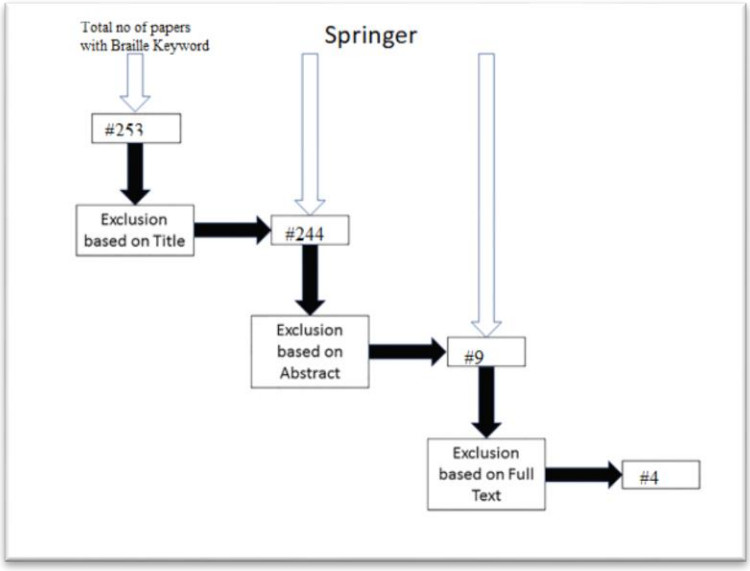
4.5 Springer



After the exclusion of papers/articles on the basis of title, Abstract and reading full papers 4 articles are left to discuss.

1 Paper Title: Braille Translation System Using Neural Machine Translation Technology I - Code Conversion. [13]: This paper was written by Shimomura, H., Nambo, Y., Kawabe, H., Seto, S. The authors built a basic translation system that translate Japanese into Braille. The software was written in C & Python using MeCab, and the morphological analysis engine translation was performed using NMT (neural machine translation) . Tensorflow was used as a neural network library. In this translation system, the authors also incorporated a translation component in the open-source package Tensor2Tensor.. As teacher data, they use 100,000 Japanese words.

The steps in this Braille translation system are as follows.
1. Morphemes are subdivided.

2. Pronunciation expression conversion

3. Braille code conversion

2 Paper Title: Chinese to Braille translation based on Braille word segmentation using statistical model [14]: This paper was written by Wang, Xiangdong & Yang, Yang & Zhang, Jinchao & Jiang, Wenbin & Liu, Hong & Qian, Yueliang., The authors suggest a Chinese-Braille translation system in this study. In this method, a statistical machine learning-based Braille word segmentation model is trained on the basis of Braille corpus. The stage of Chinese word segmentation is skipped in favour of performing Braille word segmentation directly using the statistical model. Instead of setting rules for syntactic and semantic information, this method employs statistical model to learn the rules invisibly and automatically. An algorithm for merging the findings of Chinese and Braille word segmentation is also proposed to increase performance. For Braille word segmentation, the suggested method achieves a precision of 92.81 percent, outperforming current approaches that use the segmentation-merging scheme.

3 Chapter Title: Speech, Text and Braille Conversion Technology [15]: This paper was written by Hoffmann, R., This chapter explains the various conversion technologies available for text, speech, and Braille. With the inclusion of steps to convert text into Braille for Braille users, these enable technologies allow speech into text, for thecreation of a letter, and text into voice, for reading a book. The writers also go through the fundamentals of Braille conversion technologies in this chapter.

4 Paper Title: Complete Forward and Reverse Text Transcription of Odia Braille and Hindi Braille [16]: This paper was written by Jha, V., Parvathi, K., The main focus of this work is on the translation of Odia electronic documents into Braille and vise-versa. The Braille code created is compatible with any printer's Braille embosser. For translation, a Unicode of Odia letters and a Braille code mapping table were created. The performance of this method is also tested in Hindi. According to the writers, the findings of the reverse translation of Braille to the text were likewise verified and determined to be satisfactory.

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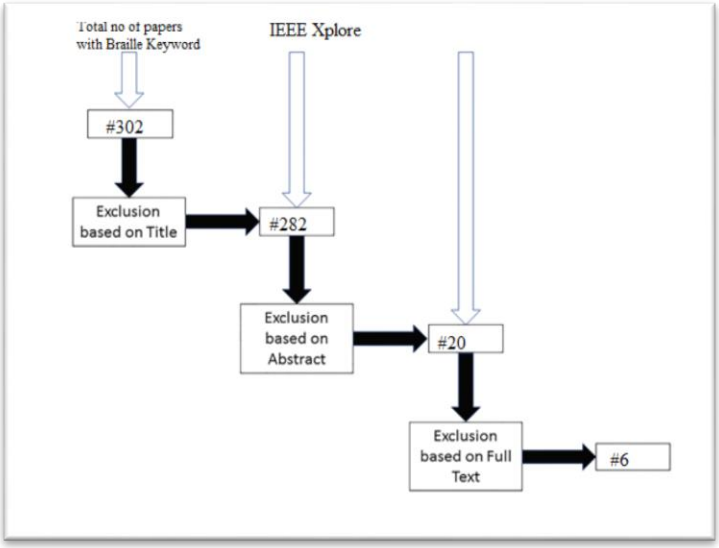
4.6 IEEE Xplore



After the exclusion of papers/articles on the basis of title, Abstract and reading full papers 6 articles are left to discuss.

1. Paper Title: Speech Synthesis of Chinese Braille with Limited Training Data [17]: This paper was written by J. Mao, J. Zhu, X. Wang, H. Liu and Y. Qian. According to the authors, their technology is the first real-time synthesis of Chinese Braille voice. The system includes prosody prediction, voice synthesis, and braille front-end processing. The Braille front-end processing includes a high-precision Chinese character prediction model and conversion from standard Braille to Pinyin. Writers of the paper present a prosody prediction model based on the RoBERTa pre-trained model to provide high-accuracy prosody prediction under limited corpus conditions.

2. Paper Title: Analysis of Bangla-2-Braille Machine Translator [18]: This paper was written by Syed Akhter Hossain, Lora Annanya Biswas and Md Iqbal Hossain. In this paper, the authors explain the Bangla to Braille translator System. They use Discrete Finite Automata (DFA) to implement a Bangla to Braille machine translator (DFA). Authors used a structured and state elimination strategy to construct and evaluate regular expressions from the DFA created for a Bangla to Braille machine translator. The authors claim that the results of testing the generated phrases for Braille language rules were adequate. The DFA for a Bangla-2-Braille machine translator is investigated in this paper, and regular expressions are created utilising the state elimination method.

3. Paper Title: Automatic System for Text to Braille Conversion [19]: This paper was written by Adrian Moise, Gabriela Bucur, and Cristina Popescu. The authors of this paper describe the creation of an automatic method for converting computer-generated text to Braille. A microcontroller is attached to a particular device that can be use by blind people in the system. A software-based paradigm for implementing FSM (Finite State Machines) has been devised for this system. The authors created and completed a project that convert text into Braille, which was then read by output device. Letters (small and capitals), digits, punctuation marks, and other special characters are converted by the software, but quotation marks & apostrophes are not converted. This is the limitation of the project.

4. Paper Title: DESIGNING OF ENGLISH TEXT TO BRAILLE CONVERSION SYSTEM: A SURVEY [20]: This paper was written by Mr Vrushabh S. Dharme, Mrs S. P. Karmore. The Automated value Thresholding algorithm is presented the work while converting text to Braille. Various strategies are also evaluated in terms of economic effectiveness, low mistake rate, and hardware implementation. The authors of this paper discovered that the Automated value Thresholding algorithm is best suited for designing and implementing a proposed system architecture for visually impaired people that provides an efficient way of converting text to Braille while maintaining flexibility, portability and low cost. At the time of publication, the research work described in this report was still in its early stages.

5. Paper Title: A SYSTEM FOR FAST TEXT-TO-BRAILLE TRANSLATION BASED ON FPGAS [21]: This paper was written by Xuan Zhang, Cesar Ortega-Sanchez and Iain Murray. The authors of this paper describe a fast text to Braille translator system based on FPGAs (field programmable gate arrays). This

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translator perform the translation in hardware rather than software. An FPGA with a large programmable resource was used to execute the quick translation, and an algorithm proposed by Paul Blenkhorn was improved to do the fast translation. An extremely high-speed IC hardware description language was used to describe the translator (VHDL). The test findings demonstrate that the hardware-based translator outperforms Blenkhorn's original approach in terms of throughput while producing results equivalent to commercial software-based translators.

6. Paper Title: Conversion of Hindi Braille to Speech using Image and Speech Processing. [22]: This paper was written by Parmesh Kaur, Sahana Ramu, Sheetal Panchakshari, Niranjana Krupa. In this paper, the writers explain the conversion of Devanagari Hindi Braille text to speech. Deep learning-based method & Traditional sequence-mapping approach is used to implement Braille to Hindi Text. The second section of the study is about converting text written in Hindi to speech, which is done by concatenating voice samples of Hindi vowels and consonants. Speech coefficients obtained from recorded voice samples were used to generate a Hindi speech corpus. The authors were able to convert Hindi Braille to text with 100 percent accuracy using the traditional method and 96 percent accuracy using the deep learning methodology. Experts also checked the excellence of speech created by the algorithm by looking at characteristics like clarity, pronunciation, sound quality, and speech speed.

5 CONCLUSION

From the above analysis, we came to know that there is a huge scope of research on Braille in regional languages. In India, there are many regional languages, but as we analysed, the work to convert text written in a regional language to Braille or vice versa was started in many languages. Still, improvement is needed to achieve the required target.

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ARTIFICIAL INTELLIGENCE IN ADVANCED HORTICULTURE

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ABSTRACT

Artificial intelligence is the process through which humans create intelligent machines. It falls under the broad category of computer science that emphasises the development of physical and intangible systems that not only behave intelligently but also exhibit behaviour on a par with how people think and act, achieving human-like performance in all cognitive tasks through the use of only logical reasoning. The fundamental building blocks of AI are decision-making that is rapid and efficient and learning from past data. A part of artificial intelligence called machine learning is where the tools are developed.

A system based on AI has been created and developed to automatically recognise the pineapple that is the most ripe. This method uses an algorithm based on computer vision and machine learning that uses Haar-like characteristics. The characteristics of an adult pineapple have been evaluated using the Python programming language. The created method was put to the test in the real world and was successful in identifying 93% of the fruits. The issues are being quickly fixed by AI technology, which also suggests precise steps that need be taken to solve the issue. AI is effective at keeping track of information and swiftly identifying solutions. The digital revolution of the agricultural and horticulture sector offers both producers and consumers enormous possibilities. The next revolution will be sparked by the introduction of digital agriculture, industrialization and mechanisation of production processes, networking, and data management. are set to unleash the next revolution in the history of agriculture and farming.

Keywords: AI, Horticulture, Data Management, Digital Revolution, Robotics, ClAES

India has the opportunity to cultivate a wide variety of horticulture crops due to its diversified agro-ecological areas, soil types, and climate conditions. Horticultural crops, which comprise fruits, vegetables, medicinal, aromatic, and decorative plants, are important components of a balanced diet, sources of medication and fragrance, as well as possessing a variety of aesthetic benefits for people.

Vegetables and fruits represent 90% of the nation's overall horticulture production. Our nation currently produces 10% of the fruits and 14% of the vegetables consumed worldwide, placing us second only to China in terms of acreage and output of these commodities. Horticulture crops contribute significantly to India's economy by raising rural residents' incomes and creating jobs for young people.

The development of intelligent systems has expanded the potential to improve the cultivation and management elements of horticulture crops on the basis of new technologies and data analysis techniques. Surprisingly, horticulture has seen a growth in agricultural technology research and commercialization despite having the least amount of digitalization. However, a variety of biotic and abiotic stressors are present in the industry. Vegetables and fruits represent 90% of the nation's overall horticulture production. Our nation currently produces 10% of the fruits and 14% of the vegetables consumed worldwide, placing us second only to China in terms of acreage and output of these commodities. Horticulture crops contribute significantly to India's economy by raising rural residents' incomes and creating jobs for young people.

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Artificial intelligence (AI) also called machine intelligence is a domain in computer science that instructs machines on how to replicate human physical actions and react like humans. Its applications in the horticulture industry are diverse. From planting, watering, and harvesting to experimenting with new systems, machines can often be created to be more efficient than people. The horticulture industry requires people with artificial intelligence acumen to enable them to improve yield. Artificial Intelligence technologies are helpful to yield healthier crops, provide information on prevailing weather conditions such as temperature, rain, wind speed, wind direction, solar radiation, pest control, monitor soil, and growing conditions, organize data for farmers, help with the workload and improve food supply chain (Manaware, 2020).

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Application of AI in Horticulture

Horticultural operations are arduous and expensive and it is challenging to get and retain the labor force in this sector. The use of robots, drones, and automated systems is the future when it comes to enhancing efficiency and productivity within the horticulture industry. Some of the important uses of AI in horticulture are as:-

Disease diagnosis: Prior image processing makes sure that the leaf pictures are divided into sections such as background, non-diseased region, and afflicted area. The infected area is then removed and transported to distant labs for further analysis. Additionally, it supports real-time suggestions for illness diagnosis and aids in the assessment of nutritional deficiencies and pest identification. By doing this, there is a decrease in pesticide losses, which also results in a decrease in soil and groundwater pollution as well as the likelihood of pesticide residues in the human food chain.

This aids farmers in overcoming the labour difficulty.

Identifying the ripeness of a produce: To evaluate the right stage of fruit development, pictures of various crops under white/UV-A light are taken. Farmers might designate various ripeness levels based ongrades based on the crop/fruit category and add them into separate stacks before sending them to

the market, especially in the case of highly perishable horticulture crops, and harvesting at proper maturity will enhance post-harvest shelf life.

Field management: Using high-definition images from airborne systems (drones or copters), real-time estimates can be made during the cultivation period by creating a field map and identifying spots where crops need water, fertilizer, or pesticides. This will sustain resource optimization up to a great extent.

Automation Systems in Irrigation: The smart irrigation system is an Internet of Things (IoT) based device that can automate the irrigation process by analysing the soil moisture status and meteorological conditions. Since AI is aware of past weather patterns, the condition of the soil, and the kind of crops to be cultivated, irrigation, one of farming's most labor-intensive operations, may be avoided. Automated irrigation systems are made to make better use of water and yields by utilising real-time technologies that can continuously maintain the ideal soil conditions. Automation can assist farmers in better managing these issues and achieving the goal of more crops per drop, as irrigation uses over 70% of the freshwater in the globe.

Fruit grading: In recent years, image processing has been used more and more in fruit grading. Grading, a crucial stage in the post-harvest process, includes classifying fruits according to their condition and the severity of any faults or contamination. Fruit grading by hand takes time and is unreliable. In this regard, it is essential to employ the automated speedier system. The automated image processing methodology for fruit sorting and grading is one such dependable method.

Drone-based technology: This technology, which is fast becoming indispensable to farmers, offers new ways to improve agricultural yields through in-depth field analysis, long-distance crop spraying, and high-efficiency crop monitoring. Drones keep an eye on the soil's condition and decide if it needs watering or planting. Cameras that monitor fruits and vegetables are being trained to spot anomalies or issues like dehydration and unwelcome insects. The best time to harvest may be predicted using all of these information. Agriculture has been given a high-tech makeover by drone technology. Additional drones may scan the ground and spray evenly in real-time. Drones produce the same results in aerial spraying five times more quickly than traditional equipment. Throughout the agricultural cycle, drones will be employed in the following ways.

Crop monitoring: Ineffective crop monitoring is a huge obstacle. With drones, time-series animations can reveal the growth of a crop and predict production inefficiencies, enabling better management practices.

Uses of Robotics in Horticulture

In the horticultural industry, robots are frequently used for harvesting, drone spraying, field monitoring, sorting, grading, and packing of finished horticultural goods, as well as to some extent in nurseries and greenhouses. A sorting robot for tulip horticulture was created by H2L. Numerous robots are already being developed for the production of fruit. Robots complete the arduous, repetitive labour quickly and without ever tiring. The following are some further applications for robotics: Robotics may be used in a variety of ways to simplify the production and transportation of potted plants while also increasing efficiency. The incredible benefit of a robotic arm is that it can carry out several jobs in a 3D environment, such as placing plants. in a carrier and, in the next movement, taking them out of a carrier and putting them on tables or in trays. This is performed with the greatest precision, even if the plants are not located precisely in the right place.

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Robots used for fruit harvesting must pick up the fruit without hurting the tree's leaves or branches. The robots must be able to access all parts of the tree being harvested and, using video image capture, discern between fruits and leaves. The camera is attached on the robot arm, and the colours that are recognised are compared to memory-stored characteristics. The fruit is collected if a match is made. An air jet can be used to blast leaves out of the way to provide a clearer view if the fruit is obscured by foliage. The amount of force used to crush the fruit is insufficient to remove it from the tree. Since the gripper's design depends on the fruit'spicked. A drone is used to pick apples and the company Bx recently showed a video robot 'dog' Spot from Boston Dynamics walking through an apple orchard with a camera and sensors.

The Robotic Apple Packing Cell: The 2016 season saw the beginning of a commercial trial for the Robotic Apple Packing Cell. The robot cells are designed to operate in typical industrial packing facilities. The system (consisting of six separate packer robots) packs 120 apples each minute, arranging the fruit such that the colour side of the apple is facing up for best presentation and all of the stems are resting horizontally in the trays and pointing in the same direction. Although this system makes use of camera technology, the truly clever technology in this robot is the vision algorithms utilised to position the stem in the proper direction. The work of two to three people is done by one robot. To handle the fruit, the robot uses pneumatics (suction cups).to handle the fruit. This is mild and assures that no human hands touch the fruit during packing (reducing contamination issues).

Multipurpose Orchard Robotics: Robotics Plus is working on the Multipurpose Orchard Robotics project. The project aims to automate the harvesting and pollination of kiwifruit and apples by developing a central system that further modules can be added for different tasks such as pollination, spraying, and harvesting. There is also a lot going on around this subject where greenhouse horticulture is concerned.

Strawberry harvesting robot: Labor shortage spurs farmers to use robots for handling delicate tasks in the fresh produce industry. An automated harvester wheeled through rows of strawberry plants can reduce the cost of picking, which otherwise is a labor-intensive operation.

A lettuce-thinning robot: It is used for thinning and weeding of lettuce to increase yield. Its vision system scrutinizes each plant and then applies advanced artificial intelligence algorithms that make plant-by-plant decisions to optimize yield and then eliminate unwanted plants according to its programming.

IMPLEMENTATION OF EXPERT SYSTEMS AT CLAES

Agriculture has developed into a sophisticated industry that calls for the acquisition and integration of data and knowledge from several varying sources. The contemporary farmer frequently relies on agricultural experts and advisers to supply information for decision-making in order to stay competitive. Unfortunately, when a farmer needs support, agricultural specialists are not always around to provide it. Expert systems were shown to be an effective instrument with enormous promise in agriculture for resolving this issue. An expert system, also known as a knowledge-based system (KBS), is a computer programme created to mimic the problem-solving methods of a subject-matter expert in a particular field or subject. Expert systems in agriculture combine the collective knowledge of several fields, such as plant pathology, entomology, horticulture, and agricultural meteorology, into a single system.into a framework that best addresses the specific on-site needs of farmers.

CONCLUSION

With the use of artificial intelligence, farmers may automate their operations while also switching to precision cultivation for improved crop quality and production while using less resources. A significant expense in horticulture is labour. More skilled workers are needed for intensive horticulture crops than for large-scale farming. Hired labour used for various tasks accounts for over 50% of manufacturing expenses. By controlling labour costs, making optimal use of pesticides and fertilisers, and harvesting crops at the right time, AI can lower the cost of agriculture. AI can assist farmers in increasing output capacity and lowering production costs. The use of AI across all application domains will also result in a desirable change in the mannerwe do research and development in horticulture now. Artificial Intelligence-based products or services like training data for agriculture, drone, and automated machine making will get technological advancements in the future and will provide more useful applications to this sector, for increasing efficiency.

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IMPLICATIONS OF BALANCE OF PAYMENT METHODS IN EXPORT-IMPORT FINANCE: AN OVERVIEW STUDY PERSPECTIVE

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ABSTRACT
This article aims to explore the implications of balance of payment (BOP) methods in the context of export-import finance. The balance of payment is a crucial indicator of a country's economic health and provides valuable insights into its international trade activities. Understanding the various BOP methods and their implications for export-import finance is essential for businesses, policymakers, and financial institutions involved in cross-border trade. This study examines different BOP methods, such as the current account, capital account, and financial account, and analyzes their impact on export-import financing decisions. It also investigates the potential risks and challenges associated with each method, highlighting the importance of managing BOP effectively to ensure sustainable economic growth and stability. The findings of this study contribute to the existing literature on BOP and provide practical insights for stakeholders involved in international trade and finance.

Keywords: Balance of Payment Methods, Foreign Exchange and Risk Mitigation, Trade Balance & Implications

1.1 INTRODUCTION OF THE STUDY

The balance of payments (BOP) is a fundamental concept in international economics and plays a crucial role in export-import finance. It provides a comprehensive record of all economic transactions between a country and the rest of the world over a specific period. The BOP consists of three main components: the current account, the capital account, and the financial account.

- **Current Account:** The current account reflects the trade in goods and services, as well as income flows such as wages, interest, and dividends. In the context of export-import finance, the current account balance is significant. It measures the net exports or imports of goods and services, indicating the trade balance of a country. A positive current account balance (surplus) implies that the value of exports exceeds imports, indicating a favourable position for a country. Conversely, a negative current account balance (deficit) suggests that a country is importing more than it is exporting, which can have implications for the country's economic stability and financing needs.
- **Capital Account:** The capital account records the flow of capital between a country and the rest of the world. It includes transactions related to investments in fixed assets, financial assets, and changes in foreign ownership of domestic assets. In the context of export-import finance, the capital account is essential as it reflects the inflows and outflows of long-term investments, such as foreign direct investment (FDI) and portfolio investments. The capital account balance indicates the overall net investment position of a country and influences its ability to attract foreign capital.
- **Financial Account:** The financial account tracks the changes in ownership of financial assets and liabilities between a country and the rest of the world. It includes transactions such as purchases and sales of stocks, bonds, and other financial instruments, as well as changes in reserve assets held by central banks. In export-import finance, the financial account is significant as it reflects the inflows and outflows of short-term capital, such as bank loans, trade credits, and currency swaps. It plays a crucial role in providing financing for international trade transactions and affects a country's exchange rate and monetary policy.

1.2 OBJECTIVES OF THE STUDY

1. To examine the relationship between balance of payment (BOP) methods and export-import finance.
2. To analyze the implications of BOP methods on the financing decisions of exporters and importers.
3. To identify the risks and challenges associated with BOP methods in export-import finance.

1.3 STATEMENT OF PROBLEM

The study aims to investigate the implications of the balance of payments (BOP) on export-import (EXIM) finance. The problem statement is as follows:

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- What are the implications of the balance of payments (BOP) methods on the financing of export and import transactions, and how do these implications impact the stakeholders involved in international trade?

This problem statement recognizes the need to examine the relationship between BOP methods and EXIM finance and understand the consequences for various stakeholders, including exporters, importers, financial institutions, and policymakers. The research seeks to address the following specific questions:

1. How do different BOP methods, such as the current account, capital account, and financial account, affect the financing decisions of exporters and importers?
2. What are the potential risks and challenges associated with BOP methods in EXIM finance, and how do they impact the financial stability of stakeholders?

1.4 SCOPE OF THE STUDY

The scope of the study focuses on examining the implications of the balance of payments (BOP) in the context of export-import (EXIM) finance. It encompasses various aspects related to BOP methods and their impact on stakeholders involved in international trade. The study will cover the following areas:

- **BOP Methods:** The study will explore the different BOP methods, including the current account, capital account, and financial account. It will analyse their relevance to EXIM finance and their influence on financing decisions, trade balances, and exchange rate dynamics.
- **Financing Options:** The study will investigate the financing options available to exporters and importers in the context of BOP. This includes examining trade credits, export financing facilities, import financing mechanisms, and other financial instruments used to facilitate EXIM transactions.
- **Risk Assessment:** The study will identify and assess the risks and challenges associated with BOP in EXIM finance. This will involve analysing currency fluctuations, exchange rate risk, capital flows volatility, and the potential impact on financial stability and profitability of stakeholders.
- **Foreign Exchange Management:** The study will examine the role of BOP in foreign exchange management for exporters and importers. It will explore strategies for managing currency risk, hedging techniques, and the impact of BOP on foreign exchange rates.
- **Stakeholder Perspectives:** The study will consider the perspectives of various stakeholders involved in EXIM finance, including exporters, importers, financial institutions, and policymakers. It will analyse how BOP methods influence their decision-making processes, financing options, and overall competitiveness in international trade.

1.5 RESEARCH METHODOLOGY

Data collection refers to the process of preparing and collecting data. The data for this study were collected through primary and secondary data.

1.5.1 Primary Data

Primary data is the information collected by the researcher directly through instruments such as interview, observation, questionnaire and schedule.

1.5.2 Secondary Data

Secondary data means published data and the data collected in the past. The secondary data used for this study is, various resources are available namely books, internet etc., and also collected from various files, records etc.

1.5.2 SAMPLING DESIGN

The sampling design used for this study is simple random sampling. It gives equal chance to the entire Stakeholders Performance during Export- Import with the various countries in the International Trade Market and it denotes in the appropriate Sample Size.

A sample design is a definite plan for obtaining a sample from a given population. It refers to the technique or the procedure the researcher would adopt in selecting items from the sample. The sample design is determined before data collection.

Quantitative analysis refers to the systematic approach of examining numerical data using statistical and mathematical techniques. It involves the use of numerical data to identify patterns, relationships, trends, and statistical significance in order to draw conclusions and make inferences. During the Period of Study, Quantitative Analysis is used.

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1.6 DATA ANALYSIS AND OVERVIEW STUDY

1.6.1 To examine the relationship between balance of payment (BOP) methods and export-import finance.

- **Trade Balance**: The BOP captures the balance of trade, which represents the difference between a country's exports and imports. The trade balance directly influences a nation's BOP position. A positive trade balance (exports exceeding imports) contributes to a current account surplus, while a negative trade balance (imports exceeding exports) results in a current account deficit.
- **Current Account and EXIM Finance:** The current account balance, a component of the BOP, reflects the net flow of goods, services, income, and unilateral transfers between countries. It has a significant impact on EXIM finance as it indicates the availability of foreign currency for financing import payments and the potential for earning foreign exchange through exports.
- **Capital Account and EXIM Finance:** The capital account of the BOP records the flow of financial investments, such as foreign direct investment (FDI) and portfolio investment. The capital account influences EXIM finance by attracting foreign capital inflows that can be utilized for financing trade activities, including export expansion and import payments.
- **Financial Account and EXIM Finance:** The financial account of the BOP captures cross-border transactions related to financial assets and liabilities. It includes activities such as foreign exchange reserves, loans, investments, and derivatives. The financial account plays a role in EXIM finance by determining the availability of credit facilities, trade financing options, and foreign currency reserves for managing currency risk.
- **Exchange Rates:** BOP factors, particularly capital flows and exchange rate movements, can significantly impact EXIM finance. Exchange rate fluctuations affect the cost of imports and exports, profitability of businesses engaged in international trade, and the ability to secure favorable financing terms.
- **Policy Implications:** BOP considerations influence policy decisions related to EXIM finance. Governments and central banks often adopt measures to manage BOP deficits or surpluses, which can impact trade financing conditions, interest rates, foreign exchange controls, and trade promotion initiatives.

1.6.2 To analyze the implications of BOP methods on the financing decisions of exporters and importers.

- **Access to Trade Financing:** BOP methods can influence the availability of trade financing options for exporters and importers. Different BOP methods, such as export credit, import credit, letters of credit, or documentary collections, may offer varying degrees of financial support and risk mitigation. Analyzing the implications involves assessing how different BOP methods impact the accessibility of financing and the terms and conditions offered by financial institutions.
- **Cost of Financing:** BOP methods can affect the cost of financing for exporters and importers. Some BOP methods may provide preferential interest rates, longer repayment periods, or lower collateral requirements, thus reducing the cost of financing. Analyzing the implications involves evaluating the cost-effectiveness of different BOP methods and how they impact the overall financial viability of export and import transactions.
- **Currency Risk Management:** BOP methods can play a role in managing currency risk for exporters and importers. For instance, BOP methods that facilitate hedging against foreign exchange rate fluctuations can help mitigate the risk of adverse currency movements. Analysing the implications involves assessing how different BOP methods impact currency risk management strategies and the effectiveness of these methods in minimizing potential losses.
- **Trade Promotion and Market Access:** BOP methods can contribute to trade promotion efforts and enhance market access for exporters and importers. Certain BOP methods, such as export credit guarantees or insurance, can provide support in entering new markets, expanding sales, and mitigating commercial risks. Analysing the implications involves evaluating how BOP methods facilitate trade promotion and market access for exporters and importers, particularly for small and medium-sized enterprises (SMEs).
- **Financial Stability and Risk Assessment:** BOP methods can have implications for the overall financial stability of exporters and importers. Analysing the implications involves assessing the potential risks associated with different BOP methods, such as counterparty risk, credit risk, and default risk. It also involves examining the impact of BOP methods on the financial stability of exporters, importers, and the financial institutions providing trade financing.

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1.6.3 To identify the risks and challenges associated with BOP methods in export-import finance.

- **Exchange Rate Risk:** BOP methods can expose exporters and importers to exchange rate risk. Fluctuations in currency exchange rates can impact the cost of imports, the revenue from exports, and the overall profitability of trade transactions. Assessing the exchange rate risk associated with different BOP methods involves evaluating the potential impact of currency volatility on trade financing costs and the financial performance of exporters and importers.
- **Credit and Counterparty Risk:** BOP methods may involve credit extensions and transactions with counterparties. This introduces the risk of default by the counterparty, which can lead to financial losses for exporters or importers. Evaluating credit and counterparty risk associated with BOP methods involves assessing the creditworthiness and financial stability of counterparties, as well as the effectiveness of risk mitigation measures, such as credit insurance or guarantees.
- **Regulatory and Compliance Risk:** BOP methods in export-import finance are subject to various regulations and compliance requirements. Non-compliance with regulatory frameworks can result in penalties, delays, or disruptions in trade financing activities. Identifying regulatory and compliance risks involves understanding the legal and regulatory environment governing BOP methods and ensuring adherence to documentation, reporting, and compliance obligations.
- **Liquidity Risk:** BOP methods may involve the use of funds tied up in trade transactions, potentially impacting liquidity for exporters and importers. Assessing liquidity risk associated with BOP methods involves evaluating the availability of working capital, the timing of cash flows, and the impact on overall liquidity management for businesses engaged in international trade.
- **Country and Sovereign Risk:** BOP methods can be influenced by the economic and political stability of the countries involved in trade transactions. The risk of economic instability, policy changes, or geopolitical tensions can impact the effectiveness and reliability of BOP methods. Evaluating country and sovereign risk involves considering factors such as political stability, macroeconomic indicators, legal frameworks, and bilateral/multilateral trade agreements.

1.7 FINDINGS FOR THE STUDY

By examining the implications of BOP methods in export-import finance, this study provides valuable insights into the management of international trade and finance. The findings and recommendations can guide businesses, policymakers, and financial institutions in making informed decisions to enhance trade competitiveness, mitigate risks, and foster sustainable economic growth.

1.8 SUGGESTIONS

- Consider incorporating both qualitative and quantitative research methods to gain a deeper understanding of the implications of BOP methods in export-import finance. Qualitative methods, such as interviews or case studies, can provide valuable insights into the experiences and perspectives of exporters, importers, and financial institutions. This can complement the quantitative analysis and add richness to the findings.
- Explore the role of technological advancements and digitalization in shaping BOP methods and their implications for export-import finance. With the increasing use of technology in trade finance, understanding how digital platforms, blockchain, or fintech solutions impact BOP methods and financing decisions can provide valuable insights for stakeholders in the industry.
- Consider examining the impact of BOP methods on different sectors or industries within the export-import landscape. Different sectors may have specific financing requirements, risk profiles, and exposure to BOP dynamics. Analysing the sector-specific implications of BOP methods can provide targeted insights and recommendations for stakeholders in those sectors.
- Evaluate the effectiveness of policy measures and regulatory frameworks in supporting BOP methods and export-import finance. Assess how policies, regulations, and trade agreements impact the availability, accessibility, and cost of financing options. Identify areas for policy improvements or regulatory reforms that can enhance the efficiency and effectiveness of BOP methods in supporting export-import finance.

1.9 CONCLUSIONS

- In conclusion, the study on the implications of balance of payments (BOP) methods in export-import finance is crucial for understanding the financing dynamics and risks associated with international trade. The study aims to examine the relationship between BOP methods and financing decisions of exporters and importers and identify the risks and challenges involved.

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- Through a comprehensive research methodology combining quantitative analysis, qualitative insights, and literature review, the study can provide valuable insights into how different BOP methods impact trade financing options, currency risk management, market access, and financial stability. The findings can help stakeholders in international trade, including exporters, importers, financial institutions, and policymakers, make informed decisions regarding trade financing strategies, risk management, and policy reforms.

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CREDIBILITY ANALYSIS OF SOCIAL CONTENTS WITH 3 WAY DEEP LEARNING

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ABSTRACT
The opinions of specialists and recognized experts are more likely to be credential and to reflect a significant viewpoint. For that reason, we propose a new method to define the credibility of sentiment polarity based on their expertise or background knowledge and apply on Twitter: social media. Hence, we identify the credibility of tweets polarity for a particular topic, we add weight of authors according to their expert knowledge. We classify tweets sentiment polarity using machine learning technique: Recurrent Neural Network and we combine it with weight of authors' background knowledge based on author's profile, twitter List feature and their tweets behavior for a given topic and then show the result as the percentage of credibility on their positive or negative views.

Keywords: social media, Tweets, Credibility, Sentiment Analysis.

INTRODUCTION
In the era of digital computing, online social networking platforms are moving far ahead of print media and television in terms of reporting information or spreading news related to any ongoing event or occasion. Social networking platform provides a capacity in one's hand to post any type of content on these platforms. These contents may be genuine information or a false rumour. The people who are audience to such fake content through their devices might considered it to be as genuine and trustworthy information. The fake/ rumoured content often includes false propagation of the information which diminishes the true facts and misled the society on a larger scale which might bring grave threats for any person and even end up into disastrous condition. These days Twitter, Facebook, Instagram, are the most popular social networking sites with millions of user's databases. These platforms are built for the benefit the society and facilitate them in building strong virtual social connection throughout the world. Contrary to their vision these platforms are often used to deceive, misinterpret, misuse, jeopardize, and disseminate the rumoured content. Therefore, building a model which helps in evaluating the credibility of the content posted on online social networking platforms is urgently required. Many of the researchers have tirelessly worked in this to build a model which not only helped in detecting the rumoured content but also helped in evaluating its credibility score. However, still, there is a lot of scope of improvement left in this domain of research, our work is to construct the model using classification and clustering machine algorithms on the basis of the extended features set in order to categories the tweet on the credibility scale.

SCOPE /NEED OF THE PROJECT WORK
Social networking platforms such as Twitter, where every individual is allowed to post their own opinion and point of view regarding any ongoing event or occasion. A chaos happened when two or more groups of people have difference in their opinions, and they started arguing with each other. And sometimes these arguments get so much tensed that these groups of people end up in posting absurd or abusive content for each other. However, the credible content are genuine news and valid information related to any ongoing event. These tweets provide benefits to the people by providing real time information and works for the well-being of the society. These tweets are never biased against any person and does not contain any negative emotions or abusive words.

LITERATURE REVIEW
Many researchers have been working for finding the credibility of content posted on social media, which had made it an essential and inquisitive research topic over the past decade. The dissemination of fake content is harmful for the well-being of both the user and micro blogging services in a long run. Fake content consists of persons own opinion, affiliation towards any particular cast, community or religion. Anything which is harmful for healthy debate and hurting the emotions of others will be taken as a fake or a non-credible content. Twitter, being one the of most popular social networking site, where millions of users post tweets from across the world, has consistently been used for sharing all kinds of information. However, authenticity of the content is not assured beforehand. Informing oneself is the foremost inspiration for peoples' involvement in such information dissemination. Unfortunately, the 'hashtag' feature amplifies the audience not only in breaking news rather also in spams and rumours. Sometimes, the information originates directly from the news source however the fear of it being somebody's opinion and being biased information cannot be ruled out.

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References	Employed Techniques	Corpus Size	Data Collection
Abbasi & Liu [1]	CredRank algorithm uses a hierarchical clustering method	600	Senators vote record from United States Senate websites.
Cha et al.[2]	Spearman's rank correlation coefficient	6 million users	Twitter API.
Wagner et al.[3	Two-way ANOVA & Topic Modeling using LDA.	1000 tweets of 1145 users	Twitter API for topics like semantic web, democrat, republican, diabetes etc.
Westerman et al. [4]	Participants assigned to view the mock twitter page, followed by statistical test like One-way ANOVA, MANOVA	-	Six different Mock Twitter page was created.
Gupta et al.[5]	Regression Prediction Model.	7888374 tweets	Rest, Streaming and Search APIs(from Boston Marathon Blast)
Canini et al. [6]	tf-igf and LDA algorithms	All the tweets posted on 60 Twitter account	We follow Twitter directory service.

EXISTING SYSTEM

Existing propose a framework to automatically and in real-time perform credibility analysis of posts on social media, based on three levels of credibility: Text, User, and Social. The general architecture of our framework is composed of a front-end, a light client proposed as a web plug-in for any browser; a back-end that implements the logic of the credibility model; and a third-party services moule. We develop a first version of the proposed system, called **T-CREo (Twitter CREdibility analysis framework)** and evaluate its performance and scalability. In summary, the main contributions of this work are: the general framework design; a credibility model adaptable to various social networks, integrated into the framework; and T-CREo as a proof of concept that demonstrates the framework applicability and allows evaluating its performance for unstructured information sources; results show that T-CREo qualifies as a highly scalable real-time service. The future work includes the improvement of T-CREo implementation, to provide a robust architecture for the development of third-party applications, as well as the extension of the credibility model for considering bots detection, semantic analysis and multimedia analysis.

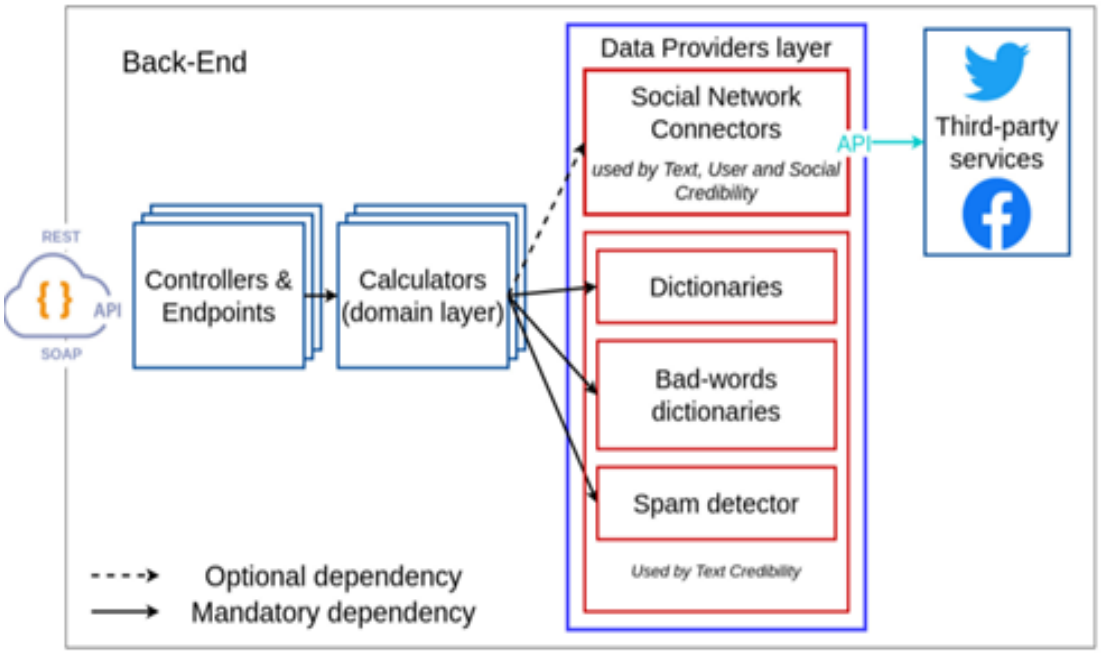

Fig 1: Architecture Diagram of Existing work

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PROPOSED SYSTEM

Module Description

In this project we deal with four modules, they are been discussed below.

➢ **Data Crawling Module**

Design and development of a crawler using Twitter API for the purpose of retrieval followed by storage of tweets on a local machine.

Twitter Social Networks facilitates research by providing the facility to extract the data set based on any hashtag# or username@. For this purpose, Twitter provides two different types of API, Streaming and Rest. Streaming API help users in providing real time data as per the request and it will keep sending you until you stop the process. However, Rest API allows us to search through the keyword and give access to the data, although it would not provide data in real time.

➢ **Data Pre-Processing Module**

We need to clean and process our data in order to fit our model to our dataset.

Data preprocessing transform the raw data into efficient and valuable format. It is a Data Mining technique that facilitates in handling missing, noisy data. The missing data are those that are either not filled or partially filled by the user, a noisy data is meaningless and would be considered as inappropriate. These kinds of data are always misinterpreted by the machine learning techniques and it needs to be removed.

➢ **Credibility Analysis Module**

Following procedure will be followed to identify the credibility of the tweets

➢ **Labelling and Categorization of Tweets Module:** We will employ pre-defined credibility scale to annotate the set of tweets for each event. A machine learning classification algorithm are supervised in nature, as it can learn by example. In a supervised machine learning approach, several input pairs are used for classifying the number of output pairs based on the mapping of input-output patterns. This means annotated data are required for the development of the classification model. The data annotation process required human efforts that have a strong background related to each topic over which tweets were extracted from Twitter. This step requires a rigorous and time-consuming endeavour. The data was outsourced to six human annotators for labelling the tweets in one of the five given categories for classifying the tweets into credible classes.

➢ **Feature Extraction Module**

Broadly, the features of the message and the properties of the user who posted the message are the two basic major characteristics from which numerous features could be recognized. Some of them are listed as under: Writer-based features, Tweet content features, Event-based features, Network based features, etc.

Feature Extraction process includes feature sets that are divided into five major categories, for instance, “User related features”, “Content related features”, “Emotions score”, “Sentiment score” and “Polarity Category”. These features are used in training and testing machine learning classifiers and acts as a credibility indicator for categorizing the tweets into classes like Credible or Uncredible. The user and content related features are provided by Twitter and extracted using Twitter API. However, the emotions, sentiment and polarity features were extracted using “Natural Language Understanding” & “Meaning Cloud” APIs provided by IBM. These two platforms are selected because they are one of the most renowned, effective and opensource platforms for natural language processing. It supports in extracting the concepts, keywords, categories, emotions, and sentiment associated with the textual content

➢ **Machine Learning Module:** Based on the labelled and the categorized data along with the newly extracted features taken into consideration the machine can be trained to classify the tweet on the credibility scale.

Machine learning is a technique to automate the analytical model for data emotion analysis and interpretation. It is a subbranch of AI and provides an idea that a system can learn from data by forming the pattern that takes minimal human efforts. RNN Machine learning is majorly divided into four categories Supervised, Unsupervised, Semi-Supervised, and **Reinforcement learning.**

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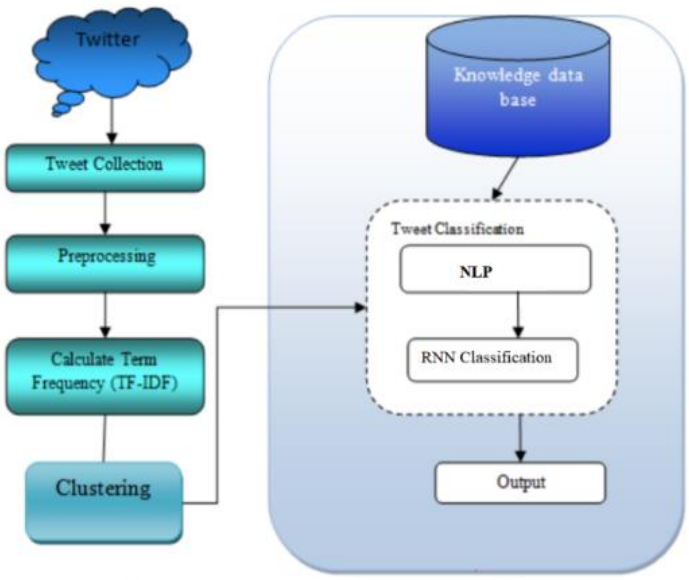

Fig 2: Architecture Diagram of Proposed System

CONCLUSION

Online Social Networks such as Twitter provides a platform for communicating, interacting, and collaborating with the people from all over the world. It provides a similar way of connecting with people, exchanging thoughts and learn from their experiences. Nowadays, people turn towards social media platform more easily and frequently than tradition news media or TV channels, easily after any high impact events or occasions. The purpose behind making these platforms is to accelerate the communication process and to the provide real time information to the masses. However, fake or rumored content often disseminates with the real one and it was found that rumors tend to spread faster than the real content as fake content tends to question more.

In this work, we tried to build a RNN machine learning models using clustering and Emotion classification algorithms for categorizing the uncredible/fake content from the credible ones. A list of features was extracted which facilitates our machine learning model to work effectively and appropriately. In this thesis three major contributions have been made which allows us to categorise the online posted content into the given credibility classes.

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A STUDY ON DEVELOPMENT STRATEGY OF YOUNG AGRICULTURAL ENTREPRENEURS IN KARNATAKA STATE

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ABSTRACT
Today's young agricultural entrepreneurs are developing innovative ways to revolutionize the entire food chain. They are at the forefront of reducing food loss and waste, increasing crop yields, improving market access, developing novel technologies, and increasing urban and sustainable farming practices across the globe. They come from diverse backgrounds, with unique insights, perspectives, and approaches to tackling global food system challenges. The agricultural sector is currently experiencing various problems such as the decreasing number of farm workers, the lack of interest of the young generation in the agricultural sector, and fewer agricultural jobs. Therefore, concrete efforts and policies are needed to overcome it.

Keywords: Agricultural Entrepreneurs, Young Entrepreneurs, Development Strategy

INTRODUCTION
Entrepreneurship and agriculture are closely related. Agriculture is an industry that affects the entire population of the earth. And, indeed, agricultural entrepreneurs will always be in demand. The youngest country in the world, The growing trend towards locally developed foods provides attractive start-up opportunities for those wishing to make their living through agriculture, even if they have the capital needed to break into the commoditized part of the industry. Even though land prices can be challenging, the low need for high technology equipment in this type of operation often makes it possible for properly prepared and experienced individuals to break into this business, run their own operations, and develop their marketing plans. It is also a big challenge for our country with great potential that the youth should be trained with modern skills so that the youth are not able to run after the job and make others fit for the job.

Agriculture in India is transforming its practices. As young and charged-up entrepreneurs are joining the fray, commodities are being turned into value-added products and premium prices can be demanded from various retail outlets. With the same available resources, young entrepreneurs are modifying their business-models and exploiting market opportunities to improve their lifestyles. This is not only helping the entrepreneur but also encouraging farmers to shift to a better world. The government should institutionalize youth-specific schemes facilitating farmer producer organizations' (FPOs) unhindered access to technical, financial, supply chain and marketing support. Change in land use may be needed to enable setting up of processing plants on the farm gate. Youth entrepreneurship is supported well in India through national policies and programs facilitating youth development. In addition, several development interventions focus on youth inclusion in rural and agricultural enterprises. National and state policies reflect this emphasis that the policymakers place on developing youth entrepreneurship in agriculture and agribusiness development. National, state, and local governments support youth entrepreneurship in agriculture through various programs. Agriculture and allied sectors such as livestock development, animal husbandry, fisheries, and other newly emerging value chains provide new opportunities for youth to engage in agriculture and entrepreneurial activities. Yet, the implementation of these programs at various levels is thwarted by the need for technical and business skills, institutional support, access to finance, and mentorship for the rural youth to sustain and grow their businesses. Youth entrepreneurship programs require better governance at the state and local levels. Institutional support for training rural youth remains limited and needs to be systematically developed. At the policy and strategy development level, there is a need to map the supply and demand for youth entrepreneurial skills that are context and locality specific. For most farmers, agriculture is not just a job - they till the earth with the hope that it will be bountiful in more ways than one. Developing strategic plans using such a mapping process must be a priority for the public, private, and NGO organizations involved in youth entrepreneurship development.

The current vocational training activities provided for the rural youth should go beyond specific technical skill development to developing the entrepreneurial skills of the youth. However, several intervention programs by NGOs and specific value chains have shown successes that could be replicated. Here waxing eloquent about farmers and entrepreneurs - India is seeing a new trend of entrepreneurship in agriculture, especially in the rural areas.

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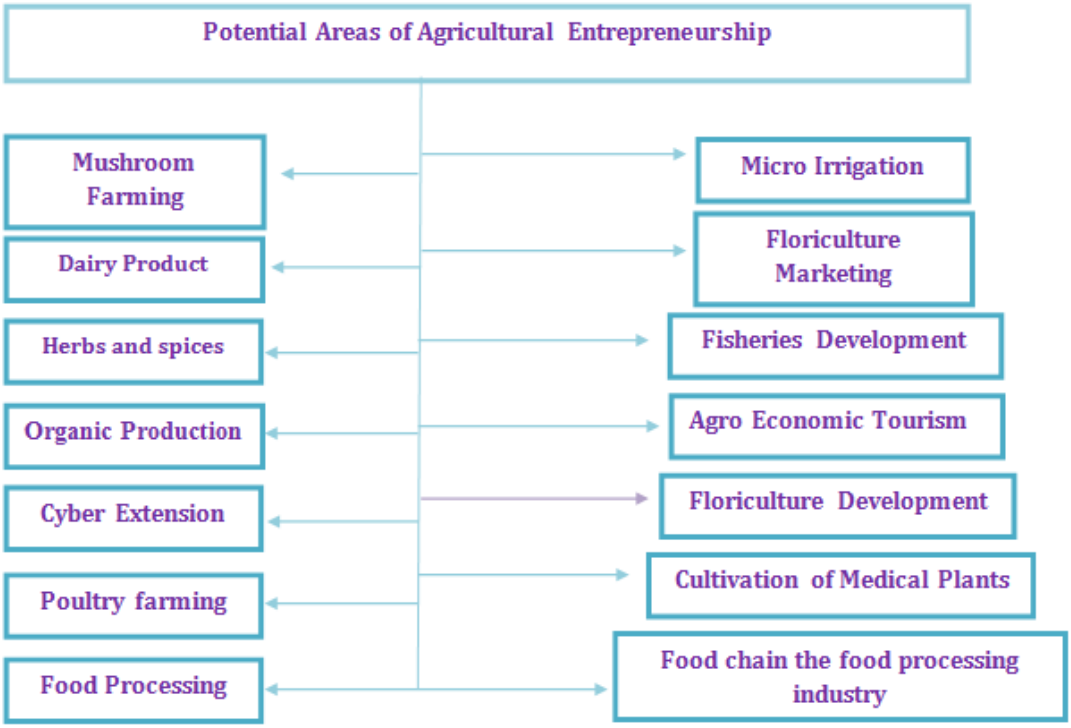

Activities of Rural Entrepreneurship in Agriculture

The rural entrepreneur is not limiting themselves to growing crops in fields. They are also including:

- Consultancy services
- Offering the latest infotech support
- Creating value added products - jams, pickles and so on
- Organic farming & Financial support and so on
- Engineering support - repair and service agricultural machinery like pumps and tractors

Challenges of Developing New Agri- Entrepreneurs in Karnataka

Every entrepreneur faces a unique set of challenges and a rural entrepreneur is no different. Some of the main bottlenecks are:

- Paucity of training
- Lack of technical knowledge
- Low levels of experience and expertise in this area
- Financial support
- Lack of Skilled and Managerial Manpower
- Lack of Infrastructural Facilities
- Problem of Marketing
- Lack of Awareness about Career in Agri-entrepreneurship
- Inefficient or Lack of Equipments and Technologies
- High Infrastructural and Distribution Costs

Objectives

- To analyze Development Strategy of Young Entrepreneurs.
- To find out the big roll of Young Entrepreneurs in Karnataka
- To study on the real challenges of Young Entrepreneurs in the study area

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FINDINGS OF THE STUDY

Agri-entrepreneurship growing awareness that rural entrepreneurship can be a powerful tool in affording a farmer a better way to cultivate crops and prevent migration to urban areas, these challenges will be met with ever-increasing efficient solutions as well. One of the most important personality traits of an entrepreneur is their drive to 'do' things and therefore, they will find every possible opportunity and means to face challenges and achieve their goals. This

NEEDS OF THE STUDY

Agri- entrepreneurship Rightly seen as the best way for to establish a peaceful future, but current agricultural entrepreneurship training and development starts from an assumption of peace, meaning that it is not always fit for purpose, the result is sub-optimal program design and inefficient use of resources. No experts in the fields of agri-business, agricultural marketing, and international development, officials and agencies developing entrepreneurship programs the practical real-life examples they need.

METHODOLOGY

The study is mainly focusing on the methodology used in this secondary data The study is completely based of Secondary data; the secondary data have been collected on available articles and literature on the concept, news paper, magazine, research articles, and schemes.

CONCLUSION

The formulation of strategies that can be carried out in the development of young agricultural entrepreneurs is by implementing an aggressive strategy, namely taking advantage of very favorable situations, where young agricultural entrepreneurs have sufficient strength and opportunities, with the strength they have can take advantage of existing opportunities to expand and develop businesses so that entrepreneurial development young agriculture can be achieved and farmer regeneration and agricultural sector problems can be resolved. The aggressive strategies used were:

1) Increasing the ease of access to capital assistance and financial stimuli by involving the banking sector;
2) Creating several agro-tourism areas;
3) Increasing the ease of access to information on business opportunities and business promotion; and
4) Improving facilities for promotion events and entrepreneurial achievement awards.
5) Supporting of government scheme and loans.

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PERFORMANCE EVALUATION OF ROUTING ALGORITHM FOR VEHICULAR AD HOC NETWORKS

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ABSTRACT
The challenge to select the best routing algorithm for network performance is a major concern in present research area. Vehicular Adhoc Network (VANET) has its own difficulties in deploying routing algorithm. The standard algorithm like DSDV, AODV, OLSR and some bio inspired routing algorithm are already available for VANET. In this paper authors discussed the problem and proposed a new framework that has been applied and tested on such routing algorithm to analyse the performance of selected routing algorithm. The Ad Hoc On-Demand Distance Vector (AODV) routing protocol is used for three distinctive traffic scenarios in the VANET environment. Open Source tools like SUMO, NS is opted for simulations. Simulation of Urban Mobility (SUMO 0.32) is the traffic simulator and Network Simulator NS-3.29 is used for network simulation to acquire the experiment results. The simulation is executed for three considered traffic scenarios are taken including realistic city traffic scenarios of Dehradun city. Through this paper, the authors wish to present the best way for performing and testing the routing protocols in VANET. Through the simulation test results it is concluded that the proposed framework is best fitted for VANET routing performance evaluation.

Keywords: VANET, DSDV, AODV, OLSR, SUMO, NS, Simulation

1. INTRODUCTION
Vehicular Ad hoc Network (VANET) is one of the fastest evolving research in the domain of Intelligent Transportation Systems (ITS). When closely looked at the taxonomy of ITS, it can be seen that the major concern is VANET routing and security. However, many international consortiums are already working on it with their agendas and products. As high cost involved in real-time testing hence simulation software is used to get proposed results. So, none of the research consortiums is directly testing their hypothesis on the field. Instead, they first create real-time scenarios using various software tools and then test them using simulation experiments. After getting the desired results, they test that with actual hardware in real-time fields [1]. Presently due to the emergence of cloud services and the Internet of Things (IoT), there will be a revolutionary change in the architecture of today's traffic and transportation system in the near future. VANET performance depends on various routing protocols and wireless standards. Otherwise, timely communication and delay in data packets may cause accidental disasters in real-time of ITS implementation [2]. For testing various routing protocols, simulation tools are also used to verify the analysis of the results. Many open-source and proprietary tools are already available, but none of the standard simulation software can fulfil all the real-time scenarios.

A new framework is proposed in this paper that makes the simulation experiments in VANET much easier and is very beneficial for the researchers to get the desired results.

3. Proposed Methodology
In this section, a proposed framework is presented and same was tested to verify the various research simulation experiments and implementation. This approach helps in performing the research test in a much simpler and faster way. The result analysis is also instant as data can be get instantly in many formats and viewed as per need. From the present experience, this can be stated that the computing resource must be robust enough so that no lagging or outages come during the execution of any simulation task. The simulation experiments were performed on HP Workstation with specification of 3.4 GHz.Corei7-8700 processor and memory of 16GB RAM. Earlier, the experiment was tried on Corei3 Laptop, but the results were not satisfactory and took too long to run, sometimes simulation stopped automatically. The framework shows that we need to iterate the simulation experiment many times to get the desired results. Hence, it is always better to use a high end machine to deploy the proposed framework.

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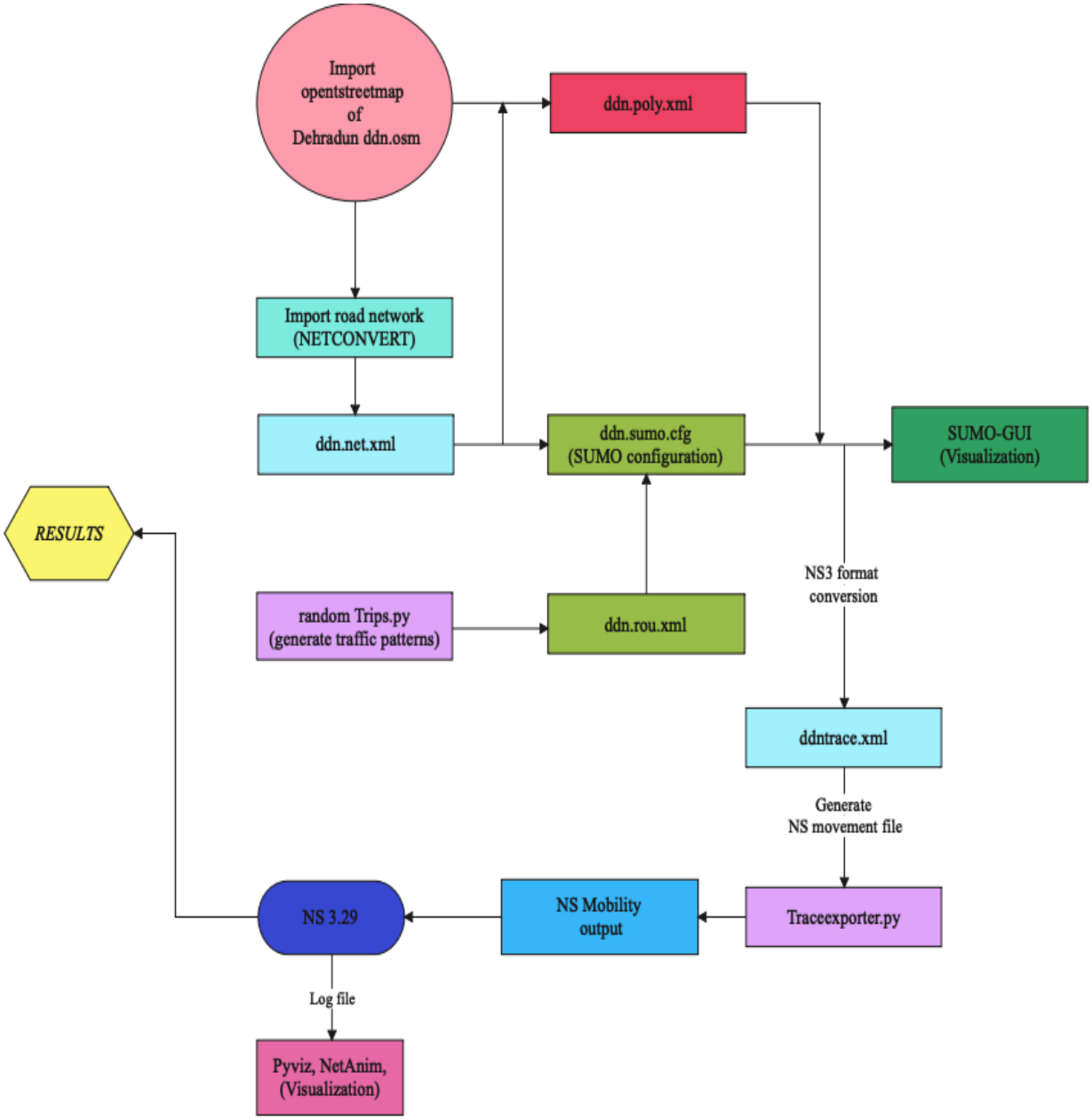

Figure 2: Designed and proposed framework for simulation experiments

The proposed framework is illustrated in figure 1 illustrates. The same framework has been used to perform all the research simulation tests. The designed and proposed framework was deployed for VANET simulation tests and is performed on above mentioned HP workstation. The proposed framework shows that only open-source tools such as Ubuntu 16.04 operating system [3] is used to setup the VANET simulation. Simulation of Urban Mobility (SUMO 0.32) [4] is used for traffic simulations and NS-3.29 is used for setting up network simulations [5] as presented in the designed framework. The real city scenario is deployed by importing Dehradun map through www.OpenStreetMap.org [6] for a realistic city traffic scenario. As shown in framework it is used for the SUMO network by converting it for real traffic simulations.

The imported OSM map is converted through the netconvert command: “netconvert --osm-ddn.osm –o ddn.net.xml”. Then randonTrips.py is used for adding the desired trip and routing in the network through the python scripts. This random trip script randomTrips.py applied through the command: “py randomTrips.py –n ddn.net.xml -r ddn.rou.xml –e 50 –l –e” to generate the route, and this generates an automatic file with extension .rou that was named as ddn.rou.xml. This completes the research simulation process at this stage. The route of the vehicle is defined as a set of edges. The separate file for the trip is also generated with the departure and end node. Next, run the network using SUMO configuration file ddn.sumo.cfg. This generates the traffic flow and road map for the real city scenario imported from opensteetmap.org. The road map generated is shown in figure 2. The last step is python script execution through “$./waf --run ddn.py –visualize” command at NS-3.29 shell prompt and netanim-module.h is included as a header file for network animator in NS-3.29.

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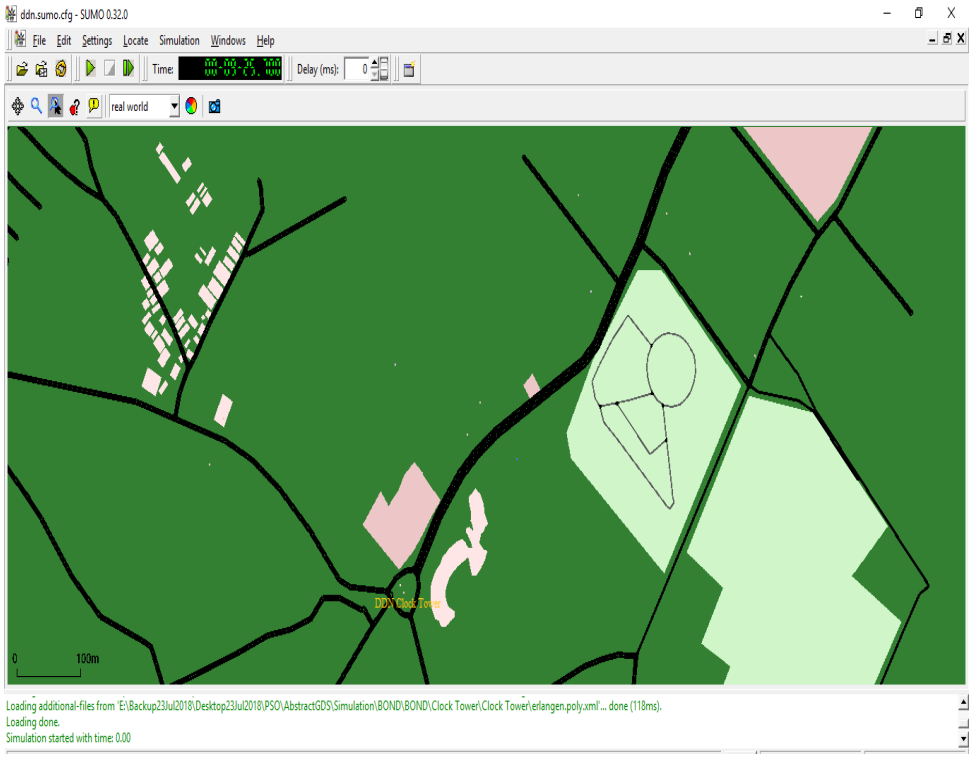

Figure 3: Dehradun city map converted from OSM

The same methodology is used in many other research works to predict the routing issues in VANET using swarm intelligence techniques and its validations. However, other methods are also available to perform the simulation test but the proposed framework provides a waterfall approach to implement the simulation tests in VANET.

4. Simulators Proposed for VANET Implementation

Many network simulators are already available to implement VANET research experiments. Some proprietary VANET simulators such as QualNet, Carisma, Daimler-Chrysler, OPNET, TSIS-CORSIM, Paramics, and VISSIM [7]. These closed source tools are not available to those who are not associated with these projects. Hence, researchers in academia are dependent on only open-source software tools for all the experimental works. The VANET simulation software can be classified into three distinguished categories: Standard Network simulator, VANET Simulator, and Mobility Generator, as illustrated in figure 3.

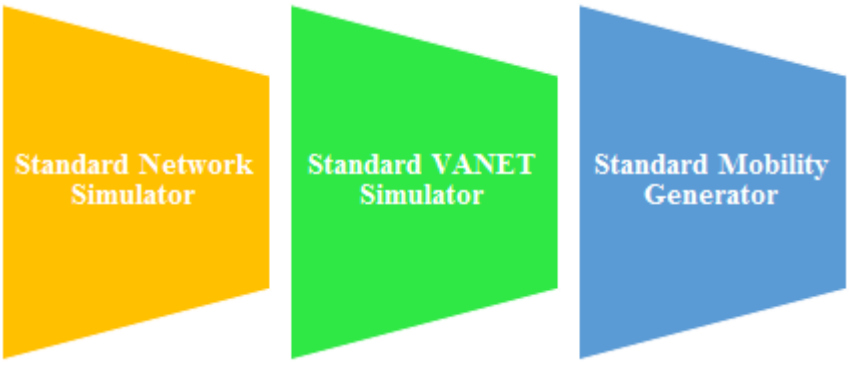

Figure 4: Types of VANET Simulators

Vehicular mobility generators provide real city road network traces as input for the network simulator. It includes vehicle speed, road model, and increase/decrease of vehicle counts. Some of the most popular open-source mobility generator tools are MOVE, STRAW CityMob, SUMO, FreeSim, VanetMobiSim, and NETstream [8].

Standard network simulators like NETSIM and NS are used for Mobile Ad hoc Network simulations, but VANET's mobility generator extension can also be used for VANET simulations. These are GTNetS, SNS, GloMoSim, and NS2 [9]. Network simulation and traffic simulation can be performed using VANET simulators such as VENTOS, VANETsim, GrooveNet, TraNS, MobiREAL, and NCTUns. Now Veins is also getting

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popularity. It is an open-source simulator designed for VANET. It is the integration of SUMO and OMNET++ [10]. But none of the VANET simulators is best suited for all types of simulation tests. VANET simulation depends on various scenarios that cannot be verified through any of the above-discussed tools. So the designed framework in this research is used to perform the simulation test on a real city scenario. The performance analysis and measurement of the average throughput using the Ad Hoc On-Demand Distance Vector (AODV) routing protocol are performed to validate the designed framework.

5. Simulation Based on Proposed Methodology

This section illustrates the results of the simulation tests performed based on the proposed framework. Table 1 specifies the properties of the simulation parameters. In this research work, the objective is to evaluate the designed framework so, the main performance metrics is considered for validation [11]. This section presents the result obtained through this performance metric, i.e. average throughput. The others will be taken in future work of this research work. The simulation was performed for three VANET scenarios. The first is the sparse network, the second is the dense network, and the third is for the real city traffic scenario imported from osm. The above-discussed framework is deployed to test the Ad hoc On-demand Distance Vector (AODV) routing protocol to verify the performance of AODV on selected traffic environments. The comparing of various performance metrics is not in the scope of this research work. Hence, the methodology and framework developed for presented simulation work is easier to perform in VANET using specified open-source tools [12]. The data considered to calculate average throughput is in kbps for AODV protocol is as specified in table 2 and performance analysis shown in figure 4.

Table 1: Simulation Parameters for the proposed framework

PARAMETERS	DETAILS WITH SPECIFICATION
Operating System	Open Source OS UBUNTU 16.04
Network Simulator	Open Source Simulator NS 3.26
Traffic Simulator	Open Source Simulator SUMO 0.32
Realistic City Traffic Map	Open Street Map (Dehradun City)
Mobility Model	Manhattan Mobility
Transmission range of network	150 m to 200 m only
Data Packets size	Data packets of 200 bytes only
Intervals	0.2 seconds
Data rate	2 Mbps only
Protocol	802.11p MAC layer
Speed	Up to 80 km/h only (as per the speed limit of the city)

Table 2: Throughput results captured through simulation

Number of Vehicles	Average Throughput (kbps)		
	Sparse Network	Dense Network	DDN Network
100	200	140	90
200	160	125	100
300	140	115	110
400	130	100	90
500	125	110	95

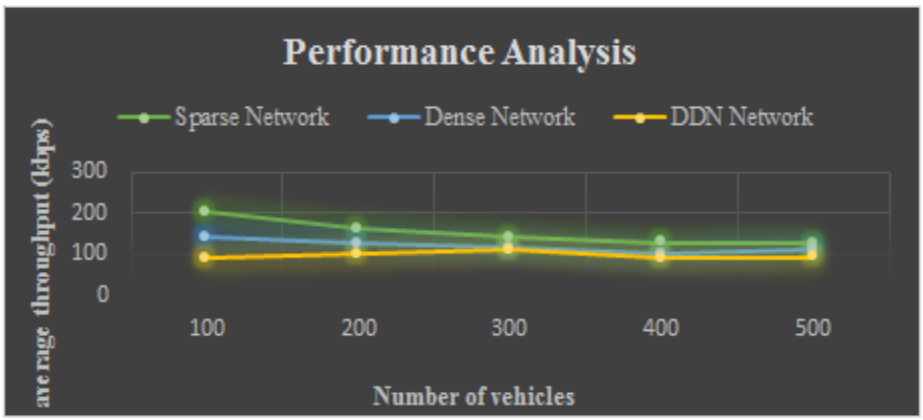

Figure 5: Performance analysis of the results captured through simulation test

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The presented work is not focusing on the performance issues of routing protocols. Instead, this work presents the framework to perform and evaluate the performance of AODV routing algorithm. The simulations performed in VANET scenarios through open source tools like Ubuntu, SUMO, NS3, OSM, and python. However, it can be concluded from the above analysis that AODV performed superior in sparse networks, and the performance is least in real city scenarios. The same can be used for further testing of other routing protocols with different performance metrics like transmission time, packet delivery ration, network delay, packet loss etc.

6. CONCLUSION

This paper has presented some of the primary open-source software tools widely accepted by the research community for realistic simulation tests. The VANET has emerged as a dynamic platform to perform simulation tests and verify the results based on various parameters, including routing protocols. The chapter focuses on developing the new optimized methodology for testing VANET simulations and is discussed in this paper. It has been concluded that the community would surely get results faster and easier by adopting this methodology for research. The same has been demonstrated in this paper by showing AODV routing protocol performance analysis of average throughput. In the future work of this research paper, the same methodology and framework will be deployed to verify the simulation performance analysis of Swarm Intelligence-based routing algorithms. Hence, it can be confidently stated that the open-source VANET simulation tools are a boon to the research community.

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PACKAGING STRATEGY FOR THE SUCCESS

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ABSTRACT
Effective packaging is an essential part of any global strategy for international success. Packaging means container wrapper or any other means for packing goods. In older day retailing was larger in offline but in E-commerce importance of packaging really gone up. In E-commerce everything is virtual, digital marketing, digital payment. The first physical interaction when you receive the delivery of goods. Receiving and unboxing the product is the first physical experience customer has with the brand as we all know first impression is the last impression. So the first impression has to be good. In E-Commerce packet goes through various process and multiple hands before it reaches customer, hence there are high chances of damage as well as chance of theft. Packaging can be described as one of the important factors or keys to success of effective marketing globally. The paper focuses on the impact of packaging on E-commerce, to become a global market leader and explains how packaging can protects the product, differentiates the product from its competitors, attract buyers, keep products safe and promotes the product in international boundaries.

Keywords: E-commerce, Packaging, Global marketing, strategy.

1. INTRODUCTION

Good packaging ensures the safe delivery of goods. According to the Steve jobs "Packaging can be theatre it can create story. In E-commerce everything is virtual. when we purchase online product the first, we see product packet. If product packaging in not good then the first impression of the product is not good then the image of company also spoiled in our mind. Thus, packaging also affect company brand loyalty. But when we go into a shop, we never come across the packaging first. We feel or experience the product first .and In E commerce We interact with package first then the product .so packaging again a touchpoint for us. In E-commerce product reaches customer from various hand. So, there are chance of damage as well as chance of theft. Packaging also impact pricing. product pricing includes packaging cost, handling cost, and so many cost .so it also impacts pricing of the product. With the growth of commerce on the internet, people can shop online 24 hours .so packaging is very important because packaging gives all the necessary information about the product which attract the customer to buy that product. E-commerce channel have changed the operation and business strategies of traditional company.

The ministry of commerce and industry has suggested e-commerce companies to gradually reduce the use of single -use plastic in the packaging of product sold through their platform. An official gave this information. The department for promotion of industrial and internal trade has also asked these companies to develop sustainable and eco-friendly packaging material. This will help in reducing the use of plastic in India. There are several variables that can contribute to effective packaging.

2. RESEARCH METHODOLOGY

2.1 Objectives of the Study

- To analyse the importance of effective packaging in international market.
- To study the impact of packaging on the 4p's of Marketing.
- To Know The purposes of packaging in E-commerce

2.2 Research Design

This research paper adopts a descriptive study design to analyze the growth and trends of FDI inflows in India and its contribution to the Indian economy.

2.3 Data Collection Method & Sources

Data Collection Method: Secondary data are used to design the Descriptive method of research.

Sources of Data Collection: The data is collected from available articles, published research, magazines, published journals, different websites, different published reports, etc.

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3. DISCUSSION

3.1 To Analyse the Importance of Effective Packaging in International Market: Effective packaging play significant role of product in the international market.

- **Differentiation:** Effective packaging can differentiate a product from its international market. Packaging design help to convey important information regarding product quality, feature, and benefits, and can help to create strong brand identity. Effective packaging ensures more profit as compared to competitor.
- **Protection of Product:** One of the main purposes of packaging is to protect the product during transportation and storage. Effective packaging can prevent damage and ensure that the product arrives at its destination in good condition.
- **Branding and Marketing:** Packaging is an important aspect of branding and marketing. Effective packaging can help differentiate a product from its competitor, catch the attention of potential customers, and communicate the product benefit and feature.
- **Compliance with regulations:** Packaging regulation vary from country to country. Effective packaging must comply with local regulations to avoid delays in customs and to ensure that the product is safe for consumers.
- **Cost-Effectiveness:** Effective packaging can reduce transportation costs by optimizing the use of space and minimize the risk of damage to the product. This can translate to cost savings for the manufacture and the consumer.
- **Cultural Consideration:** Effective packaging should also consider cultural differences and preference in different markets. For example, the packaging, the packaging for a product sold in Muslim country may need to be halal-certified, while the packaging for a product sold in Japan may need to be designed with minimalist aesthetics in mind.

In simple way effective packaging is crucial for the success of a product in the international market. It can protect the product, enhance branding and marketing efforts, ensure compliance with regulation, be cost - effective and consider cultural consideration.

3.2To Know the Purposes of Packaging in E-Commerce: -Good packaging ensures the safe delivery of good and product label give necessary information about the product. packaging is the mirror of a products and a brand soul. The main purposes of packaging in E-Commerce are as follow.

- **Brand Reputation:** packaging plays an important role in the E-commerce industry; packaging can use it as a tool to rapidly enhance the customer experience. According to a survey conducted by smithers peer survey ,58% of consumers admitted that packaging damage prevents them from buying a product from the same seller again. A poor user experience can lead a customer to leave the brand or have a negative opinion about the company and brand.
- **Safety:** No one like flimsy packaging it cannot tolerate road friction or wind turbulences. packaging plays a major role in protecting the product once it reaches the customers from the warehouse. The packaging of the product should be such that it can tolerate minor wear and tear without affecting the product. Thus, if primary or secondary packaging is not adequate, it may lead to packaging tempering and worse, damage to the product, which will affect the customer experience and ultimately reduce sales.
- **Help in reducing company costs:** good packaging help to company reducing costs. Good packaging ensures that product is not damaged during shipping which reduces the chances of customer sending the product back and additional cost of resending the returned product. company can avoid such additional costs by investing in packaging.
- **Helps to build a good relationship with customers:** if a product is well -packaged, it has a lasting impact on the customer and can increase customer loyalty as well as customer retention.it also creates a good impression of brand on the customers and help retaining the customer.
- **Increase in return rate:** when company are selling food products or electronics products than if company want to have repeat business, it is important that you do not neglect to consider the assumption that your packaging has on the end user. This is true for both retail setting, your sharp packaging has already done the job of garnering the right attention and ensuring sales. For online shopping, a sale is first completed and

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several days pass for you packaging to appear to the customer. As such it is essential that you consider both how the product reaches the customer and the unboxing experience.

- **Building brand identity:** proper packaging creates good brand images in customer mind. Proper packaging help creating a strong brand identity. A distinctive design coupled with high quality printing and packaging materials that reflect brand's imagery and positioning will help you connect with the customer and differentiate of brand.
- **Reduction in dispatch time:** Most of the seller don't realize the importance of packaging in E-Commerce. Delayed delivery will always annoy customers. Timely delivery of the product can be ensured when the pre shipping process is done in a proper manner. This also include product packaging. If it takes too long to pack and sell your products, it shows slow down the delivery process. The company should have the ability to do product packaging in a systematic manner. Ensuring prompt delivery helps in retaining loyal customer.

The importance of E-commerce has highlighted quite clearly in many facts and figure derived from numerous studies and research conducted over the years. With the explosion in E-commerce -especially through the lockdown of 2020-2021-there has been an increased focus on packaging by knowledgeable online business.

3.3 To study the impact of packaging on the 4p's of the marketing: The packaging touches each of the 4p's in its own way and therefore should be considered when deciding about each of the 4 p's (Product, Price, Place, Promotion).

PRICE: Price is an important component of 4 P's and should be seriously considered while bringing a product to market .one component of pricing a product is how should be spent on packaging. If you plan to make and sell a high-end product, perhaps make a little more cost include of product packaging in your product. An elegant package to support your upscale brand identity, Conversely, if you are selling a product that will product include cost of packaging plus handling cost, logistic cost and so many cost. thus, product packaging also impacts on product pricing, if packaging cost is high that product pricing will be also high.

PRODUCT: Product packaging also effect on product. Before seeing the product customer always see its packaging, if the packaging of the product is not good than there is huge chance that the buyer changes his mind and don't buy the product, while in case of excellent packaging, the buyer loves its appearance and this thing will give him the confidence to buy the product. There are some other reasons also, but the main reason is that packaging affect sales of the product. A product packaging communicates many things, from what the product can do for the consumer, and creates company values. Right packaging design can attract the consumer's eye and make the product stand out next to a rack of the competitor's product.

PLACE: When developing a product, it is important to think about where the product is going to be sold. The product can be sold from the online store or retail store or both.so it is important proper packaging design used. The packaging you choose should the product and promote efficient shipping during transportation. In modern time people gives more attention on product packaging. when seller launch new product in market than packaging attract customer for buying the product. Thus, packaging impact launching and commercializing the product. packaging affect 4 p's throughout a product life cycle, so it's important to choose a package that supports your sales and business plan.

PROMOTION: Packaging effect on sales also. An attractive packaging attracts the customer for buy more product from same seller. Now different online sites (flipkart, amazon, Myntra,) give more attention on product packaging. If packaging is not proper than product images in customer is not good .so for making brand loyalty it is necessary that product packaging should be proper. Packaging as a proactive strategy to increase sales. packaging plays an important functional role for protecting product during transportation. When customer open the package if the product is damage when the consumer receives it, then the perception of the consumer toward company will also be damaged. Thus, packaging play an important role for promotion. If packaging is good than product image of company in the eyes of consumer will also be good and customer purchase again those products. The packaging should be easy to open, and the packaging design should make it easy to remove the product from the package, as that makes for a better customer experience.

Thus, packaging effect all 4p's of marketing. In E-commerce everything is on online platform. So product packaging plays an important role for making brand loyalty toward E-commerce company. A good packaging ensures safety of product and also plays a vital role in attracting new potential customers. The packaging is the first thing customer interact with product on online platform. The company should make the packets easy to find, memorable, and user friendly. When a customer unboxing the product, it should evoke a positive emotion response or sentiment.

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4. RESULT

From the study of different research paper and website the author found that now people are influence from social media. people share their own personal experience of unboxing the product on you tube and Instagram and many other social platforms. Now consumer see review before buying the product. So high quality and attractive packaging is required. Different research shows that around 93% consumer are seeing review of product before purchase the product. This is the key reason why packaging is important in E-commerce. Thus, this research paper provides valuable insights into the role of packaging as a global strategy leader and offer practical guidance for companies seeking to develop successful global packaging strategies.

5. CONCLUSION

After the coronavirus pandemic, the E-commerce industry are grown very fastly. In 2020-2021 during pandemic Number of user increase in E-commerce industry. In the US, the largest E-commerce market, more than 80% of the people prefer to buy online. E-commerce selling gives an awesome opportunity for people who are starting with small businesses and want to sell the product throughout the world. many of the person make fun of some e-commerce industry like jio-mart or any other E-commerce seller a tiny product also packed in big cartoon. And also, many people complain about the experience of product packaging. Because due to the worst packaging product are damage in transit. More than half of the customers have admitted that packaging damage would stop them from purchasing again from the same seller.

Customer generally form an image of a brand and many other perceptions within 7 seconds then it became very hard to change.so it is mandatory that this type of packaging should be chosen to lasting first impression with the customer. A good packaging protects the product from damage during shipping thus minimise the chance of customer returning it. A well package product leaves a lasting impression on the customer. A proper packaging helps in creates a strong brand identity. In E-commerce the product packet goes through various process and multiple hand before it reaches customer.so a strong product packaging is necessary so that product can reach to customer in proper way. Thus, packaging play an important role for E-commerce company for increasing sales and making brand loyalty. Thus, on the basis of this study we can say packaging is a crucial component of any successful global marketing strategy. Effective packaging can help companies establish a strong brand identity, extend and shelf -life of their products, and improve consumer engagement and loyalty.

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THE ROLE OF EDUCATION IN SUSTAINABLE HAPPINESS

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Kamal Institute of Higher Education and Advance Technoogy

ABSTRACT
This research paper delves into the pivotal role of education in promoting sustainable happiness around the globe. Sustainable happiness encompasses individual well-being, societal harmony and environmental stewardship. This paper examines how educational policies including NEP 2020 initiatives and various academic curriculum and practices can contribute to sustainable happiness and also to advance a more equitable, contented and environmentally responsible world. Education plays a crucial role in promoting sustainable happiness by equipping individual with the knowledge, skills and values necessary to lead fulfilling and contented lives while also contributing to the well-being of society and the planet.

Keywords- Sustainability, sustainable happiness, well-being, education, NEP 2020, sustainable development goals.

INTRODUCTION
The concept of Sustainable happiness as defined by O'Brien is "sustainable happiness as the pursuit of happiness that does not exploit other people, the environment, or future generation". Which also brings us to the notion of sustainable development as "development that meets the present without compromising the ability of future generation to meet their own needs"? Bringing sustainability and happiness together within the concept of sustainable happiness holds very significant possibilities for individual, community and global well-being. As we know that education is recognized as having one of the highest long-term returns on investment of all development goals, so, it is the biggest weapon to achieve the path of sustainable happiness for present and future generation as well. The concept of sustainable happiness and education draws our attention towards how human beings pursuits of happiness has adverse and positive impacts, how individual and community behaviors or government policies can have repercussion on people and distant lands or globally in the present and far into the future. In addition, education is at the heart of our efforts to adapt to change and to transform the world within which we live and makes human to take the responsibility of how we pursue our happiness. Hence, education and to link happiness with sustainability shows interdependence on each other.

Education's value in promoting sustainable happiness
Happiness is defined by Veenhoven (2008) as "the overall appreciation of one's life-as-a-whole, in short, how much one likes the life one lives". On the daily bases one has to make countless decisions having various choices, so, in order to pursue sustainable happiness, individual, community or organizations substantial shift in behavior and policies would be required to sustain happiness without exploiting other people, the environment or future generation's needs.

Education stands as a powerful instrument for cultivating sustainable happiness. Educational activities and curricula gives individuals a sense of responsibility and ethical values as well which transcends their ideology and make them reasonable to act without harming other's resources. Nonetheless, education promotes quality education and eradicates the inequalities prevailing in society and the education system as well by providing education to all genders, cultural background and caste or creed. Education has a significant role in bringing respect in people coming from different backgrounds and sense of unity to respect other happiness. The academic curricula incorporate intrinsic value orientation that is associated with higher level of subjective well-being. It is the intrinsic value that makes human species satisfy their inherent psychological needs which personally impacts on their self-acceptance, physical fitness, personal growth, respectable relationship and community involvement. So, individuals who are intrinsically motivated are less materialistic and are inclined to engage environmental friendly behavior as compared to people having extrinsic orientation.

Educational reforms promote quality education to enhance student's lifelong learning, cooperative learning relationship, critical reflexivity and holistic development. "Quality education is about what and how people learn; it's relevance to today's world and global challenges, and its influence on people's choice. Many now agree, quality education for sustainable development reinforces people's sense of responsibility as global citizens and better prepares them for the world they will inherit" (Buckler and Creech 2014 . Once, they become a greater citizen who takes responsibility towards the planet, climate change, environment-friendly, civic and cultural engagement, health, education, community vitality, the world will eventually experience the sustainable happiness and these responsibility, knowledge and awareness can only be imparted through education.

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Harmonizing education through sustainable happiness approach

Several studies have considered education system as a source of social capital, human capital as well as cultural capital. Education brings awareness, transforms their aptitude, knowledge and is recognized as a continuous process of forming whole human beings. Here are some ways in which education contributes to sustainable happiness: Education can help individual to develop self-awareness and emotional intelligence, enabling them to better understand and manage their emotions. This leads to improved mental well-being and resilience in the face of life challenges. Education also fosters problem solving and critical thinking skills, enabling individuals to analyze complex situations, make informed decisions and solve problems effectively. This empowers people to navigate challenges globally or personally and make choices that lead to greater happiness.

Further, social and environmental responsibility is also imparted to individual. Sustainable happiness goes beyond personal well-being and it includes a sense of responsibility towards other and environment. Education can instill values of empathy, compassion and environmental stewardship; can raise awareness about environmental issues thus, encouraging individuals to contribute positively to their communities and the planet.

In addition, education cultivates positive relationship. It teaches interpersonal skills and conflict resolution, helping individuals build and maintain healthy, fulfilling relationships with family, friends and colleagues, which are essential for sustained happiness. Education provides essential life skill, such as financial literacy, time management and communication skill, which are vital for personal well-being and success in various life domains. It aimed to provide global perspectives which broadens individual's perspective by exposing them to diverse cultures, ideas and worldviews. This can lead to greater tolerance, acceptance and a sense of connection with a global community, enhancing overall life satisfaction. It can also guide individuals in exploring and pursuing careers that align with their interest, passions and values, increasing the likelihood of finding meaningful work and long-term job satisfaction consequently improving the productivity of individual and contributing to sustainable economic growth.

Happiness and well-being curriculum in education

Here, a very significant question arises that why do we need happiness curriculum? It is essential to have a happiness classes in education as all children are born and raised differently having different environment and situations. In modern era, children are growing in an environment which are very unstable and inconsistent because of the economy's and society's ongoing change. It is impossible to forecast or imagine how future generations will live or work.

According to the world Happiness Report 2023, India is among the world's least happy nations and ranked 126 out of 136 nations. As reported by happiness index, India's rank was 136 out of 146 nations in 2022 as well. It evens lags behind the countries like China, Nepal, Sri Lanka and Bangladesh.

UN Decade of Education and sustainable development (2005-2014) stated, "…Education for sustainable development is a life-wide and lifelong endeavor which challenges individuals, institutions and societies to view tomorrow as a day that belongs to us all, or it will not belong to anyone".Hence, happiness assessment is significant in itself. Happiness curriculum in educational program can be a new initiative to bring sustainable happiness in children's lives which will ultimately result in happier and emotionally stable adults.

Happiness curriculum is a program that is developed by the Government of NCT, Delhi and was introduced in 2018, for students from nursery to grade 8. Happiness curriculum emphasizes that the purpose of education is to create responsible, mindful and happy individuals who can inclusively build a happy and harmonious society. The curriculum attempts to guide students towards 'exploring, experiencing and expressing happiness in deeper and sustainable form. This will enable the learner to fathom happiness not just within self but also with relationship, society, and to lead happier and meaningful life, encompassing humanity as well.

Happiness curriculum promotes journey to sustainable happiness through engagement in reflective and meaningful activities and stories. Happiness classes in education system enables the learners to reflect their feelings, thoughts and behaviors, action and their impact on themselves, family, society around them and the natural environment as well.

Sustainable Happiness Implications in National Education Policy (NEP) 2020

The National Education policy (NEP) 2020 in outlines several key principles and objective that align with the idea of education's role in fostering sustainable happiness. The policy does not explicitly use the term 'sustainable happiness', however, it places a strong emphasis on inclusive and holistic education that contributes to the overall well-being and individual's entire sense of fulfillment.

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NEP 2020 recognizes that education should go beyond academic excellence and addresses the overall development of an individual by focusing on physical, emotional and mental well-being. Hence, emphasis is placed on holistic or comprehensive development.

The policy, additionally, advocates reduction of academic pressure by shifting away from rote memorization and a reduction in the examination centric-approach. It will help to reduce the stress and pressure associated with exams, thus, fostering enthusiastic engagement in academic curriculum and making them psychologically sound.

Moreover, NEP 202 encourages multilingualism and the preservation of indigenous languages and cultures. This approach fosters a sense of cultural identity and inclusivity, contributing to the well-being of diverse communities. It also promotes cross-national sharing of knowledge by exploring G-20 led initiatives for sharing best practices in education for sustainable happiness, such as mental health awareness, quality education, poverty eradication and economic development , gender equality and social protection programs, besides, identifying opportunities for cross-national collaborations in advancing sustainability and happiness around the globe.

Further, the policy emphasizes the importance of ethical and value-based education. It recognizes that education should instill values of empathy and ethical behavior which is very significant for societal harmony. It also focuses on experiential learning i.e. hands-on and practical learning experiences. Such methods can give a sense of purpose and creativity which are essential components of sustainable happiness.

NEP-2020 Congruity with Sustainable Development Goal-4 (2030) to Restructure and Reorient the Indian Educational system

NEP-2020 reflects commitment to principles and objectives that align with the broader goals of sustainable development. The Education Policy of India 2020 asserted, "This policy proposes the revision of all aspects of the education structure, including its regulation and governance, to create a new system that is aligned with the inspirational goals of 21st-century education, including SDG-4, while building upon India's tradition and value systems".

The focus of SDG-4 is to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all (SDG4.1), hence, the policy promote free primary and secondary education and universal literacy and numeracy having aim of 100 % Gross Enrollment Ratio (GER) in education by 2030.

It also includes Equal access to quality pre-primary education (SDG 4.2) which recognizes the significance of the crucial early stage for the development of their mental faculties by including the previously unaddressed age group of 3-6 years in the school curriculum with three years of Anganwadi or pre-schooling. The policy aims to achieve universal foundational literacy and numeracy by 2025, including marginalized as well as disadvantaged groups.

Moreover, it is aimed to access for all gender to affordable and quality technical, vocational and tertiary education (SDG 4.3) including higher education institutions so, NEP 2020 strives to emphasize on importance of vocational training and internship in schools from class 6, besides, flexible curriculum and multiple exit options and certification for undergraduates.

In addition, it strives to eliminate all forms of discrimination in education (SDG 4.5), thus, NEP concentrates on reintegrating 2 crore out of school children back through an open schooling system, who are not enrolled, brings them into the mainstream.

CONCLUSION

Sustainable happiness is not just important for oneself but it is also crucial for global sustainability. Happiness should be the aim of education and good education should contribute to collective and personal happiness. Education should play an essential role for improving quality of life for present and future generation. The concept of sustainability and happiness are not very well understood by the educators and the learners as well thus, awareness should be circulated for educators and others so that it would also generate interest in them as how to act appropriately that does not exploits other people, the environment and future generations.

Happiness literacy will help them to recognize the relationship with sustainability and happiness, what barriers are there, how we can overcome from that, and how to be responsible towards the environment that we deepened upon. The concept of happiness and sustainability should be introduced within the disciplines at each levels of education. Further, discussion, practices and other initiatives should be initiated to discuss the global and environmental issues and what are the factors that impacts or contributes to sustainable happiness to

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promote sustainable behavior. Thus, education has a greater role to transform and make people responsible to contribute in sustainable happiness and development for a better future, as we believe in "Vasudhaiva Kutumbakam-One Earth, One Family, and One Future".

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COVID-19 DETECTIONFROM CHEST X-RAY IMAGES USING THE LOCAL BINARY PATTERN (LBP)AND GRAY LEVEL CO-OCCURRENCE MATRIX (GLCM) FEATURE EXTRACTION METHODS

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ABSTRACT
COVID-19, which began in December 2019, resulted in a substantial number of human death and financial losses. Medical imageshelps in early diagnosis of COVID-19 and decreasethe risk of death rate. The manual observation of the images is not efficient approach for handling large volumes of radiological imaging data. The detection of COVID-19 from chest X-ray images using a variety of deep learning techniques has been the subject of numerous investigations. This study uses pretrained convolutional neural networks (CNN's) to analyze the feature extraction from the local binary patterns (LBP) and grey level co-occurrence matrix (GLCM) approaches for COVID-19 detection from chest X-ray images. The dataset is consist of 3000 chest X-ray images from various sources that have beensorted into three classes: normal, pneumonia, and COVID-19. The initial steps in preprocessing CXR images include converting color images to grayscale images,resizing the images, adding Gaussian noise , and applying DCNN for image denoising using the sigma 25 function. Thedeeplearningfeatureextraction process for image texture analysis are take place by the consolidationoflocalbinarypattern(LBP)andgraylevelco-occurrencematrix(GLCM)from chest X-ray (CXR) images. We apply GLCM along with LBP over the filter images to generate high dimension information pattern.Confusion matrices and performance parameter findings revealed that the proposed model has greater accuracy of highest accuracy value of 0.9919, PPV of 1.0, , F1 Score of 0.9919, sensitivity of 0.9940 , Specificity of 1.0. The purpose of this work is to provide a summary of the enhanced texture-based features analysis into normal, pneumonia, and COVID19 X-ray images.

Keywords: COVID-19,Grey Level Co-occurrence Matrix (GLCM), Local Binary Pattern (LBP) .

I. INTRODUCTION
The novel coronavirus gained notice on a global scale around the end of 2019. The coronavirus (COVID-19), which has killed more than 800,000 people globally and has been confirmed in over 20 million people, was first discovered in Wuhan, China. [1]. The WHO declared on January 30, 2020, that this epidemic had quickly spread from person to person, making it the most serious public health emergency ever. Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) is the virus that caused this pandemic[2]. A blood test, computed tomography, and chest X-ray images scans are used to diagnose the symptoms of COVID-19, which include cough, fever, lung infections.The real-time polymerase chain reaction (RT-PCR) test is frequently used for diagnosis.

It has the shortcomings of providing slow results and also give few times in conclusive a negative outcomes. If the COVID-19 patients are not diagnosed correctly and quickly, this could cause them to suffer from the permanent lung damage. In order to provide COVID-19 patients the best chance of survival, early accurate diagnosis and treatment are required by the doctors/radiologists.

Recently numerous studies have been conducted on detecting COVID-19 from tomography and X-ray images utilizing image processing and artificial intelligence approaches. Some researchers used machine learning classifiers such as Support Vector Machine (SVM), K-Nearest Neighbor (KNN) and random forests , for detecting COVID-19.

This study focuses on determining whether or not chest X-ray images are COVID-19-infected using machine learning

Techniques.Some researchers used deep learningclassifiers for detecting COVID-19.

Ohata et al. [3] implemented several classifiers on 194 X-ray images for healthy patients and the 194 number of images of COVID-19 infected patients. To extract the image's features, they used CNNs trained model on ImageNet using transfer learning. Following, CNNs are integrated with KNN, Naive Bayes, Random Forest, MLP, and SVM. They employed the MobileNet with SVM classifier (linear kernel) to achieve the greatest accuracy of 98.5%.

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Hasoon et al. [4] apply feature extractors with Local Binary Pattern (LBP), Gradient Histogram, and Haralick texture features after preprocessing of the COVID-19 dataset. The classification methods such as KNN and SVM were implemented. The LBP-KNN model demonstrated accuracy performance on average of 98.66%..

Alam et al. [5] utilized HOG and CNN as feature extractors from X-ray images before fusing them. They trained a two-class (normal, COVID-19) VGG classification network using the fused features. On a dataset of 5090 X-ray pictures, including 1979 COVID-19 positive images, they obtained a 98.36% accuracy score using five fold cross-validation.

Khuzani et al. [6] extracted features using a variety of methods, including Texture, FFT, Wavelet, GLCM, and GLDM. In the study, a multilayer network was built with a final classifier and two hidden layers with 128 and 16 neurons each. The COVID-19, pneumonia, and normal classifications have a 94% accuracy rate.

Alquran et al. [7] employs machine learning techniques to extract texture characteristics from LBP, Gabor Filter, and Grey Level Co-Occurrence Matrix (GLCM) in order to detect COVID-19. The lung X-ray from 1929 underwent analysis. For classification, SVM, RF, KNN, ANN, and Ensemble were employed. The Ensemble classifier's greatest accuracy was observed to be 93.1%.

Chan et al. [8] apply Binary Patterns (LBP) technique for features extraction in order to extract texture from the images. This method labels the pixels in a picture by applying a threshold to the area around each pixel.

Humeau et al. [9] explicit that combination of structural and statistical methods for texture analysis outcome a good performance. To clarify, the structural method depicts texture using patterns that look regular and are consistently situated at the surface. Statistical methods, on the other hand, express texture using non-absolute qualities and randomly distributed components. Statistical methods, then, represent texture that appears irregular and is distributed unevenly over the surface.

Medhi et al.[10] used X-ray pictures for feature extraction and segmentation. After that, COVID-19 was positively and usually categorized using CNN.

Barstugan et al.[11] employ Grey-Level Co occurrence Matrix (GLCM), Local Directional Patterns (LDP), Grey-Level Run Length Matrix (GLRLM), Grey-Level Size Zone Matrix (GLSZM), and Discrete Wavelet Transform (DWT) are four different feature extraction approaches that were used to classify X-ray images for the diagnosis of COVID-19. SVM was used to categorize the acquired characteristics. Two-fold, four-fold, and ten-fold cross-validation procedures were employed during the classification process.

Amini et al. [12] identify the severe, moderate, and mild severity of COVID-19 from 956 CT images. They made use of a number of quantitative first texture features and second-order statistical features.

The first-order tissue features taken from the histogram are variance, kurtosis, and skewness. The quadratic texture feature extraction methods include GLCM, GLRLM, and GLSZM. With the help of random forest (RF), it was classified with 90.95% accuracy.

According to the aforementioned studies, deep learning-based coronavirus identification on radiological images has the potential to reduce some of the load on radiologists. In order to classify chest X-ray images using deep learning, this research study examines the LBP and GLCM extensively utilized texture feature extraction approaches.

The paper study is organized as follows: Section two describes the data preprocessing andmethods used in this study . In Section three the experimental results are described. Finally, the conclusion of this study is presented in Section four.

II. MATERIAL AND METHOD

A. Dataset

A dataset of 3000 high-quality Chest X-ray images of normal, pneumonia and COVID19 images is employed from the Kaggle radiography database that is created by tawsifur rahman[13]. https:/ /www. kaggle. Com /datasets/tawsifurrahman/covid19-radiography-database

B. Data Preprocessing

The collected images are stored in 299×299 pixels Portable Network Graphics (PNG) file format with resolution of. To ensure consistency in the study of feature extraction, images are preprocessed and disseminated in 128x128 sizes. For our proposed model, all of the photos have been normalized based on training and testing. Fig. 1 displays the three classes of original chest X-ray images for normal, COVID-19, and viral pneumonia.

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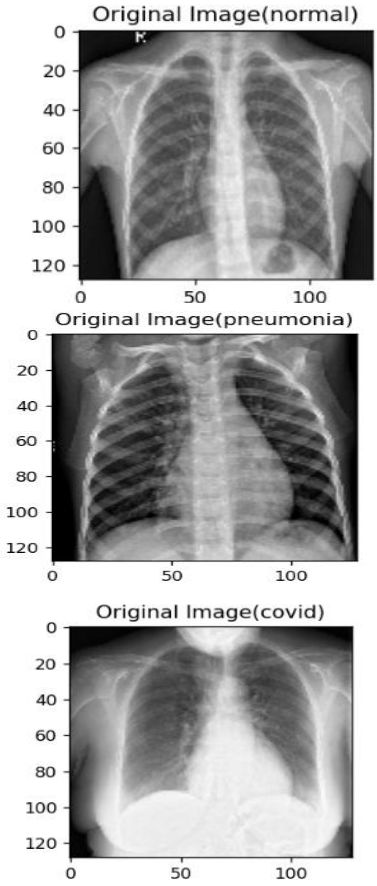
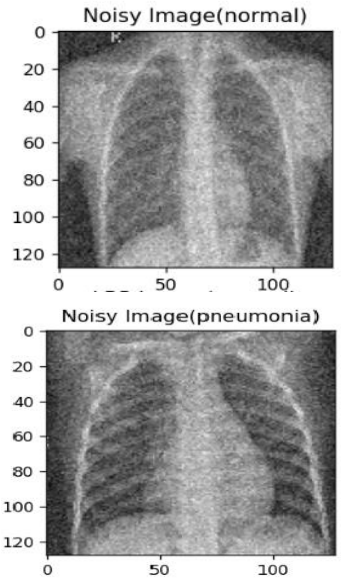


Fig. 1. Example of Input X-Ray Images used in this study

C. Addition of Gaussian noise using Deep learning method

During acquisition and transmission, images can become tainted by additive noise. There are many different kinds of noise, such as impulse noise, salt-and-pepper noise, and speckle noise, but Gaussian noise is the one that occurs most frequently in digital imaging. Gaussian noise is completely described by second order statistics, which are relatively easy to measure. When gaussian random variables are combined, the outcome is gaussian (thus you can use the same statistics after the addition as you could before)..The noise has been added to simulate the measurement noise. Gaussian noise is random noise that has Gaussian distribution, sharpen images without changing the resolution. The model can become more robust by adding noise which reduce overfitting to certain level and enhances the model's capacity to generalize to fresh data.

Fig. 2 shows the addition Gaussian noise without clipping to images using tensor with keras libraries to simulate noise for testing denoising for training data for deep learning models.



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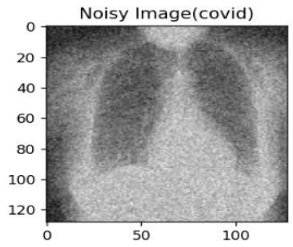

Fig. 2 Images obtained by adding Gaussian Noisy Images-(Normal, Pneumonia, COVID-19)

D. Denoising of noise using DnCNN method

Denoising is the advanced technique that are highly effective in removing noise from images while preserving important features. Deep Convolutional Neural Network for Image Denoising (DnCNN), architecture is created especially for image denoising tasks. Fig. 3 shows the architecture of DnCNN networks that makes use of residual learning, in which the network learns to guess the residual noise instead of directly estimating the clean image [14] . The use of deep learning's ability is to efficiently eliminate noise from images while retaining the underlying structures and features.

The concise for DnCNN, architecture are

a) **Input Layer**

Put Nosy image as input.

b) **Convolutional layers**

The network initially begin with a sequence of convolutional layers that train to extract features from the input image. These layers often have modest filter sizes and employ rectified linear unit (ReLU) activations to innovate non-linearity.

i. The dimension of convolutional filters is set to be 3×3 and all pooling layers are eliminated. Consequently the receptive field of DnCNN with depth of d should be (2d+1)(2d+1).

ii. The receptive field size of DnCNN is set to 35×35 with the corresponding depth of 17 for Gaussian denoising at a specific noise level. The other extensive image denoising tasks, a larger receptive field is adopted by setting the depth to be 20.

c) **Residual blocks**

DnCNN made up of numerous residual blocks. There are two or more convolutional layers with ReLU activations in each residual block. In order for the network to learn the residual noise, each residual block's output is created by adding its input to its output.

The residual learning formulation mapping is used to train a residual mapping

$$x = y\text{-}R(y).\ \text{Thus, } R(y) \text{ is learning residual.}$$

The following are three types of layers used in DnCNN, architectur

(i) Conv+ReLU

The first layer has 64 filters of size 3×3×c to create 64 feature maps. c = 1 for grayscale image and c = 3 for a color image.

(ii) Conv+BN+ReLU

The second layers to (D-1), 64 filters of size 3×3×64 are utilized, and batch normalization(BN) layers are added between convolution and ReLU.They aid in enhancing the network's denoising capabilities and stabilising the training process.

(iii) Conv

The last layer uses c filters of size 3×3×64 are in order to reconstruct the output.

d) Output layer

The final output layer creates the denoised image. A single convolutional layer without an activation function often makes up such a system. DnCNN can gradually isolate picture structure from the noisy observation through the hidden layers by combining convolution with ReLU. The number of residual blocks, the number of filters in each layer, and another architectural information can change depending on the particular implementation or modifications of DnCNN.

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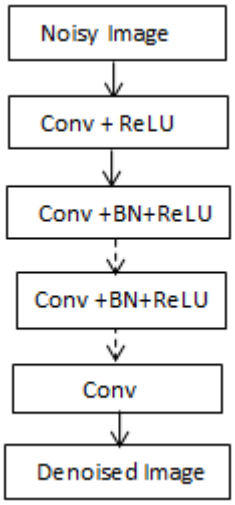

Fig. 3. DnCNN Network Architecture

DnCNN is typically trained using a suitable loss function, such as mean squared error or perceptual loss, using a large dataset of noisy and clean picture pairs. As a result, the network can learn to reduce the discrepancy between the expected residual noise and the clean images from the real world.

Image denoising fundamental goal is to reduce additive noise without compromising the image's attributes because noisy images are problematic for machine vision applications. The DnCNN model with sigma 25 function is used for denoising the images . The main focus on preprocessing part to reduce the impact of Gaussian noise and clean the images in the hidden layers.

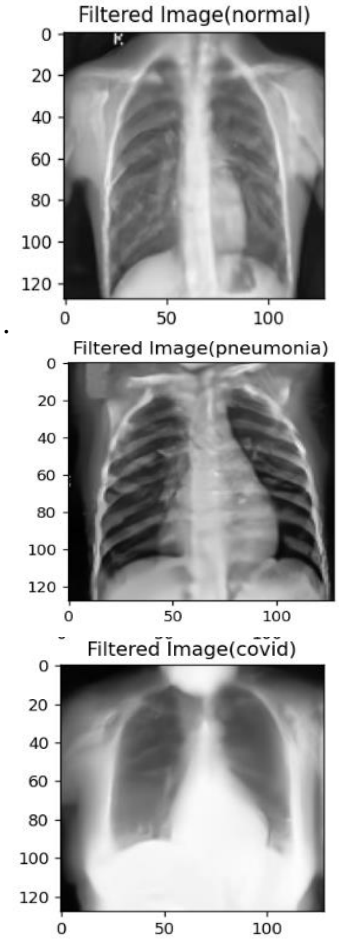

Fig.4. Filtered Images (Normal, Pneumonia, COVID-19)

Fig. 4 illustrates how the filtered X-ray images decrease these sounds while keeping the image's properties and efficiently smoothing consistent pixel intensity areas while preserving important detail information of the image.

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E. Feature Extraction by LBP and GLCM

Feature extraction is a important process that involves turning of unprocessed data into a collection of representative features that capture the vital facts for a certain activity.The previously processed and denoised images are used to extract features. Grey Level Co-occurrence Matrix (GLCM) and Local Binary Patterns (LBP) are two popular techniques for extracting features from images. GLCM is used for texture-based feature extraction in image analysis such as contrast, entropy, variance, and others. LBP is used in computer vision task such as texture analysis , object and image recognition. These features are helpful in identifying the structural and textural characteristics of COVID-19 images.

a) **Local Binary Patterns (LBP)**

The Local Binary Patterns (LBP) operator is a texture descriptor that is frequently used in literature in various computer vision applications including face recognition, texture classification, and object detection because of its effectiveness in defining local texture patterns, simplicity, speed of computation, and resistance to variations in illumination [15]. By calculating differences between nearby pixels, the LBP operator generates a local representation of textured pictures. An LBP code is generated for each image spatial position by taking into account the neighbourhood surrounding each pixel.By computing the histogram of each LBP code, the feature vector is produced. The multi-resolution approach entails the joining of feature vectors acquired at several scales. The authors also provide a uniformity requirement to enhance the derived features' rotation invariance. Texture Characterization, Robustness to Variations in Illumination, and Computational Efficiency are the key benefits of LBP.

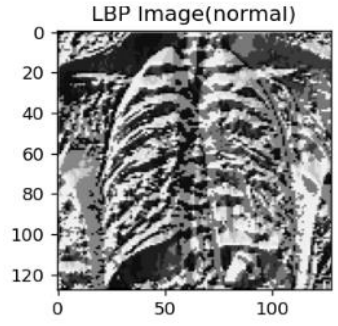
Firstly the dataset of chest X-ray images are resize to 128×128 pixels. The 3×3 window size is used since the virus-infected areas are smaller than chest photos. So the neighbouring pixels are first transformed to binary codes 0 or 1 using the gray value of the center pixel as a threshold, and then all of these codes are combined intoan ordered pattern based on their positions in relation to the centre pixel.

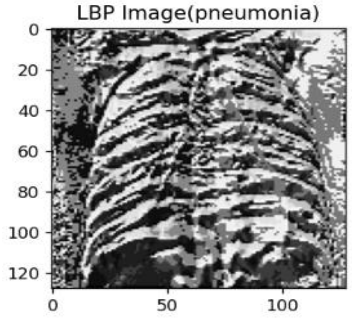
Let $g_p$be the gray value of the center pixel p, and g_i be the gray value of the ith pixel in clockwise order at the 8-neighborhood of pixel p, where i =0,1,…7. Now the LBP code for pixel p is defined as equation (1).

$$\mathrm{LBP}(p) = \sum_{i=0}^{7} 2^i \, s(g_i - g_p) \qquad (1)$$

Where, s(.) is the threshold function that can be defined as equation (4.3).

$$s(t) = \begin{cases} 1, t \geq 0 \\ 0, \text{otherwise} \end{cases} \qquad (2)$$





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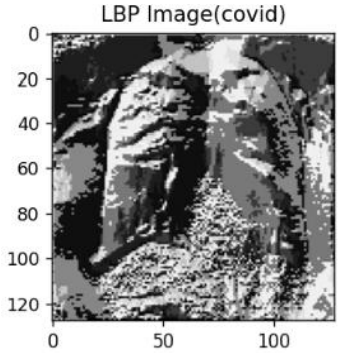

Fig. 5. Feature Images obtained by applying LBP (Normal, Pneumonia, COVID-19)

Figure 5 demonstrates the usage of LBP to produce textural graphics from the same sized photos. LBP pictures have the advantage of being able to capture highly fine-grained information in the image.

b) **Gray-Level Co-occurrence Matrix (GLCM)**

GLCM is a classical texture feature extraction technique used in image processing for measuring the spatial relationships between pixels or image elements based on their intensities levels. GLCM give a statistical features that capture the texture information within an image analysis. The features are extracted from the GLCM matrix by creating the feature vector for each chest X-ray images with in the frequency of occurrence of various combinations of pixel values at different spatial offsets. The primary benefits of GLCM such as texture characterization, spatial information and insensitive to illumination variations help to enhance the performance of the model.

The co-occurrence matrix can be used to compute the texture measurement. It is described as a function of a specific direction and distance, or a function of displacement (dx, dy) along the x and y directions in the image [16]. It is the spatial relation of two pixels. The (i, j) element of the co-occurrence matrix represents the frequency of the gray value at the current position (x, y) when the value at distant point is i for a particular displacement (dx, dy). (x+dx, y+dy) is j.Cdx,dy(i, j) = P(G(x, y) = i and G(x+dx, y+dy) = j)

The 2D GLCM expresses the frequency of appearance of pairs of pixels that are placed at specific angles and distances from one another and that have specific intensities of grey. The two elements that characterize the spatial relationship between pixels define the displacement vector:

$$d = (dx , dy) \quad (3)$$

Generally, the orientation for 2D GLCM is considered for four independent directions which are given in Fig.6.

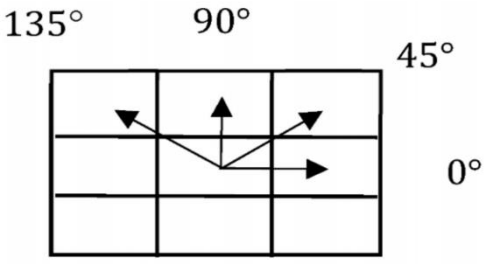

Fig. 6. The four independent directions used to compute the 2D GLCM.

The GLCM evaluates how frequently a pixel with a grey-level (grayscale intensity or level) value of i appears next to neighbouring pixels with a value of j, either horizontally , vertically , or diagonally (bottom left to top right , top left to bottom right) to adjacent pixel values.

The 2D GLCM was extended to 3D GLCM [17] in order to be able to capture information between different slices of a volumetric image. The displacement vector has three components are defined as :

$$d = (dx, dy, dz) \quad (4)$$

The GLCM is a square matrix, with Nq rows and Nq columns (Nq is the number of different pixel values in the input image). The input image can be scaled in order to reduce the number of grey-levels. Generally, the GLCM is built on images that have 8, 16,32 or 64 quantization levels. This is done for providing statistical confidence: the matrix must contain a reasonably non-sparse representation. Additionally, a smaller number of quantization levels implies reducing the computation time.

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The complete image can be used to compute the co-occurrence matrix. However, by computing it in a tiny window while scanning the image, a co-occurrence matrix can be provided for each place. The co-occurrence matrix's size is determined by how many unique intensities are present in the input image. To get the co-occurrence matrix with a reasonable size, requantization of the given image intensity levels into the smaller gray levels is one method.

The six primitive texture features of GLCM are describe under the application of co-occurrence matrix such asangular second moment, energy, contrast, maximum probability, dissimilarity, entropy, homogeneity, variance. It takes more time to calculate if there are many gray levels because the size of the co-occurrence matrix depends on how many there are. Requantization is therefore necessary in order to minimize the amount of gray levels in the input image.

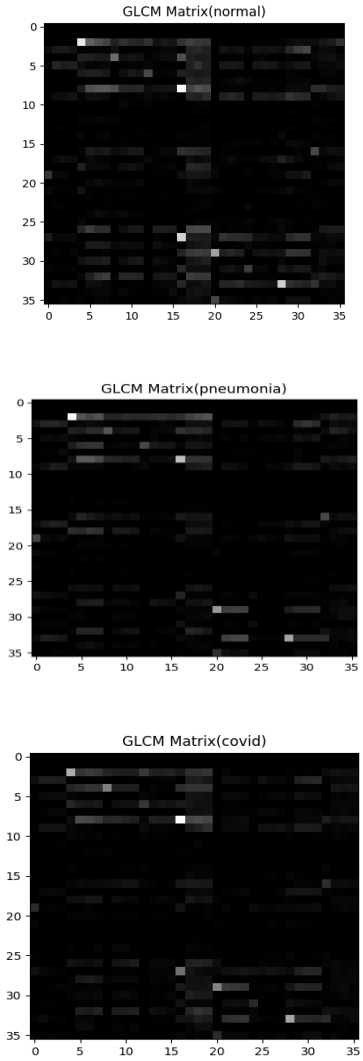

Fig. 7. GLCM Matrix (Normal, Pneumonia, COVID-19)

Fig. 7. GLCM Matrix shows that the highest values of the chest X-ray images are concentrated around the main diagonal. The image doesn't have any severe changes. There are not any stark changes to the image. The intensity of the values changes gently, and the image is quite uniform.The values of the GLCM of are significantly more dispersed. There is some contrast provided by the brick wall itself and the shadows the umbrellas cast on it.

III. EXPERIMENTAL RESULTS

The entire study's code was written in Python 3.10.3 and executed in a Google Co laboratory environment. Tensorflow framework and Keras libraries were used to define the proposed model. The data set of 3000 chest X-ray images are divides into three classes normal, pneumonia, COVID-19 images. In the first step the dataset size is consist of 299×299 Portable Network Graphics (PNG) image files is reduced to 128×128 data size. Then, colour photos are changed to grayscale images and added with Gaussian noise to aid in the evaluation of image filtering.

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In the second step, apply Local Binary Pattern (LBP) transformation to the images for texture representation . Then resulting LBP images are added to Gray-Level Co-occurrence Matrix (GLCM) for creating GLCM matrix as new texture for enhanced images.The performance of classification algorithms is evaluated by comparing target feature estimations and actual values using the confusion matrix.

Fig. 8 shows the Confusion matrix by class 0- Covid-19 , class 1-Normal , and class-3 Pneumonia is employed to visualize their predictive accuracy. Yellow cells indicate the correct prediction values and purple cells shows incorrect prediction values. It is also understood from the confusion matrix that the best result is seen in the detection of COVID-19 The predicted class with the highest probability for each sample is generated using the true positive (TP), true negative (TN), false positive (FP), and false negative (FN) values from the computed confusion matrix. The performance metrics accuracy, sensitivity, specificity, and F_score are used to calculate the experimental results by using the following formulas.

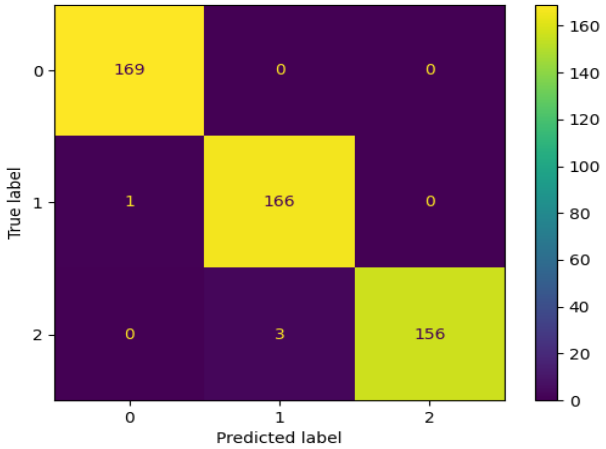

Fig. 8. Confusion matrix of classification Results

0- COVID-19, 1- Normal, 2 -Pneumonia

$$\text{Accuracy} = \frac{TN+TP}{TN+FP+TP+FN} \quad (5)$$

$$\text{PPV} = \frac{TP}{TP+FP} \quad (6)$$

$$\text{F1 Score} = 2 * \frac{\text{Precision}*\text{Recall}}{\text{Precision}+\text{Recall}} \quad (7)$$

$$\text{Sensitivity} = \frac{TP}{TP+FN} \quad (8)$$

The proposed model classification results achieved the maximum accuracy of accuracy value of 0.9919, (Positive Predicted Value) PPV of 1.0, , F1 Score of 0.9919, sensitivity of 0.9940 , Specificity of 1.0 using data set of chest X-ray images. We can compare these parametres values for evaluating the performance with other classification models.

IV. CONCLUSIONS

In this study, the feature extraction of images using Local Binary Bit Pattern and Gray Level Co occurrence Matrix is performed using 3000 Chest X-ray images belonging to the Normal, COVID-19, and Pneumonia classes. First, the 229229 PNG input data is reduced in size to 128128, and then Gaussian noise is added to the input photos to simulate a realistic environment. Finally, images are denoised using DCNN, and filter images are created. The filter pictures are then subjected to LBP feature extraction, and the LBP-created images are sent as inputs to the corresponding GLCM techniques to build GLCM Matrix.The

confusion matrix used to calculate the performance requirements was utilized to classify the chest X-ray images, and the results showed that the proposed model has the highest accuracy ofaccuracy value of 0.9919, PPV of 1.0, F1 Score of 0.9919, sensitivity of 0.9940, and Specificity of 1.0. In the future, we think to apply and evaluate different feature extraction and categorization operators.

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TRAVEL LITERATURE AND INDIAN CONSCIOUSNESS

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ABSTRACT
Travel is an investigation into a city's hidden corners. It broadens the horizon of understanding. The traveler can experience the colors and flavors of the country's cultural consciousness by probing the depths of its outward and internal places. Train travel throughout India offers a unique fusion of tastes that showcase the core Indian sensibility and passion. Indian trains, which pass through many Indian states, are real-world illustrations of various cultural trends. Indian trains are unique in that individuals from many caste, genders, sexes, and cultures can be seen. The best illustrations of cultural diversity may be found in Indian trains and stations. Because railway stories serve as symbols of the enduring hallmark of Indian culture, they are considered cultural travelogues. The nation's Indianness can be precisely located through the railways because its citizens have inexorably left their marks there. A study of railway narratives also sheds light on the issues that hamper national progress such as poverty, bribery, hunger, and corruption.

This paper examines the significance of Indianness in travel narratives of Bishwanath Ghosh. Works include Chai Chai: Places Where You Stop But Never Get Off and Gazing at Neighbours: Travels along the line that Partitioned India. It also examines the significance of Indian railway stations.

Keywords: Travel narratives, Indian Trains, Culture, Railway Stations.

INTRODUCTION
Travel is regarded as a necessary part of daily living. A travel is a natural aspect of life. It affects how one lives. The act of travelling remains an external activity that provides a respite from daily routines and stimulates the traveler's soul and mind. The traveler's knowledge about the country to which he must travel is limited at the start of the voyage. As the journey goes on, the traveler becomes happier as they learn more about the new location. The written account of a person's experiences travelling for leisure is known as travel literature. Travel narratives play a crucial role in disseminating information about the inhabitants, culture, and history of distant and exotic lands. Although there are various reasons why people travel, the desire to leave their own environment and learn about the uncharted is the main driver.

Travel experiences give us a new perspective on life and the way we think. Travelogues serve as a medium for illustrating the nation's dual nature. A clear understanding of a country's genuine identity can be gained through travel. People travel by train from different sections of the nation in significant numbers. The train is the ideal place for people from various backgrounds to connect. They encounter many people along the way, including nomads, wanderers, pilgrims, individuals from many cultures, etc. Indian train stations are among the best places to pass the time and are excellent representations of Indian life. Travelers can identify and explore traditional centers, cultural sites, etc. on train journeys. The experience of taking the train encapsulates that country. Reading the two travel accounts allows one to grasp the true essence of India. It also depicts train stations as a melting pot of many cultures. Biswanath Ghosh's travelogue *Chai Chai: Travels in Places Where You Stop But Never Get Off* and *Gazing at Neighbours: Travels along the line that Partitioned India* explores the seven little towns in India and the disparity between the cultures of the south and north. These two stories reveal the true nature of India.

AIMS AND OBJECTIVES
This research paper aims at fulfilling the following aims and objectives:

1. Understanding the true essence of India.

2. Demonstrating the differences in Indian culture.

3. Analysing the significance of railway stations in India.

HYPOTHESIS
The travelogue combines a monologue with travel, and it is mostly written as the author's monologue. In travelogues, the author describes his or her journey and travel experiences. It is regarded as one of the broadest literary genres and includes a variety of writing about adventure, exploration, and the natural world. This genre reveals the hidden side of a location or its inhabitants, emphasizing the value of travel writing. It makes it possible to comprehend the philosophies and psychological makeup of a certain region's population. A fundamental human desire has always been to travel. India's tourists always travel together in large groups. The

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travelogues for trains are created with the goal of arriving at a certain location and then exploring those locations. These travelogues primarily focus on inside and outside of train travel. This provides a fundamental overview of the country and its culture. Indian travelogues aim to reveal India's true nature.

RESEARCH METHODOLOGY

Travelogue is a form of creative writing in which the narrator's encounter with different places serves as the central subject. Travel is a movement from a familiar place to an unfamiliar place, a new place. By travelling to different places one acquires knowledge about the unfamiliar place. Travelling expands the knowledge of human beings. It not only makes understand about different heritages and cultures closer but also induces social integrity and understanding. The present study discusses the Indianness in the travelogues *Chai, Chai: Travels in Places Where You Stop But Never Get Off* and *Gazing at Neighbours: Travels along the line that Partitioned India* by Biswanath Ghosh. These travelogues help to understand the real nature of India and Indian culture and also describe how the Indian culture is different. Railway narratives are the cultural travelogues as they are indicative of the permanent sign and Indian culture. It also portrays that Indian railway stations are the blending of different cultures. Books, journals, and interviews are used as secondary sources. The study is an analysis of two Indian travelogues. The methodology is used as per the MLA eighth edition. Apart from this, almost all directives and guidelines are followed as per the norms and suggestions relating to the research study. For the present study, a broad range of data is collected. Different types of references and critical books relating to this specific area are collected.

India as Seen by a Travel Writer

India has always been a popular tourist destination. India is well-known for its long-standing customs, diverse cultural history, spirituality, etc. Thus, both Indians and foreigners have long found the nation's cultural consciousness and its conflict with contemporary ambitions to be fascinating topics. While visiting several nations, a traveler might broaden his understanding of that nation's culture. Travelogues of the present day understand the connection between culture and power. Studying railway narratives is the best approach to capture Indianness. Our country has a well-connected rail network that enables travelers to explore its interior. It might be said that Indian train stations perfectly encapsulate the country's dual essence. Any image of a train station reveals its vibrancy and simplicity upon close inspection.

In his book *Chai Chai: Travels in Places Where You Stop But Never Get Off*, Biswanath Ghosh analyzed the character of small towns and portrayed the railway stations as India's transportation network. They established the connection between solitary rural existence and metropolitan life. These tiny villages are only recognized for their enormous railway stations. In each of the towns, he discovered that the train stations served as the hub of activity. He compared the platform to a huge hospital ward. He observed that several homeless folks were sprawled out there. A person's attitudes and beliefs can serve as a window through which one observe the cultural norms and values of a country.

When travelling with Tamils, Bengalis, and Marwaris, Biswanath Ghosh spoke about one of those encounters as well as their eating customs. Unlike the Marwaris, who travel as a large family and usually have a store of food, Bengalis use train trips as an excuse to dine out, he observed. Train rides serve as his precise representation of India as it is in reality. He made a point of comparing the towns in North and South India. The people of southern India live in towns that are cleaner and more orderly.

Railways are considered as National Unity Symbol. Train travels often lead us insights into values, eating habits of different cultures. Eating habits of Marwari, Tamil and Sindhi are discussed in the narrative. Chai is the most prominent word heard on every station. Histories behind these stations, living practices of people of these stations are discussed. In Gazing our Neighbors, Ghosh points out that every house in India especially Delhi has its own story about Partition. He wonders what does that line which divided India and Pakistan (the Radcliff Line) actually looks like. What kind of life is actually being lived there on border line? He mentions that even two days after partition there was no proper demarcation. Lord Mountbatten introduced Radcliff line on 17 August 1947. He mentions that when we imagine border, we imagine conflict, soldiers facing each other, but when we move to villages near the line, it is totally different. Except the line drawn there are so many similarities there. Partition of India in 1947 was an event that has far reaching consequences on India and Pakistan. It was a game of power that lead to Partition. Jawaharlal Nehru plead for Hindus and Jinnah for Muslims. Ghosh choose this sorrowful event for his book "Gazing at neighbours: Travels Along the line that partitioned India." And described about its far reaching consequences. Sir Cyril Radcliffe was one of those people who were given the responsibility of running the pencil without comprehending the effect their line would have on humanity. Before he became arguably the most notorious cartographer in history, Sir Cyril had established a formidable reputation in Britain as a barrister. He was summoned to New Delhi in July 1947 and

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given five weeks to partition India. On its chart, he accordingly drew two lines. The province of West Punjab was created by one of the lines, which was 553 kilometres long. East Bengal was created by the other line, which was 4096 kilometres long. In an event that resulted in over a million deaths and fifteen million people being displaced, they both joined the newly formed nation of Pakistan.

The horror of partition is therefore depicted in this work. It was a dreadful occasion when India was divided. The long-lasting effects of partition are highlighted by Ghosh in his trip book. The writer is reminded of the sorrow that the masses of bearded people who were victims of this partition endured by recalling the awful occurrence that was the partition.

CONCLUSION

In particular, travel essays about railway travels highlight the fundamental Indian spirit through a shared experience. It is possible to follow the development, the culture, and the identity of the country by looking at the railway narratives as seen through the encounters and experiences of the travelers. This makes the country more apparent as a chorus of unique voices than as the implication of a unified viewpoint. Because they are a constant reminder of Indian culture, railway stories are considered cultural travelogues. The national sense in all its nuances was unveiled by Indian railways. The Indian community's foundation is found in respecting the differences in its diversification. Travelling may be a wonderful leveler and it helps to maintain the disparities between people of different caste, gender, culture, and class who travel together, according to an examination of the railway narrative. The theme of multiculturalism was heavily emphasized in these travelogues. These two travelogues are examples of Salad Bowl Theory in action. There are usually several ingredients in a salad bowl. Indian culture is a mash-up of several cultures, much like a salad bowl. India is a country with a diverse culture. When people of different religions, races, ethnicities, and nationalities came together, diverse cultures developed. The ideal example would be a railway station. Platforms and trains each have diverse components. The authors accurately depicted the railway stations as being a hub of varied cultures. The railway stations were portrayed in travelogues as a crossroads of cultures. India's hospitality is renowned around the world for its practise of "Atithi devo bava," which entails treating visitors as gods. Thus, a sense of Indianness has been cultivated. People from remote areas can connect to mainstream India through train travel. The inhabitants of the nation felt a sense of belonging as a result. The travelogues in the railway literature express the Indianness that is present there. Travelling allows one to better comprehend the characteristics that bind a nation together.

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INDIAN TRIBAL HEALTH: A CALL FOR A COMPREHENSIVE HEALTH POLICY

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ABSTRACT
The well-being of any group of people or any living thing is significantly influenced by their state of health. One of the critical components of human advancement, development, and well-being is health. The parts of tribal populations with the worst socioeconomic conditions of the Tribal. There are several problems that people must deal with, with health ranking highly among them. Even though it's one of the most often discussed subjects, it continues to be disregarded. It is more sensitive and prone to serious health difficulties due to the socioeconomic situation as well as inadequate sanitation and health conditions. This essay intends to emphasise the numerous aspects of tribal health and the medical services accessible in the nation's tribal communities. It also seeks to talk about the necessity of health policy to address the priority.

Keywords: Tribal Health, Health Policy, Socioeconomic, Vulnerability.

INTRODUCTION
A necessary condition for human productivity and growth is good health. A strong community serves as the foundation for a society with a strong economy. When it comes to promoting the idea of global health cooperation and helping humanity as a whole, the World Health Organization has done marvels. By the year 2000, "Health for all" will have been achieved.

Figure No. 1. WHO spreading health awareness among tribal communities

Rather than focusing just on the physiological features of the body, the idea of health was more closely correlated with the soundness of the mind and the moral well-being of the individual. Given their inherent fragility among tribal people, it is not surprising that women and children have the most serious health problems. There are several tribes in India, each of which exhibits a unique level of poverty and economic illiteracy.

Figure No. 2. Status of tribal women in India

The sociopolitical structure of the tribal population is distinct but distinctive. Tribal health has a unique but understandable connection to nature and its power. On the one hand, they have a strong attachment to and belief in supernatural powers to treat or cure any type of health-related issues and problems, but on the other hand,

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they have a stronger affinity for the outdoors and nature, which has a direct bearing on the general public's health, especially that of the female population. The indigenous population's lack of understanding and healthcare access further exacerbates the health situation. Despite being a diverse population, tribal people share one thing in common: they have poor health indicators, a higher burden of illness and death, and little to no access to health care services. (Report prepared for the Ministry of Health and Family Welfare by the expert committee on Tribal Health)

Figure No.3. Health infrastructure weakest in tribal areas

Primitive tribal tribes in particular and tribal societies in general are quite susceptible to illness. Additionally, they lack access to fundamental medical services and benefits. the majority of exploited, ignored, and incredibly susceptible to infections due to severe starvation. Their suffering is made worse by poverty, illiteracy, ignorance about illnesses, a bad environment, bad sanitation, a lack of clean water, and blind beliefs. Poor nutritional status, low haemoglobin (anaemia), unclean birth practices, and high maternal death rates are determined to be the main contributors. Average calorie, as well as protein consumption, is found to be below the recommended level for pregnant as well as lactating women. Some of the preventable diseases such as tuberculosis, malaria, gastroenteritis, measles, tetanus, whooping cough, and skin diseases are high among tribals.

LITERATURE REVIEW

(1992 Kshatriya) Health as a parameter for women's development is "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity". Often treated as simply women's reproductive health, many groups argue for a broader definition pertaining to the overall health of women, better expressed as "The health of Women".

(1991 Menon Geeta) Ecological transitions and the changing context of women's work in tribal India. Since the 1972 Conference on Human Environment in Sweden, the issue of gender has been discussed internationally. The connection between gender and the environment is not obvious and direct, examining gender on the basis of roles and responsibilities; access and control; different knowledge; and decision-making brings out the connections. This paper looks at gender from these prisms to discern both the positive and negative effects of gender on environmental resource management.

(2000Basus)Dimensions of Tribal Health in India. The widespread poverty, illiteracy, malnutrition, absence of safe drinking water and sanitary living conditions, poor maternal and child health services and poor coverage of national health and nutritional services are responsible for poor health conditions prevailing among the tribal population in India.

(2016 Kapoor, A.K. & Dhall, M. Poverty) Malnutrition and Biological Dynamics among Tribes of India. Health Science Journal. There was a transition from their early occupation to the present occupation which imbalanced the life of the tribes. The shift from agriculture or hunting-gathering to daily wagers was a severe shock for them which could be the reason for the deterioration of their health.

(2014Verma, Manish & Shah, Alka. Health, Tradition, and Awareness) A Perspective on the Tribal Health Care Practices. Social Research Foundation. All India's scenario of tribal health shows the prevalence of so many Communicable and non-communicable diseases threatening their existence, especially in remote areas. Traditionally, tribal communities depended primarily on hunting, food gathering and forest for natural resources for their livelihood.

RESEARCH METHODOLOGY

The study indicated that traditional Dais home births were conducted in unclean settings, with water-borne infections, various defects, a lack of information regarding how to perform home deliveries, and the use of an unscientific device to cut umbilical cords.

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In remote and tribal places, cord, unqualified medical professionals/quacks, and excessive dosages negatively hurt tribals' health. study conducted at the Warangal Govindarao Pet Mandal

Studies show that tribes have unique health issues, which are mostly influenced by multi-dimensional variables including their environment, challenging terrain, changeable ecology, isolation, illiteracy, deforestation, and superstition.

Some of the issues causing their subpar health practices and status include a lack of infrastructure, accessibility to healthcare facilities, and affordability.

OBJECTIVE

The following are the objectives of the study;

- To understand the severity of health problems and their burden.
- To review the health status of the tribal population.
- To analyse the status of health among the tribal communities.

PROBLEM STATEMENT

Detailed quantitative and qualitative evaluations of the tribals' agricultural and forestry output are conducted. Additionally, it is advised that the government present reasonable purchase costs and make plans for prompt procurement and redistribution of their agricultural and forest products. These actions will not only result in a consistent stream of money but will also inspire them to expand their agricultural endeavours. For post-graduate medical education, which should be need-based particularly in the fields of tuberculosis and malaria (for example, one tuberculosis specialist, one senior tuberculosis laboratory supervisor, and one senior treatment supervisor per million tribals), a ladder-like approach to sponsorship is advised.

CONCLUSION

It is evident that tribal health exists on a continuum of states. Numerous government and non-governmental groups are working to address the indigenous health challenges. Health care is being made available to the most vulnerable people through the application of hosts. The government is dedicated to making improvements. But until members of the communities are involved in the process of healthcare development, the problems and difficulties with this population's health will remain dormant.

At every stage of health operation and implementation, the tribal health care system, particularly their indigenous knowledge, has to be investigated and supported. To address the concerns of health and associated phenomena among the tribes, it is past time for the government to develop and put into effect a comprehensive national health strategy. Despite being in a state of obscurity, tribal medicine and health has the potential to evolve into a more comprehensive medical system in the future, not just in India but also globally. For the large population living within the tribes, there is a need for more thorough training and development, as well as suitable practical methods of scientific research and development to broaden the scope of tribal health and medicine.

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- _Comprehensive_Health_Policy

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PERFORMANCE EVALUATION OF PIG, HIVE AND PYTHON SCRIPT

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ABSTRACT
In the modern business world, it is essential to put in place a system that is able to evaluate significant amounts of data in a very short amount of time. To do this, it is necessary to take into account not only the desires of the purchaser but also their ability to make a purchase with their available funds. Big data includes both structured and unstructured data, as well as information from online retailers like as Amazon and Flip kart. In addition, it includes data from social media platforms. Controlled information organization is necessary for the effective operation of any data management system. Because of the ever-increasing demands put on big data, it is very necessary to do research into the variables that drive the clustering of massive data sets. In this piece, we will go through the research that has been conducted in the field of science in relation to massive data sets and clustering. It has come to everyone's attention that conventional research has only achieved a modest level of success in the field of huge data clustering, which is the area where commercial application focuses on satisfying consumer demand. On the other hand, Hadoop is the platform that is used the majority of the time to do analysis on massive amounts of data. For customer requirement research, however, there is a pressing need for the development of a big data clustering approach that is more capable of scaling, adapting, operating in an effective manner, and achieving high performance. In present research Pig , Hive and Python script are simulated for big data to evaluate the performance.

Keywords: Big data, Clustering, Hadoop, Customer Requirement analysis, Pig, Hive, Python.

[1] INTRODUCTION

1.1 Big Data
The capacity to quickly analyze massive datasets is very necessary in the modern business environment, which moves at a breakneck speed. To do this, it is necessary to take into consideration the requirements of the client in addition to the customer's current state of financial stability. Because of this information, customers may take advantage of extra savings opportunities. Realizing the breadth and depth of the knowledge at one's disposal may also influence the results of commercial endeavors. Big data refers to the collection of information from any and all internet platforms, such as e-mail, Facebook, WhatsApp, Instagram, and Twitter, among others. Every data management system necessitates having data storage that is adequately organized. When talking big data, it is crucial to keep in mind that users need to incorporate all data sources that would offer a comprehensive picture of their organization and examine how the data impacts the way the business is run. This is something that should be kept in mind at all times. When it came to storing and managing the huge quantities of structured data that are necessary for operating a company, the relational database was the gold standard in the past. However, recent events have caused organizations to realize that unstructured data sources, such as data from customers and social media in all of its forms, need to be incorporated in operational data. This realization has been pushed by the recent events.

1.2 Applications of Big Data
There is a plethora of information available nowadays. The information is used by large corporations to expand their operations. The following are some examples of situations in which this analysis might be helpful:

1. Tracking Customer Spending Habit, Shopping Behaviour: When running a large retail operation like Amazon, Wal-Mart, Big Bazar, etc., the management team is tasked with tracking customer spending habits (what products customers buy, what brands they prefer, how often they shop at the store), shopping patterns, and the products that customers like best. The most popular product is identified, and a set production and collection pace is established.

2. Recommendation: Big retail stores may tailor their recommendations to individual customers by keeping tabs on their buying patterns and other preferences. Online retailers like Amazon, Wal-Mart, and Flip kart provide suggestions for related items. They keep tabs on what a consumer is looking for and then make suggestions based on that information.

3. Smart Traffic System: Data about the condition of the traffic of different road, collected through camera kept beside the road, at entry and exit point of the city, GPS device placed in the vehicle (Ola, Uber cab, etc.).

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All such data are analysed and jam-free or less jam way, less time taking ways are recommended. Such a way smart traffic system can be built in the city by Big data analysis. One more profit is fuel consumption can be reduced.

4. Secure Air Traffic System: At various places of flight (like propeller etc) sensors present. These sensors capture data like the speed of flight, moisture, temperature, other environmental condition. Based on such data analysis, an environmental parameter within flight are set up and varied.

5. Auto Driving Car: Big data analysis helps drive a car without human interpretation. In the various spot of car camera, a sensor placed, that gather data like the size of the surrounding car, obstacle, distance from those, etc. These data are being analyzed, then various calculation like how many angles to rotate, what should be speed, when to stop, etc carried out. These calculations help to take action automatically.

6. Virtual Personal Assistant Tool: Big data analysis helps virtual personal assistant tool (like Siri in Apple Device, Cortana in Windows, Google Assistant in Android) to provide the answer of the various question asked by users. This tool tracks the location of the user, their local time, season, other data related to question asked, etc. Analyzing all such data, it provides an answer.

7. Education Sector: Online educational course conducting organization utilize big data to search candidate, interested in that course. If someone searches for YouTube tutorial video on a subject, then online or offline course provider organization on that subject send ad online to that person about their course.

8. Energy Sector: Smart electric meter read consumed power every 15 minutes and sends this read data to the server, where data analyzed and it can be estimated what is the time in a day when the power load is less throughout the city.

1.3 Big data use cases

Businesses of all sizes might potentially gain from using big data for purposes ranging from enhancing the customer experience to doing in-depth studies. A small selection is shown here.

Product Development

Companies like Netflix and P&G utilize big data to anticipate customer needs. Prediction models for future products and services are developed by classifying and modelling the relationship between key qualities and the commercial success of goods and services in the past and the present. P&G's product development and marketing strategies include everything from focus groups and social media to test markets and sneak previews in stores.

Predictive Maintenance

Structured data, such as the equipment's year, make, and model, and unstructured data, including millions of log entries, sensor data, error messages, and engine temperature, may conceal factors that might forecast mechanical problems. By anticipatorily analyzing these warning signs, businesses may reduce the cost of maintenance deployment while increasing the uptime of their components.

Customer Experience

The client acquisition competition has begun. It's easier than ever to get a crystal-clear picture of how customers feel about your business. With the use of big data, you may collect information from many channels (such as social media, websites, and phone calls) to enhance customer service and increase revenue. Start providing targeted promotions, cut down on client attrition, and solve problems ahead of time.

Fraud And Compliance

When it comes to cyber security, you're up against more than just a few lone wolves. Constant change characterizes both the security and compliance environments. By aggregating enormous amounts of information, big data makes regulatory reporting considerably more efficient and enables the detection of fraudulent trends in data.

Machine Learning

The field of machine learning is now quite popular. One of the reasons is because of data, and more especially, big data. Machines may now be taught, rather than programmed. This is made feasible by the availability of large datasets for use in training machine learning models.

Operational Efficiency

The influence of big data is most noticeable in the realm of operational efficiency, which is not often front-page news. Big data allows you to review and analyze production, customer feedback and returns, and other aspects

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to cut down on downtime and plan ahead for consumer needs. Decisions may be made more efficiently and in response to market needs with the use of big data.

Drive Innovation
By analyzing the relationships between people, organizations, things, and processes, big data may help you come up with novel solutions. Make better fiscal and strategic choices with the help of data analysis. Analyze market movements and consumer needs to develop fresh offerings. Make use of variable pricing. The list of potential outcomes is limitless.

1.4 Characteristics of Big Data
While there is much potential in big data, there are also many obstacles to overcome.

For starters, the quantity of data being collected is enormous. While new data storage technologies have been created, data volumes continue to double about every two years. Companies still have trouble keeping up with their data and finding efficient methods to store it. However, just storing the information is insufficient. The value of data is dependent on how it is curated and put to use. It takes a lot of effort to collect "clean data," which is defined as data that is both client-relevant and organized in a manner that facilitates meaningful analysis. Between fifty percent and eighty percent of a data scientist's effort is spent on data curation and preparation before the data can be utilized. In conclusion, developments in big data technologies are swift. A few years ago, Apache Hadoop was the go-to tool for managing massive amounts of data. Then, in 2014, along came Apache Spark. Combining the two models seems to be the most effective strategy now. Maintaining momentum with big data tools is a never-ending battle.

1.5 Hadoop
Apache Hadoop is an open-source system for storing and processing huge datasets, typically between several hundred gigabytes and several petabytes in size. Hadoop enables the clustering of several computers to analyze big datasets in parallel, which is far faster than utilizing a single large computer to store and process the data.

Hadoop's core components are as follows:

- **Hadoop Distributed File System (HDFS) –** A centralized storage solution that can also function on regular computers. HDFS has higher fault tolerance and native capability for huge datasets than other file systems, and it also has greater data speed.
- **Yet Another Resource Negotiator (YARN) –** Controls the nodes in a cluster and keeps an eye on how they're being used. Tasks and operations may be scheduled.
- **MapReduce** – A set of tools that facilitate data-processing in parallel in software. The map job is used to transform raw data into a structured dataset with calculated key-value pairs. Reduce tasks take in the output from the map task and aggregate it to get the final result.
- **Hadoop Common** – Provides a set of shared Java libraries used by all components.

1.6 Advantages of Hadoop
- Thanks to Hadoop's structure, users can quickly assess distributed systems. It's well-organized, and it uses the parallelism of the CPU cores in a sequential approach by automatically transferring data and workloads across the computers.
- Hadoop's FTHA is not hardware-specific; the Hadoop book store was built to identify and handle application-level problems.
- Hadoop processes can run smoothly even if nodes are added or withdrawn from the cluster.
- Hadoop's key advantages are not just that it is free to use but also that it is platform independent due to the Java programming language it is written in.

1.7 Customer Needs Analysis
The goal of doing a customer needs analysis is to get insight into the buying habits of a target market by learning what features and benefits of a product or service are most important to them. Organisations may adjust their marketing and product development strategies to better appeal to their target demographics after they have a better understanding of what motivates consumers to make a purchase. The objective is to learn about clients' likes, dislikes, habits, and problems. Understanding your audience's different expectations and how effectively you're meeting them is made possible by this method. Customer requirements analysis is a technique utilised in many facets of business, from new product creation and branding to advertising and promotion.

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1.8 Types of Customer Needs

Customer needs are what drive purchase decisions. When customers buy a product or service, they are trying to solve a problem. They have certain expectations, requirements, and specific things that are important to them.

Let's take a look at some of the most common customer needs:

Price: customers want to buy products or services that adjust to their budget. They expect the price to directly reflect the value and quality of the product. But a product's value is also determined by intangible factors, like a brand's perceived worth and the overall customer experience. In fact, 86% of customers would pay more if that means they will get a better customer experience.

Functionality: the product or service should be able to solve a customer's problem. There are certain features or characteristics that customers expect from a product. For example, a customer buying a gaming PC will probably look for a fast central processing unit (CPU), a powerful graphic card, and lots of storage space.

Usability: this is related to the way a product is designed and the experience it provides to the customer. Users tend to prefer products with a short learning curve, that are easy to use, and help them accomplish tasks in a seamless way. For instance, customers expect a mobile app to be intuitive, error-free, and easy to navigate.

Reliability: the product has to be able to perform its function consistently over time, without failure. Reliability can be also defined as "quality over time." A company that makes reliable products will have a positive reputation and high levels of customer satisfaction.

Support: customers crave good customer service. They expect to reach out to customer support through the channel of their choosing to get fast, personalized responses; and be treated with empathy. When it comes to buying a SaaS solution, a poor customer experience relates directly to customer churn.

Security: when they interact through digital channels, customers want to ensure that their transactions are safe, their personal data is protected, and their information will not get lost. Getting an error message after entering your credit card information on an e-commerce site, for example, would definitely turn customers away.

Effectiveness: customers buy a product or service because they want to solve a problem. So, their main interest is buying something that actually does the job it advertises.

[2] LITERATURE REVIEW

S. R. M. Zeebaree, et al.(2020) focused on the characteristics and an evaluation of hadoop's distributed systems. This piece of software was used in order to make massive amounts of data storage accessible. Hadoop was one of the most advantageous software frameworks that may be used to make use of data in distributed systems. This piece of software organizes the machines into clusters and formats the work that was distributed among them. HDFS and the Map Reduce programme are the two primary elements that constitute the Hadoop framework. They were able to process, count, and disseminate each word in a huge file using Hadoop, and they were also able to determine the total number of people that each word affects.[1]

M. Khan , et al.(2020)reviewed the hadoop architecture and deep learning, a big data approach was used to analyse the sentiment of the data on twitter . In this study, a technique to sentiment analysis was presented that makes use of an adapted version of the Hadoop framework and a deep learning classifier. The Hadoop cluster was used in order to distribute the data that was necessary for the feature extraction process. After that, the important characteristics were retrieved by utilising the data from Twitter. Classifying the input data into two categories, such as positive review and negative review, was accomplished by used a deep learning classifier known as a deep recurrent neural network classifier.[2]

Y., Fahed, et al.(2020) introduced the influence of employed data mining and clustered methods to divide the market thanks to big data's effect. This research makes use of the dynamics involved in the Hadoop distributed file system, which was known for its capacity to analyze large datasets, in order to achieve its goals. Three distinct market segmentation experiments were run with the help of modified best fit regression, also known as Expectation-Maximization (EM), and K-Means++ clustering algorithms. The results of these experiments were then evaluated with the use of cluster quality evaluation. The findings of this study may be broken down into two categories: i) The insight on customer buying behaviour that was disclosed for each Customer Lifetime Value (CLTV) segment; ii) the efficacy of the clustering method in terms of establishing correct market segments.[3]

Implementation of Resource Scheduling in Spark and MapReduce on the YARN Cross-Platform is considered by D. Cheng et al., 2017. It is processing in batches while maintaining a high throughput is a logical match for the concept of Map Reduce. Because of the execution of this plan, there has been an improvement in the

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utilization of the resources that are now accessible. This research provides in-depth information about the combination of iKayak and YARN. Experiments a test bed shown that iKayak is successful in reaching the targeted 50% improvement for Spark applications. It results in a 19% increase in the speed of Map Reduce processes. [4]

A. S. Kumar et al. presented their findings on the performance assessment of cluster processing using Apache Pig, Apache Hive, and MySQL in the year 2017. It has been determined that MySQL Cluster, a well-known clustered database, may serve both as a repository for information and as a tool for its management. The root of the issue was determined to be MySQL Cluster. Three researchers tested MySQL Cluster, Hive, and Pig with the same data model and found that Hive and Pig were much faster than MySQL Cluster in answering fundamental query queries like counting the number of rows in a dataset. The data model from the GroupLens Research Project was used in order to construct this summary. According to the results, Hive performs very well in an environment with low-cost hardware when it comes to managing this data model. [5]

2017 saw the publication of "In-Memory Parallel Processing of Massive Remotely Sensed Data Using an Apache Spark on Hadoop YARN Model," which was authored by W. Huang and co-authors. The fact that Hadoop makes use of Map Reduce is what sets it apart from other systems. The processing of enormous volumes of data in parallel has been accomplished with its assistance. As a direct consequence of this, the programming paradigm that remote-sensing algorithms use is mired in an endless loop of costly disc I/O. It has been proposed to use a strip-oriented parallel programming paradigm in order to simplify implementation while yet benefiting from the assurance of high performance provided by Spark-based approaches. In the ever-changing environment of cloud computing, these Spark-based algorithms are able to work. [6]

P. M. Bante et al. were the ones who initially presented big data analytics in 2017, and they did so by employing the hadoop map-reduce architecture and the data transfer mechanism. The size of the database, which can now be measured in petabytes, increased dramatically due to its rapid expansion. Hadoop Map Reduce is a paradigm of computer programming that is used in the processing of enormous volumes of data. In the course of this research, the method that was discovered for transferring data from a relational database to a NoSQL database (MONGODB) was identified. [7]

K. Rattanaopas and colleagues published an article in 2017 in which they described how data compression might improve the performance of Hadoop Map Reduce. Hadoop clusters have found significant application. The term "big data" refers to the very large volumes of data that may be handled and examined with the assistance of this instrument. The major purpose of this research is to improve the processing performance of a word count work that uses Hadoop by switching to a compression approach that is more effective. [8]

In 2018, P. R. Merla and colleagues presented their work on doing data analysis inside a Hadoop map-reduce environment. The analysis of UserTube data using the Hadoop map-reduce architecture on the Amazon Web Services cloud is the primary focus of this research. On a private cloud service, most often Amazon Web Services, a Hadoop multi-node cluster is built from the ground up. [9]

In 2018, T. A. Ashwitha and colleagues used Hadoop-Hive in order to do an analysis on the Movie Dataset. It has been shown that the utilization of data across all sectors has seen a significant surge in the previous years. The data was gathered from the results of a variety of independent research efforts. This information might have originated anywhere, such as social media, factories, sales records, or any number of other places. [10]

I.Chebbi et al. (2018) analyzed the processing of huge volumes of remote sensing data by comparing how Hadoop Map Reduce and Spark handled the data. The production of RS is occuring on an ongoing basis and at a very large scale. The duty of assessing the data gathered by remote sensing has been given to researchers. Several methods are shown in this section for managing large volumes of data in RS. A comparison of Hadoop and Spark has been the major strategy used in this investigation. Both of these sites are quite popular and have links to several huge RS. [11]

According to research published in 2018 by A. Q. Mohammed and colleagues, using a heterogeneous system is a helpful way for enhancing the efficiency with which Hadoop Map Reduce utilizes its available resources. This conclusion was reached after reviewing the findings of the study. The decade of the 2000s saw the introduction of a highly regarded platform that is capable of both managing and storing large amounts of data. [12]

In 2018, Dan Liu and colleagues released a paper entitled A Performance Optimization Scheme for Migrating Hive Data to the Neo4j Database. The purpose of this research is to investigate and develop a performance optimization strategy for transferring data from Hive to the Neo4j database. This research proposes a model of unstructured data that is capable of converting structured data into graph data. This model makes it possible to

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migrate data from hive to neo4j, as well as enabling the identification of data linkages and the investigation of the data's potential monetary value via the use of visual representations. [13]

Researchers F. Liu et al. focused on creation of an autonomous operation and maintenance system for VMware sphere using Python as the primary programming language. The purpose of this research was to develop an automated operation and maintenance solution for VMware vSphere that was written in Python. Python is an example of an object-oriented programming language, and this investigation presents a system for autonomous operation and maintenance that is built on top of Python. [14]

3 PROPOSED MODEL

In following architecture there are three layers. First layer is acting as client-side layer from where operator would try to pass data to server-side script. The client-side script would validate his data and send it to server-side script. On second layer server-side script would capture data and store it to database server after validation. This database layer is third layer where data is managed. Second and third layers are connected in bi-directional way. The data is transmitted from server side to database layer during insertion queries. On other hand data is transmitted from database layer to server side when selection query is applied.

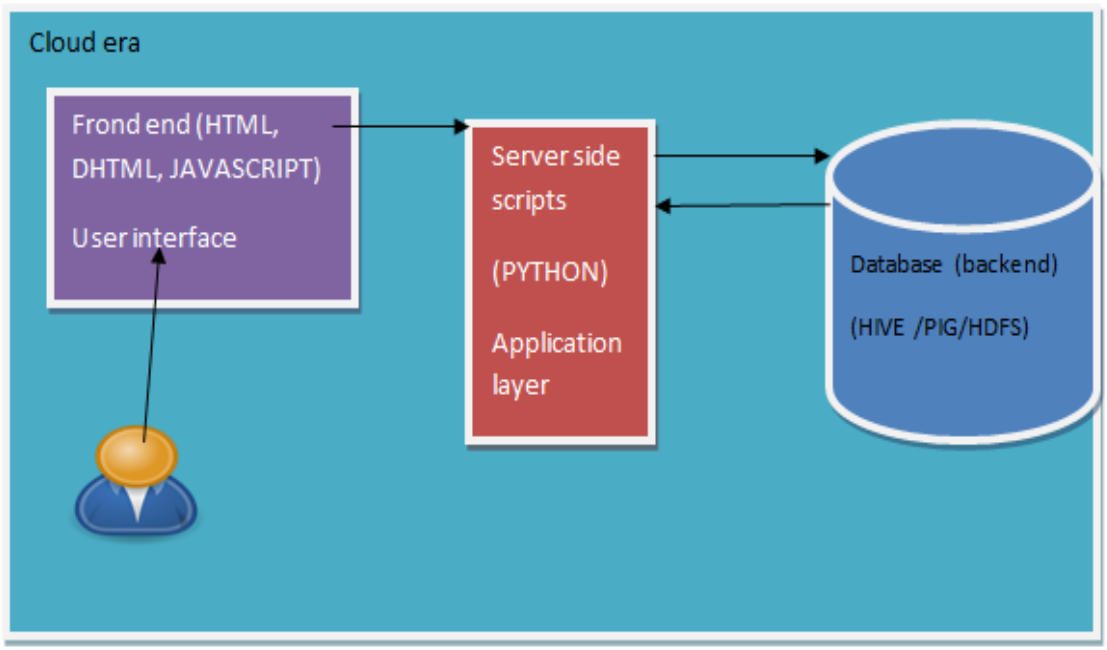

Fig. 1 Proposed design

Installation process of Virtual box and cloud era is made than configuration of CLOUD ERA ON VM BOX and make allocation of csv based Dataset takes place to import csv data set to HDFS environment in cloud era. Data to hive database is imported to analyze its performance. Development of python module to read csv data and import data to pig environment and analyze its performance is made for implementing Map reduce and spark on given dataset in cloud era environment. Python script is created to implement Map reduce on big data to compare performance of Map Reduce and Spark

DFD OF PROCESS FLOW

The following DFD is representing process flow of proposed work. The dataset is transferred to cloud era environment and processed by PIG, Hive, Python script thereafter.

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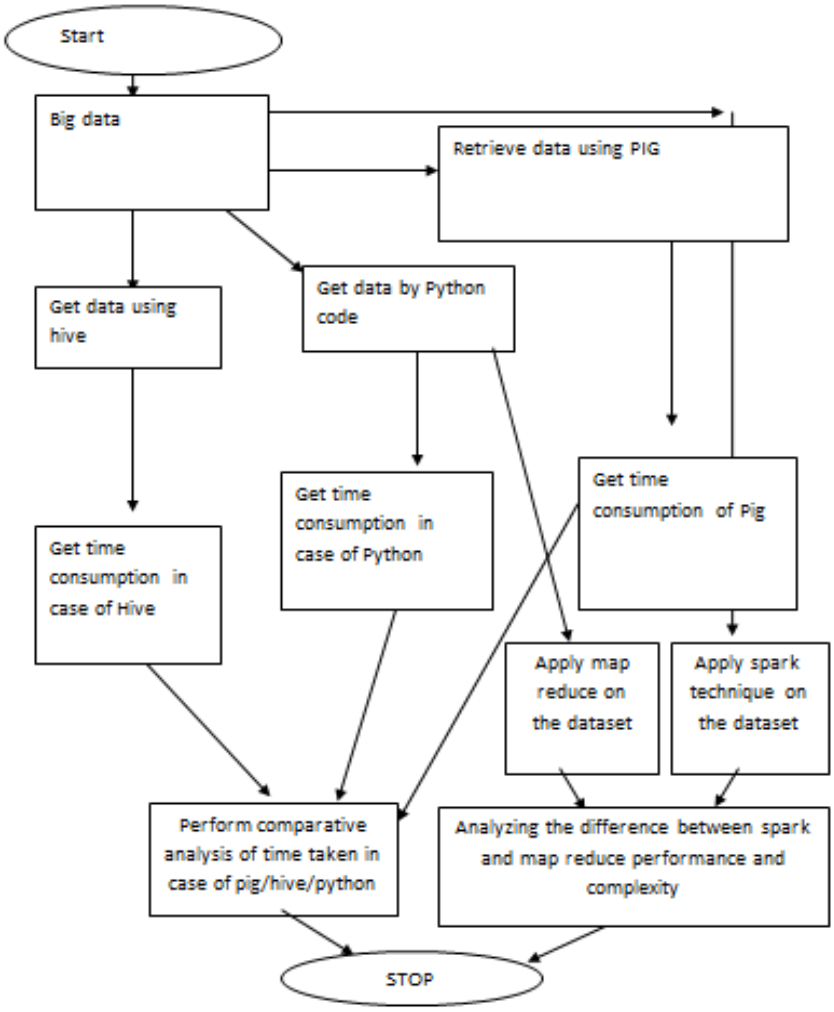

Fig 2: Process flow of proposed work

This environment is supporting Hadoop, hive, pig. The python script could be written here using gedit. The python script would be written to fetch contents of dataset. The contents of dataset would be fetched using three mechanisms. First is hive. It is well known database in Hadoop environment that is performing 100 times faster than Pig. But performance of both techniques is less than that of python. Moreover MAP Reduce and SPARK techniques have been applied further in research work in cloudera based environment that is configured with Hadoop environment. The database of Zomato has been utilized as dataset.

5. PERFORMANCE ANALYSIS OF PIG , HIVE AND PROPOSED PYTHON SCRIPT

5.1 Performance Analysis of Hive on Cloudera

Readings have been taken in case of different clock cycles from C1 to C6 to present performance of HIVE. The hive performance chart has been plotted after represent information graphically.

Table 1: Time taken in case of Hive

Cycle	Time Taken
C1	0.11
C2	0.12
C3	0.09
C4	0.10
C5	0.07
C5	0.095
C6	0.12
C6	0.13

5.2 Performance Analysis of Pig on Cloudera

Following table is representing time taken by pig in different clock cycle. The following table is showing time taken in seven different clock cycles

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Table 2: Time taken in case of pig

Cycle	Time(seconds)
C1	0.3
C2	0.4
C3	0.2
C4	0.2
C5	0.4
C6	0.36
C7	0.37

5.3 Performance Analysis of Python Script on Cloudera

Following table is representing time taken by python script in different clock cycle. The following table is showing time taken in six different clock cycles.

Table 3: Time taken in case of python script

Cycle	Time
C1	0.04
C2	0.05
C3	0.039
C4	0.038
C5	0.05
C6	0.039

Comparative Analysis of performance of existing- hive, pig and Proposed-python script for hadoop framework on cloud era

After simulation of hive, pig and python script content have been stored in following table in order to perform comparative analysis.

Table 4: Hive, pig and python script content have been stored

Cycle	Time Taken by hive	Time taken by pig	Time taken by python script
C1	0.11	0.3	0.04
C2	0.12	0.4	0.05
C3	0.09	0.2	0.039
C4	0.10	0.2	0.038
C5	0.07	0.4	0.05
C5	0.095	0.36	0.039
C6	0.12	0.37	0.04

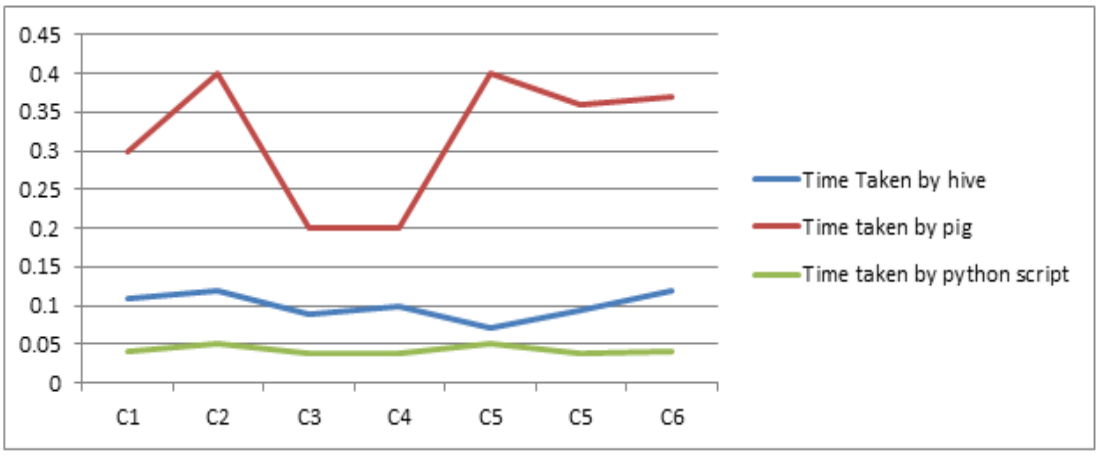

Fig 3: Comparative analysis of performance for Hive , Pig and python script

[4] Future Scope of Work

The implementation of Hive, Pig, Map Reduce, Spark, Avro, and Yarn in the Hadoop framework has been the primary focus of research. Hadoop's data storage solutions such as HDFS, Hive, HBase, and Mongo DB, are intended to make the management of complicated and large amounts of data more effective. Additionally, the

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capabilities of Map Reduce, Spark, Avro, Sqoop, Zoo keeper, Lucene/Solr, and NoSQL would play an important part in the processing of enormous amounts of data. The Hadoop framework would be able to utilize for analyzing and evaluating the performance of various big data analytical methodologies. For the purpose of determining which method or technology is most suited for the user, research effort might do more comparison analyses of big data analysis techniques and technologies using the Hadoop framework. In the future, research will make important predictions or choices by using big data analytics. The Hadoop framework will be used in order to undertake analysis as well as performance analysis and assessment of big data analytical strategies. The research would identify numerous features of the mechanisms and technologies used for massive data analytics, with the Hadoop framework and problem incorporated in each of them. A variety of research approaches, including data mining, statistics, the analysis of big data mechanisms, and game theory would be integrated via the use of predictive analysis in the study. The use of big data analytics would allow for major predictions or judgments to be made in the related study.

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SOLAR BASED ENERGY STORAGE AND CONSUMPTION SYSTEM

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ABSTRACT
Causal approach towards energy use consequently energy wastage has become a vital problem now-a-days in all the sectors may be industrial or may be residential. This happens largely due to the ignorance towards the proper use of electricity and due to other reasons like unwanted use of power at stadiums, malls, entertainment industry, auditoriums, multiplexes, etc. Hence, power should be used effectively not only to preserve the sources producing it but also to optimize the pollution produced in the environment. The practice of regulated use of energy should start from one's home which can be further extended to the larger scale. The best way is to go for renewable source of energy like solar energy instead of using conventional sources because solar energy is available almost free of cost, it is pollution & noise free as well.

A Battery Based Controlled Home Energy Consumption (SBESC) system monitors the State of Charge of the battery and decides the sequential SWITCHING OFF the loads as per the need of the house owner. The discharging of a battery is accompanied by drop in the instantaneous voltage which is sensed by the corresponding load through the programmed microcontroller and the load gets switched OFF automatically. This paper explains hardware as well as software realization of the SBESC system which helps in effective utilization of the available battery energy to minimize the energy wastage. The algorithm to perform the load control is analysed with synchronised power consumption details. The paper basically talks about the use of battery at night which may run out due to late night use and can be recharged again in the daytime, once the sun arrives in the sky.

Keywords: Relay module, Arduino, DC Loads, Battery, Voltage Sensor.

RESEARCH METHODOLOGY:

The battery based controlled energy consumption system is designed in such a way that DC loads at various parts of the house can be operated on priority basis at night-time. The aim was to run DC loads entirely managed by solar electricity using a microcontroller. For this purpose, battery voltage is sensed by the microcontroller.

Microcontroller monitors battery's state of charge (SOC) and the energy to the load is automatically cut-off which is having lower priority. The process continues for the other loads in order of priority till the load with most priority runs if DOD of the battery is not reached. Once the battery is discharged, the most prior load will also shut down. The prototype of the project involves four loads L1, L2, L3 & L4. These loads are assigned cut off voltages 12.8V, 12.6V, 12.4V and 12.2 V respectively. The least prior load (L1) gets switched off when the battery voltage becomes less than 12.8 V. This happens to all the subsequent loads when the battery voltage goes below their respective cut-off voltages and ultimately all loads will be switched off below 12.2V of the battery voltage. The idea can be extended to once house wherein various parts of the home are equipped with different types of DC loads like

DC Fan in the kitchen (L1),

DC Light in the living room (L2),

DC Study lamp (L3) and

DC Night lamp (L4).

Let DOD of the battery is set to 50% i.e., after 50% discharge of the battery it should be recharged in daytime using solar panels. We can set the loads to get switched off at various discharged levels of the battery.

EX. At 100% charging of the battery all loads will be in ON condition

Load L1 will be switched off at 80 % DOD

Load L2 will be switched off at 70 % DOD

Load L3 will be switched off at 60 % DOD and

Load L4 will be switched off at 50 % DOD

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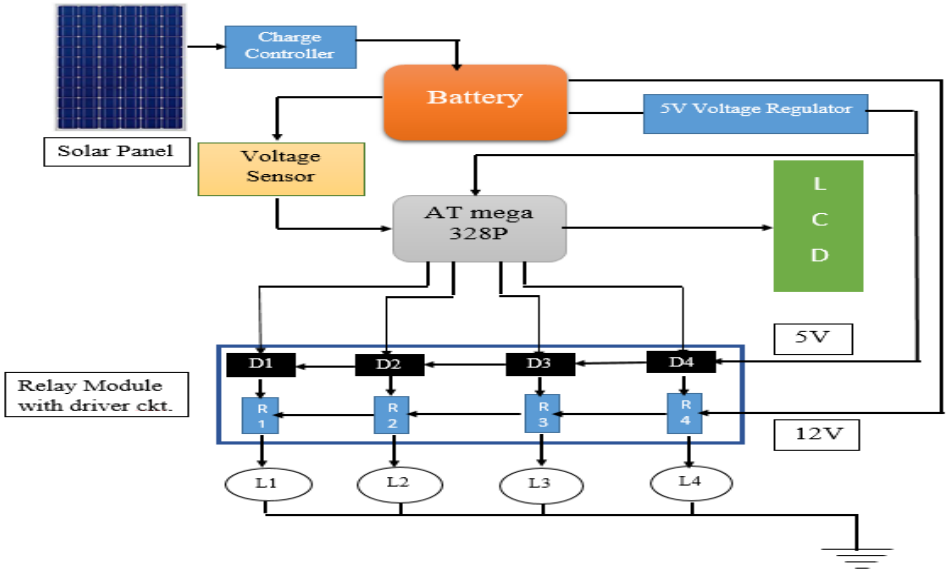
Note that these are not the only loads available in various rooms of the house. Meaning kitchen may have another Fan, living room may have other lights in it, and bedroom will have another source apart from study lamp. So, this is not a standalone system. It is grid connected PV system wherein AC loads are also available which can be used after the DC load in respective room goes OFF. This is beneficial in following ways:

1. DC loads will run on Battery which is charged with Solar PV panels.
2. DC loads have longer life and longer manufacturer warranty.
3. DC loads are more power efficient than their AC counterparts.
4. Any component of the system is readily available and easily replaceable

Experimentation:

Block Diagram:



Required Components:

1. Solar Panel: Single Polycrystalline Panel of 60 W (12V/ 6.25A)

Fig 1: 60W Polycrystalline Solar Panel

A polycrystalline solar panel of 60 W power is used in this project. Its Voc = 22.85 V and Isc = 3.52 A. The panel is around 14.735 % efficient with a Fill Factor of 77.91. It charges the battery in daytime to use it at night. The panel can charge the battery fully within 3-4 hours depending on the availability of Sunlight. The chosen Solar Panel is cost effective in its category, portable and has ease of functioning.

2. Charge Controller (2 A)

Fig. 2: PWM Solar Charge Controller

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A PWM Solar Charge Controller having 2 Amp current rating is used in the project to monitor the battery's State of Charge. It avoids overcharging of the battery during the charging process. It is packed with the features like Built in Timer, SET voltage show display, MCU control, Full battery protection and two USB ports for Mobile charging.

3. Storage: Lead Acid Battery (12V/26Ah)

Fig 3: Lead Acid SMF Battery

A 26Ah, 12 V Sealed Maintenance Free battery is used in the project. It is Lead acid storage type battery with C20 rating. It has a capacity to run Online UPS Inverter, Telecom applications, Office Automation system, etc. with enhanced design features which give a higher performance and reliability. It is better suited to Indian conditions.

4. Microcontroller: The microcontroller boards used for the BBCHEC system are ARDUINO UNO based on ATmega328p. Fig. 4 shows the ARDUINO UNO board. These boards are widely used as they are easy to program, reliable and of low cost.

Fig 4. ARDUINO UNO Microcontroller Board

5. Liquid Crystal Display:

A 16 x 4 Liquid Crystal Display unit used in the project is shown in Fig. 5a to 5e for various load conditions. It works on a 5V DC power supply and has a total of 16 pins out of which 8 pins are data bus lines. It displays the cut – off voltages of all the four loads used in the project along with the instantaneous battery voltage. The real time ON and OFF condition of loads as displayed by the LCD is shown in the following images:

Fig 5: a) All loads ON

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b) Load L1 OFF, V_{th1} < 12.8V

c) Load L2 OFF, V_{th2} < 12.6V

d) Load L3 OFF V_{th3} < 12.4V

e) All Loads OFF below V_{th4} < 12.2V

6. Relay Module:
A four-channel relay module consists of four independent controllable relay contactors and four independent driver circuits for the control signals as shown in Fig.6. All the four relay modules have been used for four different loads L1, L2, L3 and L4. These four loads are controlled by the control inputs of the module which are connected to the microcontroller.

Fig. 6 Four Channel Relay Module

Limited current from the microcontroller is not sufficient to pick up and switch the relay contacts and therefore driver circuits in the module will provide the necessary extra current to operate the relay contacts.

7. Loads:
The four loads L1, L2, L3 and L4 are realized using four LED strips operating on 12 volts and 6 watts each. We can use other home loads like DC fan, hair dryer, electric kettle, garden light, etc. Power to these loads will come from the voltage divider circuit and are controlled by four ON/OFF controllable relay switches. According to the control signal received from the controller by the relays, loads are turned ON or OFF.

Fig 7: Loads L1, L2, L3 and L4

8. Voltage Sensing Circuit:
The voltage sensor module is a small size 0-25 DC voltage sensing device. The design of the module is based on a resistive voltage divider circuit. It is a voltage sensor module that reduces the input voltage signal by the factor of 5 and generates a corresponding analogue output voltage with respect to step down voltage factor. This voltage measurement circuit is small and portable.

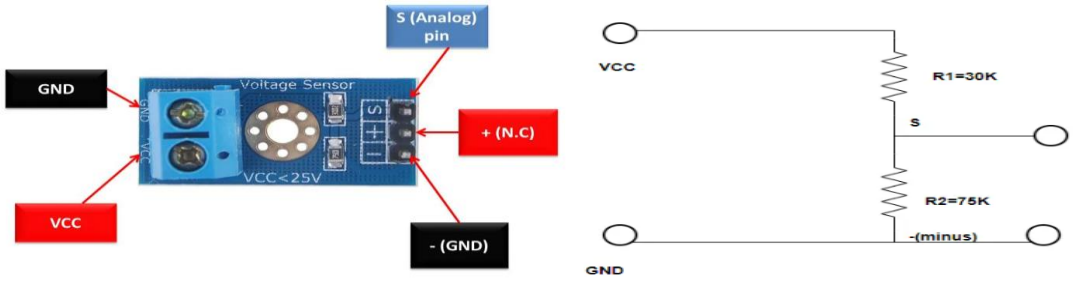

Fig 8: Voltage Sensor Module and Pin out diagram

The user can set the priority of loads. This priority can be changed and decided by user. It sets sequence of switching off and critical loads get switched off only at end.

The voltage sensor reads the battery voltage level and a software written in C-language loaded in ATmega328p processes this data and it finally takes decision to which load is to be switched off depending on the priority. If some loads get switched off earlier this saves precious energy for the higher priority critical loads.

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Sr. No.	Load	Threshold Voltage	ON/OFF status
1		V_{bat} > 12.8V	All loads glowing
2	L1	V_{th1} = 12.8V	V_{bat}< V_{th1}, L1 OFF
3	L2	V_{th2} = 12.6V	V_{bat}< V_{th2}, L2 OFF
4	L3	V_{th3} = 12.4V	V_{bat}< V_{th3}, L3 OFF
5	L4	V_{th4} = 12.2V	V_{bat}< V_{th4}, All loads OFF

Table. 1

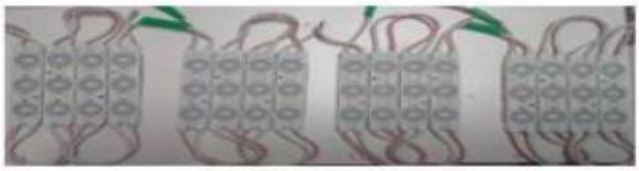
- **Status of Loads glowing at various threshold voltages:**

1. **All Four Loads glowing**

2. **Three Loads glowing**

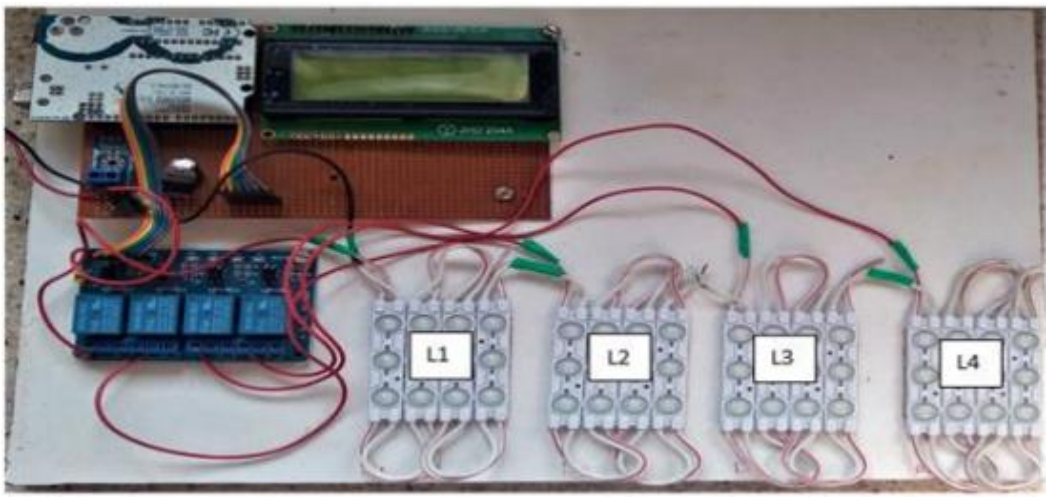
3. **Two Loads glowing**

4. **One Load Glowing**



5. **NO Load glowing**

Circuit used for the Project:



Future Scaling:

The project can be scaled for higher wattage loads instead of the ones used here. Also, instead of using only four loads, the project can be extended for 8 or 12 loads just by employing module with a greater number of relay circuits and bigger sized LCD. The program fed to the microcontroller needs to be upgraded & updated accordingly.

Conclusion:

This project mainly aims to save energy that gets wasted due to mere negligence or ignorance. The experimentation on bigger scale with greater loads will ensure that the energy bill reduces when this concept is

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implemented in one's home or in the society. This project gives a clear-cut idea of reducing the household energy bill by installing the Solar Based Energy Storage and Consumption System in cost effective manner.

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A STUDY OF HAPPINESS LEVELS OF YOUTH GROUP TOURING KONKAN REGION OF MAHARASHTRA

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ABSTRACT
Due to the efforts of the Government and tourism policy, there has been growth in the tourism of Konkan region. The present study aims to find out the tourist's perception about the state tourism and study the level of happiness in touring the Konkan region. The present study was conducted among people of suburb area / location from Mumbai city who have visited Konkan as tourists. Primary data was used for the study through structured questionnaire. Sample size was 407 respondents. Overall, it was found that tourists are satisfied with the touring Konkan region.

Keywords: Konkan Tourism, Tourist Satisfaction, Tourism Development, Happiness level

1. INTRODUCTION

The Konkan, also called the Konkan Coast is the name given to a stretch of rugged and beautiful section of the western coastline of India from Raigad to Goa. It also includes Mumbai Region and Thane District.

Although, the Konkan region considered as backward region of Maharashtra, it has various attractions that may attract to the foreign as well as domestic tourists. The Konkan region is situated in the western part of the Maharashtra State. It is located between the Arabian Sea towards the West and Sahyadri Mountain to the East and has 700 km's coastline.

"Tourism plays an important and vital role in the economic development of the developing country, like India", asserts Sardar Patil in their research paper titled as 'Tourism Development in Konkan' **(Patil S., 2012)**

In the Konkan locale, the expansion of travel related activities is there but limited to certain places only. Various waterfronts / seashores, forts, places of worship and waterfalls are principal fascination of the travelers in the Konkan. These variables are liable for the improvement of the travel industry in Konkan locale.

Expansion of Tourism Sector in Konkan

Maharashtra, one of the India's leading business states, has perceived the tourism and travel industry to be important and significant in view of achieving economic development of the state. In order to have planned development and growth of this sector (of course, with some commercial objectives in mind), Maharashtra Tourism Development Corporation (MTDC) has been set up under the Companies Act, 1956, (fully owned by Govt. of Maharashtra) in the State. MTDC, since its establishment, been associated with the development and maintenance of the various tourist locations of Maharashtra.

2. REVIEW OF LITERATURE

Pendse S. (2012) in their study titled "**Development of Historical Tourism in Konkan-Impacts and Alternatives**" mentioned need for tourism development. The author further stated that tourism development needs the tourist sites to have facilities and maintenance that support and relate to the historical significance of the site. Developing facilities need investments as well as awareness amongst the locals and the tourists as well about their responsibilities as local service providers and as tourists.

Patil S. (2012) in their study titled "**Sustainable Tourism Development in Konkan: A Need of Time**" mentioned that tourism plays an important and vital role in the economic development of the developing country, like India. Further, the said stated that the Konkan region has the strength and opportunities for the sustainable tourism development and no doubt, it will overcome on the weaknesses and threats of the region.

Potdar (2003) during their research work "**Tourism Development in South Konkan**" reveals a treasure of tourism, beaches, horticulture, scenic beauty, historical monuments, temples and churches, local folk arts, handicrafts, food and festivals, biotic life are the resources available for ideal tourism in South Konkan.

Sarngadharan M., in his book titled "**Tourism and Sustainable Economic Development**" expressed that travel and tourism industry integrates a wide range of economic activities and presently is regarded as one of the largest industries in the world. The growth of travel and tourism industry over the last five decades is one of the

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most remarkable economic and social phenomena. International tourist arrivals grew in India in real terms, over the period. According to the analytical framework growth of tourism is due to three factors, like social factors that enhancing demand; the technology that transforms selling strategy of tourism and economic factors. The innovations of new products like selling holidays by modern methods and time-share resorts played its own role in the development of the industry. The development of tourism is characterized by continuous expansion of area and diversification of destinations. All these factors enhanced the demand for tourism, which is determined by wealth.

3. OBJECTIVES OF THE STUDY

1) To study the level of happiness in touring the Konkan region.
2) To have opinion about their touring in terms of value for money/economical holiday destination.
3) To analyze the significant effect of consumption of a variety of tourism products on the quality of happiness.
4) To identify the grey areas for happiness improvement of tourists.

4. HYPOTHESIS STATEMENTS

H_0 = Tourists are of the opinion that a variety of tourism products consumed by them do not influence their satisfaction and happiness levels (about the trip).

H_1 = Tourists are of the opinion that a variety of tourism products consumed by them do influence their satisfaction and happiness levels (about the trip).

5. RESEARCH METHODOLOGY

5.1 Type of Research:

Since the current study deals with analysis of perception of the tourists towards different tourism products consumed and / or experienced during the trip, the present research is conclusive and descriptive research design.

5.2 Area of study:

The research was conducted among the people of suburb area / location from Mumbai city.

5.3 Sampling method

Here Non-Probability Convenient Random sampling technique based on judgment of surveyor was used for the purpose of data collection.

5.4 Target Population and Sample size:

The sample size of 407 respondents was selected from select suburb area / location from Mumbai city who have travelled to Konkan and visited different places there.

5.5 Type and Source of Data:

The present study is based on primary data. The primary data was collected by structured questionnaire. Close ended questions were asked in the questionnaire to get the answers.

5.6 Statistical Tools Utilised:

Graph is used to organize data and to display the data in a way that is easy to understand and remember. One Sample t test is used to test hypothesis.

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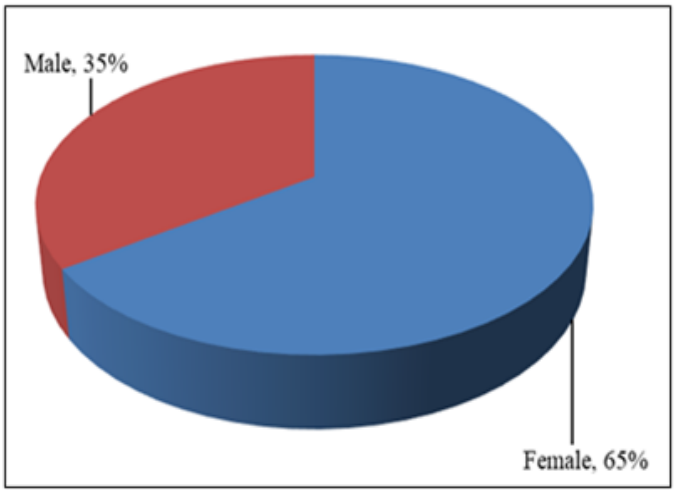
6. DATA ANALYSIS AND FINDINGS OF THE STUDY

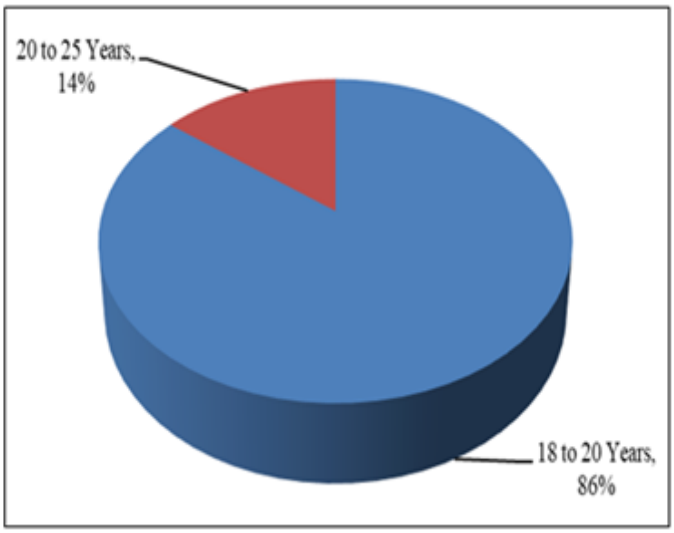
Fig. 1.1 Gender of the Respondents



The graph indicates that there were 35% male respondents and 65% female respondents.

Source: Primary Data

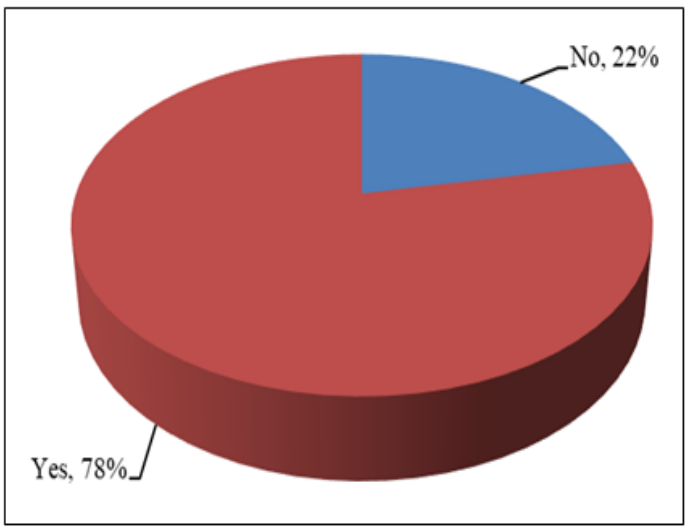
Fig. 1.2 Age of the Respondents



The graph indicates that there were 86% respondents in the age group of 18 to 20 years and 14% respondents in the age group of 20 to 25 years.

Source: Primary Data

Fig. 1.3 Have you heard about Konkan Tourism?



The graph indicates that 78% respondents have heard about Konkan Tourism and 22% respondents have not heard about Konkan Tourism.

Source: Primary Data

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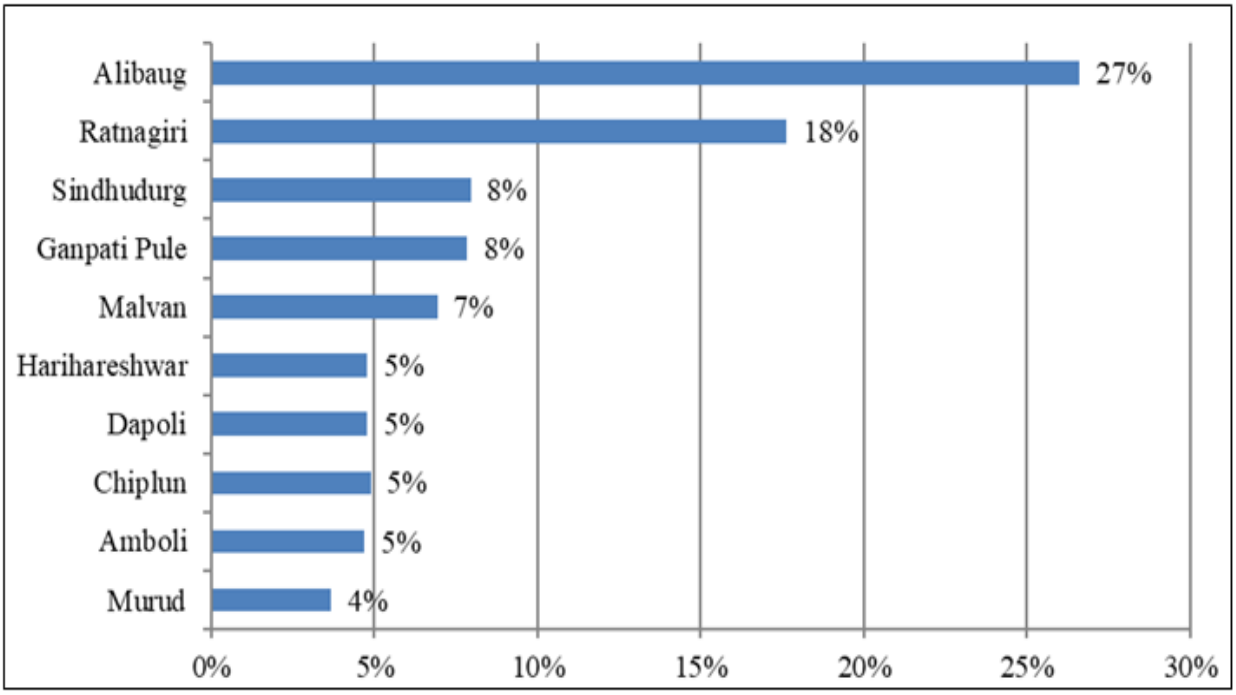
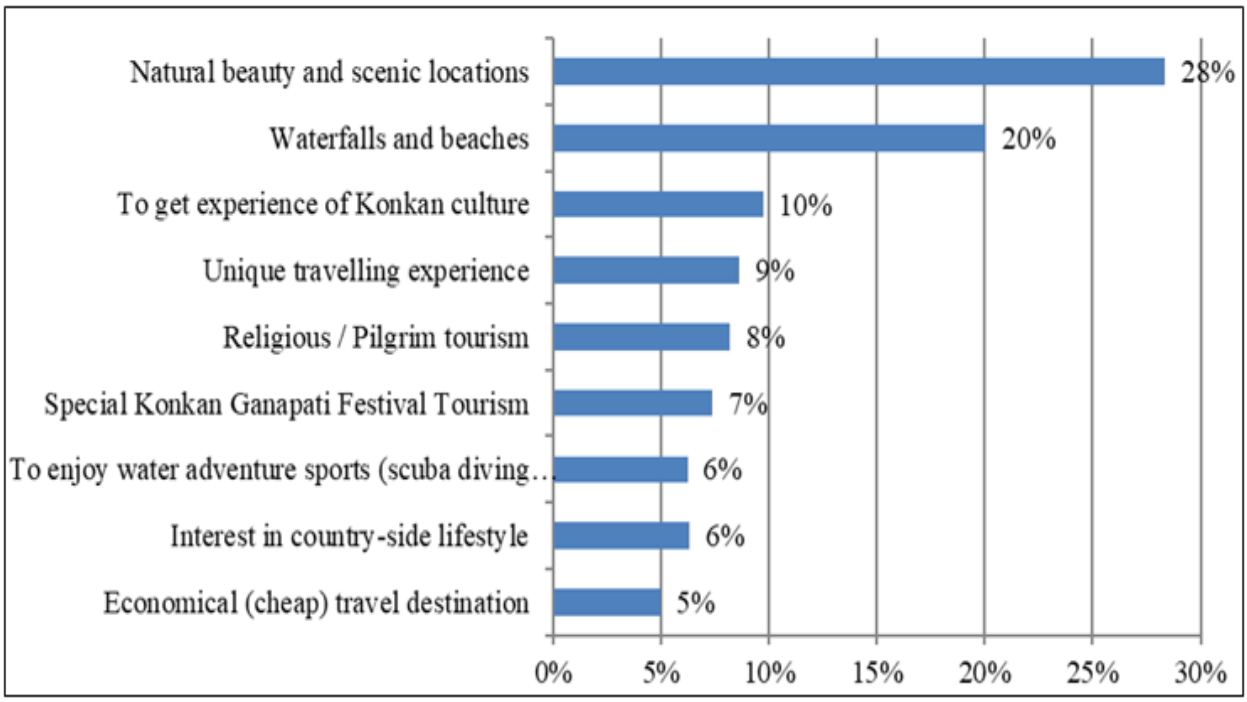
Fig. 1.4 Top 10 places visited in Konkan



Source: Primary Data

The above graph shows the opinion of tourist about top 10 places visited in Konkan. Alibaug (27%), Ratnagiri (18%), Sindhudurg (8%), Ganpati Pule (8%), Malvan (7%), Harihareshwar (5%), Dapoli (5%), Chiplun (5%), Amboli (5%) and Murud (4%)

Fig. 1.5 Reasons for visiting Konkan



Source: Primary Data

The above graph shows the opinion of respondents about reason for visiting Konkan. Natural beauty and scenic locations (28%), Waterfalls and beaches (20%), To get experience of Konkan culture (10%), Unique travelling experience (9%), Religious / Pilgrim tourism (8%), Special Konkan Ganapati Festival Tourism (7%), To enjoy water adventure sports (scuba diving and snorkeling) (6%), Interest in country-side lifestyle (6%) and Economical (cheap) travel destination (5%)

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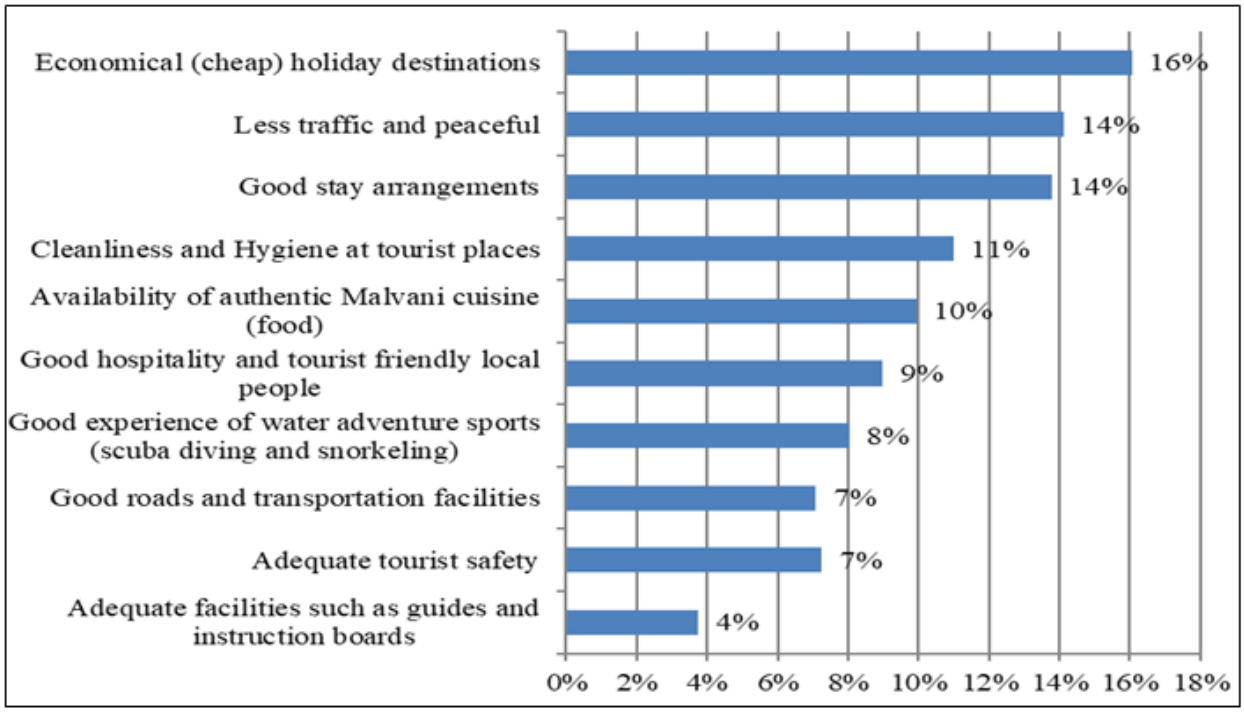
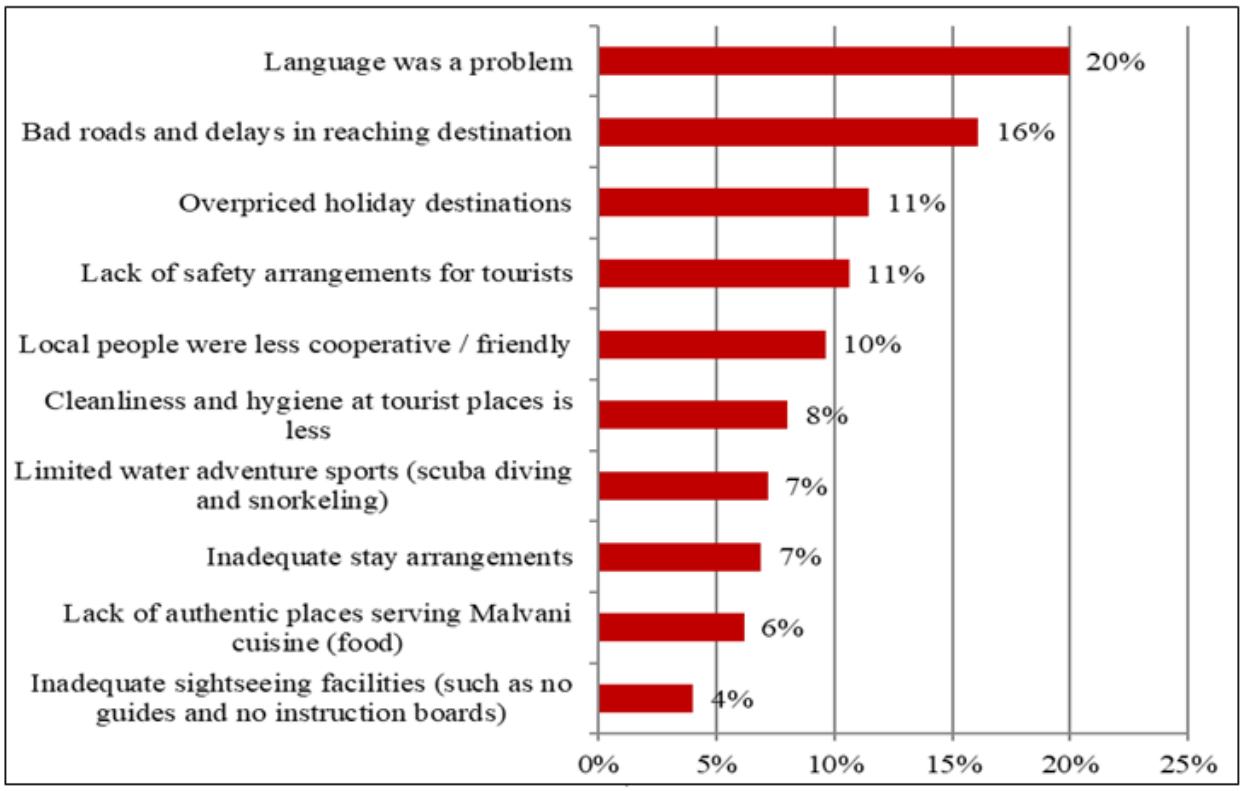
Fig. 1.6 Positive aspects experienced during the Konkan tour



Source: Primary Data

The above graph shows the opinion of respondents about positive aspects experienced during the Konkan tour. Economical (cheap) holiday destinations (16%), Less traffic and peaceful (14%), Good stay arrangements (14%), Cleanliness and Hygiene at tourist places (11%), Availability of authentic Malvani cuisine (food) (10%), Good hospitality and tourist friendly local people (9%), Good experience of water adventure sports (scuba diving and snorkeling) (8%), Good roads and transportation facilities (7%), Adequate tourist safety (7%) and Adequate facilities such as guides and instruction boards (4%).

Fig. 1.7 Negative aspects experienced during Konkan tour



Source: Primary Data

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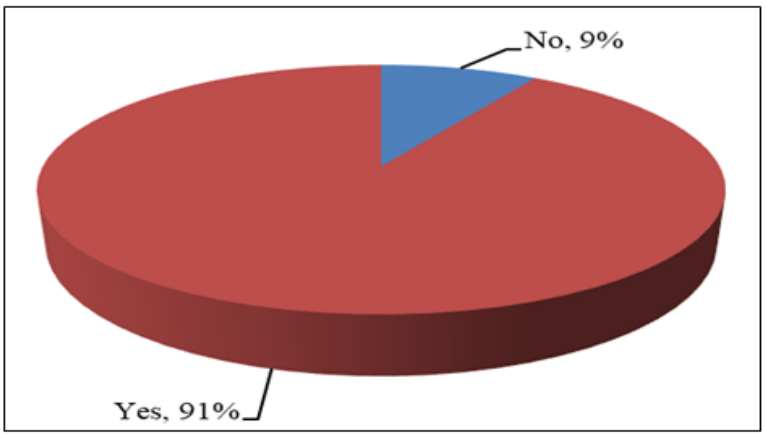
The above graph shows the opinion of respondents about negative aspects experienced during the Konkan tour. Language problem (20%), bad roads and delays in reaching destination (16%), overpriced holiday destination (11%), lack of safety arrangements for tourists (11%), less cooperation from local people (10%), less cleanliness and hygiene at tourist places (8%), limited water adventure sports (scuba diving and snorkeling) (7%), in adequate stay arrangement (7%), lack of authentic places serving Malavani cuisine (6%) and inadequate sightseeing facilities (no guides and no instruction boards (4%).

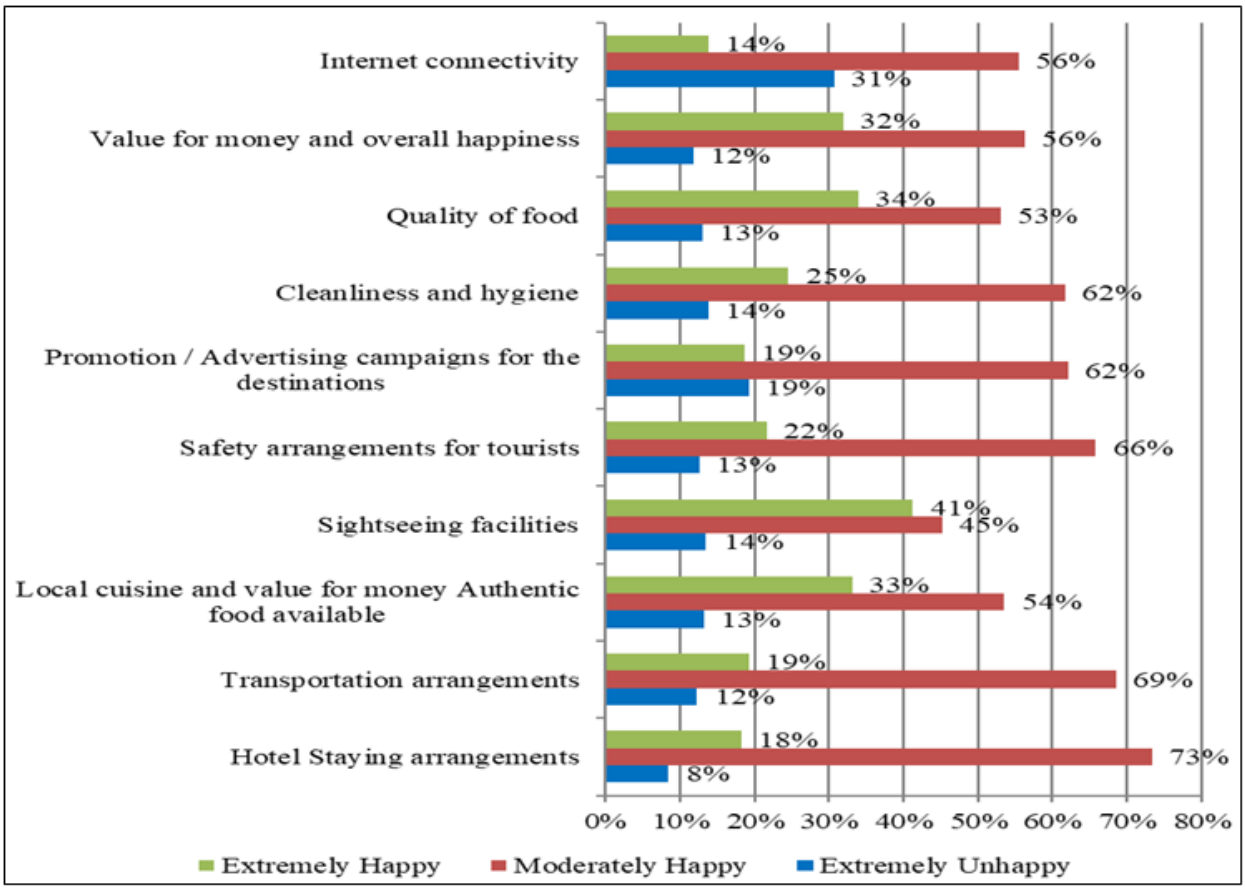
Fig. 1.8 After touring a variety of tourist destinations in Konkan, do you feel happy and satisfied?

The graph states that 91% respondents feel after touring a variety of tourist destinations in Konkan, they feel happy and satisfied and 9% do not feel so.



Source: Primary Data

Fig. 1.9 Are you satisfied with value added services available?



Source: Primary Data

The above graph respresents level of satisfaction of tourist about various tourism products. The result of extremely happy is given here : Sightseeing facilities (41%), Quality of food (34%), Local cuisine and value for money Authentic food available (33%), Value for money and verall happiness (32%), Cleanliness and hygiene (25%), Safety arrangements for tourists (22%), Promotion / Advertising campaigns for the destinations (19%), Transportation arrangements (19%), Hotel Staying arrangements (18%) and Internet connectivity (14%).

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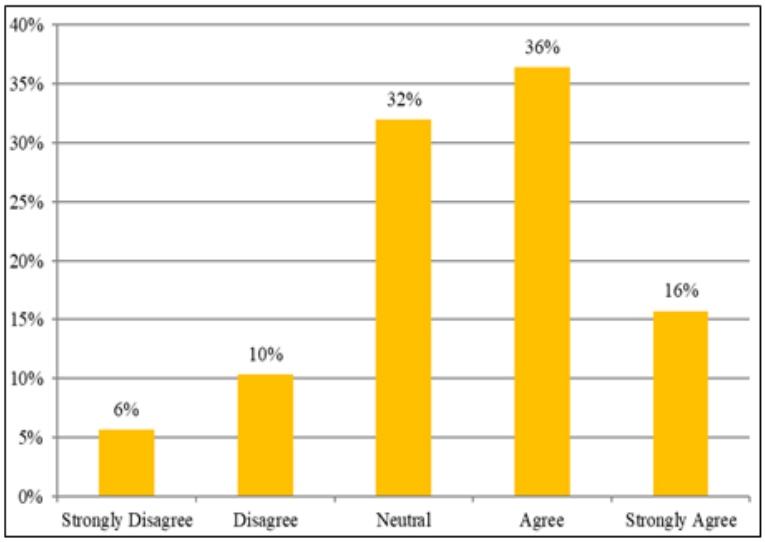
Fig. 1.10 The level of my happiness has increased after touring different places in Konkan region

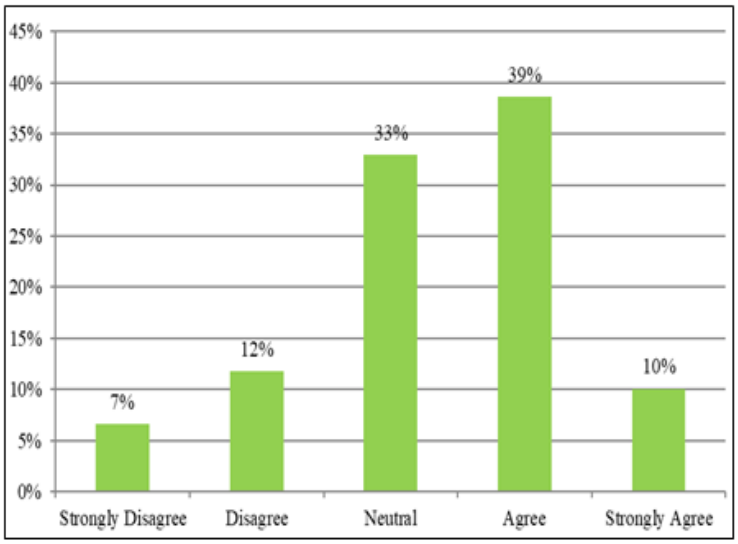


The above graph shows that most of the respondents are agree followed by neutral with the statement 'The level of my happiness has increased after touring different places in Konkan region'.

Source: Primary Data

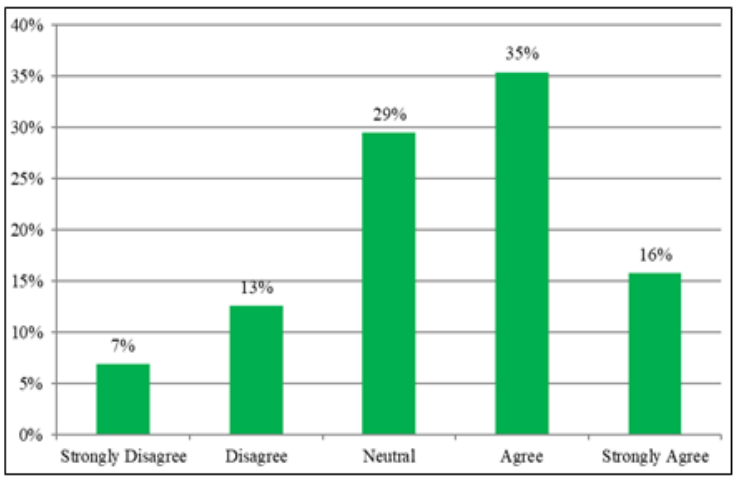
Fig. 1.11 'Konkan tourism' is economical and provides value for money spent

The above graph shows that most of the respondents are agree followed by neutral with the statement 'Konkan tourism' is economical and provides value for money spent'.



Source: Primary Data

Fig. 1.12 A variety of tourism products (such as stay, food, transport, and large variety of diverse destinations) has had a good influence on my happiness (about the trip)



The above graph shows that most of the respondents are agree followed by neutral with the statement 'A variety of tourism products (such as stay, food, transport, and large variety of diverse destinations) has had a good influence on my happiness (about the trip)'.

Source: Primary Data

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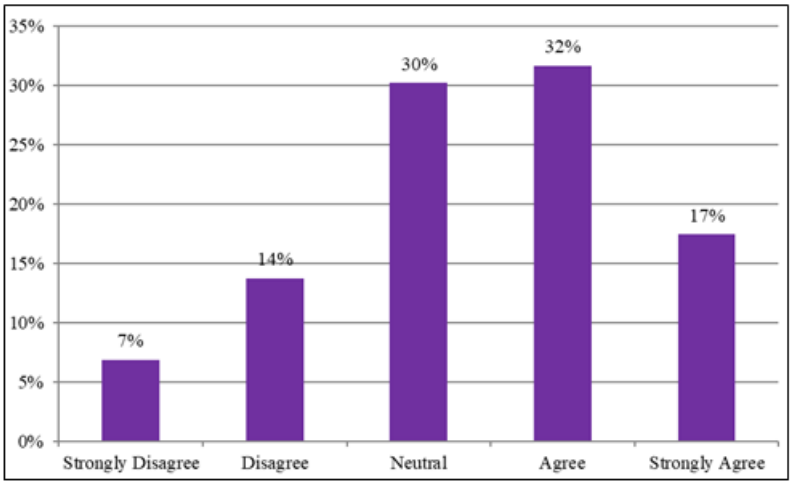
Fig. 1.13 I will tour to Konkan more frequently



The above graph shows that most of the respondents are agree followed by neutral with the statement 'I will tour to Konkan more frequently'.

Source: Primary Data

7. HYPOTHESIS TESTING

H_0: Tourists are of the opinion that a variety of tourism products consumed by them does not influence their satisfaction and happiness levels (about the trip).

For the above hypothesis, following statement is considered:

- A variety of tourism products (such as stay, food, transport, and large variety of diverse destinations) has had a good influence on my happiness (about the trip).

A variety of tourism products (such as stay, food, transport, and large variety of diverse destinations) has had a good influence on my happiness (about the trip).	
count	407
mean	3.4054
std dev	1.1054
std err	0.0548
hyp mean	5
α	0.05
tails	1
df	406
t stat	-29.1020
p value	2.1576E-101
Lower Critical Value (t)	-1.9658
Upper Critical Value (t)	1.9658
Test Result	Reject Ho

One sample t-test is applied. Result shows that null hypothesis is rejected which states that Tourists are of the opinion that a variety of tourism products consumed by them do influence their satisfaction and happiness levels (about the trip)

8. LIMITATIONS

1) The study has selected geographic location (Konkan) with the specific topic of interest such as experience of travelling to different places in Konkan.
2) The study has limited sample size – Total 407 (Four Hundred and Seven only) numbers of respondents.
3) It may not be suitable to make generalization of the findings. This is mainly because of its limited sample size and study area being limited only to limited location or suburb area.

9. CONCLUSION

The study concludes that most of the tourist prefer Alibaug as place visited in Konkan. Their reason for vising Konkan is natural beauty and scenic locations, Waterfalls and beaches. They state that positive aspect about Konkan tourism is Economical (cheap) holiday destinations, less traffic and peaceful, good stay arrangements. The negative aspect is language problem and bad roads and delays in reaching destination. Tourist feel happy

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and satisfied from Konkan tour. They are extremely happy with sightseeing facilities, quality of food, local cuisine and value for money Authentic food available and Value for money and overall happiness. The respondents are agree followed by neutral with the statement 'A variety of tourism products (such as stay, food, transport, and large variety of diverse destinations) has had a good influence on my happiness (about the trip)'. They also agree followed by neutral with the statement 'I will tour to Konkan more frequently. The hypothesis testing result states that tourists are of the opinion that a variety of tourism products consumed by them does influence their satisfaction and happiness levels (about the trip)

10. RECOMMENDATIONS

Looking at the inferences drawn from the conclusions mentioned above, the researcher recommends the following:

- The target audience to this study is college students. This is young age group and techno savvy. They like to share their travelling experience by clicking photos, sharing photos on social media with their friends and colleagues. In this context, telecommunication network support / availability network range is critical. In view of absence of network, it may be likely that tourist will not visit that place as no conversation is possible from that place.
- Ensuring that proper infrastructure is put in place (including communication facilities). Development of easily accessible internal roads, highways that may be useful to reach the destination without any further delays.
- For attracting the tourists in the region, investment for infrastructural development is inevitable for making it more attractive, interesting, easy to reach, hygienic, neat and clean, comfortable and enjoyable.
- It may be endured that hotels with good quality and variety of food at reasonable prices are provided. The rate in accordance with type of room should be displayed at the reception counters.
- Marketing of tourism needs to be more proactive and focused on developing activity-based tourism. This may call for suitable promotion / advertising campaigns for the destinations.
- It is required to ensure that proper 'trained guide services' are provided at different tourist spots. So, there will not be any 'language problem'. This will provide employment to local people and will beneficial to them.
- It may be suggested to have suitable arrangements done for the safety of the tourists.
- Local food attracts tourists hence availability of food with authentic taste and quality needs to be ensured. This will provide value for money for the tourists making them happy.

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TRAFFIC SIGN RECOGNITION SYSTEM USING CNN AND YOLOV4

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ABSTRACT
Road signs play an important role in our driving lives. They provide important information to road users. In today's world as the number of vehicles are increasing so are the road accidents and according to reports, India is on 1st spot in most number of accidents in a country. It can be caused due to many reasons such as poor enforcement of laws, carelessness etc. It gives rise to the need of such a system that recognizes traffic signals. Classification of traffic signs is used to identify and warn drivers to prevent violations. Existing classification system suffer from some disadvantages often cited by the process, such as inaccurate estimation. The proposed method uses a convolutional neural network to perform a signal classification algorithm. It also includes a webcam to detect traffic signs. This will help the driver to see traffic signs more accurately without missing,

Keywords: CNN, YOLOv4, GTSRB, mAP, IoU, SVM, KNN.

I. INTRODUCTION
Traffic-sign recognition (TSR) is a technology by which a vehicle can recognize the traffic signs put on the road e.g., "speed limit" or "children" or "turn ahead". The technology is being developed by a variety of automotive suppliers. It uses image processing techniques to detect the traffic signs. The detection methods can be generally divided into the color based, shape based and learning based methods.

The motivation behind developing such a system is clear due to the benefits of such a system in saving lives and saving cost. With advances in image processing, detection and recognition of traffic is becoming more and more important. The recent developments and interest in self-driving cars have also increased the interest in this field. An automated traffic sign detection and recognition system will provide the ability for smart cars and smart driving. Even with a driver behind the wheel, the system may provide vital information to the driver reducing human errors that cause accidents. Certainly, with such a system integrated into vehicles, it is expected that the number of car accidents will be reduced greatly saving human lives and the monetary value associated with car accidents. Automated systems will be able to control traffic on both open roads and intersections as well.

Road accidents occur due to the congestion on roads. A driver's ability to locate and recognize traffic signs is affected by his physical and mental condition. There may be cases where the content is partially hidden/damaged or placed in unexpected places. Recently, the development and interest in autonomous vehicles has also created an interest in this field. Considering all these factors, it creates problems to be solved by Traffic Sign Recognition (TSR) systems.

We are particularly interested in checking these signs in low light. In particular, our aim is to make the system accurate and efficient.

Our proposed method of traffic signs detection on time will help in following ways:

- Will eliminate collisions, and improve traffic signals, roads and geometric shapes of intersections. Traffic signs should act as a guide or spokesperson for the road network.
- Will reduce traffic accidents along the road and provide convenience to road users.
- Will inform road users of regulations and provide necessary warnings and directions for safety, consistency and efficiency.

II. PRELIMNARIES
Many articles have been published in the field of road sign recognition in the last ten years. Different algorithms are implemented in these works. Some of these are Refined mask- RCNN, YOLOv5, MLP, SVM, Random Forest (RF) and KNN classifiers. These algorithms are applied on different datasets such as traffic log or GTSRB or user created customized dataset. All these works are centered on detecting and classifying traffic signs. All the traffic sign recognition systems aim at achieving higher recognition and classification accuracy.

ROI detects traffic signs in an image based on their shape. Traffic signs are cut and hung for informational purposes. The bottom image is identified as unwanted character and black pixels are excluded from the description. With these considerations, much of the picture can be overlooked. Traffic signs are designed with special colors and shapes for easier recognition. There are some problems identifying traffic signs using a single

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image. Firstly it is not easy to accurately identify traffic signs when there are temporary disturbances; secondly is difficult to verify the accuracy of traffic signs [6].

Paper [1] This article provides an in-depth study of road sign recognition in India. Automatic traffic detection and recognition is based on end-to-end learning based on Convolutional Neural Network (CNN)-Refines Mask R-CNN.

Paper [2] Convolutional neural network (CNN) is designed for deep learning-based object recognition, which overcomes the shortcomings of traditional object recognition.

Paper [3] This study focuses on improving the efficiency and performance of machine learning systems in driver recognition systems to meet ADAS reliability and safety standards.

Paper [4] This article describes a method for a driving experience. support vector machines (SVM) and convolutional neural networks (CNN) are used to detect and recognize traffic signs, respectively.

Paper [5] This article covers a three-step traffic recognition and classification process, including image segmentation, traffic sign detection, and entry image-based phase classification.

Certain gaps in literature have been found and can be removed by using CNN, YOLOv4 and darknet framework. The overfitting problem in previous research papers will also be minimized. Maximum number of classes and quality data in dataset will be included for better results.

III. DESIGN AND ARCHITECTURE

When designing a traffic sign recognition system, there are several important aspects to consider, including the system architecture, the data collection and pre-processing methods, the feature extraction techniques, and the classification algorithms. Here's an overview of the proposed system design and methodology for a traffic sign recognition system.

Designing a traffic sign recognition system using YOLOv4 involves several components and steps. YOLO (You Only Look Once) is a popular object detection algorithm that can be used for real-time traffic sign recognition. Here's an outline of the system design:

1. **Dataset Collection:** A diverse dataset of annotated images containing different types of traffic signs is gathered. The dataset covers a wide range of lighting conditions, weather conditions, and sign variations.
2. **Dataset Pre-processing:** Pre-process the dataset by resizing images to a fixed size, converting them to the appropriate format and augmenting the data if necessary (e.g., rotating, scaling, flipping).
3. **Training:**

a. **Architecture Selection:** YOLOv4 is chosen for this as the base architecture due to its excellent object detection performance.

b. **Model Initialization:** The pre-trained weights of YOLOv4 on a large dataset is downloaded

c. **Training Process:** The model is trained on a suitable hardware setup, for faster convergence.

4. **Integration:**

a. **Real-time Inference:** The trained YOLOv4 model for real-time inference on the target hardware platform is implemented.

b. **Frame Processing:** Frames from a video stream or images from a camera are captured and are processed through the YOLOv4 model for traffic sign detection.

c. **Recognition and Classification**: The traffic sign regions from the bounding boxes is detected and further analysis is done to recognize the specific type of sign. This can involve using additional classification models or techniques specific to traffic sign recognition.

5. **Evaluation:** The system's performance will be evaluated using appropriate metrics (e.g., precision, recall, F1 score). The system is improved iteratively to achieve better accuracy and reliability.
6. **Deployment:** Once the system meets the desired performance criteria, it will be deployed on the target

It will be a platform, such as a traffic management system, autonomous vehicle, or a standalone traffic sign recognition application.

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The system architecture of a traffic sign recognition system typically consists of several interconnected components that work together to detect and classify traffic signs. A high-level overview of the system architecture is shown in Fig. 1

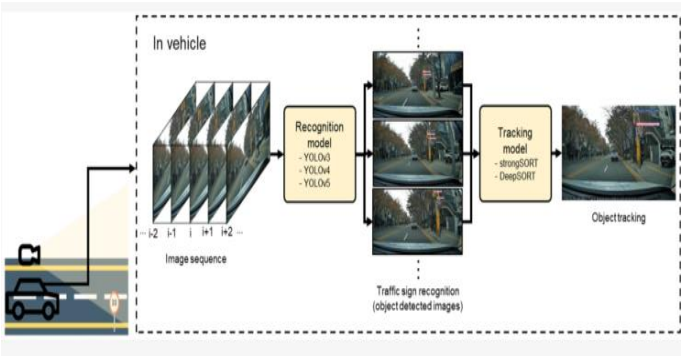

Fig 1: Traffic sign recognition system architecture using yolov4

The camera mounted on vehicle captures a video which is converted to image sequences. The recognition model then recognizes the traffic sign using yolov4 algorithm. The yolov4 model is trained to recognize the traffic signs accurately.

Details about various steps involved in designing traffic sign detection model are shown in Fig2.

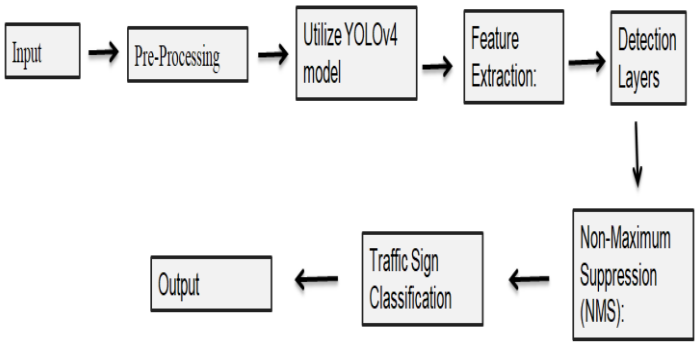

Fig 2: Traffic sign detection model design

Step 1: **Input Image** Camera which is placed inside the vehicle records a video which is nothing but a series of photos. Usually there are 24 frames per second. These photos go through the processors for the detection of sign. The camera quality should be very high that it should clearly shows the traffic sign from the minimum distance required. Generally, a camera of more than 8MP is required for this process.

Step 2: Pre-Processing The image or videos which is scanned is pre-processed through convolutional neural network. The image which has higher resolution is scaled down to small resolution.

Pre-processing involves preparing the data in a suitable format and applying various transformations to enhance the model's performance. Following are the pre-processing steps for training traffic sign recognition using YOLOv4:

a. Data Annotation:
Annotate the traffic sign dataset with bounding boxes and class labels for each traffic sign instance. Use annotation tools to accurately define the bounding box coordinates and assign the appropriate class labels.

b. Data Cleaning:
Perform data cleaning to remove any duplicate or incorrect annotations. Ensure that each traffic sign instance is properly labelled, and the bounding boxes accurately encompass the signs.

c. Data Augmentation:
Apply data augmentation techniques to increase the diversity and variability of the training data. This helps improve the model's generalization and robustness. Common data augmentation techniques for traffic sign recognition include random cropping, rotation, flipping, brightness adjustments, and adding noise.

d. Image Resizing:
Resize the input images to a fixed size suitable for the YOLOv4 model input. YOLOv4 typically takes square input images of a specific size, such as 416x416 pixels.

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e. Encoding:
Encode the class labels and bounding box coordinates in a format suitable for YOLOv4 training.

f. Train-Validation Split:
Split the pre-processed dataset into training and validation sets. The training set is used to train the YOLOv4 model, while the validation set is used for monitoring the model's performance and selecting optimal hyperparameters.

Step 3: Utilize the YOLOv4 model, a deep convolutional neural network (CNN), for traffic sign detection. The YOLOv4 model is trained on a large dataset with various object categories, including traffic signs, to learn representative features and patterns. The YOLOv4 architecture consists of a backbone network for feature extraction and several detection heads for predicting bounding boxes and class probabilities.

The detection heads are responsible for detecting traffic signs at different scales and resolutions.

Step 4: Feature Extraction:
The backbone network extracts high-level features from the input images through a series of convolutional layers, allowing the model to learn abstract representations.

Step 5: Detection Layers:
The detection layers receive feature maps from the backbone network and perform object detection by predicting bounding boxes and class probabilities.

YOLOv4 utilizes anchor boxes and grid cells to localize and classify objects within the image.

Step 6: Non-Maximum Suppression (NMS):
After detection, apply a non-maximum suppression algorithm to filter out redundant and overlapping bounding boxes.

NMS ensures that only the most confident and representative bounding boxes for each traffic sign are retained.

Step 7: Traffic Sign Classification:
If desired, an additional classification step can be added to classify the detected traffic signs into specific categories.

This step can involve passing the cropped traffic sign regions through a separate classifier network or leveraging a pre-trained classifier model.

Step 8: Output:
The system provides the final output, which includes the detected traffic signs with their corresponding bounding boxes, class labels, and confidence scores.

IV. METHODOLOGY

Two algorithms are proposed for this methodology.

1. YOLOv4 (Recognition algorithm):
The YOLOv4 algorithm, short for "You Only Look Once version 4," is an object detection algorithm that achieves state-of-the-art performance in terms of both accuracy and speed. It improves upon previous versions of YOLO by introducing various architectural enhancements and training techniques.

2. CNN algorithm (Classification Algorithm):
The CNN (Convolutional Neural Network) algorithm is a deep learning algorithm primarily used for visual recognition tasks, such as image classification and object detection. It consists of multiple interconnected layers that can automatically learn hierarchical representations from raw input data.

Implementing a traffic sign recognition system using YOLOv4, Darknet framework, and the GTSRB dataset involves several steps.

A. **Dataset Preparation:**
The GTSRB dataset is downloaded, which consists of labelled traffic sign images. The dataset is split into training, validation, and testing subsets. The dataset is organized in a format compatible with the Darknet framework, such as the YOLO format, which includes text files containing annotations for each image.

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B. **Darknet and YOLOv4 Setup:**
The Darknet repository is cloned, which consists of the implementation of the YOLO algorithm. The Darknet configuration files are modified to match the requirements of the GTSRB dataset, including the number of classes (traffic sign types).

C. **Training:**
The pre-trained weights of the YOLOv4 model are initialized, which can be downloaded from the Darknet website. The training process is started, which involves running the Darknet executable with the appropriate command-line arguments, specifying the dataset, configuration files, and hyperparameters.

D. Model Evaluation:
When training is complete, the trained model's performance is evaluated on the validation and testing datasets. Darknet executable is run with the trained weights and appropriate configuration files to perform traffic sign detection on the dataset images. The evaluation metrics is calculated to measure the model's accuracy and performance in recognizing traffic signs.

E. **Inference and Real-time Recognition:**
The trained YOLOv4 model for traffic sign recognition in real-time scenarios is applied on input images or video frames, using Darknet's detection capabilities, to detect and classify traffic signs. The detection results are post-processed, such as duplicate detections are filtered out, non-maximum suppression is applied, to improve the recognition accuracy.

V. RESULT & DISCUSSION

It is important to cover a range of scenarios to evaluate the system's performance. Here are some test cases that can be considered:

1. Different Light Conditions:
Include scenarios with different lighting conditions (e.g., day, night, direct sunlight) to assess the system's robustness.

2. Multiple Traffic Signs:
Test images with multiple traffic signs present in the scene.

Evaluate the system's ability to detect and classify multiple signs correctly, even when they are close together or partially occluded.

Include scenarios where there are similar-looking signs nearby to test the system's ability to discriminate between them accurately.

3. Different Traffic Sign Classes:
Test with images containing different types of traffic signs from the GTSRB dataset (e.g., warning signs, regulatory signs, information signs).

Include a variety of sign shapes, colors, and symbols to assess the system's ability to recognize diverse classes accurately.

4. Varied Environmental Conditions:
Evaluate the system's performance under different environmental conditions, such as different weather conditions (e.g., rain, fog, snow) or varying lighting conditions.

Include scenarios where the traffic signs are partially covered by foliage or other objects to assess the system's ability to handle occlusions.

The model is trained on Google's Collab Notebook. The dataset used has 4 classes. Before beginning the training, files are needed to be configured and some parameters are set as described in Table 1.

In our .cfg fileowe set batch = 64 and subdivisions = 116 for ultimate results, width = 416, height = 1416. Max_batches,ssteps,ffilters should be done based on the number of classes. Weosetmmax_batches = 8000 (no. of classes * 20000)mmax_batches should not be less than06000 though; steps = (180% of max_batchess), (90% ofmmax_batches); filters = 271 ((no. of classes +5)*3).

Table 1: Parameters for the training

Parameter	Value
Network size (input width, height)	0416 *4160
Batch	640

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Subdivisions	16o
Momentum	0.9490
Decay	0.00050
Learning ratee	0.001
Saturation	1.50
Exposure	1.50

mAP results are calculated of our dataset GTSRB for every 1000 iterations. IoU, Precision and Recall parameters are calculated by following formulas.

IoUurepresents the relationship between the result of the detection, the reality of the ground truth, and its relation. It measures the projection ratio.

$$IoU = \frac{Area_{pred} \cap Area_{gt}}{Area_{pred} \cup Area_{gt}}$$

The precision value represents the number of positive class predictions that belong to the positive class.

$$Precision(P) = \frac{True\ Positive(TP)}{True\ Positive(TP) + False\ Positive(FP)}$$

Recall value represents the number of positive class predictions made of all positive examples in the dataset.

$$Recall(R) = \frac{True\ Positive(TP)}{True\ Positive(TP) + False\ Negative(FN)}$$

TP represents True positives which means the true prediction of the positive class, FP represents False-positive which means the false prediction of the positive class.

VI. CONCLUSION

In this paper, the proposed method uses a convolutional neural network to perform a signal classification algorithm. It also includes a webcam to detect traffic signs. This will help the driver to see traffic signs more accurately without missing

Our work can be further improved by using a dataset that contains more signs and has a good number of images for each sign. We can also fine-tune the model and thus aim to achieve even better detection accuracy. With technology and research getting better and achieving new heights every day, we can also hope for some new detection model or technique to emerge as well**.**

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TRANSITIONING THROUGH CHANGE: LEADERSHIP IN POST COVID ERA

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ABSTRACT
As the world waits for a breakthrough from Covid 19 Pandemic, organizations and its leaders are looking for ways in which their organizations can adapt to change. There is a big responsibility on the corporate leadership to help their organization maneuver through this maze. The pandemic has left a long-term impact on the way organizations are going to conduct their activities in future. Organizational Change will be crucial in organizations adapting to the new normal. Strong leadership is required at the organizational front to seize every opportunity and transform businesses rather than react to the situation. This paper tries to differentiate between change and transition. It identifies opportunities in the hands of the organizational leader on how they can leverage on the pandemic wave to reorganize their organization and help their employees adapt to change normally without chaos.

Keywords: Organizational Change, Covid -19 Pandemic

INTRODUCTION
As the world around is witnessing major change in every sector and sphere there is an urgency in the organization to adapt and confer to the changing demands brought by the Covid 19 pandemic.

Change no doubt is becoming a norm and, in the organization, leaders are left with no choice but to adapt and lead the organization to adapt to change. Leaders who are successful understand that successful change and transition is not something that is easily achieved, it requires meticulous planning, identifying strategies and preparing the organization to face the challenges in a successful manner.

There exists a clear distinction between Change and Transition. 'Change' is defined as situations and circumstances that impact organizations and individuals. It paves way for an organization to move from an old way of doing things to a new way of doing things. To adapt to change organizations must be open to flexibility. 'Transition' is a psychological process of individuals in an organization adapting to new situations around them.

Transitioning through a period of change can be uncomfortable for the organization and its leaders, it can be a period of confusion as the future seems uncertain and unclear it is at this stage that the leader must step in to provide the much-needed clarity. He must ensure that the organization realizes that the uncertainty that the organization is experiencing is a stage between a time where the old mindsets and a particular way of doing things has ended and the organization must prepare for new beginnings.

It then becomes the responsibility of the leader to set clear short-term goals that will move the organization through times of uncertainty. It is also a time for the leader to look back and understand and learn from what the past had to teach.

Another area the leader must be prepared to face is understanding that rapid change and constant transition can lead to a lot of behavioral and emotional reactions from among the employees. Leaders must understand the complexity of the process of transition depends on frequency and how dramatic the change had been.

Managing change successfully requires that leaders effectively manage both the structural side of leading change and the human dynamic involved in transition. If a balance is not properly maintained between both of this the leaders will end up leading employees who are insecure, fearful, and skeptical.

If leaders overlook the people side of managing change, they will end up leading employees who are insecure and fearful. To become more successful as a change leader, the leader must manage human aspects of change effectively.

LITERATURE REVIEW
Covid 19 Pandemic has resulted in many businesses and organizations implementing changes to manage operational and economic challenges. A clear understanding related to how employees manage change during this pandemic process is critical to the success of organizations. (Li, J. Y., Sun, R., Tao, W., & Lee, Y,2021)

An effective change requires new strategies. Because of Covid-19 considerable lot of understanding on how to lead a planned change can be gathered through our understanding of the dynamics of unplanned change (Christine, 2020)

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In leadership emphasizing on values, purpose and communicating with clarity and meaning is very important. Only those organizations which are agile and will change proactively will thrive in the next normal (Mather, P. 2020).

Covid 19 pandemic has proved that technological advances and interconnectedness between employees has changed organizational landscape. (Lagowska, Sobral, & Furtado.2020).

OBJECTIVES OF THE STUDY

1. To understand the role of leadership in transitioning through Change in Post Covid Era.

2. To examine a few key opportunities at leadership level for transitioning change in Post Covid Era

KEY OPPORTUNITIES AT LEADERSHIP LEVEL FOR TRANSITIONING THROUGH CHANGE IN POST COVID ERA

1. Digital Transformation

Covid -19 Pandemic has ushered in the digital transformation. Before the Pandemic many organizations distrusted the technological capabilities of their own employees. During the Pandemic the companies realized that the workforce is indeed able to adapt if the right environment is provided.

2. Human Resource key to success

Post Covid organizations are coming to term that employee well-being is among the highest priority. In the new reality employees' physical and mental health will be of primary concern to organization.

3. Increase in Remote Working

Pandemic has caused the employers to be more involved in employees financial, physical, and mental wellbeing. The current economic crisis has changed how the employers view employee experience. This will require changes in security and structure. Leaders will also require the commitment of each employee to navigate their work. Remote working on a larger scale provides the company with the flexibility required to face unexpected changes in the future. Though there are second thoughts about productivity and work life balance, leaders must maneuver the change as this will become the new normal.

4. Communication for successful Change Management

Communication is seen as an important tool for successful change in the hands of the leaders. Leaders must maintain meaningful communication explaining to their employees' reasons for their new policies and plans. They must clearly spell out the objectives so that the teams can achieve their goals.

5. Making hybrid system of work effective

Leaders must adapt to the new way of working the hybrid way. It will require employees to work with their colleagues on site and sometimes even work remotely. This method can also lead to greater satisfaction among employees who will thrive under flexibility and improved productivity.

6. Rethink the role of CEO' and leaders

The Covid 19 pandemic has made the leadership rethink their leadership styles. They have understood the importance of communication and empowering their employees by building better teams. These are leaders who have energy and passion to innovate and bring change and growth into the organization.

7. Reshaping Corporate Culture

As people adapt and equip themselves with new ways of working, companies must pay attention to bringing all their employees successfully to a place where corporate culture can be reshaped to support new working models.

8. Anticipate and overcome resistance to change

Regardless of size all changes require people to spend their energy. Companies may go through a period of experiencing resistance to change. Leaders need to be empathetical before announcing new initiatives and changes. Workplace transitions need to be carefully planned and analyzed before implementation.

9. Providing specific training for managers

Managing a blended workforce where some of the employees may be working remotely and some may work in an office setting can be challenging for employees. Providing timely training for managers can prove beneficial in increasing productivity and efficiency of employees.

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10. **Make flexibility and adaptability the norm**

Workplace transitions must provide an atmosphere to accept flexibility and adaptability into their work culture. As organizations make conscious effort to chart their employees through the maze of transformation, they must ensure that the journey is nor disruptive but peaceful for its employees.

PANDEMIC TRANSITION: OPPORTUNITY FOR LEADERS

Applying pre pandemic mindset in a post-pandemic world will not result in an effective transition. The global accessibility of talent has ushered in a new culture at the workplace. Though leaders are excited and optimistic to address and deal with challenging problems posed by the Pandemic, they also feel ill-equipped and uncertain to attend to the needs of the employees.

Post-pandemic leaders need coaching, mentorship, and onboarding to help manage the workforce. They need new skills and abilities to support the workforce transition through change successfully. Because future leaders will face new threats not faced by leaders in the past, they will have to adapt to the new normal and technology focusing on long-term success.

According to (Fallon,2020), adopting effective business leadership in a Post Pandemic World has several approaches:

1. Emotional Intelligence: Emotional Intelligence is significant for contemporary leaders because it brings flexibility and empathy at work.
2. Developing trust and communication: There is a requirement for establishing policy and giving importance to direct and indirect contact. It is also a challenge for leaders to develop and maintain trust and communication, especially with remote communication.
3. Including People in Making Vital Decisions: Including workers in making vital decisions increases trust and transparency, and in the long run, it can increase their commitment.
4. Setting clear Priorities: Leaders must help employees in developing their priorities as this can go a long way in assisting them to get well organized and succeed.
5. Empathy: Empathy is crucial for a healthy work environment, especially in remote working environments. Leaders' ought to create a climate where concern and compassion are exercised for one another.
6. Futuristic Vision: Creating a futuristic vision and focusing on the priorities and keeping the organization moving ahead is a challenge that leaders must focus on.

Mckinsey has identified five crucial features that can aid organizations in recovering from the hindrance caused by the Pandemic.

1. Establishing Teams: Establishing a solid network of teams synced together in commonly adopting the goals and strategies of the firm is crucial to its success.
2. Displaying Optimism: Ambiguity and uncertainty associated with the Pandemic had drained all motivation and optimism from the workforce. Reigniting the flame and keeping the employees see the bigger picture will help a company succeed.
3. Making wise decisions: Focusing on the ultimate goals, keeping the vision clear, and making intelligent decisions amidst uncertainty are necessary to steer the company ahead.
4. Demonstrating Empathy: Employees are looking for meaningful relationships at the workplace. Being sensitive to their needs and accommodating them in the team schedule will help the employees perform and contribute better at the workplace.
5. Effective Communication: Communication is an essential ingredient in helping organizations transition. Effective and clear communication can result in better work culture and efficiency among the workforce.

CONCLUSION

Sudden change disrupting normalcy can be very challenging for leaders. Equipped with the right resource leaders can proactively usher in transformation in their organizations. In the new era Post Covid, it will be seen that the organizations that have a capacity to adapt, turn their challenges into new opportunities will be the organizations that will thrive. Leadership must use this period to reflect on their performance, get appropriate feedback, and approach change with an open mind. As they consciously take time to reflect, they may influence the business decision they are making. In turn they can create more resilient and adaptable organizations that has the capacity to thrive under all cases.

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DESIGNING AND EXECUTION OF PROTECTED ENCRYPTED CLOUD IN PERSPECTIVE OF DATA SECURITY

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ABSTRACT:
There are many problem related with cloud computing traffic, security and resource management. We can provide security in cloud by many ways like on data, network and storage. I propose holomorphic encryption to provide security on cloud. Holomorphic Encryption systems are used to perform operations on encrypted data without knowing the private key (without decryption), the client is the only holder of the secret key. When we decrypt the result of any operation, it is the same as if we had carried out the calculation on the raw data. This method provides more security on data because provider is not involving in key management. I use proxy re-encryption technique that prevents cipher text from chosen cipher text attack. This system is more secure than existing system.

***Keywords**: - Cloud computing, Cryptography, Encryption, Decryption, Cipher Text, DES.*

INTRODUCTION

Authentication is the most essential procedure to ensure the cloud data in a secured manner. However, strong user authentication is the main requirement for cloud computing that reduces the unauthorized user access of data on cloud. Data security is a more important issue of cloud computing. Thus, the need to ensure the safety of information that being exchanged between the users and the cloud became more significant. Many security and authentication techniques have been proposed to secure the exchanged data. These techniques aim to keep the authentication, privacy and reliability levels of data. Here in this survey paper, I have presented security algorithms in cloud computing. Database and web contents are hosted on cloud server and accessed via network connection. So there are the chances of attacking or hacking of data during transmission. Web programming is made using client side script and server side script. Cloud server based hosting has been provided to host web services. These services are made available to user on requirement via Internet. Cloud server hosting services has been supplied with the integration of multiple connected servers. There are different type of attacks which are performed to attack or hack the sensitive data during it transmission. In modern cloud hosting multiple physical machine are connected for cloud based hosting. This cloud host supports web hosting as well as email hosting. The net banking is one of the examples of session based login. Session is generated when user logins. Such session distinguish user from another user. The session hijacking attack in such system would make the un authentic user capable to manipulate or destroy confidential information of user. It has been seen there is time limit of particular session. But some time attacker could attack during this time. Session get generated when user login in to cloud. Intruder captures access & ability to do anything. He could access information like authorized user Hacker could steal authorized user log in by capturing his session ID. There are different techniques which are proposed to secure cloud services such as RSA, AES, DES, FLOW FISH, MD5, Multiplicative inverse etc. But these encryption have their own limitations.

Security is biggest problem of cloud computing. Many Research paper discuss about cloud and its advantage and disadvantage. In my Literature review I found security is major key point. From the Literature Review I found Holomorphic encryption is the more secure encryption scheme. In this scheme cloud server can perform any algebraic operation on cipher data. From literature Review I found that Chosen Cipher text attack is major problem.

Multiplicative Holomorphic Encryption

In Multiplicative Holomorphic encryption Multiplication of encrypted cipher text is same as Multiplication of original plain text.This property allows you to apply Multiplication on encrypted data without knowing original data.

RSA and Elgamal cryptosystems realize the properties of the multiplicative Holomorphic encryption. The client sends the pair (C1, C2) to the Cloud server and server performs the calculations requested by the client and sends the encrypted result (C1 × C2) to the client.

If the attacker intercepts two ciphers C1 et C2, which are encrypted with the same private key, so they are able to decrypt all messages exchanged between the server and the client. Because the Holomorphic encryption is multiplicative, i.e. the product of the ciphers equals the cipher of the product.

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The basic RSA algorithm and Paillier Cryptosystem is vulnerable to chosen cipher text attack (CCA).CCA is defined as an attack in which adversary chooses a number of cipher text and is given the corresponding plaintext, decrypted with the target's private key. Thus the adversary could select a plaintext, encrypt it with the target's public key and then be able to get plaintext back by having it decrypted by private key. So attacker will know the entire data in-between client and cloud server.

Proposed System:
To prevent cipher data from CCA (chosen cipher text attack) I propose Proxy Re-Encryption algorithm with paillier and RSA Cryptosystem. In Holomorphic encryption scheme data was encrypted by the private key and public key was kept with client only. We again pass that data in proxy re-encryption algorithm and get every time random key generated cipher data. If attacker gets that key ones then they need to decrypt that data twice with two different keys. If once attacker gets the plaintext than he is not able to get every plaintext between client and server. So this system provides more security than existing system.

Key generation:
1. Choose two large prime numbers p and q randomly and independently of each other such that gcd (pq ,(p-1)(q-1))=1.
2. Compute n=pq and λ=lcm (p-1, q-1).
3. select random integer g where g Є Z*n2
4. Ensure n divides the order of g by checking the existence of the following modular multiplicative inverse: μ=(L(a λ mod n2))-1mod n, where function is defined as L(u)=u-1/n.
5. The public (encryption) key is. (n,g)
6. The private (decryption) key is (λ, μ)

Encryption:

Enc (m, pk)

1. Let m be a message to be encrypted where m Є Zn.
2. Select random where r Є Zn*.
3. Compute ciphertext as: c=gm . rn mod n2.

Proxy Re-Encryption(c)

1. Compute Private and Public key.(Rsk,Rpk).
2. Re Encrypt Ciphertext generated by Paillier algorithm and send Public key (Rpk) to cloud server.

Decryption: Dec(c,sk)

1. Ciphertext c Є Zn2*.

2. Compute message: m=L(c λ mod n2)/ L (g λ mod n2). Mod n

The Need for Improvement in Cloud Security
There is a requirement for development in cloud security dependent on the reactions underneath, were 72% of respondents said Yes and just 28% say No who are of the conviction that no need of progress.

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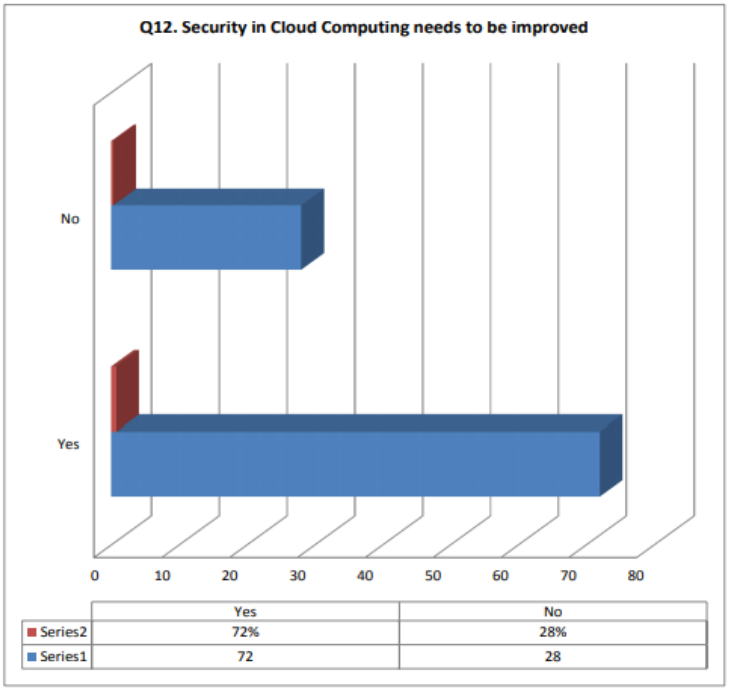

Figure: Improvement in Cloud Security (Q12)

The Issue of Adherence to Data Security Control

On the Issue of Adherence to Data Security Control as concurred in Services Level Agreements (SLA) the reactions from respondents is that 16% said Yes, 49% said No and 35% of the respondent addressed Maybe, that is to say they don't know on whether the Cloud Service Provider comply to such understanding rigorously or not.

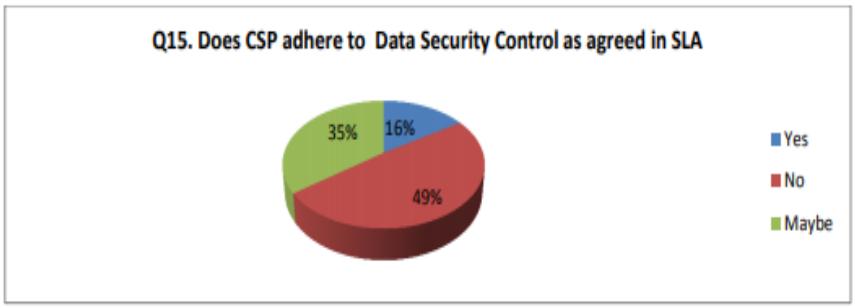

Figure: CSP adherence to Data Security Control as agreed in SLA (Q15)

Cloud Service Providers (CSP) Perspective and Users Perspective

On the security worries with respect to relationship from Cloud Service Providers (CSP) Perspective and Users Perspective, both the suppliers and clients are having related worries as far as Data and Information Storage. Most particular the protection and security issues, so reactions are introduced after investigation of the Question from the Survey structure which shows 62% of the reacted consider there is solid direct relationship from the two players and 38% are of the assessment of in a roundabout way related as displayed in the figure beneath

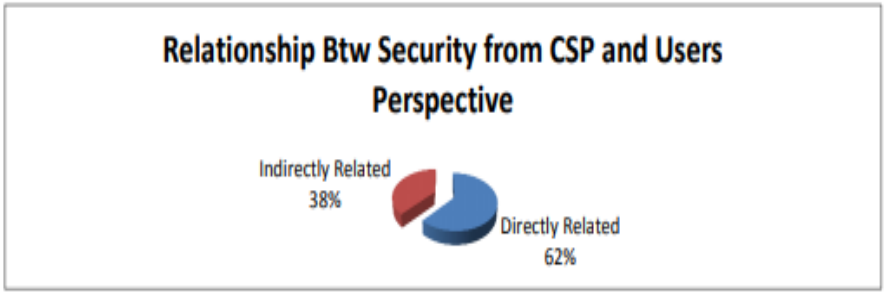

Figure: Relationship between Security from CSP and Users Perspective

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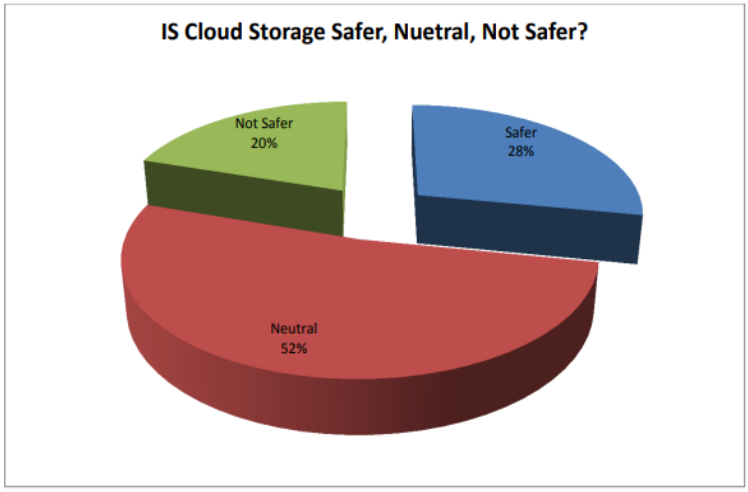
Safeness of Cloud Computing

Besides, as talked about in the past section, on the legitimacy of data that is put away in the cloud computing climate is more secure or not more secure and climate there is a requirement for further developed security in the cloud computing security for the most part to support clients in receiving the technology and surprisingly complete relocation to accomplish a portion of the utilization and advantage got from the cloud technology. Reactions are given as 28% accept whatever that is put away in cloud is more secure, 20% think the data isn't protected and about 52% are nonpartisan because of the affectability and nature of the whole Cloud Architecture.



The need for Improvement in General Security of Cloud Computing

On the requirement for cloud computing general security to be further developed dependent on the poll overview 73% of the respondent said there is a need to work on the security to empower client's appropriation and execution of cloud computing technology, just 27% of the respondents consider the security is typical. Which dependent on the scientists assessment are the little clients who are as of now utilizing the cloud computing technology for data stockpiling.

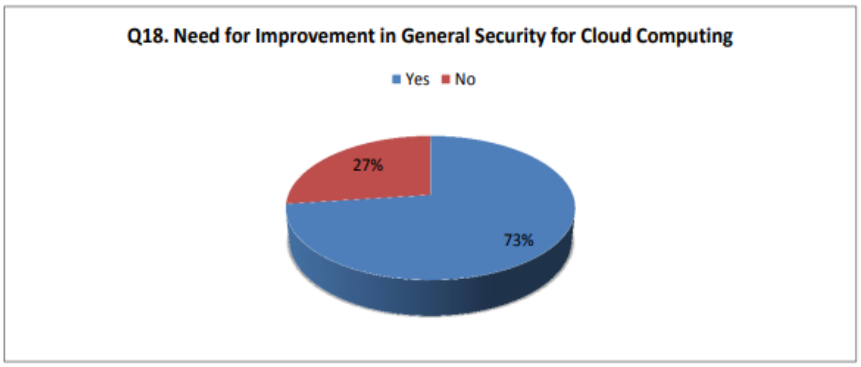


Figure: The need for improvement in General Security of Cloud Computing (Q18)

CONCLUSIONS

In this paper I have use Homomorphic encryption technique to provide security on cloud. Homomorphic encryption is a new concept of security which enables providing results of calculations on encrypted data without knowing the raw data on which the calculation was carried out, with respect of the data confidentiality. In this paper I have proposed RSA and Paillier algorithm for homomorphic encryption using proxy-Re-encryption algorithm that prevents cipher data from Chosen Cipher text Attack (CCA).So This system is more secure than existing system. In future we can optimize more efficiency of the system by reducing size of the key and we can also check proxy Re-Encryption method for other Homomorphic Encryption Scheme.

In this work, another the capacity and recovery with access control has been proposed and executed utilizing spatio-worldly limitations for giving dynamic and got cooperation in cloud. This gives dynamic and got joint effort and reasonable access control arrangements utilizing new spatio-fleeting imperatives to improve the security adequately. The presentation investigation shows that this proposed work demonstrates that the proposed calculation gives more security and burns-through less energy than the current frameworks.

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EXTENSIONS AND CONVERSIONS OF SOME ALGEBRAIC STRUCTURES

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ABSTRACT
A BCK algebra has been extended to another BCK algebra by adjoining one and two points outside the given g set and defining some binary operations suitably. Also the structure has been converted to another structure by defining some binary operations.

Keywords: *BCK, BCI, BCH, Weak BCK, Weak BCI algebras.*

§1. Preliminaries

Definition (1.1) : A structure (Z , $*$, θ) where Z is non empty set, '$*$' is a binary operation and θ is a fixed element (also called zero element) is called a BCK algebra [1,2] if the elements of Z satisfy the conditions:

[B1] $\big((\lambda * \mu) * (\lambda * \nu)\big) * (\nu * \mu) = \theta$;

[B2] $\big(\lambda * (\lambda * \mu)\big) * \mu = \theta$;

[B3] $\lambda * \lambda = \theta$;

[B4] $\lambda * \mu = \theta \; and \; \mu * \lambda = \theta \Rightarrow \lambda = \mu$

[B5] $\theta * \lambda = \theta \; for \; all \; \lambda \in Z$;

Lemma (1.2) : In a BCI/BCK algebra (Z , $*$, θ) the following conditions are also satisfied :

[B6] $\lambda * \theta = \lambda$;

[B7] $(\lambda * \nu) * n = (\lambda * \nu) * \mu$;

[B8] $\lambda * \big(\lambda * (\lambda * \mu)\big) = \lambda * \mu$.

Definition (1.3) : A system (Z , $*$, θ) is called

a) a BCH algebra [3], if the elements of Z satisfy only conditions [B3], [B4] and [B7] ;

b) a positive BCH algebra, if Z is a BCH algebra with additional condition [B5];

c) a weak BCI algebra if the elements of Z satisfy conditions [B2], [B3], [B4] and [B6];

d) a weak BCK algebra if it is a weak BCI algebra with condition [B5]..

§2. One Point Extension and Conversion

Theorem (2.1) : Let (Z, $*$, θ) be a BCK – algebra and let $\nu \notin Z$. We put Y = Z ∪ { ν }. Some binary operations are defined on Y as follows:-

a) Let ' $\bullet$ ' be a binary operations on Y defined as follows:-

$\lambda \bullet \mu = \lambda * \mu$ if $\lambda, \mu \in Z$ (2.1)

$\theta \bullet \nu = \theta$; (2.2)

$\nu \bullet \nu = \theta$; (2.3)

$\nu \bullet \theta = \nu$; (2.4)

$\nu \bullet \lambda = \theta$, $\lambda \in Z$; (2.5)

$\lambda \bullet \nu = \lambda$, $\lambda \in Z$ (2.6)

b) Let ' $\triangle$' be a binary operation on Y defined as follows:

Conditions (2.1) to (2.4) and (2.6) are same for $\triangle$ and

$\nu \triangle \lambda = \nu$, $\lambda \in Z$ (2.7)

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c) Let ' ⦿ ' be a binary operation on Y defined as follows:

Conditions (2.1) to (2.5) are same for ⦿.

Further,

$\lambda \circledcirc \nu = \nu$ for all $\lambda \in Z$. (2.8)

Then Y is a BCK algebra under above binary operations.

Proof : We see that properties [B3], [B4] and [B5] are satisfied for all the binary operations discussed above. So we need to examine [B1] and [B2] under different binary operations.

For this, we have to check the conditions for elements θ, ν and some λ, μ ∈ Z. We consider binary operations '•' defined in (a).

For [B2] we have,

$(\nu \bullet (\nu \bullet \lambda)) \bullet \lambda = (\nu \bullet \theta) \bullet \lambda = \nu \bullet \lambda = \theta.$

Also, $(\lambda \bullet (\bullet \nu)) \bullet \nu = (\lambda \bullet \lambda) \bullet \nu = \theta \bullet \nu = \theta.$

Further, $(\theta \bullet (\theta \bullet \nu)) \bullet \nu = (\theta \bullet \theta) \bullet \nu = \theta \bullet \nu = \theta.$

This means that [B2] is satisfied for binary operation '•'.

Again we see that,

$((\lambda \bullet \nu) \bullet (\lambda \bullet \theta)) \bullet (\theta \bullet \nu) = (\lambda \bullet \lambda) \bullet \theta = \theta \bullet \theta = \theta.$

Also, $((\nu \bullet \lambda) \bullet (\nu \bullet \theta)) \bullet (\theta \bullet \lambda) = (\theta \bullet \nu) \bullet \theta = \theta \bullet \theta = \theta.$

Again, $\big((\lambda \bullet \nu) \bullet (\lambda \bullet \mu)\big) \bullet (\mu \bullet \nu) = \big(\lambda \bullet (\lambda \bullet \nu)\big) \bullet \mu = \theta.$

and $\big((\nu \bullet \lambda) \bullet (\nu \bullet \mu)\big) \bullet (\mu \bullet \lambda) = (\theta \bullet \theta) \bullet (\mu \bullet \lambda) = \theta.$

So, [B1] is also satisfied. Hence, (Y, •, θ) is a BCK-algebra.

We consider the binary operation △ defined in (b)

For [B2] we have,

$\big(\lambda \triangle (\lambda \triangle \nu)\big) \triangle \nu = (\lambda \triangle \lambda) \triangle \nu = \theta \triangle \nu = \theta$

and, $\big(\nu \triangle (\nu \triangle \lambda)\big) \triangle \lambda = (\nu \triangle \nu) \triangle \lambda = \theta \triangle \lambda = \theta$

This means that [B2] is satisfied.

For [B1] we have,

$((\lambda \triangle \nu) \triangle (\lambda \triangle \theta)) \triangle (\theta \triangle \nu) = (\lambda \triangle \lambda) \triangle \theta = \theta \triangle \theta = \theta.$

Also, $((\nu \triangle \lambda) \triangle (\nu \triangle \theta)) \triangle (\theta \triangle \lambda) = (\theta \triangle \nu) \triangle \theta = \theta \triangle \theta = \theta.$

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and $\big((\nu \triangle \lambda) \triangle (\nu \triangle \mu)\big) \triangle (\mu \triangle \lambda) = (\nu \triangle \nu) \triangle (\mu \triangle \lambda) = \theta.$

So [B1] is satisfied. Hence, (Y, △, θ) is a BCK-algebra.

Now we consider the binary operation ⦿ given in (c)

For [B2] we have,

$\big(\lambda \circledcirc (\lambda \circledcirc \nu)\big) \circledcirc \nu = (\lambda \circledcirc \nu) \circledcirc \nu = \nu \circledcirc \nu = \theta$

Also, $\big(\nu \circledcirc (\nu \circledcirc \lambda)\big) \circledcirc \lambda = (\nu \circledcirc \theta) \circledcirc \theta = \nu \circledcirc \lambda = \theta$

which means that [B2] is satisfied.

For [B1] we have,

$\big((\lambda \circledcirc \nu) \circledcirc (\lambda \circledcirc \theta)\big) \circledcirc (\theta \circledcirc \nu) = (\nu \circledcirc \lambda) \circledcirc \theta = \theta \circledcirc \theta = \theta$

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Also, $\big((\nu \circledcirc \lambda) \circledcirc (\nu \circledcirc \theta)\big) \circledcirc (\theta \circledcirc \lambda) = (\theta \circledcirc \nu) \circledcirc \theta = \theta \circledcirc \theta = \theta$

Since [B2] and [B1] are satisfied in this case, (Y, ⊙, θ) is a BCK-algebra.

Remark(2.2):- In all the three cases Z is maximal BCK-subalgebra of Y.

Theorem (2.3) : We recall the assumptions of theorem (2.1) and define a binary operation ⊚ on Y which satisfy conditions (2.1), (2.3), (2.4) and

$\theta \circledcirc \nu = \nu$ (2.9)

$\nu \circledcirc \lambda = \nu = \lambda \circledcirc \nu$ (2.10)

for all $\lambda \in Z$.

Then (Y, ⊚, θ) is a BCI algebra.

Proof : From the given conditions we see that [B3] and [B4] are satisfied. We need to prove conditions [B1] and [B2]. We choose triplet θ, ν and $\lambda \in Z$. We see that

$((\theta \circledcirc \nu) \circledcirc (\theta \circledcirc \lambda) \circledcirc (\lambda \circledcirc \nu) = (\nu \circledcirc \theta) \circledcirc \nu = \nu \circledcirc \nu = \theta$;

$((\nu \circledcirc \lambda) \circledcirc (\nu \circledcirc \theta)) \circledcirc (\theta \circledcirc \lambda) = (\nu \circledcirc \nu) \circledcirc \theta = \theta \circledcirc \theta = \theta$;

$(\theta \circledcirc (\theta \circledcirc \nu)) \circledcirc \nu = (\theta \circledcirc \nu) \circledcirc \nu = \nu \circledcirc \nu = \theta$;

$(\nu \circledcirc (\nu \circledcirc \lambda)) \circledcirc \lambda = (\nu \circledcirc \nu) \circledcirc \lambda = \theta \circledcirc \lambda = \theta$.

Again for the triplet $\lambda, \mu \in Z$ and ν we have

$((\lambda \circledcirc \mu) \circledcirc (\lambda \circledcirc \nu) \circledcirc (\nu \circledcirc \mu) = (\lambda \circledcirc \mu) \circledcirc \nu) \circledcirc \nu = \nu \circledcirc \nu = \theta$;

$((\nu \circledcirc \lambda) \circledcirc (\nu \circledcirc \mu)) \circledcirc (\mu \circledcirc \lambda) = (\nu \circledcirc \nu) \circledcirc (\mu \circledcirc \lambda) = \theta \circledcirc (\mu \circledcirc \lambda) = \theta$;

$(\mu \circledcirc (\mu \circledcirc \nu)) \circledcirc \nu = (\mu \circledcirc \nu) \circledcirc \nu = \nu \circledcirc \nu = \theta$.

Thus [B1] and [B2] are satisfied for all possible triplets. Hence the result.

The above result gives a conversion of a BCK algebra into a BCI algebra.

Now we present some conversions of BCK-algebras to weak BCK and weak BCI algebras.

Theorem (2.4):- We assume the assumptions of theorem (2.1). A binary operation ▲ is defined on Y which satisfies conditions (2.1) to (2.4). Also,

$\lambda \blacktriangle \nu = \lambda$, $\nu \blacktriangle \lambda = \theta$ for some $\lambda \in Z$ (2.11)

and $\mu \blacktriangle \nu = \theta$, $\nu \blacktriangle \mu = \nu$ for some $\mu \in Z$ (2.12)

Then (Y, ▲, θ) is a weak BCK algebra.

Proof : From the above definition conditions [B3], [B4], [B5] and [B6] are satisfied. Now we see that

$(\lambda \blacktriangle (\lambda \blacktriangle \nu)) \blacktriangle \nu = (\lambda \blacktriangle \lambda) \blacktriangle \nu = \theta \blacktriangle \nu = \theta$;

$(\nu \blacktriangle (\nu \blacktriangle \lambda)) \blacktriangle \lambda = (\nu \blacktriangle \theta) \blacktriangle \lambda = \nu \blacktriangle \lambda = \theta$;

$(\mu \blacktriangle (\mu \blacktriangle \nu)) \blacktriangle \nu = (\mu \blacktriangle \theta) \blacktriangle \nu = \mu \blacktriangle \nu = \theta$;

$(\nu \blacktriangle (\nu \blacktriangle \mu)) \blacktriangle \mu = (\nu \blacktriangle \nu) \blacktriangle \mu = \theta \blacktriangle \mu = \theta$.

This means that [B2] is satisfied for the binary operation ▲. Hence (Y, ▲,θ) is a weak BCK algebra.

Theorem (2.5): We change condition (2.2) of (a) and (b) in theorem (2.1) and denote the new binary operation as $\bullet'$ and $\triangle'$ such that

$\theta \bullet' \nu = \ ;$ $\theta \triangle' \nu = \nu$ (2.13)

Then (Y, $\bullet'$, θ) and (Y, $\triangle'$, θ) are weak BCI algebras.

Proof : From the given conditions on $\bullet'$ and $\triangle'$, it is clear that [B3], [B4] and [B6] are satisfied for weak BCI algebra. We need to establish [B2] for these operations.

Now we consider the binary operation $\bullet'$ defined on Y and see that

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$(\theta \bullet'(\theta \bullet' \nu)) \bullet' \nu = (\theta \bullet' \nu) \bullet' \nu = \nu \bullet' \nu = \theta.$

Also, $(\nu \bullet' (\nu \bullet' \theta)) \bullet' \theta = (\nu \bullet' \nu) \bullet' \theta = \theta \bullet' \theta = \theta.$

For $\lambda \in Z$ and ν, [B2] can be established as given in theorem (2.1). So, condition [B2] is satisfied for all possible pairs.

Thus we see that (Y, $\bullet'$, θ) is a weak BCI algebra.

§3. Two Point Extension

Theorem (3.1): Every BCK algebra can be extended to another BCK algebra by adjoining two different points outside the given BCK algebra and defining binary operations suitably.

Proof: Let (Z, $*$, θ) be a BCK – algebra and let $\nu, \gamma \notin Z$. We put $Y = Z \cup \{\nu, \gamma\}$. A binary operation ' $\bullet$ ' is defined on Y as follows:-

$\lambda \bullet \mu = \lambda * \mu$ if $\lambda, \mu \in Z$ (3.1)

$\theta \bullet \nu = \theta$ $\theta \bullet \gamma = \theta;$ (3.2)

$\nu \bullet \nu = \theta$ $\gamma \bullet \gamma = \theta;$ (3.3)

$\nu \bullet \theta = \nu$ $\gamma \bullet \theta = \gamma;$ (3.4)

$\nu \bullet \lambda = \theta$ $\gamma \bullet \lambda = \theta;$ $\lambda \in Z$ (3.5)

$\lambda \bullet \nu = \lambda$ $\lambda \bullet \gamma = \lambda;$ $\lambda \in Z$ (3.6)

$\nu \bullet \gamma = \gamma;$ (3.7)

$\gamma \bullet \nu = \theta;$ (3.8)

From the above definitions, we see that [B3], [B4] and [B5] are satisfied. So we need to examine [B1] and [B2] for different elements of the set Y. First we consider elements θ, ν and γ. We have

$(\gamma \bullet (\gamma \bullet \nu)) \bullet \nu = (\gamma \bullet \theta) \bullet \nu = \gamma \bullet \nu = \theta.$

Also, $(\nu \bullet (\nu \bullet \gamma)) \bullet \gamma = (\nu \bullet \gamma) \bullet \gamma = \gamma \bullet \gamma = \theta.$

Again, $(\nu \bullet (\nu \bullet \theta)) \bullet \theta = (\nu \bullet \nu) \bullet \theta = \theta \bullet \theta = \theta.$

and, $(\theta \bullet (\theta \bullet \gamma)) \bullet \gamma = (\theta \bullet \theta) \bullet \gamma = \theta \bullet \gamma = \theta.$

So, [B2] is satisfied.

We also have,

$((\nu \bullet \gamma) \bullet (\nu \bullet \theta)) \bullet (\theta \bullet \gamma) = (\gamma \bullet \nu) \bullet \theta = \theta \bullet \theta = \theta;$

and $((\gamma \bullet \nu) \bullet (\gamma \bullet \theta)) \bullet (\theta \bullet \nu) = (\theta \bullet \gamma) \bullet \theta = \theta \bullet \theta = \theta.$

Again, $\big((\gamma \bullet \theta) \bullet (\gamma \bullet \nu)\big) \bullet (\nu \bullet \theta) = (\gamma \bullet \theta) \bullet \nu = \gamma \bullet \nu = \theta$

and $\big((\theta \bullet \nu) \bullet (\theta \bullet \gamma)\big) \bullet (\gamma \bullet \nu) = (\theta \bullet \theta) \bullet \theta = \theta \bullet \theta = \theta.$

So, [B1] is also satisfied.

Now we consider elements $\lambda \in Z$ and $\nu, \gamma,$. We see that

$(\gamma \bullet (\gamma \bullet \lambda)) \bullet \lambda = (\gamma \bullet \theta) \bullet \lambda = \gamma \bullet \lambda = \theta$

and $(\lambda \bullet (\lambda \bullet \nu)) \bullet \nu = (\lambda \bullet \lambda) \bullet \nu = \theta \bullet \nu = \theta.$

So [B2] is satisfied.

Further

$((\nu \bullet \gamma) \bullet (\nu \bullet \lambda)) \bullet (\lambda \bullet \gamma) = (\gamma \bullet \theta) \bullet \lambda = \gamma \bullet \lambda = \theta$

$((\gamma \bullet \lambda) \bullet (\gamma \bullet \nu)) \bullet (\nu \bullet \lambda) = (\theta \bullet \theta) \bullet \theta = \theta$

and $((\lambda \bullet \nu) \bullet (\lambda \bullet \gamma)) \bullet (\gamma \bullet \nu) = (\lambda \bullet \lambda) \bullet \theta = \theta$

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This proves that [B1] is satisfied for elements λ, ν, γ.

For triplet θ, λ, γ, we have

$((\lambda \bullet \theta) \bullet (\lambda \bullet \gamma)) \bullet (\gamma \bullet \theta) = (\lambda \bullet \lambda) \bullet \gamma = \theta \bullet \gamma = \theta$.

Similarity of binary operation for ν and γ implies that [B1] is true for triplet θ, λ, ν.

Hence $(Y, \bullet, \theta)$ is a BCK algebra.

Corollary (3.2):- There also exist binary operations $\bullet_1$, $\bullet_2$, and $\bullet_3$ on Y for which Y become BCK algebras.

These binary operations satisfy conditions (3.1) to (3.4) as binary operation $\bullet$.

We assume further as follows:-

$\nu \bullet_1 \lambda = \nu$, $\quad \gamma \bullet_1 \lambda = \gamma$; $\quad \lambda \in Z$ $\quad$ (3.9)

$\lambda \bullet_1 \nu = \theta$, $\quad \lambda \bullet_1 \gamma = \theta$; $\quad \lambda \in Z$ $\quad$ (3.10)

$\nu \bullet_1 \gamma = \theta$, $\quad$ (3.11)

$\gamma \bullet_1 \nu = \gamma$. $\quad$ (3.12)

Binary operation $\bullet_2$ is such that ν and γ are disjoint from each element of Z and ν and γ are disjoint from each other.

Binary operation $\bullet_3$ is such that ν and γ are disjoint from each element of Z and

$\nu \bullet_3 \gamma = \gamma$, $\quad$ (3.13)

$\gamma \bullet_3 \nu = \theta$. $\quad$ (3.14)

Proof : Taking triplets as in theorem (3.1) we can prove the results easily.

Remark(3.3):- Extensions by two points can also be performed by repeating the process one by one point as discussed in theorem(3.1).

Remark(3.4):- It is easy to verify that $Z \cup \{\nu\}$ and $Z \cup \{\gamma\}$ are maximal BCK algebras of Y w.r.t. binary operations '$\bullet$', '$\bullet_1$', '$\bullet_2$', and '$\bullet_3$'.

Remark(3.5) :- To describe methods to extend a BCK algebra by adjoining more than two elements, first we construct a BCK algebra with such elements taking zero element as the zero element of the given BCK algebra and then using the following result:

For given two BCK algebras $(E, *, 0)$ and $(F, \bullet, 0)$ with $E \cap F = \{0\}$, $E \cup F$ is also a BCK algebra with binary operation $\triangle$ defined as

$m \triangle k = m * k$ $\quad$ if $m, k \in E$

$= m \bullet k$ $\quad$ if $m, k \in F$

$= m$ $\quad$ otherwise.

The above result is also valid for two non-negative BCH algebras and BCC – algebras.

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SYNTHESIS, CHARACTERIZATION AND BIOLOGICAL EVALUATION OF SOME 2,3-DI SUBSTITUTED QUINAZOLIN-4(3H)-ONES

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ABSTRACT
This work involves the synthesis and characterization of novel quinazolin-4(3H)-ones compounds and evaluating their pharmacological activity. Quinazolin-4(3H)-ones derivatives are associated with wide range of biological and pharmacological activities. The synthesis involves the reaction between a variety of amines with benzoxazine-4-one which in turn prepared from anthranilic acid. The chemical structure of the synthesized compounds were confirmed on the basis of the spectral data (FTIR, UV-visible, H^1NMR & mass spectral analysis). All the synthesized compounds were tested in invitro conditions for number of micro-organisms (Staphylococcus aureus, Bacillus subtilis, Escherichia coli) and two fungal (Aspergillis flavus and Candida albicans) in order to assess antibacterial and antifungal property. All the synthesized compounds were screened for anti bacterial activity and antifungal activity by using Ciproflaxacin and Griseofulvin as standards. The results had shown that some of the synthesized molecules had shown more significant activity when compared to standard. As some of the titled compounds have significant anti bacterial and antifungal activity, the further research on this work in future might lead to the discovery of some novel potent and safe pharmacological active drugs.

Keywords: *Quinazolin-4(3H)-ones, benzoxazine-4-one, antibacterial, antifungal activity.*

INTRODUCTION
Heterocyclic chemistry is a chemistry involving the heterocyclic compounds which has atoms of at least two different elements as number of rings. The heterocyclic atoms may be inorganic, though the compound contains carbon atoms in the ring. The word hetero means "different from carbon and hydrogen" (2011;Selvam T).Heterocyclic chemistry comprises at least half of all organic chemistry research worldwide. In particular, heterocyclic structures form the basis of many pharmaceutical agrochemical and veterinary products(2011;Maity A).Heterocyclic chemistry is a potential part of synthetic organic chemistry, covering a wide variety of bioactive molecules. Among six-membered heterocyclics, quinazoline occupies significant position and is commonly found in a wide variety of natural products, synthetic pharmaceutical molecules, and other functional materials (2008;Gundla R).The critical role played by heterocycles in drug design cannot be denied. Even where the natural substrate or ligand for a biological target does not contain a heterocycle,drugs whether of natural are man-made origin that act on the target frequently contain heterocyclic groups (2010;Balakumar C).

Literature Review reveals that quinazolinones are associated with a widerange of biological and pharmacological activities. It has been established that quinazolinone possess anti-viral (Selvam.P), cytotoxic agents (Selvam.P, Hennequin LF), anti-bacterial (Trivedi V.P, Gupta A.K.S, Siddappa K), anti-tubercular activity (kumar P), anti- fungal (Mukherji D.D, Gupta A.K.S, Siddappa K), anti-allergic (Sengupta A.K, John H.Sellsted), anti-tumour (Chauarasia M R) and hypoglycaemic properties (Rett N P). In the recent past, quinazolinones were reported to exhibit pronounced coronary vasodilatory (Singh P) and H_1 &H_2-receptor antagonistic activities (Hussain M I, Hosona M). Along with this it also exhibits MAO (Monoamine oxidase) inhibitory activity.

The main aim of this work is to highlight the wide range of developments displayed by quinazolinone derivatives which have been found to posses wide spectrum of activities such as anti-inflammatory,anti-oxidant, anti-microbial, anti-psychotic and anti-hypertensive. Quinazoline is a building for approximately 150 naturally occurring alkaloids isolated till date from a number of families of plant kingdom, from animals and from microorganisms such as *Bacillus cereus, Bouchardatianeurococca, Dichroafebrifuga,* and *Peganumnigellastrum*.Some of its derivatives are already in the market and several compounds are found in patented literature indicating that many of them are undergoing trials for their clinical activity. The commertially available drugs with various pharmacological activities were carbromal (Hypnotic/sedative), Aloglipitin(anti-diabetic), Halofuginone (anti-inflammatory), Mecloqualone (anxiolytic), Febrifugine (anti-malarial) and so on. It is proved from the literature survey that the 2,3-disubstituted-4(3*H*)-1,3-benzoxazin-4-

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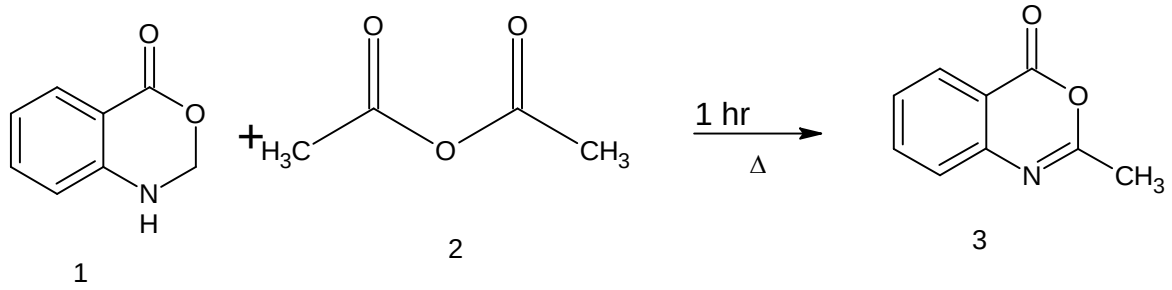
one and its derivatives were found to possess important biological activities. Keeping in view of this, it was proposed to synthesize some new 2,3-disubstituted quinazolin-4-ones by conventional method.

METHODOLOGY:

2.1. SYNTHESIS OF TITLE COMPOUNDS

STEPI-SYNTHESIS OF BENZOXAZINE-4-ONE DERIVATIVES: Methyl and phenylderivatives of benzoxazine-4-one is synthesized from various reactants and reaction conditions.

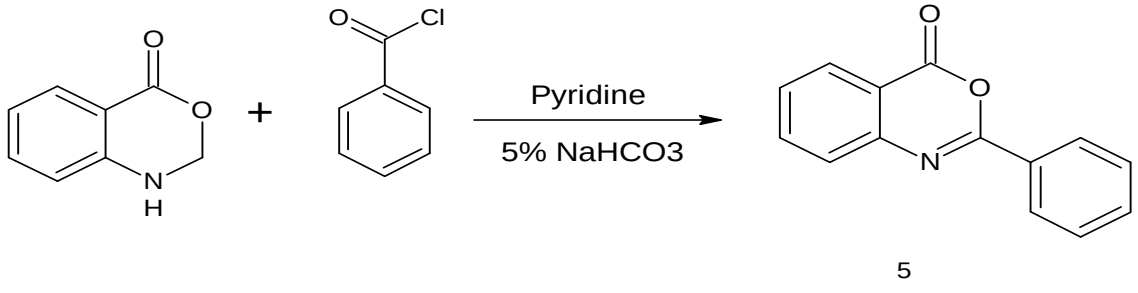
i) By using acetic anhydride: For one hour; A mixture of anthranilic acid**1** (0.02M,2.7242g) in acetic anhydride **2** (4ml) was heated the excess solvent was then distilled off under reduced pressure.The reaction mixture was cooled, filtered, washed with petroleum ether, dried and recrystalized with absolute ethanol to get 2-methyl-(4H)-Benzo [1,3]oxazine-4-one **3**.Completion of reaction was determined by TLC using Cyclohexane:ethylacetate (2:1) as mobile phase and reaction was presented in **Scheme-Ia**.



1 2 3

Scheme-Ia: synthesis of 2-methyl quinazoline derivative from anthranilic acid and aceticanhydride.

ii) By using benzoyl chloride: To a mixture of anthranilic acid**1** (0.1M) dissolved in pyridine (60ml) and benzoyl chloride **4** (0.2M) was added.The mixture was stirred for 30 min followed by treatment with 5%$NaHCo_3$(15ml).The solid obtained was recrystalized with ethanol to get 2-phenyl-(4H)-benzo[1,3]oxazin-4-one **5**.Completion of the reaction was determined by TLC usingcyclohexane:ethylacetate (2:1) as mobile phase and reaction was presented in **scheme-Ib**.



1 4 5

Scheme-Ib: Synthesis of 2-phenyl quinazoline-4-one derivative from anthranilic acid and benzoyl chloride.

STEP 2- SYNTHESIS OF QUINAZOLINONE DERIVATIVES:
Quinazolinone derivatives were synthesized using various amino reagents like phenyl hydrazine **6**,p-bromo aniline **7**, 2,4-DNPH **8**, INH **9** and O-toulidine**10.**2-phenyl-(4*H*)-benzo[1,3]oxazin-4-one**5** and 2-methyl-(4H)-benzo[1,3]oxazin-4-one **3**(0.01mol) reacts with amino reagents**6**-**10**(0.02mol) in ethanol (30ml)was heated under reflux for 3 hrs .Then the reaction mixture was concentrated and solid separated was dried and recrystallized with ethanol to get 2-phenyl-3-substituted quinazolin-4-one derivatives (**RQ_1, RQ_3, RQ_5, RQ_7, RQ_9**) and 2-methyl-3-substituted quinazoline-4-one derivatives (**RQ_2, RQ_4, RQ_6, RQ_8, RQ_{10}**) of respective amino reagents.The reactions of all these derivatives were presented in **scheme-IIa and IIb**.The homogeneity and purity of the compounds were ascertained by TLC on silica gel G-plates using cyclohexane:ethyl acetate (2:1) and the spots were visualized in iodine chamber.

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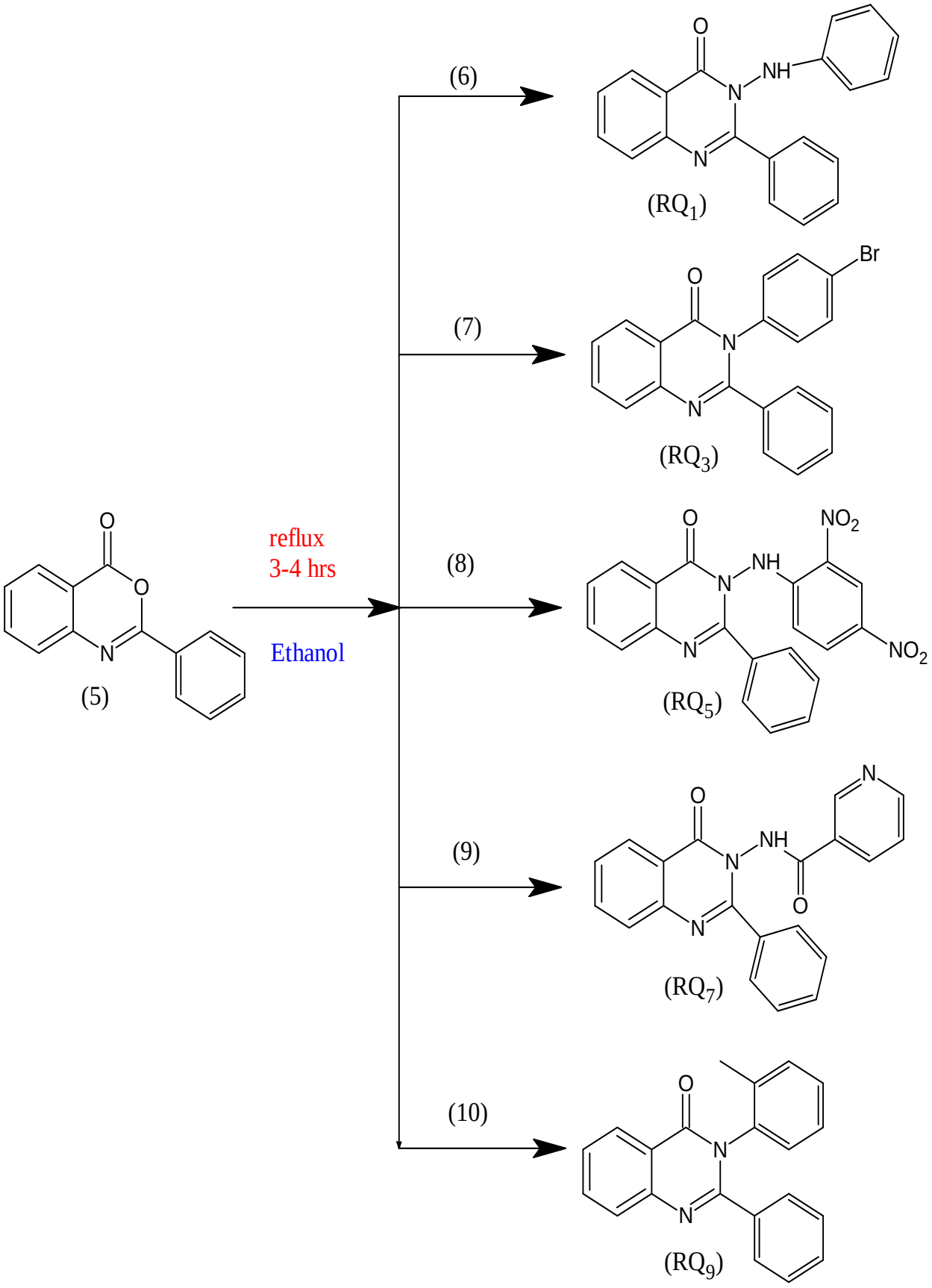

Scheme-IIa: Synthesis of 2-phenyl-3-substituted quinazoline-4-one derivatives from 2-phenyl benzoxazine-4-one using ethanol; (6) phenyl hydrazine; (7) p-bromo aniline; (8) 2,4-DNPH; (9) INH; (10) O-toludine.

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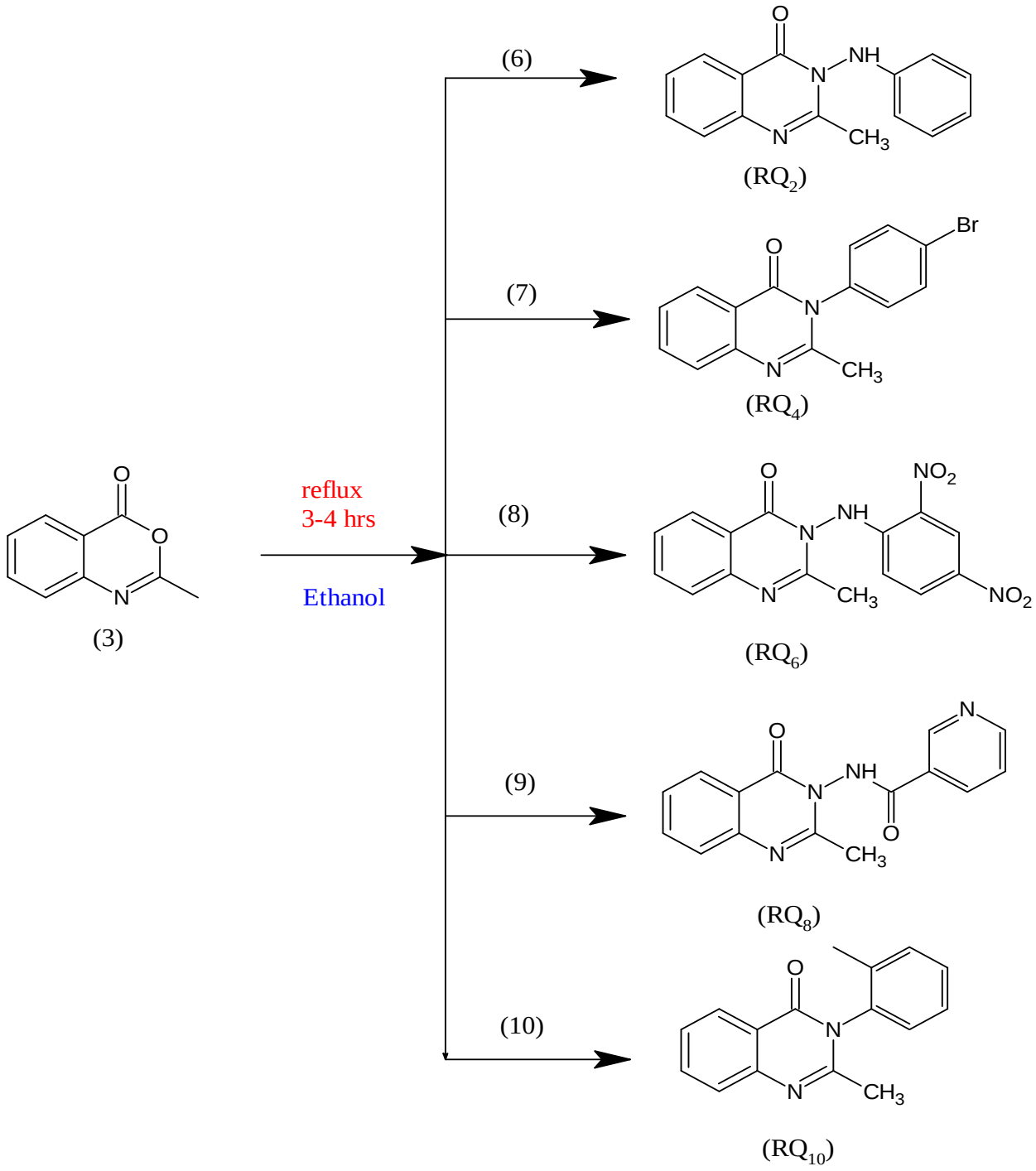

Scheme-IIb: Synthesis of 2-methyl-3-substituted quinazoline-4-one derivatives from 2-methyl benzoxazine-4-one using methanol; (6)- phenyl hydrazine; (7)- p-bromo aniline; (8)- 2,4-DNPH; (9)- INH; (10)- O-toludine.

2.2 Screening of title compounds:

2.2.1. Solubility:the synthesized derivatives were screened for solubility using various solvents like chloroform, dimethylformamide (DMF), dimethyl sulphoxide (DMSO), ethyl acetate and n-Hexane.

2.2.2.THIN LAYER CHROMATOGRAPHY: The pre-coated silica gel G were used as a stationary phase. A solvent system hexane; ethyl acetate(1:1) was prepared and poured into a depth of chromatographic chamber for saturation. After saturation of a chamber the sample was plates were allowed to dry. the plates were placed in UV-chamber for detection of spots then the R_f value was calculated using the formula.

R_f value =distance travelled by solute/distance travelled by solvent

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2.2.3. SPECTRAL ANALYSIS: All the 10 4-quinazolinone derivatives (**RQ_1-RQ_{10}**) were characterized by IR, H^1 NMR and mass spectrum. IR spectra of all the derivatives were measured. In which sample taken in the form of solid by mixing with potassium bromide in the ratio 1:100 as KBr discs. IR spectra were recorded using Shimadzu FT-IR 4000. H^1 NMR spectra were recorded using Bruker AV-III 500 MHz FT NMR spectrophotometer using tetramethylsilane (TMS) as internal standard and chloroform, DMF used as solvents. Mass spectra for all the 10 derivatives were obtained on JEOL GCMATE II GC-Mass spectrophotometer at 70ev using electron spray ionization method.

2.3 PHARMACOLOGICAL EVALUATION:

2.3.1 ANTI-FUNGAL ACTIVITY:

All the title compounds screened for anti-fungal activity by using cup plate method. The fungi employed for screening were ***Candida albicans*** and ***Asperigillus flavus***.The test organisms were sub-cultured using potato dextrose agar medium. The tubes containing sterilized medium were inoculated with test fungi and after incubation at 25^{o}c for 48hr and they were stored at 4^{o}c in a refrigerator.The inoculums were prepared by taking a loopful of stock culture to about 100ml of nutrient broth, in 250ml clean and sterilized conical flasks. The flasks were incubated at 25^{o}c for 24hr before use.The stock solution of the reference standard (Griseofulvin) and test compound were prepared by dissolving in dimethyl formamide to obtain concentrations of 50µg/ml and 100µg/ml.The potato-dextrose-agar medium was sterilized by autoclaving at 121^{o}c (15lb pressure), for15 minutes. The Petri plates, tubes and flasks plugged with cotton plugs were sterilized in hot air-oven at 120^{o}c, for an hour. Into each sterilized Petri plate (10cmdiameter), about 30ml each of molten potato dextrose agar medium inoculated with respective fungus (6ml of inoculums to 300ml of potato dextrose agar medium) was transferred aseptically. After solidification of the medium at room temperature, five cups of 6mm diameter were made in each plate with a sterile borer. Using sterile graduated syringes, the standard and the test compounds solution of known concentrations were fed into the bored cups.The order of the solution was as follows: Cup1 and 2 for Standard concentrations 50& 100 µg/ml; Cup3&4 for compound concentrations50& 100µg/ml; Cup-5: Solvent control (DMF).

2.3.2 Anti-bacterial activity:

All the 10 quinazoline-4-one derivatives are screened for their antibacterial activity using agar cup plate method. The drug used as a standard is ciprofloxacin against various gram-positive and gram-negative bacteria including *bacillus subtilis*, *S. aureus* and *Pseudomonas aeruginosa*, *Escherichia coli* respectively. Required conditions for the growth of microorganismsshould be provided along with culture media and should be same throughout the study. And the work area should be in aseptic condition. The antibacterial activity of **RQ_1-RQ_{10}** derivatives against standard drug were measured by preparing two different concentration(50 and 100 µg/ml) solutions of these derivatives and standard drug. Initially, pour the 30ml of agar media into the sterilized petri plates and kept aside for few minutes for solidifying the agar media. In the next step, add the few drops of bacterial inoculum and spread over the solidified agar medium. Then make 5 cups having diameter about 6mm and pour the 1ml of different concentration solutions as described in antifungal activity. Then incubate these petri plates for 24 hours at 25^{0}C. Finally measure the zone of inhibition values.

2.3.3ANTI-INFLAMMATORY ACTIVITY:

Step1-Reagent preparation: All the required reagents were prepared initially before performing the assay procedure. The reagents used are 0.2M potassium dihydrogen phosphate (27.218g in 1000ml water), pH 7.0 phosphate buffer using 150ml of 0.2M potassium dihydrogen phosphate and 39.1ml of 0.2M NaOH and dilute to 2000ml with distilled water. 0.2M sodium hydroxide solution was prepared by dissolving sodium hydroxide in water to produce 40 to 60 %W/V solution and allow to stand. Taking precautions to avoid absorption of carbon dioxide sithon off the clear supernatant liquid and dilute with carbon dioxide free water a suitable volume of the liquid to contain 8.0gm of sodium hydroxide in 1000ml. 1mM albumin solution (dissolve 0.476 of egg albumin in phosphate buffer 7.4 and diluted with buffer to 1000ml)

Step2- Procedure: The standard drug synthesized compounds were dissolved in minimum quantity of DMF and diluted with phosphate buffer (0.2m, PH 7.4).Final concentration of DMF in all solution was less than 2.5%. Test solution (1ml) containing different concentration of drug was mixed with 1ml of 1mm albumin solution in phosphate buffer and incubated at 37c in incubater for 15 min. Denaturation was induced by keeping the mixture at 60c in water for 10min.After cooling,the turbidity was measured at 660nm (UV-visible spectroscopy Sl-159,Elico).Percentage of inhibition of denaturation was calculated from controlwhere no drug was added. Each experiment was done in triplicate and average is taken.The Ibuprofen was used as standard drug.The percentage inhibition of denaturation was calculated by using following formula the results are described below.

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Percentage of inhibition=100(AC-AS)/AC

AC=Absorbance of control; AS=Absorbance of sample/standard

3. RESULTS and DISCUSION:

3.1.Prelimnary screening: All the title compounds were synthesized and characterized by physical methods such as TLC,solubility and melting point determination. The data related to structure, molecular weight, melting point, solubility and TLC was presented in **table 1,2& 3**.

TABLE1:Structural details and some physico-chemical properties of the title compounds

S.No.	COMPOUND CODE	MOLECULAR FORMULA	MOLECULAR WEIGHT	MELTING POINT
1	**RQ_1**	$C_{14}H_{11}N_3O$	237.25664	125^0C
2	**RQ_2**	$C_{14}H_{11}N_3O$	237.25664	139^0C
3	**RQ_3**	$C_{14}H_9BrN_2O$	301.13806	255-260^0C
4	**RQ_4**	$C_{14}H_9BrN_2O$	301.13806	204^0C
5	**RQ_5**	$C_{14}H_{11}N_5O_5$	329.26764	173-175^0C
6	**RQ_6**	$C_{14}H_{11}N_5O_5$	329.26764	153-155^0C
7	**RQ_7**	$C_{15}H_{13}N_3O_2$	267.28262	104-105^0C
8	**RQ_8**	$C_{15}H_{13}N_3O_2$	267.28262	122^0C
9	**RQ_9**	$C_{15}H_{12}N_2O$	236.26858	202^0C
10	**RQ_{10}**	$C_{15}H_{12}N_2O$	236.26858	148-150^0C

TABLE2:Solubility Profile of 2,3-disubstituted Quinazolin-4(3H)-ones

S.No	Compound code	chloroform	DMF	DMSO	Ethyl acetate	n-hexane
1.	**RQ_1**	Soluble	-	-	soluble	-
2.	**RQ_2**	Soluble	-	-	Soluble	-
3.	**RQ_3**	-	Soluble	-	-	-
4.	**RQ_4**	-	Soluble	-	-	-
5.	**RQ_5**	-	Soluble	-	-	-
6.	**RQ_6**	-	Soluble	-	-	-
7.	**RQ_7**	-	-	Soluble	-	-
8.	**RQ_8**	-	-	Soluble	-	-
9.	**RQ_9**	-	Soluble	-	Soluble	-
10.	**RQ_{10}**	-	Soluble	-	-	-

TABLE3: TLC for selected 2,3-disubstituted Quinazolin-4(3H)-ones

S.NO	COMPOUND	SOLVENT FRONT MOVED (cm)	SOLUTE FRONT MOVED (cm)	R_f VALUES
1	**RQ_3**	5.4	3.3	0.61
2	**RQ_4**	5.1	3.1	0.6
3	**RQ_5**	5.3	3.1	0.58
4	**RQ_6**	5.4	3.8	0.7
5	**RQ_9**	5.3	3.5	0.66
6	**RQ_{10}**	5.1	3.3	0.647

cm- centimeter; Rf- Retardation factor.

3.2. **Spectral Analysis:**All the synthesized compounds(**RQ_1-RQ_{10}**) were characterized by FT-IR. Selected compounds[**RQ_2**and **RQ_9**] were also characterized by ^{1}H NMR and Mass spectra.From the mass spectral data,the molecular weight of the synthesized compounds was confirmed. The spectral data was presented in **table 4&5**. The IR, NMR and Mass spectra of compound **RQ_2**was displayed in figures 1, 2&3.

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TABLE 4: IR SPECTRAL DETAILS OF 2,3-DI SUBSTITUTED QUINAZOLIN-4(3H)-ONES: (RQ_1-RQ_{10})

Compound Code	IR Spectral Data (cm^{-1})
RQ_1	1655.01(C=0Str)-Ketone, 1948.20-Aromatic carbons, 3105.55(C-H,stre,aromatic), 3391.03 (NH-N), 1369.53 (C-N str).
RQ_2	1672.39(C=O str)- Ketone, 1848.29-aromatic carbons, 3013.194(C-H-aromaticstr), 3392.765(N-H str), 1232.734(-N str), 3189.912 (NH-N),2921.018(-CH_3)
RQ_3	1655.01(C=0, STR)-Ketone, 1369.53(C-Nstr), 3109.40(C-H-str,aromatic), 790.85(C-BR,str), 1948.20(aromatic)
RQ_4	1653.583-(C=O,str)Ketone, 1908.942-(aromatic), 3115.876-(C-H str aromatic) 751.799-(C-BR,str), 1233.717-(C-N,str), 2875.401-(-CH_3 str)
RQ_5	1607.649(C=0,str)Ketone, 2997.704(C-H,aromatic, str) 3166.866(C-N,str), 1227.999(C-N,str), 2112.820(aromatic)
RQ_6	1639.026-(C=O,str), 1900.605-(aromatic), 3234.651-(NH-N), 2878.762-(-CH,str), 1310.607-(C-N,str), 2608.250-(C-H,str,aromatic)
RQ_7	1649.230-(C=0,str), 1225.759-(C-N,str), 3177.355 – (NH-N), 2963.323 –(C-H,str,aromatic), 2357.307-(aromatic).
RQ_8	1662.245 –(c=o,str)Ketone, 3231.39 –(NH-N), 2083.445 –(aromatic), 2858.144-(-CH_3) 2994.576 –(C-H,str, aromatic)
RQ_9	1658.86-(C=0,str),Ketone, 2816.21-(-CH_3), 3105.55-(C-H,str,aromatic), 1369.53-(C-N,str), 1944.34-(aromatic).
RQ_{10}	1661.720-(c=0,str,)Ketone, 1894.031-(aromatic), 3233.736-(C-H,str , aromatic), 1314.475-(C-N,str), 2549.853-(-CH_3)

cm^{-1}- units of frequency

TABLE 5: ^{1}HNMR and Mass spectral data of synthesized compounds

Compound code	^{1}HNMR Chemical shift δ (ppm)	Mass Spectra (m/z)
RQ_2	CH-(7.507) benzene, CH-(7.514)benzene, CH-(7.519) benzene, CH-(7.526) benzene CH-(7.219) benzene, CH-(7.226) benzene, CH-(7.231) benzene, CH-(7.237) benzene CH-(7.530) benzylideneimine, CH-(7.545) benzenylideneimine, CH_3 -(2.615) methyl	222.9847
RQ_9	NH-4.4 (aromatic), CH-(7.235) benzene, CH-(7.241) benzene, CH-(7.247) benzene, CH-(7.253) benzene, CH-(7.520) benzene, CH-(7.526) benzene CH-(7.532) benzene, CH-(7.538) benzene, CH_3-(1.8) methyl	236.268

Ppm- parts per million; m- mass; z- charge of ion

Figure 1: IR spectra of quinazolinone derivative RQ_2

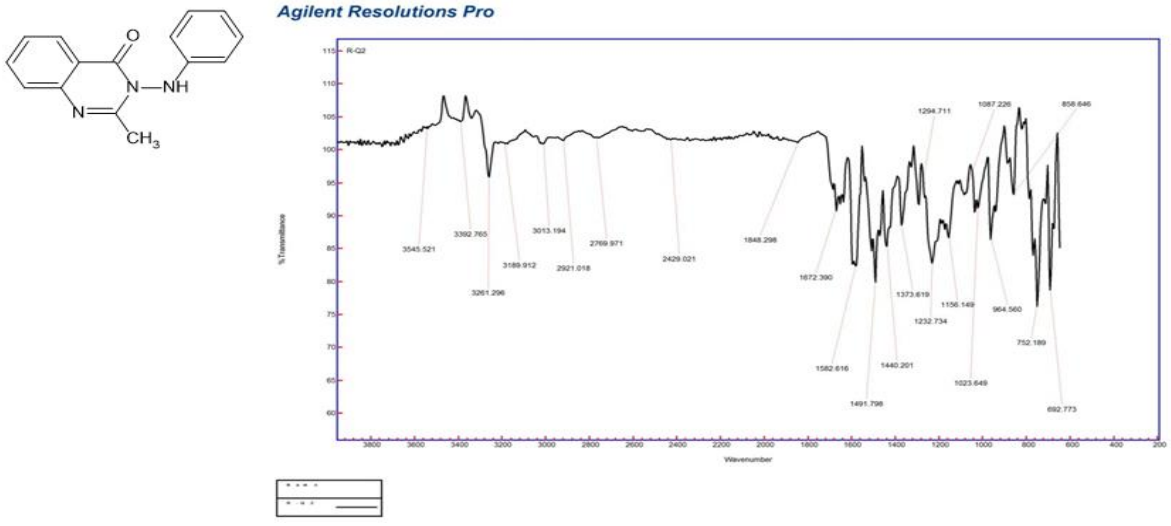

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Figure 2: NMR spectra of Quinazolinone derivative RQ_2

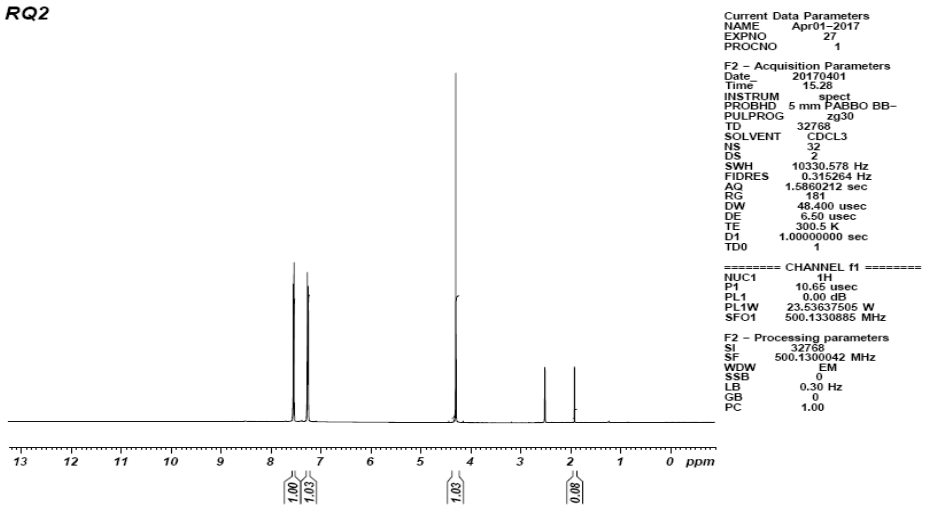
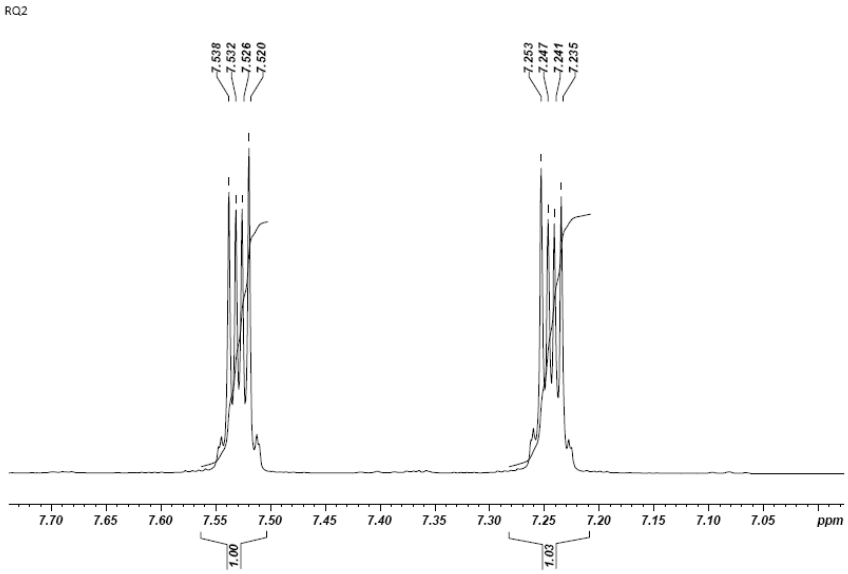


Figure 3: Mass spectra of quinazolinone derivative RQ_2



3.3. Pharmacological Assays:

3.3.1. ANTI-FUNGAL ACTIVITY: Anti-fungal activity was done to synthesized compounds against *Candida albicans* and *Aspergillus flavus* .The mean zone of inhibition were measured in mm and activity of compounds were compared with Griseofulvin.From the tabulated results of anti-fungal activity, RQ_2 and RQ_3 showed potent activity against Candida albicans and RQ_4 exhibited significant anti-fungal activity against Aspergillus flavus whereas RQ_1, RQ_6, RQ_9 showed same range of activity.

TABLE NO:6 Anti-fungal activity for 2,3-disubstituted Quinazolin-4(3H)-one derivatives.

S. No	SAMPLE CODE	MEAN ZONE OF INHIBITION (mm)			
		CANDIDA ALBICANS		ASPERGILLUS FLAVUS	
		50µg	100µg	50µg	100µg
1	Griseofulvin	20	22	19	23
2	RQ_1	14	17	15	19
3	RQ_2	16	19	14	17
4	RQ_3	17	19	12	16
5	RQ_4	8	11	17	19
6	RQ_5	13	16	14	18
7	RQ_6	15	16	16	19

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8	RQ_7	12	15	11	13
9	RQ_8	16	18	14	17
10	RQ_9	14	17	15	19
11	RQ_{10}	10	15	11	16

mm- millimeter; µg- micrograms.

3.3.2. ANTI-BACTERIAL ACTIVITY: The title compounds were evaluated for anti-bacterial activity against Gram- positive *Bacillus subtilis* and *Staphylococcus aureus*,Gram-negative *Pseudomonas aeruginosa* and *Escherichia coli* after 24 hours of incubation at 37ºC the zone of inhibition were measured in mm. The activity was compared with the known antibiotics Ciprofloxacin.From the tabulated anti-bacterial activity results,it was shown that at lower concentration (50µg/ml) RQ_2 , RQ_7 and RQ_1 exhibited significant activity and RQ_1,RQ_6 and RQ_7 exhibited significant anti-bacterial activity at higher concentrations(100µg/ml).

Table 7: Anti-bacterial activity of 2,3-disubstituted Quinazolin-4(3H)-onederivatives by agar cup plate method against gram positive and gram negative bacteria.

S. No	SAMPLE CODE	MEAN ZONE OF INHIBITION (mm)							
		B. SUBTILIS (G+VE)		S. AUREUS (G+VE)		PSEUDOMONAS AERUGINOSA (G-VE)		E. COLI (G-VE)	
		50µg	100µg	50µg	100µg	50µg	100µg	50µg	100µg
1	Ciprafloxacin	16	19	16	20	18	22	18	20
2	RQ_1	13	16	16	18	14	17	14	19
3	RQ_2	15	18	14	16	16	20	14	16
4	RQ_3	12	15	13	15	12	14	17	19
5	RQ_4	14	18	12	16	15	18	13	15
6	RQ_5	13	15	15	17	14	16	11	14
7	RQ_6	9	12	14	18	12	15	10	15
8	RQ_7	17	19	16	15	15	19	13	15
9	RQ_8	14	17	15	17	14	18	16	13
10	RQ_9	13	16	12	15	13	15	12	15
11	RQ_{10}	14	17	13	14	16	19	17	16

mm- millimeter; µg- micrograms.

3.3.3. ANTI-INFLAMMATORY ACTIVITY: Selected compounds [**RQ_2,RQ_3,RQ_6**and **RQ_9**] have been screened for in-vitro anti-inflammatory activity using ibuprofen as standard at 20,40 and 60 µg/ml concentrations.From the results of in-vitro anti-inflammatory activity tabulated, it was observed that RQ3and RQ_9 showed significant activity at the concentration level of 60µg/ml and 20µg/ml than 40µg/ml. The probable reason for this is the presence of electron donating groups like $–NH_2$,-CH_3 and $–C_6H_5$.

TABLE 8:Anti-inflammatory activity for selected 2,3-disubstituted Quinazolin-4(3H)-ones

S.No.	Compound name	Percentage inhibition at different concentrations (%)		
		20µg	40µg	60µg
1	Ibuprofen(std)	98.33	98.88	99.4
2	RQ_2	65	82.2	97.2
3	RQ_3	96.1	90.5	92.7
4	RQ_6	102.2	97.7	98.3
5	RQ_9	99.4	99.4	98.3

4. CONCLUSION:

2,3-disubstituted quinazolin-4(3H)-ones were synthesized by using the standard synthetic procedure.The Synthesized compounds were characterized by using physical and analytical methods such as TLC, melting point determination, FTIR, ^{1}HNMR and Mass spectroscopy.The IR spectroscopic data showed that the functional groups present in the respective compounds were confirmed.The ^{1}HNMR spectroscopic data showed that the number of protons present in the respective compounds were confirmed.The Mass spectroscopic data showed that the molecular weight of the synthesized compounds were confirmed.The anti-inflammatory activity for selected compounds i.e, RQ_3 and RQ_9 showed significant activity when compared to Ibuprofen.The anti-bacterial activity for selected compounds i.e, RQ_1, RQ_2, RQ_6 and RQ_7 exhibited potent anti-bacterial

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activity when compared with known anti-biotic(ciprofloxacin).The anti-fungal activity for selected compounds i.e, RQ_2 RQ_3, andRQ_4 showed potent activity when compared with known anti-fungal drug(Griseofulvin).

5. CONFLICT OF INTEREST:

The authors have no conflicts of interest regarding this investigation**.**

6. ACKNOWLEDGMENTS:

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IMPACT OF AEROBIC AND FOLK DANCE ON CARDIO RESPIRATORYENDURANCE AND BODY COMPOSITION AMONG OBESE BOYS

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ABSTRACT
The purpose of the study was to find out the impact of aerobic and folk dance on cardio respiratory endurance and body composition among obese boys. Two hundred and eighty eight boys were chosen at random basis and their age ranged between 14 and 16 years from Chennai, Tamil Nadu. They were screened for Body Mass Index measured (Weight (kg)/Height (m^2)) on basis of BMI guidelines given by World Health Organization. After Body Mass Index analysis one hundred class-I obesity (30.0-34.9) school boys were randomly from the available 139 subjects in the category of class-I obesity selected and their age ranged between 14 and 16 years from Chennai City, Tamil Nadu, India. They were assigned into four equal groups. Each group consisted of twenty five subjects. The four groups were are namely Group I as Experimental Group I -(Aerobic Dance), Group II as Experimental Group II - (Folk Dance), Group III as Experimental Group III (Aerobic and Folk Dance combination), and Group IV as Control group. In this study Cardio respiratory endurance-VO2 max and body composition- Percent Body Fat were selected as variables. The selected variables were tested through Coopers 12 Minute Run/Walk- VO2 Max = 0.0268(Distance, m) – 11.3 (Cooper, 1968) in ml/kg/min and Skin FolderCaliber, 0.735(triceps + calf) +1 (Slaughter et al. 1988) in Percentage. Pre and post test was conducted before and after the twelve weeks, weekly five days- one day 60 minutes of experimental training. The result of the study shows that there was significant improvement on cardio respiratory endurance-VO2 max and body composition-percent body fat impact by the three experimental groups namely the aerobic dance, folk dance and its combination of dance (aerobic and folk) training group among obese boys.

Keywords: Aerobic Dance, Folk Dance, Cardio Respiratory Endurance, Body Composition and Obese Boys.

INTRODUCTION
Rising prevalence of obesity in India may be due to various factors such as sedentary life-style, unhealthy eating habits, increasing urbanization, mechanization of jobs and transportation facility, dependency development on mass media for leisure, adopting less physically active lifestyles and consuming more "energy-dense, nutrient-poor" diets (Bundred et al. 2001).

Obesity is an abnormal accumulation of body fat, usually 20% or more over an individual's ideal body weight. Obesity is associated with increased risk of illness, disability and death.

The mechanism for excessive weight gain is clear more calories are consumed than the body burns, and the excess calories are stored as fat (adipose) tissue. (Sunyer & F. Xavier 2000).

The most common approach measure of obesity is the Body Mass Index (BMI) BMI= Weight (kg)/ Height (m^2)

The BMI individuals who scored, below 18.5, 18.5-24.9, 25.0-29.9, 30.0-34.9, 35.0-39.9 and above 40 were considered as underweight, underweight, overweight, obesity class I, obesity class II and obesity class III respectively (WHO, 2000).

Dance is a popular physical activity of people of all ages. It is both a physical activity and a performing art that gives participants an opportunity for aesthetic expression through various combination of physical movement (Deboraha, 2010).

The term „aerobic" means „with air" or „with oxygen". Aerobic exercise uses muscles in a rhythmical and continuous fashion. It is a physical exercise requires additional effort by the heart and lungs to meet the increased demand by the skeletal muscles for oxygen (Virginia, 2002).

Folk dance is a form of dance developed by a group of people that reflects the traditional life of the people of a certain country or region.

As for as Indian is concern folk dance may mean dance by the small holders and agricultural labors, because the rural population in India is more than 85 percentof total and so The majority of the people belongs to the rural areas folk dance is the art of the village folk (Aakriti Sinha, 2006).

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The ability of the lungs, heart rate and blood vessels to deliver adequate amounts of oxygen to the cells to meet the demands of prolonged physical activity (Wener & Sharon, 2009).

Body composition describes the relative proportions of fat, bone, and muscle mass in the human body (Wolters, 2014).

STATEMENT OF THE PROBLEM

The purpose of the study was to find out the impact of aerobic and folk danceon cardio respiratory endurance and body composition among obese boys.

HYPOTHESIS

It was hypothesized that there would be a significant improvement on cardio respiratory endurance and body composition due to the aerobic dance and folk dance and its combination of dance training among obese boys.

REVIEW OF RELATED LITERATURE

Whooten et al. (2018) examined effects of Build Our Kids Success-a 12-week, 1-hour before-school physical activity program-on BMI and social-emotional wellness among kindergarten to eighth grade students was examined. Participants were from 24 schools in Massachusetts; there were 707 children from kindergarten to eighth grade. Children in the 3 days/week group had improvements in BMI z-score and this mean change was significantly different than the comparisongroup. Children in the 3 days/week group also had higher odds of being in a lower BMI category at follow-up; significantly different than the comparison group. Children in the 2 days/week program had no significant changes in BMI outcomes. Children in the 3 days/week group demonstrated improvement in their student engagement scores and had no significant improvements in reported peer relationships, affect, and life satisfaction versus comparison. The 2 days/week group had significant improvements in positive affect and vitality/energy versus comparison. A 3 days/week before-school physical activity program resulted in improved BMI andprevented increases in child obesity.

METHODOLOGY

The purpose of the study was to find out the impact of aerobic and folk dance on cardio respiratory endurance and body composition among obese boys. Two hundred and eighty eight boys were chosen at random basis and their age ranged between 14 and 16 years from Chennai, Tamil Nadu. They were screened for Body Mass Index measured (Weight (kg)/Height (m^2)) on basis of BMI guidelines given by World Health Organization. After Body Mass Index analysis one hundred class-I obesity (30.0-34.9) school boys were randomly from the available 139 subjects in the category of class I obesity selected and their age ranged between 14 and 16 years from Chennai City, Tamil Nadu, India. They were assigned into four equal groups. Each group consisted of twenty five subjects. The four groups were are namely GroupI as Experimental Group I -(Aerobic Dance), Group II as Experimental Group II - (Folk Dance), Group III as Experimental Group III (Aerobic and Folk Dance combination), and Group IV as Control group. In this study Cardio respiratory endurance-VO2 max and body composition- Percent Body Fat were selected as variables. The selected variables were tested through Coopers 12 Minute Run/Walk- VO2 Max = 0.0268(Distance, m) – 11.3 (Cooper, 1968) in ml/kg/min and Skin FolderCaliber, 0.735(triceps + calf) +1 (Slaughter et al. 1988) in Percentage. Pre and post test was conducted before and after the twelve weeks, weekly five days- one day 60 minutes of experimental training.

Table-I
Training Programme for Experimental Group I- Aerobic Dance andExperimental Group II Folk Dance Training Groups

Weeks	Aerobics Dance Training Group	Folk Dance Training Group	Duration	Load
I to III Weeks	**Warming up Aerobic Dance** On Spot Marching Touch Out V Step Side to Side **Warming down**	**Warming upFolk Dance** Oyilattam Kolattam Karagattam **Warming down**	**5 minutes 45 minutes** **10 minutes**	2 sets x 2 repetitions intensity of60% Rest in betweensets (2 minutes)
IV to VI Weeks	**Warming up Aerobic Dance**Grapevine Front Kick Side Kick A Step Cross Over Step **Warming down**	**Warming upFolk Dance** Kummi Oyilattam Kolattam **Warming down**	**5 minutes 45 minutes** **10 minutes**	3 sets x 2 repetitions intensity of65% Rest in betweensets (2 minutes)

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VII to IX Weeks	**Warming up Aerobic Dance**Step Touch V Step GrapevineFront Kick Knee and Arm Lift **Warming down**	**Warming upFolk Dance** KaragattamKolattam Kummi **Warming down**	**5 minutes** **45 minutes** **10 minutes**	3 sets x 3 repetitions intensity of70% Rest in betweensets (2 minutes)
X to XII Weeks	**Warming up Aerobic Dance** On Spot Marching Side Kick A Step Touch Out Step Touch	**Warming upFolk Dance** Kolattam Oyilattam Kummi	**5 minutes** **45 minutes**	3 sets x 3 repetitions intensity of75% Rest in betweensets (2 minutes
	Warming down	**Warming down**	**10 minutes**	

Table-II

Training Programme for Experimental Group III - Combination ofAerobic and Folk Dance Training Group

Weeks	Day I & III	Day II & IV	Day V	Load
I to III	**Warming up** **Aerobic Dance** On Spot Marching Step Touch Touch Out V step Side to Side **Warming down**	**Warming up** **Folk Dance** KaragattamKolattam Kummi **Warming down**	**Warming up** **Aerobic andFolk Dance** On Spot Marching Step TouchV step KaragattamKolattam **Warming down**	**5 minutes** **45 minutes** 2 sets x 2 repetition Intensity of60% Rest in betweensets (2 minutes) **10 minutes**
IV to VI	**Warming up** **Aerobic Dance** Grapevine Front Kick Side Kick A Step Cross Over Step **Warming down**	**Warming up** **Folk Dance**Kummi Oyilattam Kolattam **Warming down**	**Warming up** **Aerobic andFolk Dance** Front Kick Side Kick Cross Over Step Kummi Oyilattam **Warming down**	**5 minutes** **45 minutes** 3 sets x 2 repetition Intensity of65% Rest in betweensets (2 minutes) **10 minutes**
VII toIX	**Warming up** **Aerobic Dance** Step TouchV Step Grapevine Front Kick Knee and Arm Lift **Warming down**	**Warming up** **Folk Dance** KaragattamOyilattam Kolattam **Warming down**	**Warming up** **Aerobic andFolk Dance** Front Kick Side Kick A Step Kummi Oyilattam **Warming down**	**5 minutes** **45 minutes** 3 sets x 3 repetition Intensity of70% Rest in betweensets (2 minutes) **10 minutes**
X to XII	**Warming up** **Aerobic Dance** Touch OutV Step Side Kick A Step Side to Side **Warming down**	**Warming up** **Folk Dance** OyilattamKolattam Kummi **Warming down**	**Warming up** **Aerobic andFolk Dance** Power Walk Side Kick A Step Oyilattam Kummi **Warming down**	**5 minutes** **45 minutes** 3 sets x 3 repetition Intensity of75% Rest in betweensets (2 minutes) **10 minutes**

Prescription of Intensity

The karvonen formula was used to prescribe the intensity (Target Heart RateZone) for each individual (Swain & Leutholtz, 2007).

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Ratings of Perceived Exertion Method

In the lights of limitations associated with using Heart rate for setting exercise intensity, consider using a combination of heart rate and rating perceived exertion in developing prescription for the subjects (Birk & Birk, 1987).

Statistical Techniques

The collected data were statistically analyzed Analysis of Covariance (ANCOVA) was applied, If the mean difference was significant the pairs of adjusted final group mean was tested for significance by applying Scheffe‟s post hoc test. In allcases 0.05 level of significance was fixed to test the hypotheses.

RESULTS AND DISCUSSIONS

Table -III

Computation of Analysis of Covariance on Cardio Respiratory Endurance -VO2 max and Body Composition-Percent Body Fat among Obese Boys

Variables	Test	Mean				SV	SoS	df	MS	ObtainedF
		Ex.GrpI	Ex.GrpII	Ex.Grp III	Con. Grp					
Cardio Respiratory Endurance- VO2 max (ml/kg/min)	**Pre**	30.18	30.40	30.49	30.86	**B**	5.94	3	1.98	1.05
						W	180.20	96	1.88	
	Post	32.91	31.55	34.61	29.74	**B**	319.96	3	106.65	**65.66***
						W	155.93	96	1.62	
	Adjusted	33.03	31.59	34.61	29.59	**B**	337.146	3	112.38	**82.77***
						W	128.987	95	1.36	
Body Composition-Percent Body Fat (Percentage**)**	**Pre Test**	30.74	30.65	30.70	30.79	**B**	0.27	3	0.09	1.41
						W	6.23	96	0.06	
	PostTest	29.80	30.07	29.48	30.84	**B**	25.09	3	8.36	**113.27***
						W	7.09	96	0.07	
	Adjusted	29.79	30.09	29.49	30.81	**B**	23.548	3	7.85	**121.90***
						W	6.118	95	0.06	

*Significant at 0.05 level of significance for 4 and 96 (df) = 2.70, and 95 (df) = 2.70 The results presented in table-III indicated that the difference among pre test, post test scores and adjusted means scores of cardio respiratory endurance-VO2 max of the subjects were statistically treated using ANCOVA and F value were 1.05, 65.66and 82.77 respectively. It was found that obtained F value on pre test scores were not significant at 0.05 level of confidence as these were lesser than the required table F value of 2.70 and the obtained F Values on post-test and adjusted means were significant at 0.05 level of confidence as these were greater than the required table F value of 2.70.

The results also presented in table-III indicated that the difference among pre test, post test scores and adjusted means scores of body composition-percent body fat of the subjects were statistically treated using ANCOVA and F value were 1.41,

113.27 and 121.90 respectively. It was found that obtained F value on pre test scores were not significant at 0.05 level of confidence as these were lesser than the required table F value of 2.70 and the obtained F Values on post-test and adjusted means were significant at 0.05 level of confidence as these were greater than the required table F value of 2.70. Whooten et al. (2018) examined the 12-week, 1-hour before-school physical activity program resulted in significantly reduced BMI and prevented increases in child obesity.

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Table -IV

Scheffe's Post Hoc Test on Cardio Respiratory Endurance -VO2 max andBody Composition-Percent Body Fat among Obese Boys

Variable	Ex-Grp - I (ADTG)	Ex-Grp - II (FDTG)	Ex-Grp - III (CAFDTG)	Control Group	MD	CI
Cardio Respiratory Endurance- VO2 max (ml/kg/min)	33.03	31.59	-	-	**1.44***	1.33
	33.03	-	-	29.59	**3.44***	
	-	31.59	-	29.59	**2.00***	
	-		34.61	29.59	**5.02***	
	-	31.59	34.61	-	**3.02***	
	33.03	-	34.61	-	**1.58***	
Body Composition-Percent Body Fat (Percentage**)**	29.79	30.09	-	-	**0.30***	0.29
	29.79	-	-	30.81	**1.01***	
	-	30.09	-	30.81	**0.71***	
	-	-	29.49	30.81	**1.32***	
	-	30.09	29.49	-	**0.60***	
	29.79	-	29.49	-	**0.31***	

***Significant**

CONCLUSIONS

1. The result of the study showed that there was a better significant improvement on cardio respiratory endurance-VO2 max and body composition-percent body fat impact by the three experimental groups namely the aerobic dance and folk dance and its combination of dance (aerobic and folk) training group among obese boys.
2. The combination of aerobic and folk dance training group proved to be better than the isolated aerobic and folk dance training groups in improving on cardio respiratory endurance-VO2 max and body composition-percent bodyfat among obese school boys.

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ANALYZING CUSTOMER RESPONSES TO FACTORS SHAPING PURCHASE DECISIONS IN THE TWO-WHEELER MARKET: THE ROLE OF INFORMATION SOURCES AND PROMOTIONAL TOOLS

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ABSTRACT
This study investigates the complex decision-making process of Indian consumers when selecting a two-wheeler brand in an increasingly crowded and competitive market. Two-wheelers have become the favoured mode of transportation due to traffic congestion and cost-effectiveness. However, consumers face a bewildering array of choices, prompting them to employ systematic evaluation methods.

This study unveils the motivations propelling consumers to select one two-wheeler brand over another. It meticulously examines the sources of information and influence that carry significant weight in consumers' decision-making processes. Moreover, it probes the realm of promotional tools, including celebrity endorsements, finance schemes, and enticing offers, to elucidate their role in stimulating purchase decisions.

In Pune, as in any other city, a purchase decision seldom unfolds in isolation. It is often the outcome of discussions with immediate family, relatives, friends, colleagues, and even the local mechanics whose expertise is sought in understanding these vehicles. These discussions form the crucible in which consumer preferences are forged, rendering the study of these interactions all the more pertinent.

As we venture deeper into Pune's bustling consumer landscape, our aim is to unravel the factors and influences that steer choices within this thriving metropolis. This research not only aims to provide insights valuable to manufacturers, marketers, and policymakers within the two-wheeler industry but also contributes to the broader understanding of consumer behaviour in the context of urban transportation preferences in India. Within Pune's narrative, we find echoes of the larger tale of choice, influence, and mobility in the modern world.

INTRODUCTION
In a nation that cherishes the freedom of movement, the two-wheeler has emerged as the quintessential companion for commuters seeking a seamless, cost-effective, and agile means of travel. The appeal of these vehicles extends far beyond their utilitarian aspects; it encapsulates the essence of convenience, style, and efficiency. Yet, this burgeoning market is a paradox in itself. While it offers consumers the liberty to explore a multitude of brands and models, it also presents them with a labyrinthine puzzle of choices. From the sleek city scooters designed for nimble urban navigation to the robust motorcycles built for long-haul adventures, each brand and model seeks to carve its niche in the hearts and lives of Indian consumers.

As we delve into this enthralling world of consumer preferences, Pune emerges as our focal point. This thriving city, much like the rest of India, has embraced two-wheelers with open arms. Pune's denizens, in their quest for pragmatic mobility solutions, find themselves at crossroads where a multitude of options converge. It's within this dynamic urban landscape that consumers wrestle with a complex interplay of factors and influences, ultimately shaping their brand preferences.

Why Pune?
Pune's distinctive character lies in its blend of tradition and modernity. This city, known for its rich history, is also a burgeoning IT and industrial hub. As urbanization continues its march, the city's roadways have witnessed an influx of two-wheelers, mirroring a broader national trend. To unravel the intricate dynamics of brand selection, we focus on Pune – a microcosm of the larger Indian urban landscape.

Navigating the Maze: Sources and Influences
In a world inundated with information, consumers embark on their two-wheeler journey with a diverse set of guiding stars. Friends, family, online reviews, television advertisements, the expert counsel of local mechanics – each plays a role in shaping the final decision. It is in these interactions and discussions that preferences are honed and choices are crystallized. This research endeavors to illuminate the pathways through which these sources and influences guide consumers' decisions.

Beyond the Product: The Role of Promotion

In a realm where marketing and promotion hold sway, the role of celebrity endorsements, finance schemes, and alluring offers cannot be underestimated. These promotional tools have the power to sway decisions, often

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transcending the product's intrinsic qualities. By delving into this dimension, we seek to understand how marketing strategies impact consumer choices.

The Broader Implications

The insights drawn from this study extend beyond the boundaries of Pune. They offer valuable perspectives to manufacturers, marketers, and policymakers in the two-wheeler industry. Moreover, they contribute to a deeper understanding of consumer behavior in the context of urban transportation preferences across India.

NEED OF THE STUDY

This study is indispensable in unravelling the intricate dynamics of consumer behaviour within Pune's two-wheeler market, which has burgeoned due to traffic congestion and the need for cost-effective urban mobility. With consumers facing an overwhelming array of choices, understanding the pivotal factors and influences guiding their purchase decisions is imperative. This research not only empowers consumers by providing insights for informed choices but also aids businesses in tailoring their strategies, thus enhancing market competitiveness. Policymakers can use these findings to craft consumer-centric regulations, while academia benefits from a nuanced understanding of urban transportation preferences. Moreover, the study holds economic significance, as it can bolster economic growth and job creation in Pune and the wider region.

LITERATURE REVIEW

(Nath, 2006) conducted a study on 294 motorbike users in upper Assam to understand the impact of advertising and promotions on their buying behaviour and brand preferences. The research found that age significantly influenced brand choice, with younger individuals favouring premium brands and older individuals opting for economy brands. Interestingly, income levels did not correlate with motorcycle choice. The study highlighted the importance of advertising and promotions in influencing rural and urban consumers, with Hero-Honda emerging as the most preferred brand due to factors like comfort, fuel economy, and price. It emphasized the diverse nature of motorbike consumers and the need for tailored marketing efforts.

(Prof. Pradeep Biradar & Prof. K.M.Prashan, 2014) explored the role of advertising in the purchasing decisions of two-wheeler customers, both men and women. Their study focused on advertising strategies to attract consumers and create brand awareness. The research revealed that factors like better mileage, price, and engine power significantly influenced consumer choices. Effective advertising media support was seen as crucial for making consumers aware of product availability. The study underscored the challenge for marketers to make product information more appealing and distinct and suggested that Integrated Marketing Communication programs play a key role in target analysis, brand positioning, and product promotion.

(J. Martin Leonard, 2015) focuses on the showcasing and marketing strategies within the two-wheeler industry, emphasizing the crucial role of dealer networks and showrooms. It involves a sample of 40 showroom staff and 150 customers from four prominent showrooms in Tiruchirapalli. The research examines customer preferences, perceptions of dealer services, and satisfaction levels, as well as showcasing techniques, promotional activities, and company responsibilities in two-wheeler sales. The study's recommendations underscore the importance of enhancing customer services to attract a broader customer base.

(Chauhan, 2015) explores how various types of social media affect sales promotion and influence individuals and organizations in their buying decisions. The study concluded that social media indeed plays a substantial role in enhancing both sales and sales promotion within the automobile sector.

(Kamra, 2015) assessed the extent of social media's influence on Indian automotive consumers. Through comprehensive primary research, the results revealed a robust impact of social media across various parameters in the buying process. These parameters included vehicular research, recommendations, vehicle technologies, finance calculators, and Facebook page marketing. All of these aspects significantly influenced consumers before making their automobile purchases.

OBJECTIVES OF THE STUDY

1. To examine the sources of information that influence consumers while making two-wheeler purchase decisions.
2. To assess the impact of promotional tools on consumers' buying choices.
3. To gain insights into how discussions with family members, relatives, friends, colleagues, and local mechanics shape consumers' preferences and purchase decisions.

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METHODOLOGY OF THE STUDY

Data for this study was collected from both primary and secondary sources. Primary data was obtained from 755 two-wheeler customers in Pune through a structured questionnaire. These respondents provided insights into their demographic profiles and sources of information that influence consumers while making two-wheeler purchase decisions. The data was collected within two-wheeler dealer outlets in Pune, systematically tabulated, and analyzed. Additionally, the inclusion of secondary data from various reputable sources, such as books, journals, and reports, further enriches the study's context. The study follows a descriptive research design, employs Convenience Non-Probability Sampling, and focuses on Pune city as the study area.

SCOPE OF THE STUDY

The scope of this study encompasses a comprehensive exploration of the factors influencing two-wheeler purchase decisions among consumers in Pune, India, within the period of 2010 to 2015. It delves into demographic variations, sources of information, and the impact of promotional tools, while also considering the interpersonal influences that shape consumer choices. The study aims to provide valuable insights for manufacturers, marketers, policymakers, and consumers, offering a nuanced understanding of the complex decision-making process in the Pune two-wheeler market.

RESULT & DISCUSSION

1. DEMOGRAPHIC PROFILE OF THE RESPONDENTS

The demographic profile of the 755 respondents in this study, representing two-wheeler customers in Pune, encompasses a diverse range of age groups, income levels, genders, educational qualifications, and occupations.

Table 1. Demographic Profile of Respondents

Gender	Male	632 (83.7%)	Female	123 (16.3%)						
Marital Status	Single	486 (64.4%)	Married	269 (35.6%)						
Age (in yrs)	18 -21	106 (14.0%)	21-25	305 (40.4%)	25-35	242 (32.1%)	35-50	83 (11.0%)	50 and above	19 (2.5%)
Qualification	High School	15	SSC	43	HSC	95	Graduation	387	PG	215
Occupation	Student	241	Professional/ Business	195	Salaried	298	House wife	17	Retired	4
Annual Family Income (Rs.)	Less than 1,50,000	23	1,50,000 to 2,50,000	175	2,50,000 to 5,00,000	253	5,00,000 and 10,00,000	179	10,00,000 and above	125

The respondents in this study were drawn from Pune city, and they exhibited variations in key demographic aspects, including income group, educational qualifications, and occupation. Out of the total sample size of 755 respondents, a significant majority, comprising 632 individuals (83.7%), were males, while the remaining 123 (16.3%) were females. The age distribution among the male respondents indicated that 33.2% fell within the 21-25 years bracket, and 27.3% belonged to the 25-35 years category. Among female respondents, 7.2% were in the 21-25 years age group, and 4.8% were in the 25-35 years age group. Furthermore, a smaller subset of 19 respondents (16 males and 3 females) were aged above 50 years, and 11% fell within the 35-50 years age range, comprising 74 males (9.8%) and 9 females (1.2%). The marital status of the respondents revealed that 486 individuals (64%) were married, primarily owing to the prevalence of late adolescents in the respondent pool. In terms of occupation, the data showed that 39.5% of respondents were salaried, 31.9% were students, 25.80%

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were professionals or businessmen, 2.3% were housewives, and the remaining 0.5% were retired. Notably, the highest usage of two-wheelers was observed among the salaried class. Regarding educational qualifications and income, 144 respondents (19.1%) were graduates with annual household incomes ranging from Rs. 2.5 to 5 lakhs. Conversely, there were only 11 respondents (1.1%) with lower educational qualifications and incomes (HSC and below HSC with less than Rs. 1.5 lakhs annual income). This data underscores that a majority of two-wheeler respondents in Pune are well-educated, highly qualified, and possess an annual average household income exceeding Rs. 1.5 lakhs.

2. FACTORS INFLUENCING THE CUSTOMERS PURCHASE DECISION

In Pune, a city where two-wheelers have emerged as the go-to mode of transportation owing to escalating traffic congestion and inadequate road infrastructure, owning a two-wheeler is a choice grounded in convenience, ease of use, cost-effectiveness, mobility, and hassle-free parking. However, the Indian two-wheeler market presents consumers with an abundance of choices, spanning various segments and brands, leaving them in a state of bewilderment. The relentless and inventive advertising and promotional campaigns by two-wheeler companies add to the complexity of the purchasing decision. In this technologically driven age, consumers meticulously evaluate brands before making their choices, a process that's crucial in an industry characterized by a multitude of competitors. This study, set against the backdrop of Pune city, seeks to unravel the factors guiding the purchase decisions of respondents, shedding light on what prompts them to select one two-wheeler brand over others in this bustling urban environment.

2.1 SOURCE OF INFORMATION

The most important ingredient in the buying process is information. No buyer can actually buy a product without having sufficient and adequate information. Acquisition of information is the first step in the buying process. In a normal buying process, acquisition of information is a multifarious task which is completed by using various formal and informal sources. What sources of information buyers use for collection of information and how they process this information is studied by the researcher. The questionnaire has incorporated a scale, where in the respondents were requested to rank the identified sources (TV, Friends/Relatives, Displays, etc) that registered the brand while making buying decision. The respondents were requested to rank these parameters on a seven point scale, where 1 meant least influential and 7 meant most influential. The data collected is shown in table below:

Table 2: Influence of various Sources of Information

Responses	Friends / Relatives	TV	Local Mechanic	Displays	Internet/ Social Media	Hoardings/ Banners	Newspaper/ Magazine
Least Influential	6.1	6.1	21.1	9.0	22.9	13.2	20.5
2	5.4	8.2	13.6	15.9	11.7	23.4	20.8
3	6.6	9.1	14.6	14.7	18.4	18.4	16.6
4	10.3	12.5	12.7	20.4	12.7	16.8	15.4
5	10.5	17.5	16.3	15.0	15.6	15.5	10.9
6	15.8	24.5	14.2	13.4	10.6	9.9	11.9
Most Influential	45.3	22.1	7.5	11.7	8.1	2.6	4.0
Total	100%	100%	100%	100%	100%	100%	100%

From the above it is observed that influence of friends/relatives is ranked highly 61.1% to register the brand in customers mind followed by Television (46.6%). Whereas local mechanics, hoardings/ banners, newspaper/ magazine and paper insertions are not so influential to register the brand in customers mind. Product display shows a neutral influencing balance on registering the brand.

2.2 PROMOTIONAL ELEMENT

Basic requirement and desire of a two wheeler company is to communicate information about a product to potential customers and influence customers to buy. To convey a message about the product information, such as features, benefits, quality, usage and price a variety of promotional elements are used. The informational cognizance depends on the response of the target customers that the two wheeler is attempting to reach with its message. The researcher has incorporated a scale, where in the respondents were requested to rank the identified

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promotional tools (Advertisements, Celebrity Endorsement, Finance schemes, etc.) that triggered the buying decision. The respondents were appealed to rank these parameters on a six point scale, where 1 meant least influential and 6 meant most influential. Table 4.18 shows their responses in this regard.

Table 3: Ranking of different promotional elements

Responses	Celebrity Endorsement	Advertisement	Finance Schemes	Attractive Discount Offers	Promotional Campaign	Contest / Sweepstake
Least Influential	16.8	3.0	9.1	7.5	8.9	54.0
2	17.5	10.2	12.2	10.2	28.9	20.7
3	17.4	9.9	16.4	18.1	25.8	11.8
4	15.8	12.1	20.4	23.2	20.0	9.8
5	17.6	22.0	23.7	23.2	11.1	3.0
Most Influential	15.0	42.8	18.1	17.7	5.3	.7
Total	100%	100%	100%	100%	100%	100%

Form the above table it is inferred that 62.8% of the respondents have ranked advertisement as influential promotional element that persuade the customer to buy followed by finance schemes 41.8% as second influential factor and attractive discount offers 40.9% as third influential factor. Form the above table the respondents are neutral with impulse to buy the brand due to the influence of celebrity endorsement. Form the above table 74.7% of the respondents are not influenced to buy due to contest or sweepstake.

2.2.1 Effectiveness of promotional tools

In all eight promotional tools given with the scale of 1-5, where 1- Not at all effective, 2- Less Effective, 3- Neutral, 4- Effective and 5- Very effective to customers and dealers and responses were analysed.

Table 4: Ranking of Effective Promotional Tools

Ranks of Effectiveness of Promotional Tools		
Promotional Tools	**Mean Rank**	
	Customers view	**Dealers view**
TV	4.87	4.64
Internet/Social Media	3.49	3.36
Hoardings / Banners	3.37	4.41
Newspaper / Magazine	3.25	5.72
Finance Schemes	3.92	4.88
Attractive Discount Offers	3.97	5.16
Promotional Campaign	3.11	4.55
Contest / Sweepstake	1.88	3.28

It is observed from the table that television, attractive discount offers and finance schemes are most effective promotional tools as per customer's responses whereas newspaper / magazine, attractive discount offers and finance schemes are top three effective promotional tools as per dealer's responses.

2.3 MAJOR INFLUENCE ON PURCHASE DECISION

An individual tends to discuss with his immediate family members, relatives, friends, colleagues and may be his local mechanics before purchasing a particular product or service. All these members might support an individual's decision to buy a particular product, stop him from purchasing it or suggest few other options. They influence the purchase decision of a customer.

Table 5: M**ajor influence on purchase decision regarding the brand/model**

	Frequency	Percent
Self	275	36.4
Family Members	257	34.0

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Friends / Relatives	189	25.0
Colleagues	20	2.6
Local Mechanic	14	1.9
Total	755	100.0

From the above table, it is inferred that the 36.4% of the respondent's decision is self- made, 34.0% of the respondents choose the brand by the influence of family members wish and 25.0% of the respondents choose this brand by the influence of their friends. Colleagues and local mechanics have very negligible influence on purchase decisions regarding the brand.

2.5 BUYING PREFERENCE GIVEN TO A VEHICLE WHICH IS USED BY FRIEND/ RELATIVES/ COLLEAGUES

Table 6: Preference given to a vehicle which is used by Friend/ relatives/ colleagues

	Frequency	Percent
Yes	534	70.7
No	221	29.3
Total	755	100.0

From the above table, it is inferred that 70.7% of the respondents give preference in buying a vehicle used by their friends/relatives/ colleagues and 29.3% respondents do not prefer to buy a vehicle used by any of their friends/relatives/ colleagues. Customers change as per their associations with the different individual i.e. the extended family individuals like the relatives, friends and colleagues providing them with information and support. The customers offer inclination to the perspectives of these individuals to lessen the risk and uncertainty they associate with the purchasing task.

FINDINGS

1. **Sources of Information:** Friends and relatives are the most influential sources of information for customers in Pune, with 61.1% ranking them as highly influential, followed by television at 46.6%. Local mechanics, hoardings/banners, newspapers/magazines, and paper insertions have a lower impact on brand registration.
2. **Promotional Elements:** Advertisements are ranked as the most influential promotional element, with 62.8% of respondents considering them persuasive. Finance schemes and attractive discount offers also play significant roles in the buying decision, with 41.8% and 40.9% of respondents finding them influential, respectively. Celebrity endorsements have a neutral influence.
3. **Major Influence on Purchase Decision:** Self is the major influencer for 36.4% of respondents, while 34.0% are influenced by family members, and 25.0% are influenced by friends/relatives when making purchase decisions. Colleagues and local mechanics have minimal influence.
4. **Buying Preference Based on Associations:** A significant portion of respondents, 70.7%, prefer to buy a vehicle used by their friends, relatives, or colleagues, indicating the impact of social networks on purchase decisions.

SCOPE FOR FUTURE STUDY:

Future research can explore the dynamics of information sources and promotional tools in other cities and regions in India to identify regional variations in consumer behavior. Additionally, studying the effectiveness of specific advertising and promotional campaigns on two-wheeler purchase decisions could provide valuable insights for marketing strategies.

LIMITATIONS OF THE STUDY:

1. The study is limited to Pune city, and findings may not fully represent consumer behavior in other Indian cities.
2. The study relies on self-reported data, which may be subject to response bias.
3. Factors such as cultural influences and brand loyalty were not deeply explored and could be considered in future research.

SUGGESTIONS

In light of the findings, it is recommended that businesses operating in Pune's two-wheeler market adapt their marketing strategies to harness the significant influence of information sources, including both traditional channels like television advertisements and digital platforms such as social media. Recognizing the generational

shift towards online information-seeking among younger buyers, companies should bolster their online presence and engagement. Moreover, the study highlights the persuasive power of well-crafted advertisements, finance schemes, and discount offers, underscoring the importance of aligning promotional tools with consumer preferences. Building on the paramount role of social networks, businesses should actively encourage positive word-of-mouth and personal recommendations, which remain pivotal in purchase decisions. Given the diversity of Pune's two-wheeler consumers, tailoring marketing approaches to specific demographic segments can enhance brand appeal. While this study offers valuable insights into Pune's market, future research could delve deeper into regional variations and the effectiveness of targeted marketing campaigns, providing businesses with an edge in the ever-evolving and competitive Indian two-wheeler industry.

CONCLUSION

In the dynamic landscape of the two-wheeler market in Pune, this study delves into the multifaceted factors that steer consumer purchase decisions. It becomes evident that information sources wield substantial influence, with friends and relatives emerging as formidable opinion-shapers, and television advertisements casting a significant sway over consumer choices. However, the digital age has brought forth a generational shift, with younger buyers turning to the internet and social media for information, underlining the evolving nature of consumer preferences.

Promotional elements also play a pivotal role, with advertisements reigning supreme as the most persuasive tool. Finance schemes and attractive discount offers are influential in wooing customers, whereas celebrity endorsements appear to tread a more neutral ground. This nuanced understanding of promotional tools can aid businesses in crafting strategies that align with the preferences of their target audience.

It is intriguing to note the paramount role of social networks in purchase decisions. Friends, family, and colleagues contribute substantially to the decision-making process, underscoring the significance of personal recommendations and word-of-mouth in shaping consumer choices.

Moreover, the study's insights into the demographic profile of respondents reveal that Pune's two-wheeler consumers are a diverse group, spanning various age groups, marital statuses, occupations, and income brackets. This diversity presents an opportunity for businesses to tailor their marketing approaches to cater to the specific needs and preferences of different segments.

While this study provides valuable insights into the factors influencing two-wheeler purchase decisions in Pune, it is crucial to acknowledge its limitations. The findings are specific to Pune and may not be fully representative of consumer behavior in other Indian cities. Additionally, the reliance on self-reported data introduces the possibility of response bias.

As the Indian two-wheeler market continues to evolve, future research can explore regional variations in consumer behavior and the effectiveness of targeted marketing campaigns. Understanding the ever-changing dynamics of this industry will be essential for businesses aiming to thrive in the competitive and vibrant two-wheeler market.

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THE STUDY OF EFFECT OF TECHNOLOGICAL CHANGES & SOCIAL INNOVATION ON WORK-LIFE BALANCE OF STAFF IN CANCER HOSPITAL

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The holistic objective of this paper is to investigate the optimum impact of Social Innovation& Technological disruptions on the Work-Life Balance of staff in the cancer hospital. This paper is to examine the extent to which, how, and why, social innovation & technological disruptions are being used by, and having an impact on, and balanced life between personal and professional. Ample evidence is available in the study revealing the fact that the revolution in technological disruptions can bring substantial transformation in the economic, social, productive, and administrative systems of cancer hospitals. Various paradigm shifts were also seen in the status quo, the character of communication, relationship building, collaboration platforms, information access and data usage, social choices, service models, financing, and much more. With the unique, rapid, and accelerating growth of technological disruptions, worldwide new ways and socially innovative ideas are carried out to face the most common and challenging problems of the world like Non-Communicable Diseases (NCD) disease like cancer in health care. The study tries to make us understand the different and possible ways to identify and strengthen the existing design thinking of the traumatic illness &problems of cancer and create a new process to contribute to a better quality of treatment, social impact, social changes, and add valuable advantages in the health industry's existing services and goods. Social Innovation and Technological Disruptions radically alter the expectations and behavior in the culture of the staff of the hospital and process.

However, the study gives a pictorial glimpse that describes the blending of social innovation and technological disruption resulting in an effective and efficient solution in the work-life balance, and healthcare ecosystem. Therefore the generalization of social innovation with the use of technological disruptions is beneficiary in creating content that identifies the unmet needs of staff. This matches assets to needs and actions taken to meet hospitals and their staff needs. Such contributory elements and evolution break down into that tells what disruptions and innovations do best and what stakeholders do best out of it. Technology advancements explore the proponents £or the stakeholders that create a comfortable work culture providing the balance measurement between a person's work life and personal life.

Social Innovation & **Technological Disruptions: Introductions**

Social Innovation is the thinking phenomenon of developing effective and efficient solutions to complex societal problems like demographic change, hunger, and poverty. The environment of social innovation results in new and improved products, and improved inclusions for an existing process, or program and all these have a common outcome. The incorporation and introduction of changes in societal innovations and technology improve the lives or change the system or status quo of the stakeholders impacted by the problem at hand.

Social Innovation is the dimension of an innovation paradigm. It is the source of growth and prosperity. The importance of social innovation depends upon addressing the major problems of the world faced like hunger, poverty, financial instability, slow economic growth, and political turmoil. The stakeholders use Social Innovation as their talent tool to solve the neglected and cropped societal illness by disrupting the status quo.

Various examples support Social Innovation to understand.

1. Recycling Processes of waste products to handle global warming crisis.
2. Flower Factory is dedicated to urban farming where non-profits train young people from juvenile justice to transform *our* nation into a green city.
3. The Nudge CSI is designed to improve the condition of Indian farmers by providing solutions to various agricultural challenges faced by them.
4. Intellectual property rights and open-source systems are made free]y available.
5. Focusing on affordable health care services.

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6. Availability of nutritious food to every corner of the world
7. Improvement in the quality of educational outcomes (like distance learning programs and pedagogical models of childcare)
8. Mobile Money Transfer and much more.

Many new processes are developed to solve other problems and top into the social innovation of the whole country.

The stakeholders can look over the many social, environmental, and governmental challenges and submit their ideas for the solution to the challenges. All the challenges have common in them is the intersection of different hobbies, Industries, sectors, and walks of life. Social Innovation can also be described as creativity. Creativity is the process of finding pattern and connecting things that are unrelated. It is the bringing of things together that are seemingly different from one another so that their intersection can form one original thing.

The significance of social innovation is that it doesn't require the person to be a genius or have an Exceptional education or tons and tons of resources. The magic behind the process of inspiration is design thinking which deals with the step-by-step process to develop social innovation ideas. It narrows down the thinking, beliefs, basic practices, resources, and social power structure.

The idea of design thinking in the context of social impact provides the platform with the solutions to problems prioritizing the needs of the people who are most impacted by the problem. Social Impact and Social Change are all about creating a better life impacted by the problems at hand despite thinking that what is to be done or making more money. Using design thinking, with the aim of searching for solutions to a particular challenge stakeholders follow the following social innovative process.

1. The first step to being socially innovative is simply to have the clarity to **Identify the Problem,** its Scalability, and its scope.
2. **Empathizing** is the next step. It is the gathering of information from the people impacted by the problem identified. It is comprised of surveys, and interviews to get feedback from the people impacted by day- to-day challenges which define the situation.
3. Third is the **Define** which is narrowing down the challenges that are identified.
4. **Ideate** is the next step is the brainstorming phase. It is a team that works on a critical part of the problem and thinks about all possible solutions.
5. **A prototype** is a step after ideate that creates a simple model or pilot test of an actual product, process, or program. It is actually the implementation of a product, process, or program. It is a simple prototype.
6. **Test** & **Assess-** In this taking prototype, honest feedba.ck is taken from the people who are interviewed

Previously. It is generously meeting the needs or challenges of the people. What part of the products or process needs to be redefined in order to make it even better the goa1l in which the feedback is given is continuously to improve and update until it reaches the peak of effectiveness.

Once the great product and program are explored, designed, and built with team cooperation, ideas very Effectively and satisfactorily meet the needs of the society, understanding their challenges paves the way for the implementation of the solutions accordingly to achieve sustainability, viability, and vast impact over the challenges.

The Social Process describes Social Innovation as the combination of mindset and skill sets. Embedding Social innovation with the mindset and skill sets help the stakeholders participate in most things but with different and unique agenda. The mindset for social innovation is to believe that one can utilize their talents to do things differently. It is a noble way to face complex social challenges. Research says that students should have such a mindset of social innovation. Hence social innovation is an essential element in the education ecosystem. It has a great impact on students which helps students in thinking about what they want to be. Students should believe that they bring changes in themselves and humanity in the future. **Atamnirbhar Bharat** is one of the ways of Social Innovation that empowers India's Transformation. The youth of India under this innovation call out to the country's

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leadership to build a comprehensive foundation to meet its sustainable development Goals and ensure the improved Quality of Life of the citizens. If nations understand that changes are required, they collaboratively come up with different ways through social innovation to empower the country globally.

Social Innovation is an interdisciplinary activity that is a blend of different activities which come up with something new. Each and every citizen can become a change-maker using the mindset of creativity, problem- solving, social intelligence, critical thinking, curiosity, agility, resilience; and lateral thinking.

However, Social Innovation remotely can be described as the pillar where it supports people and Organizations to co-create; learn, adapt, and scale more effective solutions to entrenched social problems- making our human and natural systems more adaptive and resilient. System thinking is the key to Social Innovation.

Social Innovations offer the majority of opportunities in the field of technology, a collaboration of communities, knowledge sharing, social enterprises, business engagement, and stakeholders.

Social innovations and Technological Disruptions have direct relation We are living in an era of constant Discontinuity. Disruptions are hitting every economy of the industries. It is important to understand to ride proactively over the Waves of Technology Disruptions. It is considered to be the Global force that brings changes in the world.

Disruptions mean a change in the way we work and how we work and even a change in the design of the Workplace. It is essential to have plans with us so that it should make sure that nobody could become the victim of disruption by leaving behind.

Innovation is increasing exponentially. It is accelerating at a faster rate. Disruptions are changing the quality of life. Disruptions significantly alter the path of consumers, industries, or business operations. It brings a change in the business, how we buy, how we make payments, and how we interact with the customers.

Disruptive Technology brought the Industrial Revol1lltion. Start-ups always aim at technology disruption for revolutionary changes but established and giant companies focus only on incremental improvements that is what they ,can do best or pursue. This gives us a way to think to bring start-ups into our business. We need to think and open our eyes to the start-up to bring in our business is fixing the problem of our business. The start- ups in the business are the experts that easily fix the challenges in the initial stage of the business rather than changing it after becoming the giant business. This is called Organizational Inertia.

Continuous demanding Customers are served by giant Company's. Innovators/ Risk-taking companies recognize The potential of disruptive technology and incorporate it into the business for Social Innovation. Many other companies are risk Averse. They first measure the succeeding rate of innovations and then they positioned themselves in the competition. The business which fails to adopt technological disruptions loses accountability, stakeholders, monopoly, and the overall whole market point.

We need to know the examples of Disruptive Technology that bring revolutionary changes in the field of Innovation.

1. Video Streaming like Netflix largest video streaming company in the world
2. Digital Transport Services like Uber. A business model which connects drivers to people who are in need of transport in a practical, economical., and effective way
3. Virtual Reality is usually related to games and entertainment
4. Online Lodging like Airbnb allows to rent out their property or homes
5. Music Streaming like Spotify
6. Instant Messaging Apps like WhatsApp
7. Online Encyclopaedias
8. Digital Currency like bitcoin

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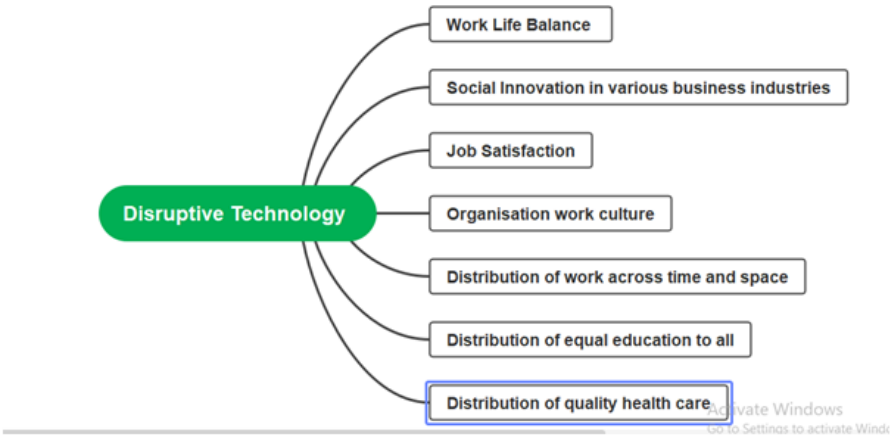
9. E-commerce like Amazon
10. Online Education
11. 3D Printing
12. Augmented Reality and much more

The Overall Conceptual Model of Technology Disruptions:



OBJECTIVES OF THESTUDY:

1. To understand the holistic and conceptual approach to social innovation, work-life balance, and technological disruptions.
2. To understand the social innovation process so that the common and complex challenges of the stakeholders can be identified and provide the solutions utilizing the technology to maintain work-life balance.
3. To understand the role of technology disruption in HRM
4. To understand the impact of technology disruption on cancer health care.
5. To anticipate the future scope of research on technology disruptions for the foundation of HR practices in cancer hospitals for employee retention and improving the productivity of the staff for handling quality & right treatment of patients at right time maintaining the balance in the staff's personal & professional life.

TECHNOLOGICAL DISRUPTIONS AND HR PRACTICES:

HR is the intangible resource of an organization. It becomes the driver to drive the growth of an organization to its maximum by managing human capital. Supporting technologies make the domain of **HR** competent enough that leverage and improve the competency and effectiveness of human capital to meet the expected demands of the internal and external environment. Achievement of organization goals depends on exercising better control over the performance and behavior of organization stakeholders in collaboration with technology. Electronic Human Resource Management **(E-HRM)** is the more strategic and effective function that develops the skillsets of HR professionals. This enables the HR leaders to be supported by technological skillsets like innovating reasoning, data analytics, and design thinking HR. The outcome using this skill set results in employee retention, job satisfaction, work-life balance, and fight right, healthy, and disruptive solutions to complex business problems. Disruptive Technology strengthens the pillar of the organization which is HRM.

Technological Disruptions and Work-Life Balance:

Work-Life in HR is the strategic tool that helps employees in endeavoring a suitable balance between work and individual life. It is adjusting their working hours and vitality among work and the prerequisites of their lives. Organizations always try to find a way to provide a collaborative work arrangement for their stakeholders so that they can perform in a different and unique way and away from the traditional way of work culture. The use of technological disruption is one of the arrangements that help in achieving the work-life balance of employees. To justify the context one unique way is **to work from home** through the use of telecommunication and computers during business hours globally. Organizations are proactively working on these kinds of arrangements so that personal and professional life cannot get

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affected by any serious means. The involvement of technologies is actively managing the work arrangements. The disruptions in technologies prove to be a spill over in bringing the work home and also home to work. The spill over is in both directions.

Work-Life Balance is a psychological perspective.

Technological Disruption and Work-Life Balance in Cancer Hospital:
The healthcare industry is an industry where technological disruptions are playing a very vital role. Technology adoptions are seen in the healthcare industry for decades but are very seriously seen currently. This can be explained with a very simple example is ride band that we wear. This ensures we change our way to manage our health at affordable prices. Conventionally we go to doctors to see us but this variable actually helps us to track the constant matrix of our health conditions and also predict it. This enables us to get the doctor's assistance in our pocket every day.

Disruptive Revolution is majorly seen in cancer detection in health care industry. The goal of this study is to understand how the innovations and disruptions of technology are applied in cancer hospitals for treating the patient early and saving the life which in turn provides happiness to staff significantly gives the positive impact Om work-life balance on daily basis even in the stress environment. The use of technology may have a variety of effects. It includes

- The improved worker health,
- Reduced workplace stress,
- Reduced workload,
- Increases awareness about the disease.,
- Increases the communication between the staff,
- Provides a safe climate to the staff,
- Bring name & fame to the hospital as the patient can get the complete remedy of the disease on one platform

Innovation & Technology significantly impact the performance and productivity of staff and organizations. The **HR** department of cancer hospitals can now comprehend how the work-life balance is impacted, and they can then adapt the environment to better suit their flexibility and ideas for change.

In this reform, even the chance of survival increases if the cancer is detected in the early stage and the patient starts getting the treatment as soon as possible. In oncology, advanced cancer care supported by Disruptive Technology is being taken which is not just a new way of doing something better but considers an entirely new approach that wasn't used previously. This improves the prevention, diagnosis, treatment, or supportive care. UCS (Universal Cancer Screening) or MCED (Multi Cancer Early Detection) is a disruptive innovation that takes place in the early detection of cancer and diagnosis and that leads to treatment. Suspicion tests involve the screening test or biopsy which is analyzed. The treatment of cancer involves a team of medical staff. The primary level of cancer doctors and the team of oncologists and medical staff are able to use the technology for testing. These technologies help in the detection of 20 to 50 cancers or even more from a single sample of cancer disease. The early and ultimate diagnosis of disease through the use of technology brings immense pleasure and happiness to staff who are standing continuously for the welfare of the patients and their survival.

Healthcare industries are using these innovative, creative and smoother disruptive technological platforms so that cancer has a shorter period of life, a more efficient and balanced journey for medical staff, and better outcomes for patients at affordable costs.

The study reveals that cancer hospitals have a Collaborative space of social innovation & technological disruptions that are designed and built in such a way that it has a positive impact on the work-life balance of their staff. This develops a proactive, creative, and good & qualified cancer staff community who associates together to adopt smart work strategies to provide quality care to the patient. This is intended to favor staff as an individual well-being and work-life balance.

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Impacts of Technological Disruptions on Work-Lite im cancer care:
Patients and staff are all in the comfortable chair due to the use of advanced technology in health care. Cancer patients are bound to access the best treatment, less pain involved and result in better and fast recovery in a limited factor of time. Globally, digital tools have helped to reshape cancer care

Personal Impact
Cancer caregivers are always concerned about patients' health and treatment. They are sometimes the guilt that whatever they are doing that is not enough for the patient. The chances of recovery of cancer patients are very low. The death of the patient is the ultimate failure for the staff. The loss of a family member is always a crisis

In the family. With such thought caregiver, focused on technology training so that they could not leave any Chance of saving lives from such an incurable disease.

Social impact
The patient generally takes out all his or her frustrations on the staff, since they are the persons who are available 24 * 7 and ones who would not retaliate. Sometimes if the staff is allotted different work and he is unable to give the time to the patient or he is on leave then telecommunication is the best way for the patient to communicate with the staff and release their emotional burden. Surprisingly it is found that most of the staff did not feel that their social life is getting hamper. The use of technology has reduced the loss of personal time or social time with no guilt or sense of negative feeling that the patients left unattended.

Entrapment
Due to excessive workload sometimes the staff ·wanted to run away from the situations. The use of technology subsidizes this situation. Special efforts need to be taken to identify the reason for the excessive workload of staff and counsel them rigorously and train them on innovative and disruptive technology to improve the care given to the patients.

Sometimes the cancer staff runs away from the situation, out of fear of public ridicule, peer pressure, and Medicolegal issues if any malpractice happens to the patient. This imbalance the work & Life.

Facilitates improved communication
Technology has increased communication within the organization. Communication in cancer care is mandatory because cancer involves a team of professionals of different specializations. Awareness of diagnosis by each professional among the team is important in the better treatment of cancer. Video, AR/VR, and real-time meeting capacities help in transferring knowledge easily. Teleconferencing made communication easy beyond the geographic border. It helps in reducing stress and encourages work-life balance.

Electronic Medical Records
Nowadays maintaining the medical record became hassle-free and improves the coordination in sharing big, complex data &information between specialists and labs. The electronic medical record gives insights into lab reports, diagnoses, prescriptions,

Surgical interventions, and even details of hospital stays. Implementation of technology reduces medical Negligence or chances of making mistakes which in turn supports the personal and professional life.

Computerized decision support at the point of contact
Computerized decision support integrates with the spectrum of cancer care. It involves appointment making and information sharing, monitoring the toxicity of the disease, chemotherapy sequencing& dosing schedule, personalized treatment planning, and support system at all levels of diagnosis. This ensures the uninterrupted, continuity of care which provides the next level of care inculcating a sense of satisfaction in the staff.

Health Impact: Repeated deaths in cancer hospitals have varied impacts on the health of staff. Due to excessive workload, the staff reports continually tired, exhausted, lack of sleep, unable to focus, and having mental Confusion. This creates a negative impact on staff health, well-being, and on job performance. But the use and Designing of technology disruption help in the scalability of the capacities of staff **in** identifying professionals at risk and supporting them.

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Overall stress

Chronic illnesses like cancer where the battle for survival is the ultimate goal of the patient, family members of the patient, and medical staff. Care of a cancer patient is one of the most difficult jobs. The use of technology helps minimize the stress of the staff and the pain of the patient gives a positive effect on the work & life of the staff.

The research concludes that Technology disruptions significantly affect every day Work-Life balance. The flexibility and stability of the regular work-life arrangement are impacted positively due to technology disruptions. The management of cancer hospitals can acknowledge the Work-Life Balance of their staff through the use of social media, the internet, and mobile devices.

Pictorial Representation of Better Work Life through Technology Disruption:

Recommendations are needed to explore further studies with respect to reducing the burnout of healthcare professionals in the sector of healthcare, especially in cancer where the work-life balance of the healthcare professionals is required using social innovations and disruptive technology.

Health care professionals especially in cancer are continuously in an environment of stress due to repeated exposure to death and complex protocols of treatment and organization. More arrangements should be done through technology interference to reduce the burnout of healthcare professionals and bridge a balance between

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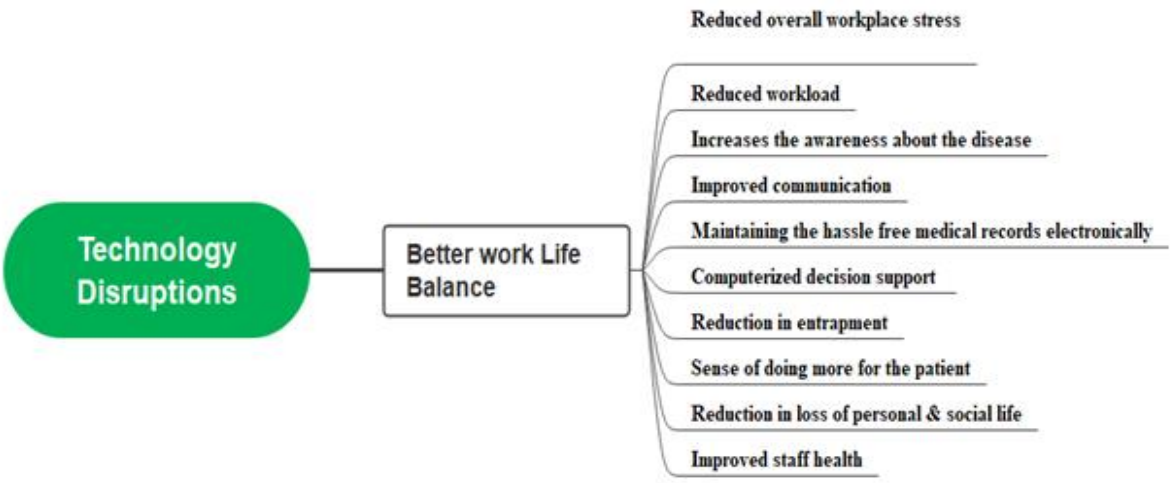

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CONCLUSION

The development in technology compels us to think that we have to manage our business very differently. This inculcates the quality of leadership in us. The leadership of tomorrow will be different from

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yesterday's leadership. In every step of professional life, it is to understand that whatever we have learned over the years will not work in the future. Unlearn many things and learn new things. The anticipating of the future can be easily done digitally.

The bonding of technology disruptions and social innovations fosters people who seem to do their best and make them equally balanced in their homes and work. The best can be in terms of Care, teaching, counseling, advising, advocacy, managing and undertaking tasks - Decision- and policy-making tasks - Creating, innovating, brainstorming, understanding, empathizing, and socializing. Significant improvements to prosperity, well-being, and quality of life, especially boosting the uniqueness and qualities of localities and places. It gives unbelievable solutions for handling the problems of poverty, health, education, unemployment, means of achieving results, learner empowerment, and all types of disadvantage and marginalization, including loneliness and alienation, and improving personal lifestyles and self-confidence.

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THE UNINTENTIONAL MENACE OF THE NOBLES: ENVIRONMENTAL POLLUTION IN THE FIELD OF MEDICINAL SCIENCES

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ABSTRACT
Medicine has always been peaked and idealised as the segment which fundamentally focusing on providing the service in the society to not only cure human but also mark a futuristic accession for prevent any such diseases or actions that can affect the progress of the society. The environment has been opened as a place of honour and integrating the smaller niches that grow and function of all species of living beings. The two are different segments are heavily intertwined amongst themselves as well as providing for a structure that pushes forward the idea of motivating and enunciating the life as well as the human being development. However, over the period of time, as the development of mankind is on the rise, so is the ostensible irking rise of one of the deadliest threat to the potential damage of the environment in the form of Environmental pollution. The sufferings and outcomes of the pollution results in the diseases that attract and lure with the highest potential substantiating rate that is no less and farther from the development of the medical field. With the same threat, the higher seeking rise emerges through the medicine and medical industry. The paper presently intends to look at the present situation of how medicinal disposability as well as the ignorance has been responsible for being a contributor to the global pollution level. The paper also seeks to create an ever-increasing sourcing of alternatively resolving the effects of pollution through the medicinal industry and in large create a structural reform which will be owning the twin benefits of sustainability and global hygienic responsibility. The paper concludes with the optimistic note on improving the graphical structure and improving the quantitative as well as qualitative approach towards environmental benefits as well as enriching towards the developmental goals.

INTRODUCTION
The environment has been developmentally providing a magnanimity to the developmental structure of the lifestyle that extends from plants to the animal kingdom which has been greatly impactful in terms of providing for a wide range of living style that have been helpful to sustain the living beings, economise, socialise and carry out the future legacy of the living beings. Such impact is of the importance which goes on to hold a pole position and key impacting indicator which has been considered to be of utmost importance that not only lays down the ideal structure as well as develop the idealist's theory who believe to carry out the developmental goals in the near future not only for themselves but also rise out of the way for the catering and utility. Such believes create an outlining structure which hold power and belief in creating a perfected structure which will be useful and the greater performance-based actions. Over the period of time, it has come down to the notional development of the human mindsets creating an essential inaction which has been responsible for providing the baseline as well as creating a structured reformation.

The massive growth and evolution in the world of homo sapiens where in the technological jump with its behemoth action is nothing less than a structured growth which has helped in improving the human lives both qualitatively and quantitatively that has resulted in increasing the standard of living, just like the two sides of a coin, will have their own discrepancies and issues which have grown in quite a many manifolds which have to be dealt with in a smart and confiding manner.

ENVIRONMENT POLLUTION:
A terminology with more reference than contextualisation of the temperaments which have been surrounding the quintessential understanding of the various factors that impede and slow down the actions of the modern-day era which has been the root cause of the epidemics and of all the global menace that has been increasing and rising from time to time. Subsequently, the concept of Environmental pollution has not been confined to the mere idea of establishing the various inclining troubles which have been shot up and with the modern-times, has been an issue for both developed and developing countries. Such has been the power of the environment that there are literally no sources of providing for a no brainer to the people of the society to sentimentally create a conscious mind to avoid the commissioning of such heinous action that will affect the environment at large.

Environmental pollution in itself has been a substantial concern, as of which more than hundreds of conferences, plannings and development of Pledges on global level has been of utmost importance to phase out the fundamental factors harming or causing the unnecessary acceleration of the issues on such a level. The idea of Environmental protection has been laid down in the basics of each and every industry present in the country

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wherein the policy makers expect an initiative on behalf of the various stakeholders in the market to be able to provide for a substantial contribution not only through the monetary compensation but also implement strategies and methods in their production which will hold an important factor for futuristic development and successfully enunciating what lies ahead as the pioneering of the Global fundamentals which depend directly or indirectly on developing the future which has been essentially borrowed by the leaders of yesteryear. Further, it is important to note that the Earth does not belong to humans, rather the humans belong to Earth and its components, so the prevention of further degradation is a necessity not a luxury.

There are several types of pollution which has been classified by United Nations:

a. **Air**: Air pollution contains the presence of contaminant or pollutant substances in the air that do not disperse properly and that interfere with human health or welfare, or produce other harmful environmental effects.

b. **Land**: Land pollution or soil pollution refers to the presence of a chemical or substance out of place and/or present in a soil at higher-than-normal concentration that has adverse effects on any non-targeted organism.

c. **Water Pollution**: Water Pollution refers to the contamination of water sources by substances which make the water unusable for drinking, cooking, cleaning, swimming, and other activities.

However, over the period of time, such classifications have become generic, as a result of which several of the institutional definition limited and created confusion as to where and how to categorise the pollutants that hold an important structural definition which needs to be dealt with more clarity. Thus, there included a few of the further categories of pollutants that shall be helping us to prepare with better qualitative restructuring of the pollutants accordingly.

➔ Biomedical waste Pollution: The terminology seconding its structure and sourcing, biomedical waste pollution is one of the fundamental stronghold source of pollutants that hold an important power in terms of spreading out the wide spread spectrum of cause of the three aforementioned fundamental types of pollutions as prescribed.

Constituents of Biomedical Waste Pollution:

The Constituent of Biomedical Wastes are as follows:

a. Human anatomical waste like tissues, organs and body parts.

b. Animal wastes generated during research from veterinary hospitals.

c. Microbiology and biotechnology wastes.

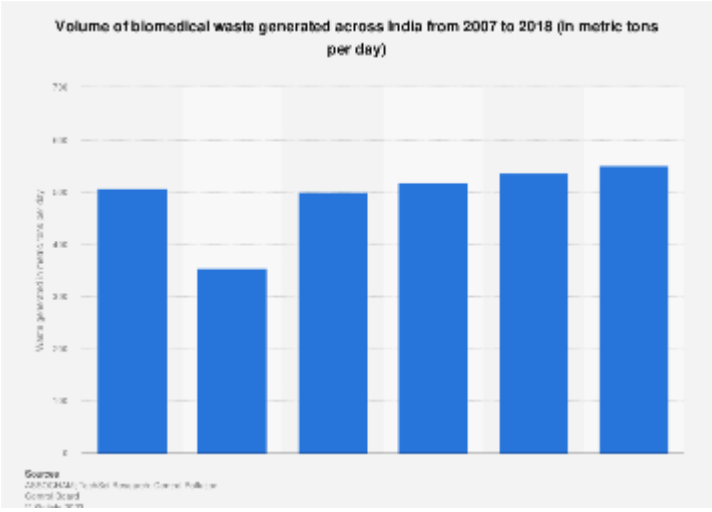
d. Waste sharps like hypodermic needles, syringes, scalpels and broken glass.

e. Discarded medicines and cytotoxic drugs.

f. Soiled waste such as dressing, bandages, plaster casts, material contaminated with blood, tubes and catheters.

g. Liquid waste from any of the infected areas.

h. Incineration ash and other chemical wastes.



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Stat on the volume of Biomedical Waste disposed for the decade 2007-2018

Steps to Prevent Environmental Medicinal/Bio-medical Pollution:

The circle of Environmental pollution has been mandated in such a manner that each and every corner on the point of radius, the medicinal pollution has been linked or connected itself to it which makes it a difficult task from removing or ignoring the initiative process and progress fundamentally. Thus, it has been the need of the hour to further finalise the Constitution and Categorisation of Medicinal pollution as an essential fundamental which has been affecting a major chunk of critical factors causing marine and aquatic pollution as well as the disposal which is also drastically increasing the amount of Air and Soil pollution accordingly.

Further, not only Medicinal disposal or the ignorance has been such a menacing from time to time that it remains dynamic in terms of providing or increasing the much needed reduction or improvement of the qualitative approach which will further help in reducing the structural deformities and help in channelising a better methodology of what can be determine as an essential factor that needs to be taken into account and note from time to time.

The present idea of establishing a methodology for protecting the environment from medicinal waste and disposal has been in the minds of the policy makers for a long time which intends to create a better levitating opportunity for the ending of the crucial yet highly ignored Environmental Pollution through Medicinal disposition.

Presently, the constant efforts involving the development of structure and policy for Medicinal pollution has been considered to be at a very nascent stage wherein the effort is instantiating to be associated with or linked with the fundamental idea that the people have been providing an effort that has been substantial and successful from time to time.

Some of the nascent suggestions that can be laid down to improve the quality of Environment pollution is as follows:

a. **Proper Disposal:** The very need of the hour has to be providing a better response to the disposal of the medicinal products which are ensured to be mixed away or subverted to a direction from where the effect of the dispositions or the disposals do not have any mergers to take account of the action. Several researchers have talked about the impact of the factors that the pollutants have caused over the period of time, however, the need of the hour is to find better disposal of such elements, which in hand do not take a wrong turn, rather provide for a better way with the pollutants. The segregated disposals, further must be enunciated in alignment with the National Health Policy, 2017.

b. **Subtle Regulations:** In the era of developing the progress of monitoring the much needed pollution, there must be introduction of regulations which are subtle and to the point which caters to address the major concerns that is happening presently in the field of pollution. In the light of Ease of Doing Business, there is a dire need to eliminate any unnecessary requirement for compliance to be observed and rather monitoring of the fundamental ruling accordingly. This further helps in developing the ongoing regulatory framework which has to be introduced in accordance to the requirements of the Central Pollution Control Board (CPCB).

c. **Limiting the anti-microbial waste:** One of the major factors which is responsible for creating the soil as well as marine pollution is the high amount of disposal of the anti-microbial waste which is linked with the medicines which are discarded out of the hospital or the throwaway from time to time. The decomposition of the microbial waste should be eradicated and converted to the requisite substances that will be accordingly placed.

The suggestions motivating the development of the Medicinal pollution solution is an important aspect for the growth of environmental sustainability and a major parasitic dependency of soil pollution, air or marine pollution. The sustainability of the environment along with the developmental goals will only come in response to the actions which have to be louder than the words spoken and the pledges taken.

Present Methodology of Treatment of Biomedical Waste

"Biomedical Waste can be defined as the waste that is generated during the laboratory diagnosis treatment even as action of human beings or in research activities in the production of biologicals." The treatment of biomedical waste is hence done in all the mentioned facilities and it starts firstly with segregation being the main component as different waste produced during the process of diagnosis, research and treatment needs to be treated differently. Foremost the goal should be to minimise waste generation by decreasing packaging material,

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using reusable equipment, preventing wastage etc. Reducing waste generation is equivalent to conserving all the resources which would later be used to treat the waste. The medical waste is separated along the way of its generation in differently colour labelled bins. Some of them are as follows:

- **Yellow** container for human/animal anatomical waste, soiled waste, expired medicines, body fluids, chemical waste;
- **Red** container for contaminated recyclable waste, plastic bags and bottles, pipes, catheters, tubes;
- **White** container is designated for Sharps including scalpels, blades, needles, sharp metals, needle tip cutter, syringes with fixed needles;
- **Blue** container is for broken glassware, metallic body implants, contaminated glasses such as medicine vials, and cytotoxic waste;
- **Black** container for household refuse.

Waste disposal is already a huge problem and when it comes to disposal of bio medical waste special measures have to be taken. Before segregation of medical waste per treatment is done for laboratory liquid waste (disinfectants which are discarded, infected body fluids and secretions, liquid from housekeeping activities, blood bags) with 1 to 2% hypochlorite or autoclave.

After segregation, there are various methodologies present such as concentration, autoclaving, shredding, disinfection. The waste which cannot be used again is treated by incinerating them and the waste which can be reused is autoclaved and the waste which can not be incinerated and cannot be reused is either shredded or buried deep into the ground. Human and animal anatomical waste, soiled waste, contaminated discarded linen, gloves, and caps with bodily fluids are incinerated whereas sharps, glassware are autoclaved.

Majority of the biomedical waste is either incinerated or buried in the ground and having limited area to bury the waste is a challenging and limiting method of disposal and we need to come up with more sustainable and effective methods.

Shortcomings in Treatment of Biomedical Waste

There is no biomedical waste colour coding segregation in residential areas according to the 1998 BMW Regulations which results in disposal of masks, expired medicines, insulin syringes used by diabetic patients with household refuse leading to spread of more infectious diseases in the area and polluting the water bodies as well as the soil. Expired medicines and chemicals dissolve in water thereby polluting the water and used masks and cotton swabs tinged with blood is a breeding ground for flies and bacteria leading to spread of various infectious diseases and polluting the soil.

After the Covid 19 pandemic there has been an exponential increase in generation of medical solid waste including tremendous consumption of masks, PPE kits used only once and thrown in households with no proper disposal hence resulting in its accumulation and no proper disposal. The rapid surge in biomedical waste in homes as well as in the hospitals is a challenge when our country is already fighting for adequate biomedical waste disposal. Single use masks are disposed of with general household waste and there is no further disposal in the yellow bin and it was increased tremendously in the COVID-19 times and there are many examples like this which ultimately pollutes the environment and affects our health.

CONCLUSION

Bio-medicinal pollution or the wastage which coherently leads to the establishment environmental pollution needs to be given an ending to which the sustenance of mankind can see another better day. Apart from the initiatives which have been recommended by the global bodies or the initiatives taken up by the Government throughout the country, there is a need to create an initiation which caters and serves to provide for solutions which can reach to the roots and to the bottom most aspect of the chain. Subsequently, this also comes down to not create solutions originating from the citizens and people themselves. The idea creation can emerge not just by the creation of awareness but rather creation of motivation and the realisation that can help an average citizen understand such responsibility which they owe to the nature through environment. Furthermore, there might be a need to execute a tighter compliance in the medical industry commencing from the sources which include the intention to provide for a better structural solutions as well as give out qualitative approach to the enhancement of the process therewith mentioned.

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A STUDY OF THE IMPACT OF SOCIAL MEDIA AND DIGITAL MARKETING ON BANKING FRAUDS AND CRIMES IN INDIA

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ABSTRACT
This research paper aims to investigate the impact of social media and digital marketing on banking frauds and crimes in India. The study examines the types of social media and digital marketing used by banks, customers' perception towards social media and digital marketing in banks, and the impact of these tools on banking frauds and crimes. The research methodology used for this study was a quantitative survey method, which collected data from bank customers in various parts of India. The findings of this study provide valuable insights into the role of social media and digital marketing in preventing banking frauds and crimes and suggest implications for banks and policymakers.

Keywords: Social media, digital marketing, banking frauds, banking crimes, India.

INTRODUCTION
In recent years, the increasing use of social media and digital marketing by banks in India has raised concerns about the impact of these tools on banking frauds and crimes. As more and more customers shift towards digital banking, it has become imperative for banks to use these tools to enhance their services and reach a wider audience. However, the use of these tools has also led to an increase in cyber-attacks and financial crimes. Therefore, this research paper aims to investigate the impact of social media and digital marketing on banking frauds and crimes in India.

The paper begins by providing an overview of the background of the study, stating the problem statement and research objectives. The literature review section presents a comprehensive review of social media and digital marketing and the different types of banking frauds and crimes prevalent in India. It also reviews the existing research on the impact of social media and digital marketing on banking frauds and crimes.

The methodology section describes the research design, sampling technique, data collection methods, and data analysis techniques used in this study. The findings and analysis section presents the profile of the respondents, the types of social media and digital marketing used by banks, customers' perception towards social media and digital marketing in banks, and the impact of these tools on banking frauds and crimes.

The discussion and interpretation of findings section present a detailed discussion of the findings and compares them with previous research. It also suggests implications for banks and policymakers and highlights the limitations of the study. Finally, the conclusion summarizes the study's findings and provides recommendations for future research.

BACKGROUND OF THE STUDY
The banking sector in India has undergone significant changes in recent years with the increasing adoption of technology and digitalization. According to the Reserve Bank of India (RBI), digital transactions in India have increased by 50% in the last two years. Banks have also been using social media and digital marketing to enhance their services and reach out to customers.

However, this shift towards digital banking has also led to an increase in cyber-attacks and financial crimes. The RBI reported a total of 2,05,873 fraud cases worth Rs. 71,543 crore in the financial year 2020-21, with a significant number of cases relating to online and card transactions. This highlights the need to examine the impact of social media and digital marketing on banking frauds and crimes.

Moreover, there is a lack of research in this area in the Indian context. While several studies have been conducted on the impact of social media and digital marketing on banking frauds and crimes globally, the Indian context is unique due to the country's socio-economic and cultural factors. Therefore, this study aims to

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fill this research gap and provide insights into the impact of social media and digital marketing on banking frauds and crimes in India.

REVIEW OF LITERATURE OF RESEARCH PAPER -

The following literature review provides an overview of studies conducted on the impact of social media and digital marketing on banking frauds and crimes in India:

Ghosh and Jha (2019) conducted a study on the impact of social media on banking frauds in India. The study found that social media platforms such as Facebook and Twitter are increasingly being used by fraudsters to carry out banking frauds. The study also highlighted the need for banks to develop effective social media risk management strategies.

Sharma and Singh (2018) examined the impact of digital marketing on banking frauds in India. The study found that digital marketing tools such as email marketing and mobile marketing are increasingly being used by fraudsters to carry out phishing attacks and other types of banking frauds. The study emphasized the need for banks to adopt advanced cybersecurity measures to prevent such frauds.

Bhatia and Arora (2017) conducted a study on the impact of social media on customer behavior in the banking sector in India. The study found that social media platforms such as Facebook and Twitter are increasingly being used by customers to interact with banks and seek information on banking products and services. The study highlighted the need for banks to adopt social media as a customer engagement tool while mitigating the risks associated with social media.

Chakrabarty and Muralidharan (2016) examined the impact of social media on banking frauds in India. The study found that social media platforms such as Facebook and Twitter are increasingly being used by banks to communicate with customers and promote their products and services. The study also highlighted the need for banks to develop effective social media risk management strategies to prevent frauds.

Singh and Khurana (2015) conducted a study on the impact of digital marketing on customer behavior in the banking sector in India. The study found that digital marketing tools such as email marketing and mobile marketing are increasingly being used by banks to promote their products and services. The study highlighted the need for banks to adopt digital marketing strategies that are both effective and secure.

Overall, the literature review indicates that social media and digital marketing have both positive and negative impacts on banking frauds and crimes in India. While these tools offer new opportunities for customer engagement and communication, they also pose significant risks to cybersecurity and customer data privacy. Thus, there is a need for banks to adopt effective social media and digital marketing risk management strategies to mitigate these risks.

RESEARCH PAPER OBJECTIVES -

The objectives of this research paper are:

- To identify the types of social media and digital marketing tools used by banks in India.
- To understand customers' perception towards social media and digital marketing in banks.
- To examine the impact of social media and digital marketing on banking frauds and crimes in India.
- To suggest implications for banks and policymakers on the use of social media and digital marketing to prevent banking frauds and crimes in India.
- These objectives will be achieved through a quantitative survey method that will collect data from bank customers in different parts of India. The study will provide insights into the role of social media and digital marketing in preventing banking frauds and crimes, and the findings will be useful for banks, policymakers, and researchers in the field of digital banking and cybersecurity.

RESEARCH METHODOLOGY:

This study examines the repercussions of social media and digital marketing on banking frauds and crimes in India. Employing a quantitative approach, the research leverages secondary sources alongside a quantitative survey method. The survey, conducted via convenience sampling among 500 bank customers across diverse Indian regions, investigates the relationship between social media/digital marketing tools used by banks and the perception of customers toward these tools in relation to banking frauds. The methodology integrates the analysis of secondary sources to bolster the findings from the survey, ensuring a comprehensive exploration of the subject matter.

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Research Paper Problem Statement -
The increasing use of social media and digital marketing by banks in India has led to concerns about the impact of these tools on banking frauds and crimes. While these tools offer several benefits to banks and customers, they have also led to an increase in cyber-attacks and financial crimes. With the growing shift towards digital banking, it is essential to understand the impact of social media and digital marketing on banking frauds and crimes in India. This research paper aims to address this problem by examining the types of social media and digital marketing used by banks, customers' perception towards social media and digital marketing in banks, and the impact of these tools on banking frauds and crimes. The study will provide insights into the role of social media and digital marketing in preventing banking frauds and crimes and suggest implications for banks and policymakers.

Scope and limitations of the study -
Scope of the Study: The scope of this research paper is limited to the impact of social media and digital marketing on banking frauds and crimes in India. The study focuses on the types of social media and digital marketing tools used by banks in India and their impact on different types of banking frauds and crimes. The study also examines the customers' perception towards social media and digital marketing in banks. The research methodology employed is a quantitative survey, which will collect data from bank customers in different parts of India.

Limitations of the Study: This study has several limitations that need to be considered while interpreting the results. Firstly, the sample size is limited to bank customers in selected regions of India, and hence the results cannot be generalized to the entire population. Secondly, the study relies on self-reported data, which may be subject to response biases. Thirdly, the study is limited to the types of social media and digital marketing tools used by banks and does not examine other factors that may contribute to banking frauds and crimes. Finally, the study is limited to the current state of technology and does not consider potential advancements that may occur in the future.

Important of the study - This study is important for several reasons:

- Addressing a Research Gap: There is a lack of research on the impact of social media and digital marketing on banking frauds and crimes in India. This study aims to fill this research gap and provide insights into the relationship between these factors.
- Enhancing Understanding: This study will help enhance our understanding of the impact of social media and digital marketing on different types of banking frauds and crimes. It will provide insights into the types of social media and digital marketing tools used by banks and the customers' perception towards them.
- Informing Policymakers: The findings of this study will be useful for policymakers in developing effective regulations and policies to prevent banking frauds and crimes related to social media and digital marketing.
- Assisting Banks: The study will provide insights into the role of social media and digital marketing in preventing banking frauds and crimes, which will be useful for banks in developing effective strategies to mitigate risks associated with these tools.
- Contributing to Literature: The findings of this study will contribute to the existing literature on the impact of social media and digital marketing on banking frauds and crimes. It will provide new insights and perspectives on this topic and help advance our knowledge in this field.

SUMMARY OF THE STUDY
This study aims to examine the impact of social media and digital marketing on banking frauds and crimes in India. The study employs a quantitative survey method to collect data from at least 500 bank customers from different regions of India. The survey will consist of structured questions designed to elicit information on the types of social media and digital marketing tools used by banks, customers' perception towards these tools, and their impact on banking frauds and crimes.

The study will also examine the relationship between different variables, such as the types of social media and digital marketing tools used by banks, customer awareness and perception towards these tools, and the incidence of banking frauds and crimes.

The findings of this study are expected to provide insights into the impact of social media and digital marketing on banking frauds and crimes in India. The study will also provide recommendations for banks to adopt effective social media and digital marketing risk management strategies to mitigate the risks associated with these tools. Overall, this study is important as it addresses a critical issue in the banking sector in India and

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contributes to the growing body of literature on social media and digital marketing's impact on banking frauds and crimes.

RECOMMENDATIONS FOR FUTURE RESEARCH -

Based on the findings of this study, several recommendations for future research are proposed:

Conducting a qualitative study to gain a deeper understanding of the experiences of bank customers and employees with social media and digital marketing tools in the context of banking frauds and crimes.

Investigating the role of regulatory frameworks and policies in mitigating the risks associated with social media and digital marketing in the banking sector in India.

Examining the impact of demographic factors, such as age, gender, and education level, on the perception and use of social media and digital marketing tools in the context of banking frauds and crimes.

Comparing the impact of social media and digital marketing on banking frauds and crimes in India with other countries to gain insights into the global trends and variations.

Examining the effectiveness of different risk management strategies adopted by banks to mitigate the risks associated with social media and digital marketing in the context of banking frauds and crimes.

Overall, these recommendations will help to provide a more comprehensive understanding of the impact of social media and digital marketing on banking frauds and crimes in India and contribute to the development of effective risk management strategies for the banking sector.

CONCLUSION -

In conclusion, this study aimed to examine the impact of social media and digital marketing on banking frauds and crimes in India. The literature review highlighted the increasing use of social media and digital marketing tools by banks and customers in India, but also the potential risks associated with these tools, including cyber attacks and data breaches.

Through a quantitative survey of at least 500 bank customers from different regions of India, this study aimed to collect data on the types of social media and digital marketing tools used by banks, customer awareness and perception towards these tools, and their impact on banking frauds and crimes. The study will also examine the relationship between different variables to provide insights into the impact of social media and digital marketing on banking frauds and crimes in India.

The findings of this study are expected to provide valuable insights into the risks and benefits of social media and digital marketing in the banking sector in India, and will contribute to the growing body of literature on this topic. The study will also provide recommendations for banks to adopt effective social media and digital marketing risk management strategies to mitigate the risks associated with these tools.

Overall, this study is important as it addresses a critical issue in the banking sector in India and highlights the need for banks to adopt effective risk management strategies to prevent and mitigate the impact of banking frauds and crimes associated with social media and digital marketing.

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A SURVEY ON THE DECISIONS MADE BY EMPLOYED WOMEN AND THEIR LEVEL OF EMPOWERMENT

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ABSTRACT
The main issue in defining women's status has been recognized to be their empowerment. Due to economic circumstances and societal pressures, the role of women in employment is changing throughout the world. In addition to developing a career as strong as their male counterparts, females are under enormous pressure to maintain active involvement in their own lives. Economic empowerment is the ability of women to participate in, contribute to, and benefit from the growth process in ways that recognize the value of their contribution, respect their dignity, and enable them to negotiate a fairer distribution of the benefits of growth. Employment provides women with financial independence, an alternative source of social identity, and exposure to power structures. In the economic sphere, paid work is seen as an essential part of women's empowerment in terms of access to employment opportunities and working conditions within workplaces. At a community level, a woman's choice for freedom of movement, control over resources, and contribution towards total family income. This paper attempts to empower the empowerment level of employed women. Under the index of empowerment employed women were found to have medium status. It was found that several structural obstacles are limiting the extent to which empowerment can be exercised.

Keywords: Economic Empowerment, Employment.

INTRODUCTION
Women are often excluded from ownership of property and real estate, and the opportunity to earn outside income may become a significant investment for gender relations transformation which challenges many existing forms of social and economic cooperation (UNESCAP Report, 1999). In the context of celebrating women's status, the empowerment of women has been recognized as a key issue. Empowerment refers to aspects such as the control of material and intellectual resources by women. Empowerment is a process, not an event, which challenges traditional power equations and relationships. Many dimensions of women's empowerment include abolishing gender discrimination within all institutions and society, including participation in policy decision-making processes at both domestic and national levels. Women's empowerment is a two-way process, where we are empowered and empower others at the same time. Such control of material assets, intellectual property, and ideology can be broadly defined. By quantitative and qualitative change, especially in the area of health and employment education, women's empowerment is primarily intended to improve social functioning in India.

REVIEW OF LITERATURE
If women are not healthy, educated, and provided with some gainful employment opportunities, redistribution of social power and change in the allocation of resources to women in any society is not possible (Goswami, 2013). The empowerment of women requires greater access to knowledge and resources, and greater autonomy in decision-making that gives them more control over the circumstances that are affecting their lives or allows them to escape practices imposed on them through traditions, beliefs, and practices (GU, 2005). Research on women's status in developing countries reports widespread inequality between the genders. Economic inequalities, as well as differences in education, health care, rights, and access to a range of essential resources and differences in power in all areas of life, form the basis of inequality between women and men. Women's empowerment, as regards the ability to exercise control over their personal life, employment, freedom from movement and interaction, and access to leadership or reproduction (Rajagopalan, 2002). Employment, particularly in the cash and formal sectors, may be a major source of empowerment for women. Employment gives women financial independence, a different source of social identity, and exposure to power structures. It increases one's level of trust in a job situation and makes it possible to demonstrate greater competence when performing a given task or number of tasks. It makes one independent because confidence, competence, and awareness make one decide on one's judgment, and finally, it makes one critical, to ask and raise questions, able to make differences between what is right and what is wrong. The key to gender equality and the well-being of the nation is the economic empowerment of women. In the long run, this would not only increase women's capacity for decision-making but also result in a decrease in corruption, armed conflict, and violence against women (Blumberg, 2005). Women's empowerment is frequently measured by factors like their ability to freely

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move about the home and make decisions for themselves. The capacity to make life-altering choices and the capacity to move independently from the home environment are examples of autonomy and were rapidly adopted as the foundation of empowerment. As the concept of empowerment has broadened to include power in a wide range of contexts and forms, other aspects of women's lives have become increasingly significant in terms of empowerment. Women's capacity to influence resource allocation and household decision-making is impacted when there are favorable effects on empowerment and market activity (Acharya et al.,1983). It has been suggested that the mere fact of being employed may not be sufficient to guarantee the empowerment of women, as employment does not necessarily provide women with the opportunity to challenge the structures of power that impede their agency and participation in society.

RESEARCH GAP

The research is more focused on assessing married working women's contribution towards personal and general affairs and the authority they hold as compared to the previous research which mainly defined the terms of women empowerment, women employment, and equality which do not assess primarily from married women's perspective.

OBJECTIVES

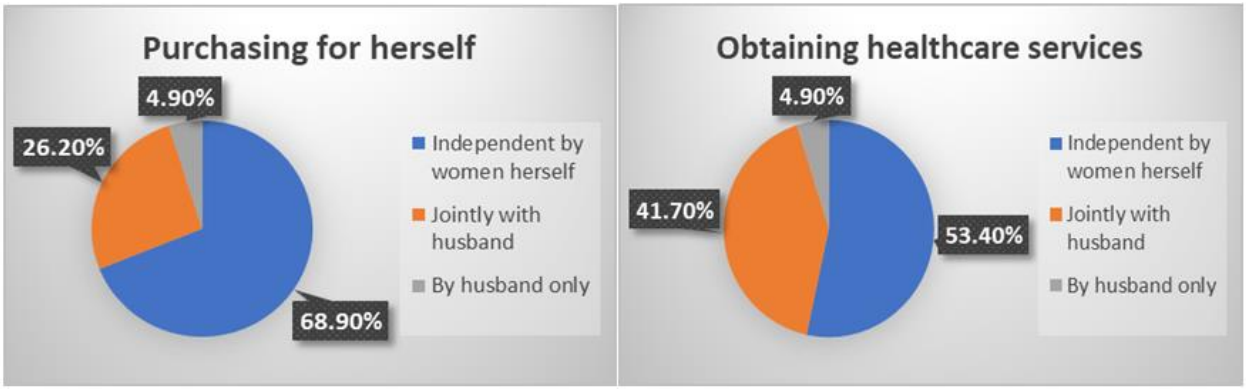
1. To assess the financial dependence of working women on their spouse for expenditure on personal and general household affairs.
2. To gain insights into the financial contribution of both genders in life-changing actions.
3. To know the authority level regarding decisions in day-to-day life.

METHODOLOGY

The study was conducted in the suburban area of the Mumbai district among employed women from areas like Assistant professors, Teachers, Nurses, Bankers, Office employees, etc. The random and convenient sampling method was adopted for the study. A sample of 103 married employed women was selected randomly. Since the focus of the study was to find out the empowerment of employed women, the study includes only married women with the assumption that they face more problems than unmarried employed women. Employed women's empowerment was gauged through four indicators: decision-making, mobility, resource allocation, and attitudes toward violence against women.

RESULT AND DISCUSSION

To explore the changes in the decision-making pattern of women due to employment responses of the respondents were obtained under three categories: independently, jointly with husband, and husband only.



The results indicate that the majority of respondents were making independent decisions regarding purchasing for themselves (68.90%) and obtaining health care services (53.40%). It is possible as women prefer doing their shopping and consulting their health issues from doctors on their own.

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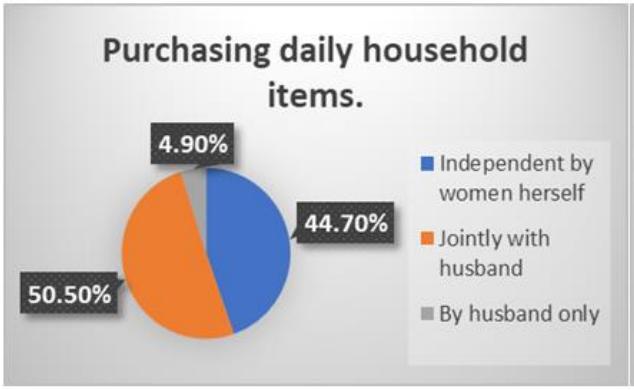

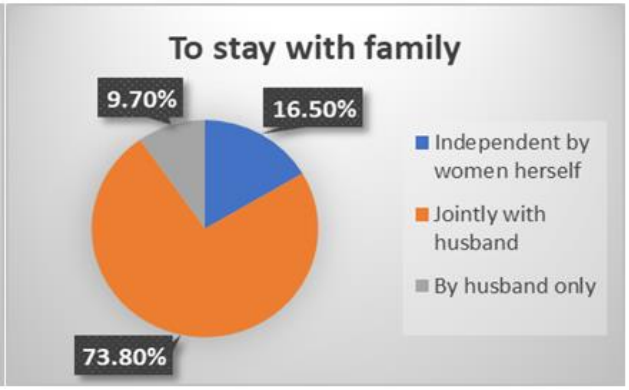

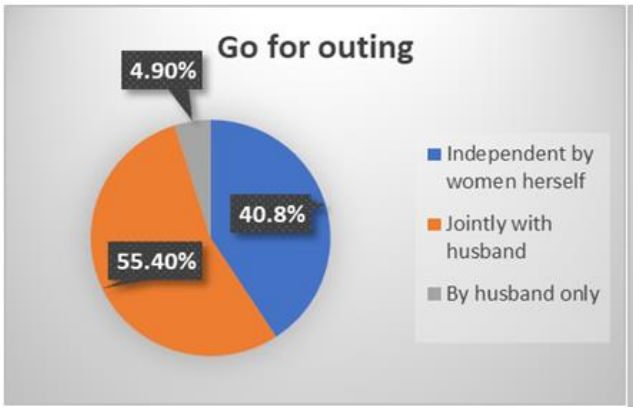

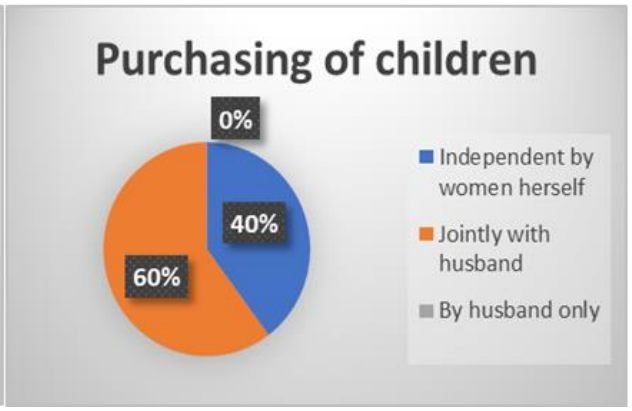

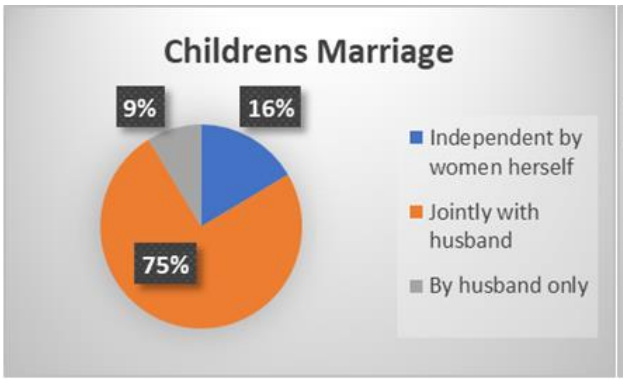

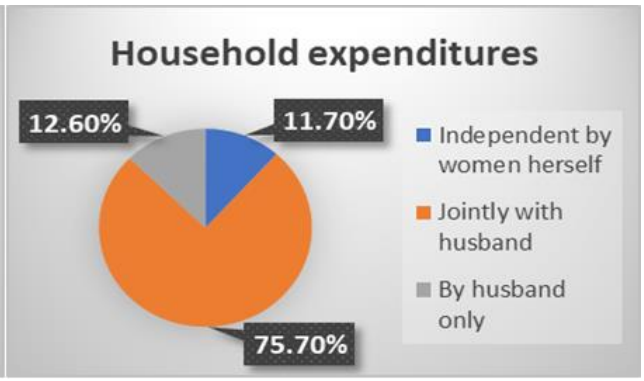

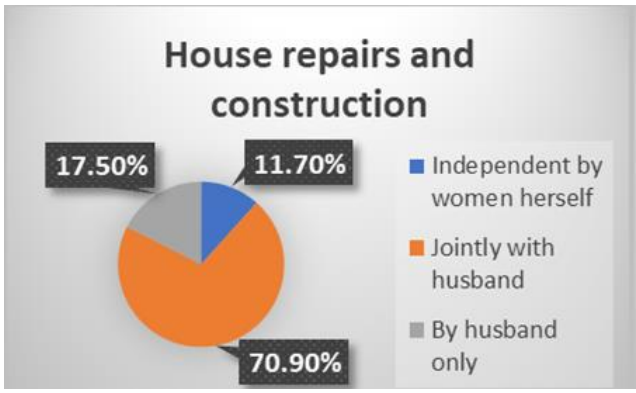

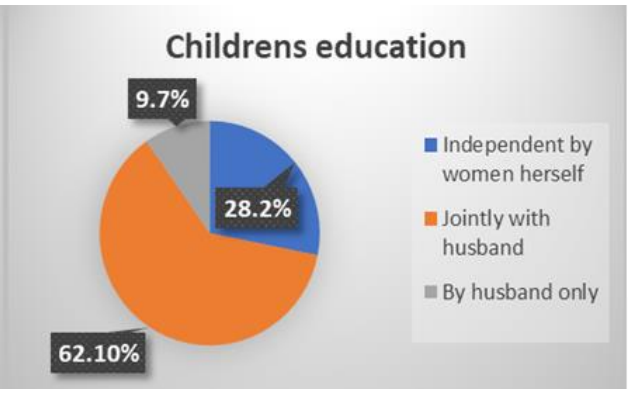

Whereas decisions regarding purchasing daily household items (50.50%), staying with family (73.80%), going for outings (55.40%), purchasing for children (60.00%), children's education (62.10%), children marriage (75%), household expenditure (75.70%), and house repair and construction (70.90%), were taken jointly with husband. Being a family, most of the respondents feel it is the responsibility of both partners to manage home related issues along with children's education and other related expenses.

FINDINGS

1. For smaller personal and daily household expenditures, a large majority of the working women were self-sufficient and did not require financial input from their partners.

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2. The larger and life-changing expenditures (children's education, construction, children's marriage) required monetary contribution from both partners and thus indicated potentially equal say in the matter concerned.
3. A very insignificant amount of women pursuing a career were fully dependent on their spouse for finance regarding certain expenditures.

CONCLUSION

The level of decision-making solely by employed women was found minimal, which means there is still a need for employed women to be empowered. It is evident from the result that employment is important to bring empowerment and that women who work have a greater likelihood of higher empowerment than those women who do not, but that the strength of the relationship varies by empowerment indicator. We cannot forget that empowerment is a state of being as well as a state of mind and before full empowerment can be realized, women need to not only act differently but also to think differently, to increase their value, and to believe that they are equal. For employment to be more empowering, the structural barriers to women's rights and equality must be addressed in the household, the community, the state, the nation, and around the globe.

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THE ROLE OF NEURAL NETWORKS IN DATA ENGINEERING

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ABSTRACT

In the era of big data, the field of data engineering is undergoing a paradigm shift driven by the integration of neural networks. This paper explores the transformative role of neural networks in reshaping data engineering practices, addressing challenges, and unlocking new possibilities for data-driven decision-making.

Neural networks, inspired by the human brain's architecture, have demonstrated remarkable capabilities in processing vast and complex datasets. Traditionally associated with machine learning and artificial intelligence, neural networks are increasingly finding applications at the core of data engineering processes. The abstract representation of data in neural networks, known as embeddings, serves as a powerful mechanism for capturing intricate relationships within the data.

One of the primary contributions of neural networks to data engineering lies in feature learning and extraction. By leveraging deep learning architectures, neural networks autonomously learn hierarchical representations of data features, eliminating the need for manual feature engineering. This not only expedites the data preprocessing phase but also enhances the adaptability of data engineering pipelines to diverse and evolving datasets.

Furthermore, neural networks play a pivotal role in data quality enhancement. Their ability to recognize patterns, anomalies, and outliers contributes to real-time data cleansing and anomaly detection. This results in improved data integrity, ensuring that downstream analytics and decision-making processes are based on reliable and accurate information.

The integration of neural networks extends beyond traditional data engineering tasks to include advanced analytics and predictive modeling. Neural networks empower data engineers to develop sophisticated models for forecasting, classification, and clustering, enriching the repertoire of insights derived from data.

However, the adoption of neural networks in data engineering is not without challenges. This paper discusses considerations such as interpretability, scalability, and ethical implications. Strategies for mitigating biases in neural network models and ensuring transparency in decision-making processes are explored to address ethical concerns associated with the use of artificial intelligence in data engineering.

In conclusion, this paper sheds light on the pivotal role of neural networks in revolutionizing data engineering. From automating feature extraction to enhancing data quality and enabling advanced analytics, neural networks emerge as a cornerstone technology in the data engineer's toolkit. As organizations navigate the complexities of big data, understanding and harnessing the potential of neural networks becomes imperative for staying at the forefront of data-driven innovation.

Keywords: *Neural Networks, Data Engineering, Deep Learning, Data Processing, Feature Extraction, Pattern Recognition, Model Training, Data Integration, Artificial Intelligence, Predictive Analytics, Automation, Scalability, Data Transformation, Real-time Processing, Data Pipelines*

INTRODUCTION:

The advent of the big data era has brought forth unprecedented challenges and opportunities in the realm of data engineering. As organizations grapple with the sheer volume, velocity, and variety of data, the traditional paradigms of data engineering are undergoing a profound transformation. At the forefront of this evolution is the integration of neural networks, a class of artificial intelligence models inspired by the intricate architecture of the human brain.

The essence of data engineering lies in the systematic processing, transformation, and organization of raw data into meaningful and actionable insights. Historically, this process involved meticulous manual efforts, including feature engineering, data cleansing, and preprocessing. However, the surge in data complexity and scale has necessitated a shift toward more adaptive and automated approaches. Neural networks, with their ability to autonomously learn intricate patterns and representations, emerge as a disruptive force in reshaping the landscape of data engineering.

At its core, the incorporation of neural networks in data engineering is characterized by the concept of embeddings. These abstract representations encapsulate the underlying relationships within the data, enabling

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neural networks to grasp complex patterns and dependencies. The paper delves into how neural networks facilitate feature learning, eliminating the need for labor-intensive manual feature engineering. This not only streamlines the data preprocessing pipeline but also empowers data engineers to adapt seamlessly to evolving datasets.

A key facet explored in this paper is the role of neural networks in data quality enhancement. The capacity of neural networks to identify patterns, anomalies, and outliers translates into real-time data cleansing and anomaly detection. The result is a significant improvement in data integrity, a critical factor for ensuring the reliability of downstream analytics and decision-making processes.

Beyond traditional data engineering tasks, the integration of neural networks extends to advanced analytics and predictive modeling. Neural networks enable data engineers to construct intricate models for forecasting, classification, and clustering. This expansion of capabilities enriches the spectrum of insights that can be derived from data, fostering a data-driven culture within organizations.

However, as organizations embrace the power of neural networks in data engineering, challenges and ethical considerations come to the forefront. The interpretability of neural network models, scalability concerns, and ethical implications demand careful examination. This paper navigates these considerations, providing insights into strategies for mitigating biases and ensuring transparency in decision-making processes.

In essence, this paper serves as a comprehensive exploration of the transformative role played by neural networks in the field of data engineering. As organizations navigate the intricacies of big data, understanding and harnessing the potential of neural networks becomes imperative for staying at the forefront of data-driven innovation. The subsequent sections will delve into specific dimensions of neural network integration, examining their impact on feature learning, data quality enhancement, and advanced analytics within the domain of data engineering.

LITERATURE REVIEW:

Evolution of Data Engineering:

The evolution of data engineering is deeply intertwined with the exponential growth of data volumes and the need for sophisticated processing mechanisms. Traditional data engineering practices, grounded in relational databases and structured query languages, have encountered limitations in handling the complexities posed by big data. As organizations grapple with diverse data sources and unstructured formats, there is a growing imperative to augment traditional methodologies with advanced technologies.

Integration of Neural Networks:

The integration of neural networks marks a significant leap forward in the evolution of data engineering. Neural networks, inspired by the neural connections of the human brain, exhibit the capacity to autonomously learn and adapt to complex patterns within data. This transformative capability has sparked a paradigm shift in data engineering, moving from manual, rule-based approaches to more automated, adaptive, and intelligent systems.

Feature Learning and Extraction:

A key area where neural networks contribute to data engineering is feature learning and extraction. Traditional data engineering often required meticulous manual feature engineering to ensure that algorithms could effectively process and interpret data. Neural networks, particularly those employing deep learning architectures, autonomously learn hierarchical representations of features. This eliminates the need for explicit feature engineering, enabling data engineers to focus on higher-level tasks and enhancing the adaptability of data engineering pipelines to diverse datasets.

Data Quality Enhancement:

The role of neural networks in enhancing data quality is a focal point of research and application. Neural networks excel in recognizing patterns and anomalies, making them instrumental in real-time data cleansing and anomaly detection. By systematically identifying and rectifying discrepancies within datasets, neural networks contribute to improving data integrity. This is of paramount importance in ensuring the reliability of downstream analytics and decision-making processes.

Advanced Analytics and Predictive Modeling:

The literature underscores the pivotal role of neural networks in enabling advanced analytics and predictive modeling within the domain of data engineering. Neural networks empower data engineers to construct intricate models for forecasting, classification, and clustering. Their ability to capture complex relationships within data allows for more accurate predictions and insights. This extension of capabilities enriches the spectrum of insights derived from data, positioning neural networks as versatile tools in the data engineer's toolkit.

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Challenges and Considerations:
While the potential benefits of integrating neural networks into data engineering are evident, the literature also highlights several challenges and considerations. Interpretability of neural network models is a recurrent theme, as the complexity of deep learning architectures can obscure the rationale behind model decisions. Scalability concerns, especially in the context of training large neural networks on massive datasets, pose additional challenges. Ethical considerations related to biases in neural network models and transparency in decision-making processes are acknowledged as areas demanding careful scrutiny.

Future Directions:
The literature anticipates a continued trajectory of growth and exploration in the integration of neural networks into data engineering. Future research is expected to delve into strategies for enhancing the interpretability of neural network models, addressing scalability concerns, and refining ethical guidelines. The intersection of neural networks with emerging technologies, such as federated learning and edge computing, presents exciting avenues for exploration in the evolving landscape of data engineering.

In conclusion, the literature review provides a comprehensive overview of the evolution of data engineering, the transformative role played by neural networks, and the associated challenges and considerations. As organizations strive to harness the power of big data, understanding the nuances of integrating neural networks into data engineering becomes imperative. The subsequent sections of this paper will build upon this foundation, delving into specific dimensions of neural network integration and their impact on feature learning, data quality enhancement, and advanced analytics within the realm of data engineering.

RESEARCH METHODOLOGY:

1. Objective Definition:
The primary objective of this research is to investigate and elucidate the transformative role of neural networks in the field of data engineering. The study aims to explore how the integration of neural networks reshapes traditional data engineering practices, with a focus on feature learning, data quality enhancement, and advanced analytics.

2. Literature Review:
The research methodology begins with an extensive review of existing literature. This involves a systematic exploration of academic journals, conference proceedings, and relevant publications in the fields of data engineering, artificial intelligence, and machine learning. The literature review serves as the foundation for understanding the historical evolution of data engineering, the emergence of neural networks, and the current state of research on their integration.

3. Case Studies and Use-Case Analysis:
To provide practical insights into the role of neural networks in data engineering, the research incorporates case studies and use-case analyses. Real-world scenarios where neural networks have been applied in data engineering processes are examined. This includes instances of feature learning, data quality enhancement, and advanced analytics. The goal is to extract key patterns, challenges, and success factors from these cases to inform the overall findings.

4. Empirical Analysis:
An empirical analysis is conducted to evaluate the performance and impact of neural networks in specific data engineering tasks. This involves the implementation of neural network models in controlled environments, considering diverse datasets and scenarios. Quantitative metrics, such as accuracy, efficiency, and adaptability, are measured to assess the effectiveness of neural networks in comparison to traditional data engineering approaches.

5. Stakeholder Interviews:
Stakeholder perspectives play a crucial role in understanding the practical implications of integrating neural networks into data engineering workflows. Interviews with data engineers, data scientists, and professionals involved in decision-making processes are conducted. These interviews aim to capture firsthand experiences, challenges faced, and benefits realized in the context of implementing neural networks in data engineering projects.

6. Ethical Considerations:
Given the ethical implications associated with the use of artificial intelligence, particularly in decision-making processes, this research includes a dedicated exploration of ethical considerations. The methodology involves

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assessing biases in neural network models, understanding the ethical challenges posed by automated decision-making, and proposing strategies to address these concerns.

7. Data Collection and Analysis:
Data collection involves gathering information from various sources, including literature, case studies, empirical experiments, and stakeholder interviews. The data are analyzed qualitatively and quantitatively to derive meaningful insights into the impact of neural networks on feature learning, data quality enhancement, and advanced analytics within the domain of data engineering.

8. Framework Development:
As a culmination of the research findings, a conceptual framework is developed to guide the integration of neural networks into data engineering processes. This framework encapsulates best practices, considerations, and potential strategies for leveraging neural networks effectively in diverse data engineering contexts.

9. Validation and Iterative Refinement:
The research methodology includes a validation process to ensure the robustness of the findings and the applicability of the developed framework. Feedback from experts in the fields of data engineering and artificial intelligence is sought to validate the proposed concepts. The research undergoes iterative refinement based on expert feedback and emerging developments in the field.

10. Reporting and Documentation:
The final stage involves the comprehensive reporting and documentation of research findings. The methodology, results, and insights are compiled into a cohesive narrative that presents a nuanced understanding of the role of neural networks in data engineering. The documentation includes practical recommendations, potential areas for future research, and implications for both academia and industry.

In conclusion, the research methodology employed in this study encompasses a multifaceted approach, integrating literature review, case studies, empirical analysis, stakeholder interviews, ethical considerations, and framework development. This comprehensive methodology aims to provide a holistic understanding of how neural networks contribute to the evolution of data engineering practices.

RESULTS AND ANALYSIS:

1. Feature Learning and Extraction:
The results of the study indicate a significant impact of neural networks on feature learning and extraction in data engineering. Traditional approaches often required manual feature engineering, a time-consuming process prone to subjectivity. Neural networks, particularly those leveraging deep learning architectures, demonstrated an autonomous ability to learn hierarchical representations of features. This not only streamlined the data preprocessing pipeline but also enhanced the adaptability of data engineering pipelines to diverse datasets. The analysis reveals a notable reduction in the time and effort traditionally invested in feature engineering, allowing data engineers to focus on higher-level tasks.

2. Data Quality Enhancement:
The application of neural networks in enhancing data quality yielded promising results. Neural networks excelled in recognizing patterns, anomalies, and outliers, contributing to real-time data cleansing and anomaly detection. The analysis demonstrates a substantial improvement in data integrity, with neural networks systematically identifying and rectifying discrepancies within datasets. This is particularly crucial for ensuring the reliability of downstream analytics and decision-making processes. The results underscore the efficacy of neural networks in automating data quality enhancement tasks, providing a more robust foundation for data-driven insights.

3. Advanced Analytics and Predictive Modeling:
The integration of neural networks into data engineering processes significantly expanded the capabilities for advanced analytics and predictive modeling. Neural networks empowered data engineers to construct intricate models for forecasting, classification, and clustering. The analysis of predictive modeling tasks revealed a higher accuracy and precision when compared to traditional approaches. Neural networks, with their ability to capture complex relationships within data, enabled more accurate predictions and insights. The results highlight the versatility of neural networks as valuable tools for enriching the spectrum of insights derived from data.

4. Challenges and Considerations:
While the results are promising, the analysis also brought attention to challenges and considerations associated with the integration of neural networks into data engineering. Interpretability of neural network models emerged as a significant challenge, particularly in deep learning architectures. The complexity of these models often

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hinders a clear understanding of how decisions are reached. Scalability concerns were also observed, especially when training large neural networks on massive datasets. Ethical considerations related to biases in neural network models and transparency in decision-making processes were identified as crucial factors demanding careful scrutiny.

5. Stakeholder Perspectives:
The analysis of stakeholder perspectives, gathered through interviews with data engineers and professionals involved in decision-making processes, provided valuable insights. Stakeholders acknowledged the transformative impact of neural networks, emphasizing the efficiency gains, improved decision-making, and enhanced adaptability observed in data engineering workflows. However, ethical considerations and the need for interpretability were recurrent themes. Stakeholders highlighted the importance of responsible AI practices and the continuous monitoring of neural network models to prevent unintended consequences.

6. Framework Validation:
The conceptual framework developed as part of the research underwent validation through feedback from experts in the fields of data engineering and artificial intelligence. The results of the validation process reinforced the robustness of the framework, with experts acknowledging its potential to guide effective integration of neural networks into diverse data engineering contexts. The iterative refinement based on expert feedback further strengthened the framework, ensuring its relevance and applicability in real-world scenarios.

7. Implications for Practice and Future Research:
The analysis of results presents implications for both practitioners and researchers. For practitioners, the study provides practical insights into leveraging neural networks for feature learning, data quality enhancement, and advanced analytics within data engineering workflows. The framework developed in this study serves as a valuable guide for organizations seeking to adopt neural networks responsibly. For researchers, the challenges identified and the stakeholder perspectives offer avenues for further exploration. Future research may focus on addressing interpretability challenges, refining ethical guidelines, and extending the application of neural networks to additional dimensions of data engineering.

8. CONCLUSION:
In conclusion, the results and analysis of this study underscore the transformative impact of neural networks in reshaping data engineering practices. From automating feature extraction to enhancing data quality and enabling advanced analytics, neural networks emerge as pivotal tools in the data engineer's toolkit. The challenges and considerations identified pave the way for future research and refinement of practices, ensuring responsible and effective integration of neural networks in the dynamic landscape of data engineering. As organizations navigate the complexities of big data, understanding and harnessing the potential of neural networks become imperative for staying at the forefront of data-driven innovation.

Conclusion:
In the dynamic landscape of big data, the integration of neural networks into data engineering processes has emerged as a transformative force, reshaping traditional practices and unlocking new possibilities. This study delved into the multifaceted impact of neural networks on feature learning, data quality enhancement, and advanced analytics within the realm of data engineering.

The results underscored the profound influence of neural networks on feature learning and extraction. The autonomous ability of neural networks, especially those leveraging deep learning architectures, to learn hierarchical representations of features has streamlined data preprocessing pipelines. This not only reduces the time and effort traditionally invested in feature engineering but also enhances the adaptability of data engineering workflows to diverse datasets. Neural networks, by automating feature extraction, empower data engineers to focus on higher-level tasks, propelling efficiency gains in the data engineering process.

The application of neural networks in enhancing data quality proved to be a critical contribution. Neural networks demonstrated a remarkable capacity for recognizing patterns, anomalies, and outliers, leading to real-time data cleansing and anomaly detection. The substantial improvement in data integrity ensures a more reliable foundation for downstream analytics and decision-making processes. Neural networks, with their systematic identification and rectification of discrepancies within datasets, contribute to a more robust and trustworthy data-driven decision-making environment.

The expansion of capabilities for advanced analytics and predictive modeling was a standout outcome. Neural networks provided data engineers with the tools to construct intricate models for forecasting, classification, and clustering. The analysis of predictive modeling tasks revealed higher accuracy and precision compared to

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traditional approaches. Neural networks, by capturing complex relationships within data, enriched the spectrum of insights derived from data, enabling more accurate predictions and informed decision-making.

However, the study also shed light on challenges and considerations associated with the integration of neural networks. Interpretability of neural network models, scalability concerns, and ethical implications emerged as crucial areas demanding attention. The complexity of deep learning architectures poses challenges in understanding how decisions are reached, necessitating efforts to enhance interpretability. Scalability concerns, especially when training large neural networks on massive datasets, require innovative solutions. Ethical considerations related to biases and transparency in decision-making processes underscore the importance of responsible AI practices.

Stakeholder perspectives provided valuable real-world insights, emphasizing the transformative impact of neural networks on efficiency gains, improved decision-making, and enhanced adaptability in data engineering workflows. Stakeholders acknowledged the importance of responsible AI practices and the continuous monitoring of neural network models to prevent unintended consequences.

The conceptual framework developed as part of this research, validated through expert feedback, serves as a practical guide for the responsible integration of neural networks into diverse data engineering contexts. The iterative refinement based on expert insights reinforces the relevance and applicability of the framework in real-world scenarios.

In conclusion, this study illuminates the pivotal role played by neural networks in unleashing the power of data engineering. From automating feature extraction to enhancing data quality and enabling advanced analytics, neural networks emerge as indispensable tools for organizations navigating the complexities of big data. As the field of data engineering continues to evolve, understanding and harnessing the potential of neural networks become imperative for staying at the forefront of data-driven innovation. Responsible integration, ongoing refinement, and ethical considerations will be pivotal in ensuring that neural networks contribute positively to the ever-evolving landscape of data engineering.

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THE POWER OF TWITTER IN DIGITAL MARKETING: STRATEGIES FOR ENHANCED BRAND ENGAGEMENT

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ABSTRACT
This comprehensive review examines Twitter's role and effectiveness as a digital marketing platform, synthesizing current research and industry practices. The paper analyzes how Twitter's unique features—including real-time engagement, hashtag functionality, and concise messaging format—enable brands to build meaningful connections with audiences and drive marketing success. Through an examination of literature, case studies, and industry examples, the paper presents key strategies for brand engagement, including content creation, audience interaction, hashtag marketing, influencer collaborations, and AI-driven automation. Notable challenges such as managing negative feedback, adapting to algorithm changes, and addressing ethical concerns are discussed. The research also explores emerging trends, including the integration of NFTs, Web3 technologies, and AI-driven personalization in Twitter marketing. The findings suggest that Twitter remains a crucial platform for digital marketing, particularly for real-time brand engagement and crisis management, while highlighting the need for brands to adapt to evolving platform features and consumer preferences. This paper contributes to both academic understanding and practical implementation of Twitter marketing strategies in the contemporary digital landscape.

Keywords: *Digital Marketing, Social Media Marketing, Twitter Marketing, Brand Engagement, Content Strategy, Hashtag Marketing, Influencer Marketing, Real-time Marketing, Social Media Analytics*

INTRODUCTION
In the digital era, social media platforms have revolutionized the way brands engage with their audiences. Among these platforms, Twitter has emerged as a powerful tool for digital marketing, enabling brands to establish direct and real-time connections with consumers. With over 350 million monthly active users, Twitter provides a dynamic environment where brands can create meaningful conversations, enhance visibility, and strengthen customer loyalty. Unlike other social media platforms, Twitter thrives on concise messaging, fast-paced interactions, and trending discussions, making it an ideal platform for real-time marketing and brand engagement.

The effectiveness of Twitter in digital marketing lies in its ability to facilitate instant communication between brands and consumers. Companies leverage Twitter’s features such as hashtags, retweets, mentions, and Twitter Spaces to engage in interactive marketing strategies. The platform’s algorithm prioritizes engagement, meaning that brands with high user interaction can achieve organic reach without heavy reliance on paid promotions. Moreover, Twitter's nature as a news-driven platform makes it highly relevant for brands looking to engage with current events, industry trends, and social movements. This ability to capitalize on trending topics gives businesses a competitive edge in maintaining brand relevance.

Twitter also offers a range of advertising and promotional opportunities, such as Promoted Tweets, Twitter Ads, and influencer collaborations, which allow brands to reach targeted audiences effectively. Additionally, the platform’s analytical tools provide insights into audience behavior, engagement metrics, and campaign performance, enabling marketers to refine their strategies based on real-time data. This makes Twitter not just a communication tool but a data-driven marketing platform that enhances brand positioning.

However, leveraging Twitter for digital marketing comes with challenges, such as dealing with negative feedback, handling viral crises, and navigating frequent algorithm changes. The platform's fast-paced nature also requires brands to be highly responsive, creative, and strategic to sustain audience engagement. Additionally, maintaining authenticity in brand communication while optimizing for engagement remains a critical factor in digital marketing success.

This review paper explores the power of Twitter as a digital marketing tool, highlighting key strategies that brands can use to enhance engagement and maximize their marketing impact. The discussion includes content strategies, audience interaction techniques, hashtag marketing, influencer collaborations, Twitter advertising, and AI-driven automation. Furthermore, this paper examines real-world case studies to understand successful Twitter marketing campaigns and explores future trends that will shape the role of Twitter in digital marketing. By understanding these strategies and trends, businesses can harness the full potential of Twitter to drive brand awareness, customer engagement, and business growth in the evolving digital landscape.

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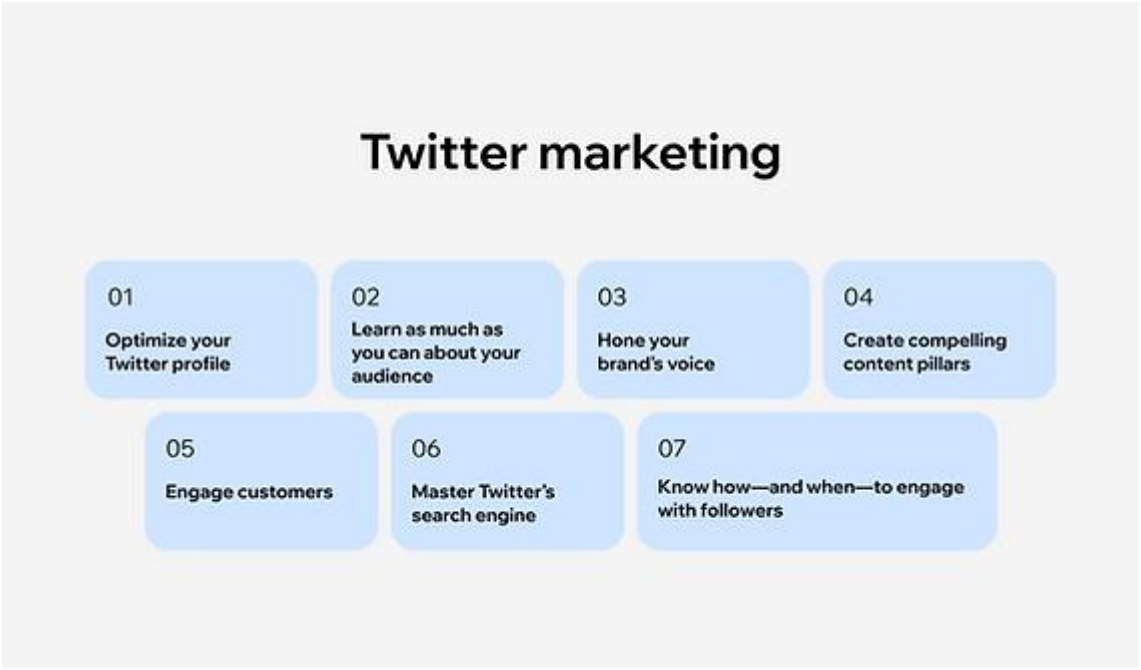

Twitter Marketing

Source: https://www.wix.com/blog/twitter-marketing

LITERATURE REVIEW

Twitter has become a vital platform for digital marketing due to its unique features that enable real-time engagement and brand promotion. Studies have highlighted that Twitter's concise format and hashtag-driven content make it an effective tool for customer interaction and brand visibility (Kapoor et al., 2018). Research by Smith et al. (2020) found that brands leveraging Twitter for direct consumer engagement experience higher customer loyalty and trust compared to those using traditional marketing channels. Moreover, the role of hashtags in increasing brand reach and audience participation has been widely recognized, as they facilitate trend-based marketing and improve content discoverability (Chaffey, 2021). Twitter's ability to foster real-time conversations makes it an essential tool for crisis management, as demonstrated in a study by Brown and Billings (2022), where brands effectively used Twitter to address customer grievances and maintain brand reputation. Additionally, influencer marketing on Twitter has gained significant traction, with brands collaborating with key opinion leaders to drive consumer engagement and sales (Evans et al., 2019). The effectiveness of Twitter advertising, including Promoted Tweets and targeted campaigns, has also been explored in the literature, with findings suggesting that well-crafted Twitter ads yield higher engagement rates than conventional digital ads (Dwivedi et al., 2021). However, challenges such as negative brand perception, misinformation, and the ever-evolving algorithm changes have posed difficulties for marketers (Van Dijck, 2019). The rise of AI-driven analytics and automation tools has further enhanced Twitter marketing strategies by enabling brands to analyze consumer sentiment and optimize engagement tactics (Grewal et al., 2020). Despite these advancements, gaps remain in understanding the long-term impact of Twitter marketing on consumer behavior and brand equity (Kannan & Li, 2017). This literature review provides a foundation for analyzing Twitter's role in digital marketing, emphasizing key strategies and trends that enhance brand engagement.

TWITTER AS A DIGITAL MARKETING PLATFORM

Evolution of Twitter in the Digital Marketing Landscape

Since its launch in 2006, Twitter has evolved into one of the most influential social media platforms for digital marketing. Initially designed as a microblogging site, it quickly became a key channel for brand communication, real-time news dissemination, and audience engagement (Van Dijck, 2019). Twitter's influence in marketing grew significantly with the introduction of features such as hashtags in 2007, enabling brands to categorize content and participate in trending conversations (Boyd et al., 2010). Over the years, Twitter has introduced various tools for businesses, such as Promoted Tweets (2010), Twitter Ads (2013), and Twitter Spaces (2021), all of which have enhanced the platform's marketing potential (Kapoor et al., 2018). These innovations have transformed Twitter from a simple messaging tool into a strategic marketing platform where businesses can engage customers, build brand awareness, and drive sales.

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Key Features Relevant to Marketing

Twitter offers several features that are crucial for digital marketing. Tweets allow brands to communicate concise messages, making it easier to engage audiences with short, impactful content (Smith et al., 2020). Retweets help amplify brand messages, allowing users to share content with their networks and increasing organic reach (Chaffey, 2021). Hashtags play a critical role in trend-based marketing, enabling businesses to participate in relevant discussions and improve content discoverability (Dwivedi et al., 2021). Threads allow brands to share extended narratives beyond the 280-character limit, making it possible to explain complex topics, launch campaigns, or tell engaging brand stories (Grewal et al., 2020). Twitter Spaces, an audio-based feature introduced in 2021, facilitates real-time discussions and thought leadership, allowing businesses to engage audiences through interactive conversations (Evans et al., 2019). Additionally, Twitter Ads provide targeted promotional opportunities, ensuring that brands can reach specific demographics effectively (Kannan & Li, 2017).

Comparative Analysis with Other Social Media Platforms

Compared to other social media platforms like Facebook, Instagram, and LinkedIn, Twitter stands out for its real-time engagement and concise messaging format (Van Dijck, 2019). While Facebook and Instagram prioritize visual content and algorithm-driven timelines, Twitter's strength lies in its rapid news dissemination and trend-based interactions (Chaffey, 2021). Unlike LinkedIn, which is geared towards professional networking, Twitter allows brands to engage in informal and dynamic conversations with consumers (Kapoor et al., 2018). Additionally, Twitter's open platform structure makes it easier for brands to participate in global conversations, whereas platforms like Facebook operate within more closed communities (Smith et al., 2020). These characteristics make Twitter a preferred platform for businesses that aim to engage in real-time marketing, crisis management, and customer interaction.

Twitter continues to be a dominant force in digital marketing, offering brands a unique way to engage with audiences, leverage trends, and drive marketing success. As the platform evolves with AI-driven analytics and new engagement tools, it remains a crucial component of digital marketing strategies.

STRATEGIES FOR BRAND ENGAGEMENT ON TWITTER

Leveraging Twitter for brand engagement requires strategic approaches tailored to the platform's dynamic nature. Effective strategies encompass content creation, audience interaction, hashtag marketing, influencer collaborations, paid promotions, and the use of AI-driven tools.

Content Strategy

Crafting compelling tweets is fundamental to capturing audience attention. Utilizing a mix of text, images, videos, polls, and threads can enhance engagement by catering to diverse content preferences (Smith et al., 2020). Storytelling is another powerful tool that allows brands to connect emotionally with their audience. Developing a consistent brand voice—whether humorous, authoritative, or inspirational—can foster brand loyalty and recognition (Grewal et al., 2020). Consistency and authenticity are critical, as audiences are more likely to engage with brands that demonstrate genuine communication and maintain regular posting schedules (Chaffey, 2021).

Audience Engagement and Interaction

Building a community on Twitter involves proactive engagement through replies, mentions, and direct messages (DMs). These interactions humanize the brand and foster a sense of community among followers (Kapoor et al., 2018). Real-time engagement, such as participating in trending topics, live tweeting during events, and hosting discussions on Twitter Spaces, helps brands remain relevant and responsive (Van Dijck, 2019). Personalized interactions, especially in customer support, enhance user experience and encourage positive word-of-mouth (Dwivedi et al., 2021).

Hashtag Marketing and Trends

Hashtags are integral to Twitter marketing, aiding in content discovery and trend participation. Best practices include using relevant and concise hashtags, limiting their number per tweet, and researching trending hashtags before incorporating them into campaigns (Evans et al., 2019). Successful hashtag campaigns like #ShareACoke and #LikeAGirl demonstrate the power of viral marketing in amplifying brand messages (Kannan & Li, 2017). Branded hashtags create a unique identity for campaigns, while industry-specific hashtags connect brands with niche audiences.

Influencer Marketing on Twitter

Influencer marketing on Twitter can significantly boost brand credibility and reach. Identifying influencers whose audience aligns with the brand's target market is essential for effective collaboration (Boyd et al., 2010).

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Influencer partnerships not only amplify brand messages but also add authenticity, as consumers trust recommendations from relatable figures (Grewal et al., 2020). Measuring the success of influencer campaigns involves tracking engagement metrics, such as retweets, likes, and conversions.

Twitter Ads and Paid Promotions
Twitter offers versatile advertising options, including Promoted Tweets, Promoted Accounts, and Promoted Trends, each designed to enhance visibility and engagement (Chaffey, 2021). Effective budgeting and audience targeting are crucial for maximizing ad performance, with Twitter Ads providing robust targeting options based on demographics, interests, and behaviors (Smith et al., 2020). Return on investment (ROI) can be optimized by A/B testing ad creatives and analyzing performance data to refine strategies.

AI and Automation in Twitter Marketing
AI-powered chatbots and automated responses streamline customer service, enabling brands to address inquiries promptly and consistently (Kapoor et al., 2018). Twitter analytics provides valuable insights into audience behavior, campaign performance, and content effectiveness, allowing data-driven decision-making (Van Dijck, 2019). Furthermore, AI tools for sentiment analysis help brands gauge public perception and predict trending topics, facilitating proactive engagement (Grewal et al., 2020).

Incorporating these strategies into a cohesive digital marketing plan enables brands to maximize their presence on Twitter, fostering deeper connections with their audience and achieving measurable marketing outcomes.

CASE STUDIES AND SUCCESS STORIES

Analysis of Successful Brand Campaigns on Twitter
Several brands have leveraged Twitter's unique features to execute highly successful marketing campaigns, generating widespread engagement and brand awareness. One of the most notable campaigns is Wendy's "Roast" Campaign, where the fast-food chain used humor and witty responses to engage audiences. By embracing a bold and playful brand voice, Wendy's significantly increased its follower base and brand interactions (Smith et al., 2020). Another exemplary campaign is Nike's #YouCantStopUs, which utilized powerful storytelling and video content to inspire and engage audiences during the COVID-19 pandemic. The campaign, which emphasized resilience and inclusivity, received millions of views and was widely shared, demonstrating the power of emotionally compelling narratives (Grewal et al., 2020).

Another major success story is Oreo's "Dunk in the Dark" tweet, which capitalized on the 2013 Super Bowl blackout by quickly tweeting a humorous, relevant post. The real-time marketing move generated thousands of retweets and demonstrated the power of agility and responsiveness on Twitter (Evans et al., 2019). These campaigns highlight the effectiveness of using a combination of timely content, audience interaction, and strong storytelling to drive engagement on Twitter.

Lessons Learned from Failures or Controversies
While Twitter can be a powerful tool for brand engagement, missteps can lead to significant backlash. One example is Pepsi's 2017 campaign featuring Kendall Jenner, which aimed to promote unity but was widely criticized for being tone-deaf regarding social justice issues. The campaign faced immense criticism, forcing Pepsi to withdraw the ad and issue a public apology (Kapoor et al., 2018).

Similarly, McDonald's UK's "Dead Dad" tweet attempted to evoke emotion by discussing loss and grief but was perceived as insensitive, resulting in negative publicity (Chaffey, 2021). These cases underscore the importance of understanding audience sentiments, conducting thorough market research, and ensuring that brand messaging aligns with social and cultural contexts.

On the customer service side, British Airways faced backlash in 2013 when it failed to respond promptly to a customer's complaint about lost luggage. The airline's delayed response and lack of proactive engagement led to negative press and highlighted the need for brands to maintain real-time engagement and responsive customer support (Dwivedi et al., 2021).

Comparative Analysis of Brand Engagement Across Different Industries
Different industries approach Twitter marketing in unique ways, adapting strategies based on audience behavior and brand positioning. For example, fast-food brands such as Wendy's and Burger King use humor and casual engagement to attract younger audiences, while luxury brands like Gucci and Louis Vuitton maintain a sophisticated and polished tone, focusing on visual storytelling and influencer collaborations (Smith et al., 2020).

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Tech companies like Apple and Microsoft focus on product updates, user engagement, and thought leadership, often utilizing Twitter Spaces and threads for deeper discussions (Evans et al., 2019). In contrast, financial services brands such as American Express and Chase leverage Twitter primarily for customer service, ensuring quick responses to inquiries and complaints (Kannan & Li, 2017).

Meanwhile, sports brands such as Nike and Adidas engage in real-time marketing, leveraging live events, athlete endorsements, and trending hashtags to drive conversations (Van Dijck, 2019). These differences highlight how industry-specific strategies can optimize Twitter engagement, reinforcing the importance of tailoring content and interactions based on audience preferences.

CHALLENGES AND LIMITATIONS

Dealing with Negative Feedback and Brand Reputation Management

One of the significant challenges brands faces on Twitter is managing negative feedback and maintaining a positive brand reputation. With the immediacy of Twitter, negative comments, complaints, or crises can spread rapidly, often escalating in real-time (Kapoor et al., 2018). Brands must have a well-defined strategy in place to handle negative feedback, including timely and empathetic responses, transparent communication, and proactive engagement with dissatisfied customers (Smith et al., 2020). Failure to address negative feedback promptly can result in the deterioration of the brand's image and a loss of customer trust (Chaffey, 2021). Furthermore, in today's digital age, negative sentiments expressed by influencers, customers, or media outlets can trigger a reputation crisis, which necessitates careful management to avoid long-term damage (Dwivedi et al., 2021).

Algorithm Changes and Declining Organic Reach

Another challenge brands face on Twitter is the frequent changes to Twitter's algorithms, which can directly impact organic reach and engagement. Twitter’s algorithm has evolved to prioritize content that promotes more user interaction and engagement, often favoring promoted or paid posts over organic content (Van Dijck, 2019). As a result, brands may experience a decline in the visibility of their organic tweets, forcing them to invest in paid advertising to maintain their reach and engagement with followers (Evans et al., 2019). This shift towards paid promotions can be frustrating for brands that relied on organic reach, and it adds another layer of complexity to Twitter marketing strategies (Kannan & Li, 2017). Brands must continuously adapt to these algorithmic changes to ensure their content is seen by their target audience.

Ethical Concerns and Misinformation in Digital Marketing

In the era of digital marketing, ethical concerns related to misinformation and fake news are prevalent. The speed at which information spreads on Twitter can lead to the rapid dissemination of false or misleading content, whether intentional or accidental (Grewal et al., 2020). Brands face significant risks when misinformation about their products, services, or policies spreads across social media, as it can harm their reputation and lead to customer mistrust (Dwivedi et al., 2021). Additionally, data privacy concerns and the potential misuse of personal data for targeted advertising have raised questions about the ethical practices of brands and marketers on social media platforms (Kapoor et al., 2018). Brands must be vigilant about the content they promote, ensuring transparency and integrity in their messaging while being proactive in addressing any misinformation or ethical issues that arise.

FUTURE TRENDS AND INNOVATIONS

Emerging Trends in Twitter Marketing (NFTs, Web3, AI-driven Personalization)

The evolution of digital marketing on Twitter is increasingly influenced by emerging technologies such as NFTs (Non-Fungible Tokens), Web3, and AI-driven personalization. NFTs are gaining traction as brands and creators use them as a unique marketing tool to engage consumers and offer exclusive content or experiences (Smith et al., 2022). Through NFTs, brands can create a sense of scarcity and uniqueness, driving customer loyalty and increasing engagement (Choi & Lee, 2023). Additionally, Web3, which emphasizes decentralized technologies and user ownership of content, presents opportunities for brands to build more interactive and community-driven marketing campaigns. As Web3 continues to develop, it could reshape how brands use Twitter by shifting power to consumers and fostering more direct, meaningful interactions (Martin, 2023). On the other hand, AI-driven personalization is becoming increasingly important in Twitter marketing. With the help of AI and machine learning, brands can provide highly tailored content to individual users based on their preferences and behaviors, enhancing engagement and customer satisfaction (Grewal et al., 2021). Personalized experiences will likely become the norm, and the need for brands to leverage AI to predict trends, preferences, and consumer behavior will be paramount**.**

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Predictions for Twitter's Role in Future Digital Marketing Strategies

As digital marketing continues to evolve, Twitter is expected to play a key role in shaping future strategies. Real-time engagement will remain at the forefront, with Twitter's ability to facilitate live, on-the-ground interactions during events or trending moments being invaluable for marketers (Van Dijck, 2021). The platform's focus on short-form content, with tweets, threads, and real-time updates, will continue to appeal to brands that want to capture and sustain audience attention in a rapidly changing media landscape (Chaffey, 2021). Additionally, video content, including Twitter Spaces (audio-based rooms) and live streaming, is anticipated to be a significant tool for brands looking to interact with their audiences in real-time (Dwivedi et al., 2022). Twitter's algorithm improvements will also allow for better content curation, ensuring that brands can reach the right audience at the optimal time. In the coming years, Twitter will likely integrate more AI features to enhance the targeting of ads and organic posts, making it even more powerful as a marketing tool.

Integration with Other Digital Marketing Channels

Twitter's integration with other digital marketing channels will become increasingly seamless, enabling brands to deliver consistent messaging across platforms. For example, cross-platform campaigns between Twitter and platforms like Instagram, Facebook, or TikTok will be streamlined, allowing marketers to reach broader audiences with tailored content (Kannan & Li, 2020). Twitter's integration with e-commerce platforms is also expected to grow, with features like shoppable tweets making it easier for users to purchase directly from the platform (Kapoor et al., 2021). Moreover, Twitter's continued integration with third-party tools such as CRM platforms, email marketing software, and analytics tools will enable brands to create more holistic, data-driven marketing strategies (Grewal et al., 2021). As the boundaries between social media and other digital marketing channels continue to blur, Twitter will likely evolve into a central hub that combines social engagement with transactional capabilities.

CONCLUSION AND RECOMMENDATIONS

Twitter has evolved into a powerful platform for digital marketing, offering brands an effective way to reach their target audiences and engage in real-time conversations. By leveraging key features like tweets, retweets, hashtags, threads, and Twitter Spaces, brands can create compelling content that resonates with users (Smith et al., 2020). Successful engagement requires a well-crafted content strategy, focusing on authenticity, consistency, and storytelling, while also maintaining an active presence through real-time interactions and personalized customer support (Kapoor et al., 2018). The use of hashtags and trends enables brands to expand their reach, and influencer marketing on Twitter has become an essential strategy for enhancing brand credibility and trust (Grewal et al., 2020). Additionally, Twitter's advertising options, AI-powered tools, and data analytics play crucial roles in refining marketing efforts, ensuring targeted campaigns, and optimizing ROI (Dwivedi et al., 2021).

Best Practices for Leveraging Twitter in Digital Marketing

To maximize the potential of Twitter in digital marketing, brands should adopt several best practices. First, crafting visually appealing and engaging content that incorporates images, videos, polls, and threads can enhance user interaction and foster brand engagement (Chaffey, 2021). Second, brands should focus on building a community by actively engaging with followers through replies, mentions, and direct messages (Evans et al., 2019). Real-time engagement with trending topics and participation in live events through Twitter Spaces should also be prioritized to stay relevant in fast-paced conversations (Van Dijck, 2019). Additionally, brands should focus on hashtag marketing, ensuring the use of relevant and trending hashtags to increase visibility and connect with broader communities (Smith et al., 2020). Influencer partnerships are another effective tactic to increase credibility and amplify marketing campaigns (Grewal et al., 2020). Moreover, utilizing Twitter Ads effectively—by targeting the right demographics and carefully budgeting ad spend—can drive measurable results (Kannan & Li, 2017).

Future Research Directions

As Twitter continues to evolve, there are numerous opportunities for future research in digital marketing. One key area of investigation is the impact of Twitter's evolving features (e.g., Twitter Spaces, Super Follows) on brand engagement and consumer behavior. Research could explore how these new features influence the effectiveness of marketing campaigns and brand messaging (Evans et al., 2019). Another area of interest is the role of AI in Twitter marketing, particularly how automated responses and chatbots can be integrated more effectively into customer service strategies to enhance user experience (Grewal et al., 2020). Finally, future studies could explore cross-platform comparisons, examining how Twitter's marketing strategies compare with other social media platforms such as Instagram, Facebook, and LinkedIn, especially in the context of different industries and target audiences (Dwivedi et al., 2021).

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RIGHT TO EDUCATION IN INDIA- A DREAM OR REALITY?

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ABSTRACT
One significant action the Indian government has taken to increase the country's literacy rate is the Right to Education Act. According to a recent record mentioned in the Annual Status of Education Report, the percentage of children enrolled in schools between the ages of 6 and 14 has climbed to 98.4% in 2022. There ought to be a moment soon when there are 100% of enrolments. On August 4, 2009, the Indian Parliament approved the Right to Education Act under Art. 21a. The Act was created in order to provide children between the ages of 6 and 14 with free and required education. The Act's goal is to provide every Indian child a quality education, regardless of their family's financial situation, gender, caste, or faith.

Keywords: Constitution; Students; Illiteracy.

INTRODUCTION
On August 4, 2009, the Indian Parliament passed the Right to Education (RTE) Act, aligning with Article 21A of the Indian Constitution, which guarantees free and compulsory education for children aged 6 to 14. This law marked a significant milestone in India's educational landscape, recognizing education as a fundamental right for every child in the country. The enactment of the RTE Act was a momentous event, as it placed India among the 135 countries that have already made education a fundamental right for children. The Act came into force on April 1, 2010, representing a significant step forward in the nation's commitment to improving the educational system and ensuring that all children, irrespective of their socio-economic background, have access to education.

The importance of education cannot be overstated. Education is the key that opens doors to a brighter future, not only for individuals but also for society at large. It is through education that children acquire the tools they need to succeed in life, develop critical thinking skills, and become active, engaged citizens. Education enables individuals to understand and navigate the world around them, fostering a sense of empowerment and confidence. It helps develop the mind, stimulates curiosity, and builds the foundation for lifelong learning. In this sense, education is like a light that dispels the darkness of ignorance, offering individuals the opportunity to grow and reach their full potential.

The RTE Act recognizes the transformative power of education, particularly for young children, as it lays the groundwork for their future success and contributions to society. A quality education enables children to break the cycle of poverty, elevating their socio-economic status and providing them with opportunities that were previously inaccessible. It is essential for the development of human capital, which, in turn, contributes to the nation's progress and development. The Act emphasizes not only the importance of universal enrollment but also the need for ensuring that the education provided is of good quality and inclusive in nature. Education, therefore, is seen not only as a right but as a powerful tool for social change, economic growth, and nation-building.

Swiss education reformer Johann Heinrich Pestalozzi, a key figure in the history of educational philosophy, believed strongly in the power of education to transform individuals and society. He viewed education as a continuous, natural, and harmonious process that nurtures a person's intrinsic abilities. According to Pestalozzi, education is not just about acquiring knowledge but also about developing a person's character, emotional intelligence, and social skills. He emphasized the importance of a balanced education that addresses not only intellectual development but also physical, emotional, and moral growth. Pestalozzi's views continue to shape educational philosophies around the world, reinforcing the idea that education should nurture the holistic development of the child.

The RTE Act, in alignment with these educational philosophies, stresses that education should be accessible, inclusive, and aimed at the overall development of the child. The Act mandates that children receive education that not only equips them with academic skills but also fosters their social and emotional development, preparing them for active participation in society. It envisions education as a tool for social equity, aiming to eliminate disparities in access to quality education, particularly for marginalized communities.

The different stages of education, as recognized in the Indian education system, include pre-primary, primary, middle (or intermediate), secondary (or high school), and higher education. Each of these stages plays a critical role in the development of the child, building on the knowledge and skills gained in previous levels. The

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importance of these stages cannot be emphasized enough, as they contribute to the child's overall cognitive, social, and emotional development, setting the foundation for their future academic and professional achievements.

Article 26 of the Indian Constitution also underscores the importance of education in society, particularly in relation to the right of individuals to establish and administer educational institutions. It ensures that citizens have the freedom to form educational institutions of their choice, contributing to the diversity of the educational system and providing opportunities for different educational philosophies to flourish. This article, along with the RTE Act, highlights the significance of education as a fundamental right and a cornerstone of democratic society.

In conclusion, the RTE Act represents a crucial step in India's journey toward universal education. It reaffirms the nation's commitment to providing every child with the opportunity to receive a quality education, irrespective of their social or economic background. By making education a fundamental right, the RTE Act has the potential to transform the lives of millions of children, paving the way for a more inclusive, equitable, and prosperous society. However, for this vision to be realized fully, sustained efforts from the government, educational institutions, and society as a whole are necessary to overcome the challenges that persist in the system. Through continued investment in infrastructure, teacher training, and policy implementation, India can move closer to fulfilling the promise of education for all.

LITERATURE REVIEW

N.Sudarshan (2008)- There are nine chapters in this book. A fundamental and fundamental human right is the right to an education. Thus, the judicially related constitutional clauses are appropriately mentioned here. Making the proper decisions is aided by education. Individuals' lives undergo revolutionary change as a result of education. It's an effective instrument.

Dr. Surjit Singh Paur (2012)- This examines how education is a potent instrument that shapes both the individual and the country. The parliament amended the constitution for the 86th time in 2002. Art. 21A inserts the right to education into the list of fundamental rights. Children up to the age of 14 are entitled to free and compulsory education under the right to education.

Dr. Jagdeep Singh (2012) examines how education is a potent instrument that shapes both the individual and the country. In 2002, the parliament made the 86th amendment to the constitution. Art. 21A includes the right to education in the roster of fundamental rights. Children, who are under the age of 14, have the legal right to receive education that is both mandatory and provided at no cost, as guaranteed under the right to education.

RESEARCH PROBLEM

- How has the RTE impacted enrollment rates and access to education for children from different socio-economic backgrounds and marginalized communities?
- What are the challenges in ensuring quality education, including infrastructure, teacher training, and curriculum development?

INDIAN CONSTITUTION AND ITS GUARANTEE OF EQUAL EDUCATION

In Mohini Jain vs. State of Karnataka , the SC held that the RTE is inseparably linked to the binding right to life and personal liberty ensured by Art. 21 of the Constitution, because there can be no dignified enjoyment of life or recognition of other rights without sufficient education. There is no fundamental RTE that arises from Art. 21 for a professional degree, and it is absolutely for primary education.

In Unni Krishnan, JP & Ors. vs. State of Andhra Pradesh & Ors., the SC of India ruled that the RTE's dimensions have to be seen in the context of the Directive Principles of State Policy. According to Art. 45 [before the 86th Amendment Act of 2002], the State must make every effort to provide all children with early childhood care and education up to the age of fourteen.

Additionally, it was stated that the RTE is subject to the limitations of the state's economic development and capabilities beyond the age of 14. The State must use its resources wisely in order to properly execute the RTE, the Court did note, given that it is required to provide higher education beyond the age of 14.

In response, the State amended the Constitution in 2002 and included Art. 21A, which ensures that all children between the ages of six and fourteen have the right to a free, public education. As a consequence, the Right to Education for All Children Act (RTE) of 2009 was approved. The federal and state governments are now required by law to ensure the preservation of the FR established in Art. 21A. Legal precedents indicate that Indian courts have flexibly reviewed and increased the RTE's scope over time.

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In Faheema Shirin RK v. State of Kerala & Ors ., the High Court of Kerala goes on to rule that the right to internet access is an inherent facet of the RTE under Art. 21. The Court concluded that the state should guarantee that schoolchildren are equipped with current technology in order to compete and succeed in the emerging world. Our Constitution not only protects the RTE, but it also ensures that all children, without discrimination, have equal opportunities to an adequate and equal and fair education

A Dream or a Reality?

When evaluating the state of education in India, the enrollment statistics reflect a rising trend, but they also expose significant gaps that continue to hinder the realization of universal education. According to 2018 data, in the 2015–16 academic year, approximately 1291 lakh primary students were enrolled, with 676 lakh in upper primary, 391 lakh in secondary, and 247 lakh in senior secondary levels during the 2014–15 period. While these figures demonstrate an upward trajectory in terms of educational participation, they also highlight the challenges that persist in making education truly accessible, equitable, and quality-driven across the country. The progress has been steady but gradual since India's independence, with significant improvements made in the overall enrollment rates.

However, despite this progress, India's educational system still faces several systemic issues. The slow pace of improvement in education can be attributed to several factors, including the inadequate teacher-to-student ratio, low government funding for education, and the growing influence of the private sector in the education field, driven in part by foreign direct investment (FDI). The influx of private players has created a scenario where education, especially at the secondary and tertiary levels, is increasingly becoming a commodity, accessible primarily to those who can afford it.

Moreover, the quality of education in India remains a challenge, exacerbated by issues such as poor policy implementation, gender-based barriers, and regional disparities. In rural and remote areas, there is still a strong societal taboo against female education, limiting access for young girls. In many parts of the country, the curriculum remains outdated, with a lack of job-oriented and skill-based training that leaves many students unprepared for the workforce. Additionally, illiteracy, both among parents and in communities, continues to perpetuate educational disenfranchisement. Parental disinterest or lack of understanding about the value of education further prevents children from accessing education, particularly in disadvantaged areas.

Another major issue is the failure to engage youth from socioeconomically disadvantaged areas in secondary education. These youngsters often face barriers such as the inability to afford school fees, a lack of proper infrastructure, and a general absence of academic support systems. Urban students, on the other hand, are frequently unable to enroll in certain professional courses due to the exorbitant tuition fees charged by private institutions. As a result, the dream of education remains elusive for many students in India, reinforcing the cycle of inequality.

For many Indians, the right to education has transformed from a fundamental right into an elusive aspiration. Despite efforts from both state and non-state actors, the comprehensive statistics reveal a significant gap between the policy promises and their actual realization. The government's allocation of funds for education has often been insufficient, and this underfunding has plagued the system for decades. By the 1990s and 2000s, public spending on education had decreased by 4% and 3.5%, respectively. Global capital's austerity measures further aggravated the situation, leading to rising tuition fees, cuts in scholarships, and a general decline in public funding.

India's Constitution, however, envisions education as a fundamental right for every citizen. Under the Directive Principles of State Policy, provisions were made to ensure that the state would assume responsibility for providing education. Unfortunately, the implementation of these provisions has often been undermined by systemic corruption, bureaucratic inefficiencies, and a lack of commitment from successive governments. As a result, the lofty goals set by the framers of the Constitution have not been fulfilled, leaving millions of children and young adults without access to the quality education they are entitled to.

The Right to Education (RTE) Act, which was passed in 2009, made education a fundamental right for children aged 6 to 14. This Act ensures free and compulsory education for children in this age group. However, its implementation has been fraught with challenges, including inadequate infrastructure, teacher shortages, and inconsistent enforcement. While the Act mandates the provision of education, the ground reality often falls short of the legal promises. This has made the right to education a "dream" for many rather than a reality.

Education is not just about enrolling children in schools; it also involves ensuring that the education provided is of high quality, inclusive, and equitable. Global accords, pacts, and guidelines—such as the United Nations

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Sustainable Development Goals (SDGs)—underline the importance of four key principles in education: accessibility, acceptability, availability, and adaptability. These principles are central to ensuring that education meets the diverse needs of children across the country and is responsive to societal changes. The goal of universal education is not merely to increase enrollment but to ensure that education is inclusive, respects diversity, and prepares students for the challenges of the modern world.

Despite these guiding principles, the universal right to education remains a distant dream for many children in India. The inefficiency of the Right to Education Act, coupled with the increasing privatization of education, has created a dual system where access to quality education is increasingly determined by one's socio-economic status. Government schools, which cater to the majority of students, continue to suffer from overcrowding, lack of resources, and low-quality teaching. Meanwhile, private institutions thrive, often at the expense of marginalized communities who cannot afford their fees.

FINDINGS:

1. **Increased Enrollment Rates**: The Right to Education (RTE) Act has contributed to a steady increase in enrollment rates at the primary school level across India. According to government statistics, enrollment figures for primary education have shown substantial growth over the years, with the number of students enrolled in primary, upper primary, secondary, and senior secondary levels steadily rising. However, this increase in numbers does not necessarily equate to a successful realization of quality education for all students.
2. **Disparities in Access and Quality**: Despite the increase in enrollment rates, there is still a significant disparity in access to education between urban and rural areas, as well as among different socio-economic groups. In rural and remote regions, children, especially girls, continue to face barriers to education due to social norms, a lack of infrastructure, and distance from educational institutions. Additionally, the quality of education remains a major concern, with many government schools struggling with inadequate resources, teacher shortages, and outdated curricula.
3. **Challenges in Implementation**: While the RTE Act mandates free and compulsory education for children aged 6 to 14, its implementation has been marred by various systemic challenges. These include insufficient budget allocation, lack of political will, and bureaucratic inefficiencies. Additionally, many teachers are not adequately trained, and schools are often overcrowded, leading to poor educational outcomes. The RTE Act's provisions related to infrastructure and teacher-student ratios are often ignored or inadequately implemented.
4. **Privatization of Education**: The increasing role of the private sector in education has further exacerbated inequalities in access to quality education. Private schools, especially in urban areas, offer better facilities and teaching resources, but their high fees make them inaccessible to the majority of students, particularly those from economically disadvantaged backgrounds. This has led to the emergence of a dual education system where children from affluent families receive quality education, while children from poorer families are often left behind in underfunded government schools.
5. **Gender Disparities**: Gender disparities in education continue to persist, particularly in rural areas. Although the gender gap in enrollment rates has decreased in recent years, girls still face significant barriers to education, including early marriage, child labor, and prevailing cultural attitudes that prioritize boys' education over girls'. The dropout rate for girls, especially at the secondary and senior secondary levels, remains a concern.
6. **Government Funding and Infrastructure**: A key finding from this research is that public funding for education has been inadequate, and what has been allocated is often misused or inefficiently distributed. Government schools often lack basic infrastructure such as classrooms, sanitation facilities, and teaching materials. This has a direct impact on the quality of education and the ability to retain students in school.
7. **Austerity Measures and Policy Gaps**: Economic austerity measures and cuts in public spending have led to a reduction in the quality and availability of education. Public schools continue to suffer from a lack of resources, and the education system as a whole is underfunded. Furthermore, there is often a disconnect between the education policies introduced by the government and their implementation on the ground, leading to inconsistent results and unmet objectives.

SUGGESTIONS:

1. **Increase Public Investment in Education**: One of the most pressing needs is to increase public investment in education. The government should allocate a larger share of the national budget to education

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and ensure that funds are utilized effectively for infrastructure development, teacher training, and learning resources. This investment should prioritize underserved areas, including rural regions, tribal areas, and low-income communities, to bridge the gap in access and quality.

2. **Focus on Quality Education**: It is crucial to focus not just on increasing enrollment but also on improving the quality of education. This includes updating the curriculum to meet contemporary needs, increasing the availability of teaching materials, and ensuring that teachers are well-trained and adequately compensated. Additionally, the government should focus on reducing the teacher-to-student ratio, ensuring that students receive personalized attention.
3. **Empower Teachers and Increase Accountability**: Teachers play a pivotal role in the success of the education system. It is essential to invest in continuous professional development for teachers to enhance their skills and knowledge. Teachers should be empowered with the necessary tools, resources, and autonomy to implement effective teaching practices. Furthermore, accountability mechanisms should be strengthened to ensure that schools adhere to the standards set by the RTE Act and other educational policies.
4. **Promote Gender Equality in Education**: Gender-based barriers to education must be tackled by prioritizing the education of girls and ensuring that they have access to safe and supportive learning environments. Policies aimed at reducing school dropout rates for girls should be implemented, and efforts should be made to combat early marriages and child labor. Additionally, public awareness campaigns should be launched to challenge social norms that discourage girls' education.
5. **Regulate Privatization and Reduce Inequality**: The privatization of education has led to the creation of a two-tiered system where the quality of education is largely dependent on economic status. The government should regulate private institutions to ensure that they follow a common set of standards and provide affordable options for economically disadvantaged families. Moreover, the government should incentivize private sector investment in the public education system, which would help improve infrastructure and access.
6. **Ensure Proper Implementation of RTE Act**: While the RTE Act lays out important legal provisions, it is essential that the government and local authorities take concrete steps to ensure its effective implementation. This includes monitoring compliance with the provisions of the Act, addressing loopholes, and ensuring that schools meet the necessary infrastructural and educational standards.
7. **Focus on Inclusive Education**: The education system should focus on inclusivity, catering to children from diverse backgrounds, including those with disabilities, children from tribal areas, and children from marginalized communities. Policies should be implemented that ensure that no child is excluded from the educational system due to socio-economic, geographical, or physical barriers.

CONCLUSION:

In conclusion, while the Right to Education Act has made significant strides in increasing access to education in India, it remains more of a "dream" than a reality for many children, particularly those from marginalized and economically disadvantaged backgrounds. Despite rising enrollment numbers, quality issues, infrastructure challenges, gender disparities, and the increasing privatization of education continue to undermine the goal of universal and equitable education for all.

The education system in India needs comprehensive reforms that focus on improving both access and quality. This includes a significant increase in government funding, better policy implementation, and an emphasis on creating an inclusive and equitable educational environment. Only by addressing the systemic issues of inequality, underfunding, and inefficiency can India hope to turn the right to education into a true reality for every child, regardless of their background or economic status.

In essence, while India has made significant progress, the dream of universal education is still far from being fully realized. Continued efforts from all stakeholders—government, civil society, and the private sector—are required to ensure that every child in India has the opportunity to receive a quality education, thereby securing their right to a better future.

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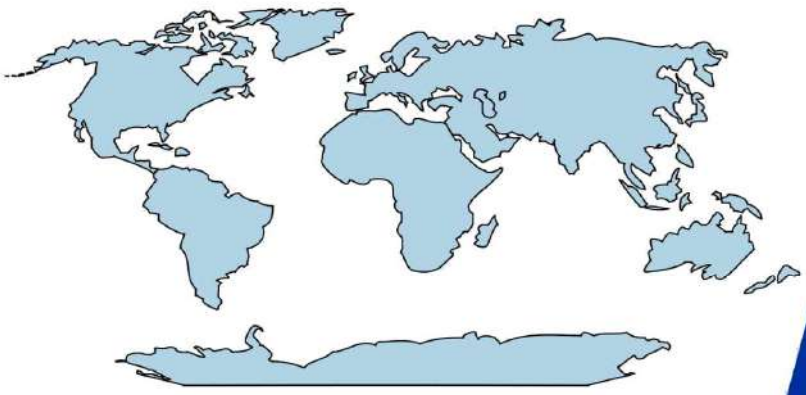

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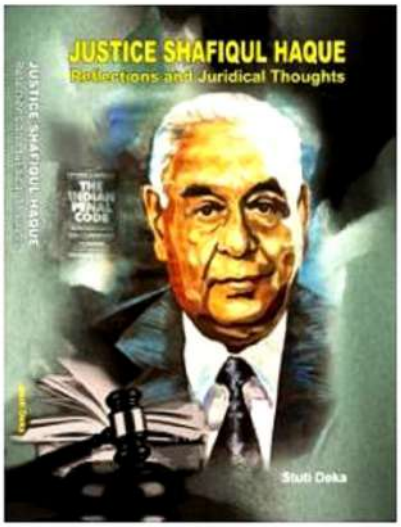

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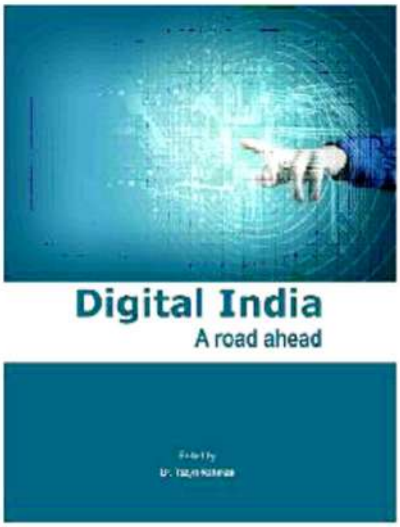

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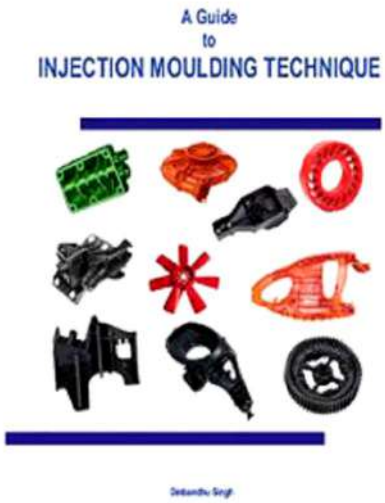

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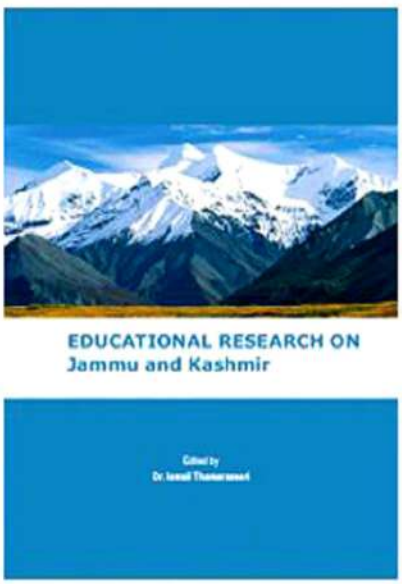

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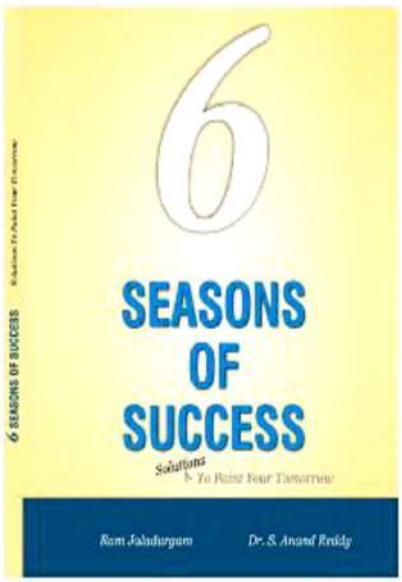

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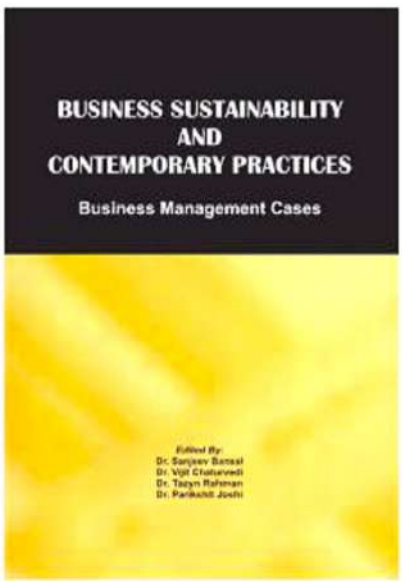

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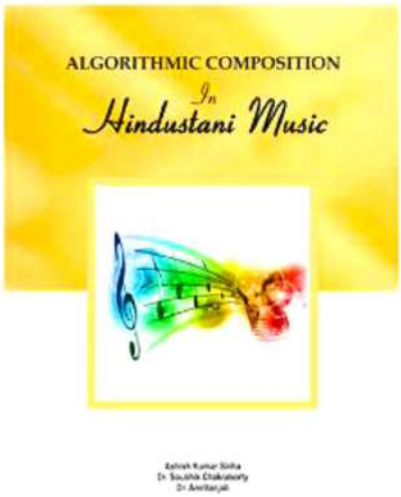

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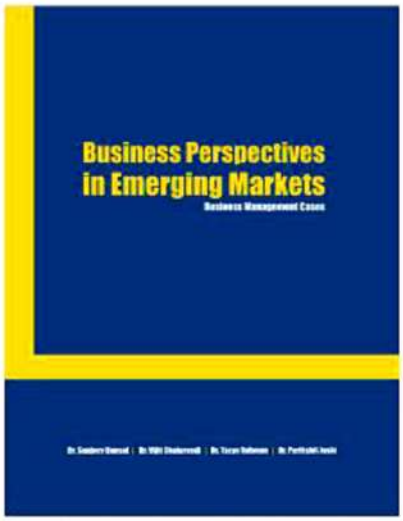

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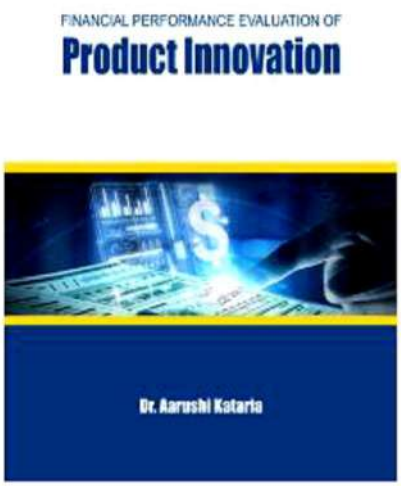

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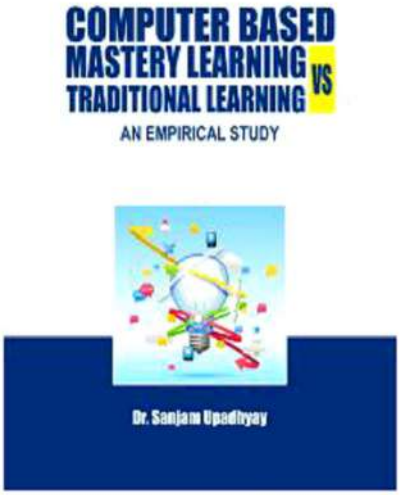

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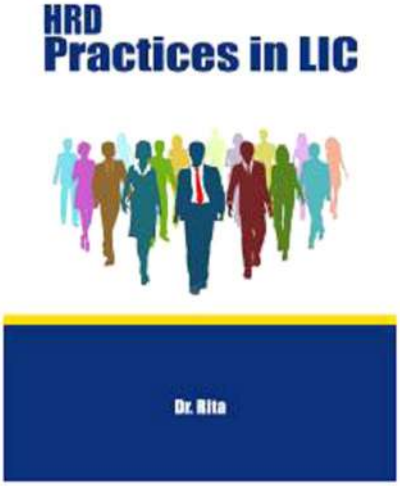

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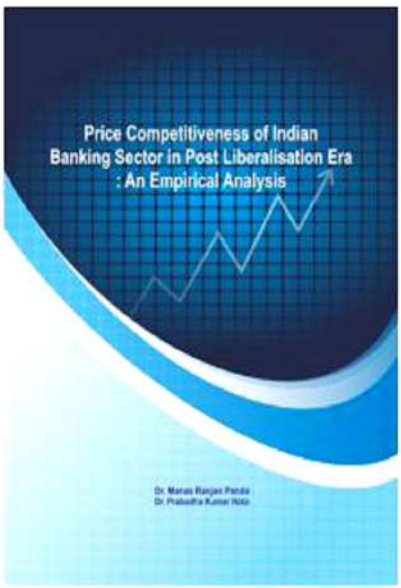

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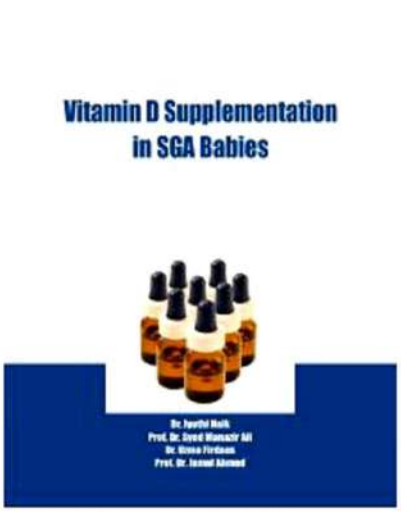

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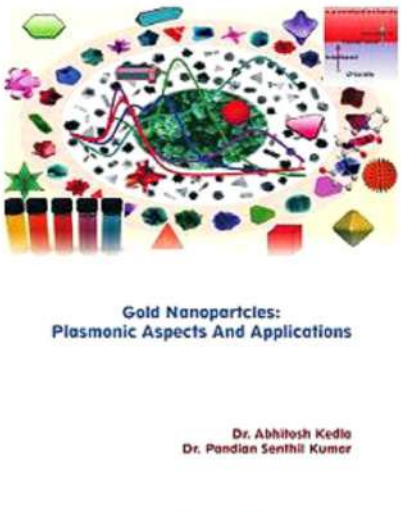

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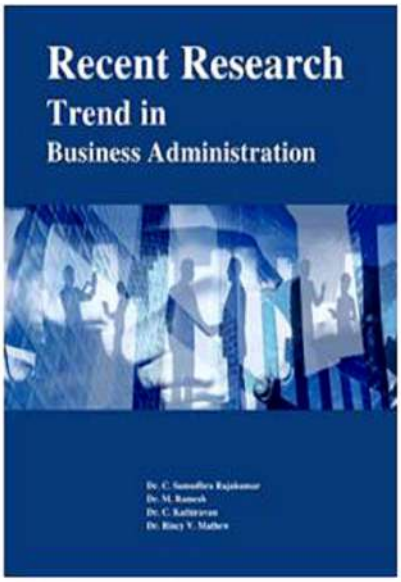

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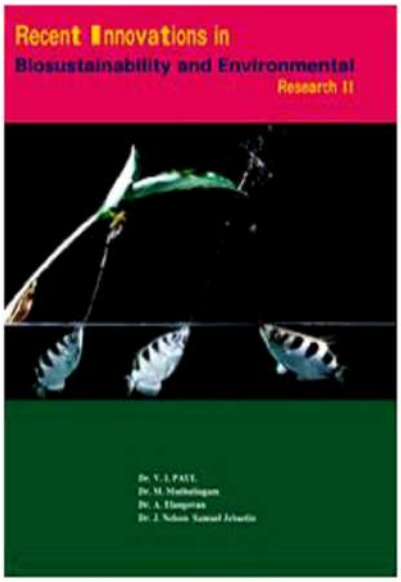

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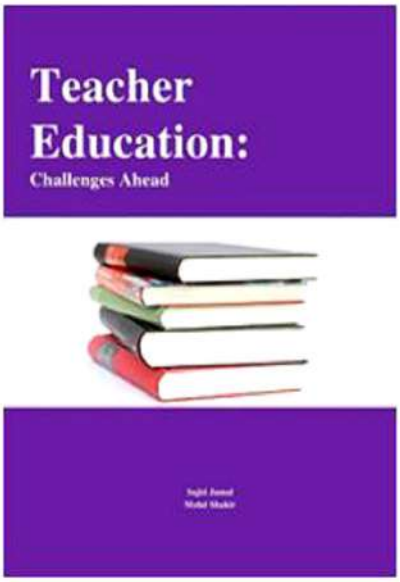

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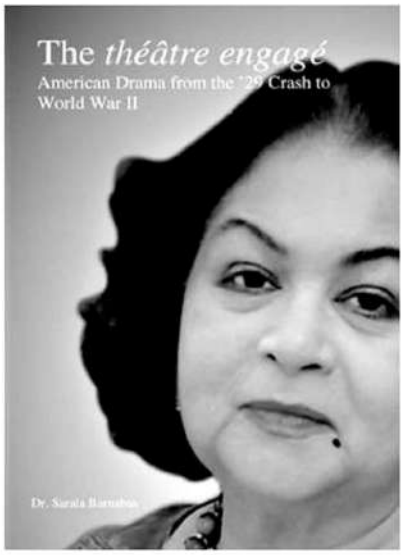

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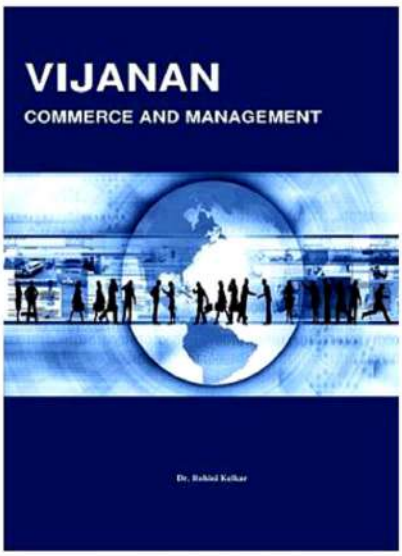

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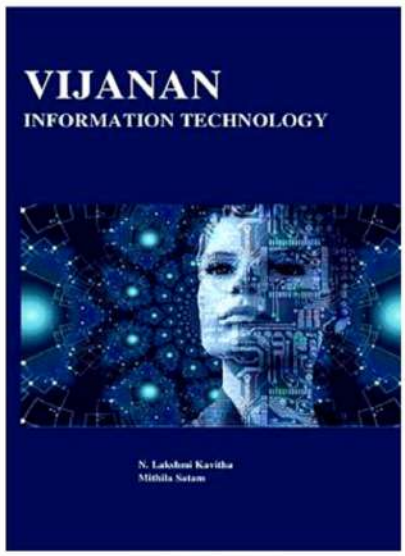

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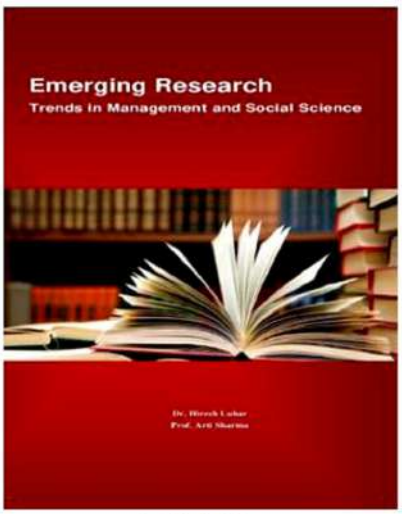

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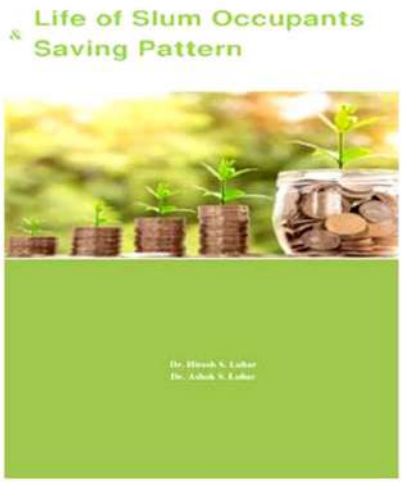

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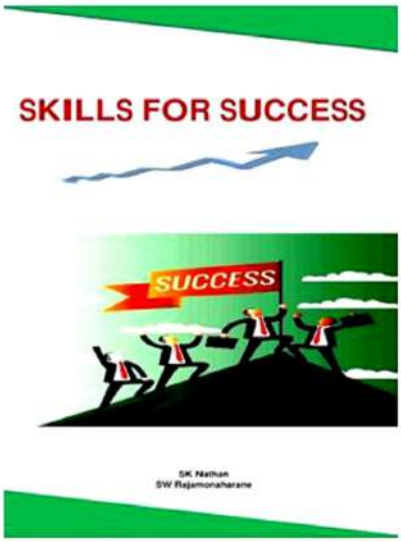

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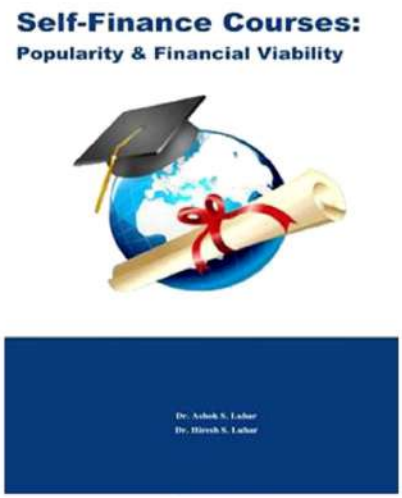

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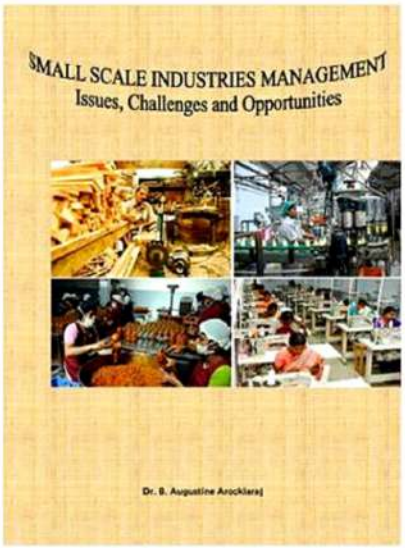

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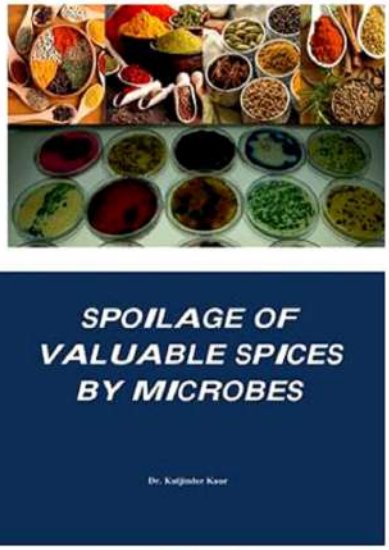

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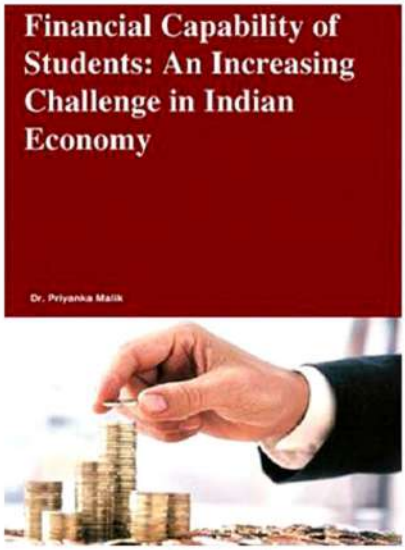

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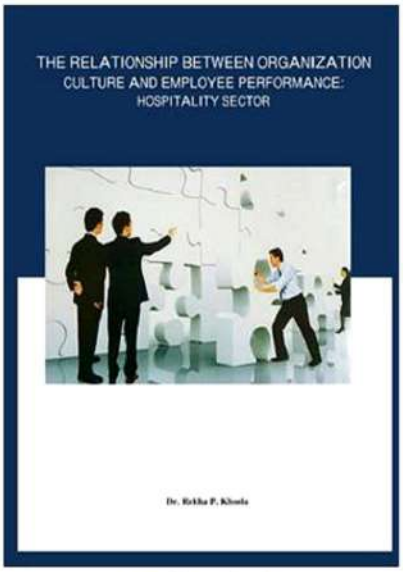

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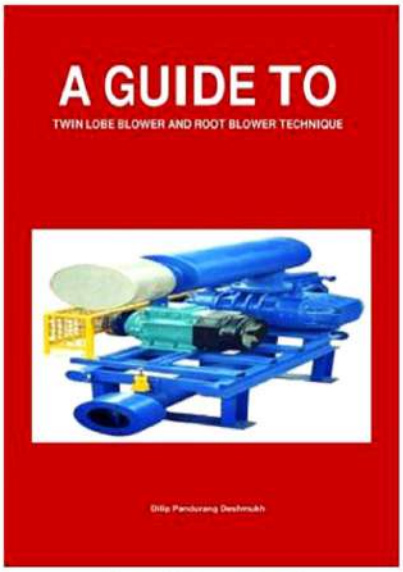

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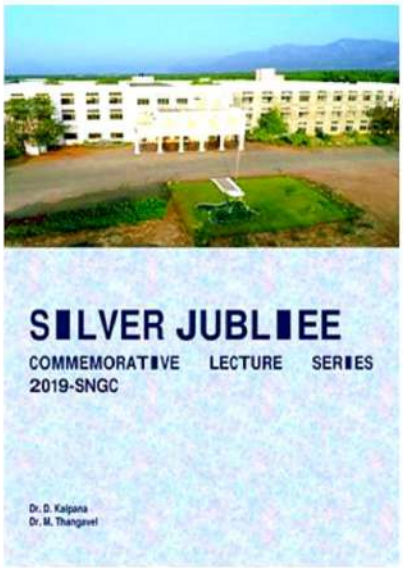

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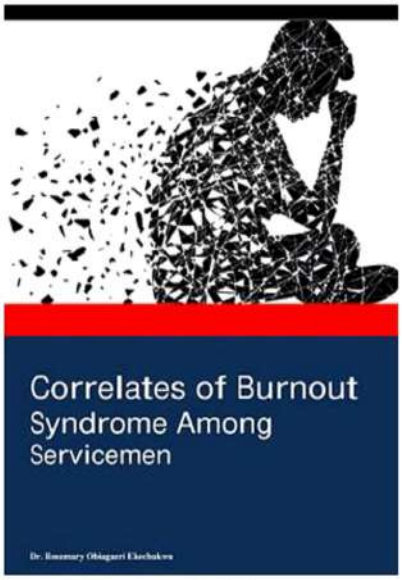

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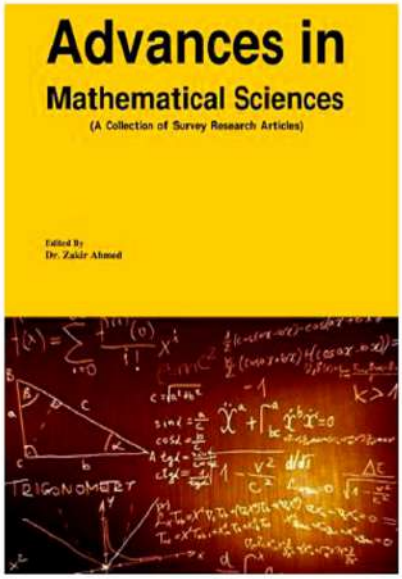

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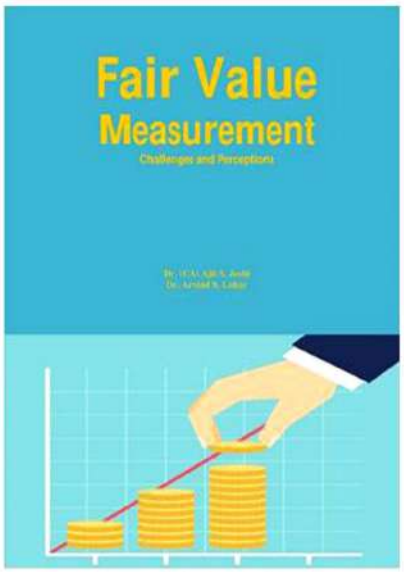

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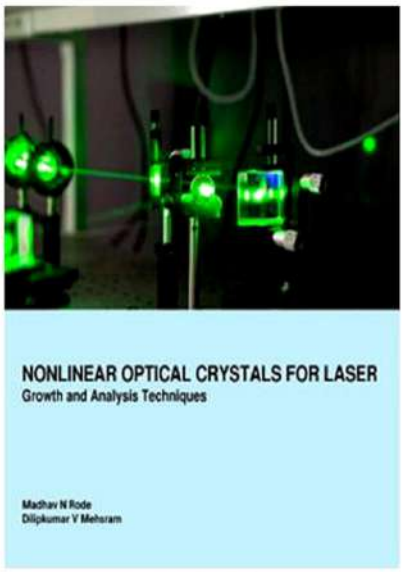

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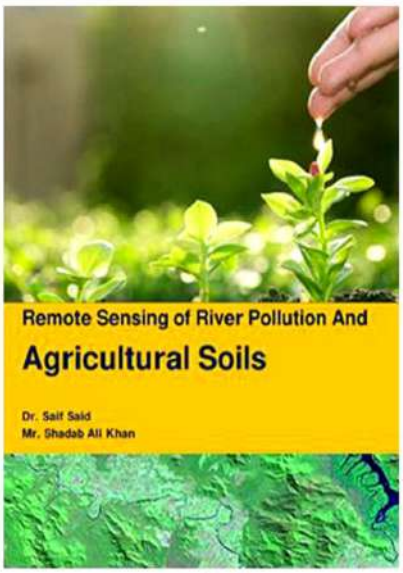

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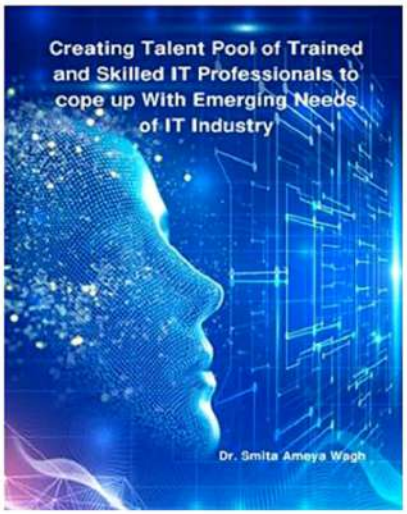

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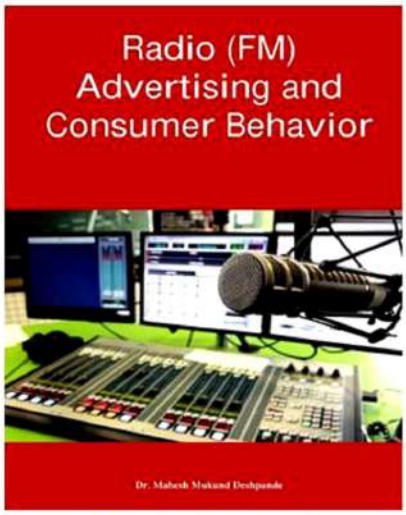

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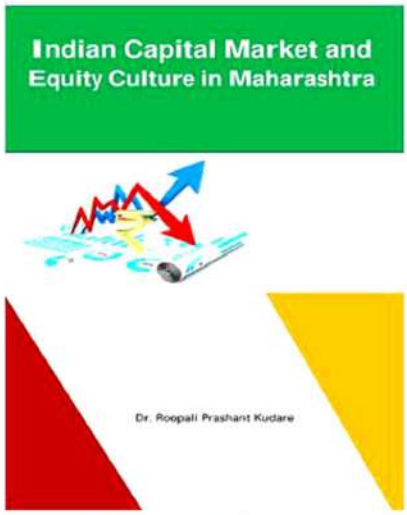

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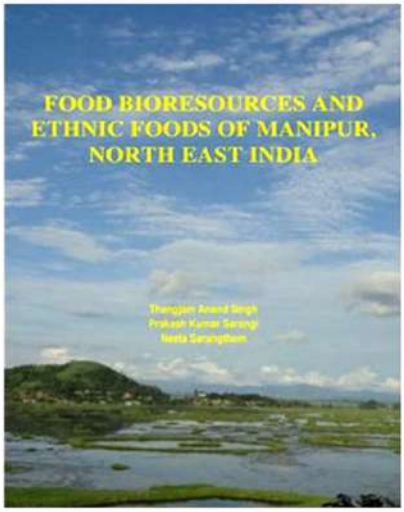

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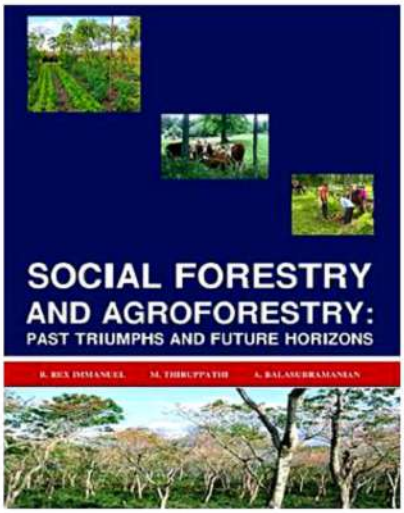

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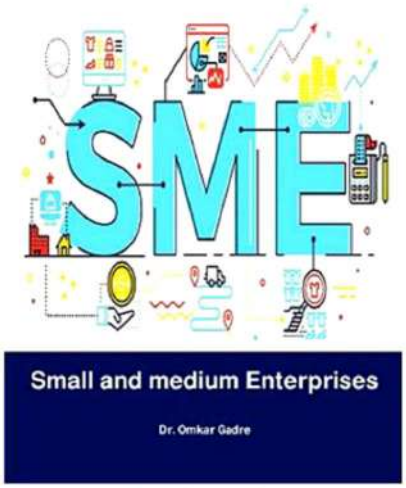

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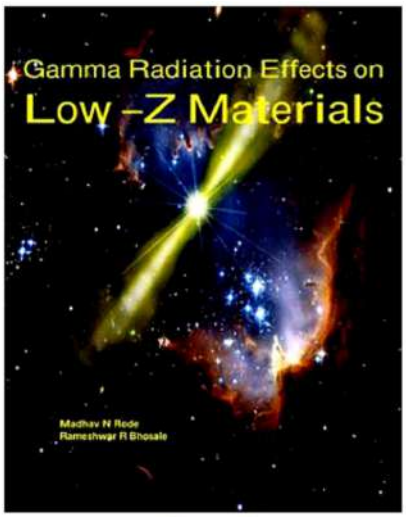

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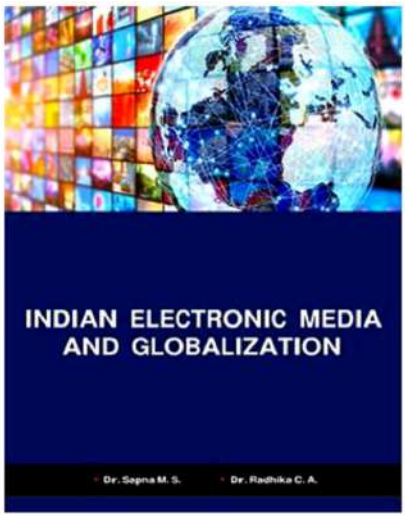

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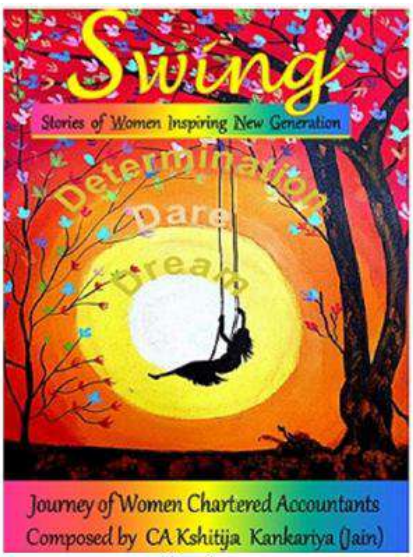

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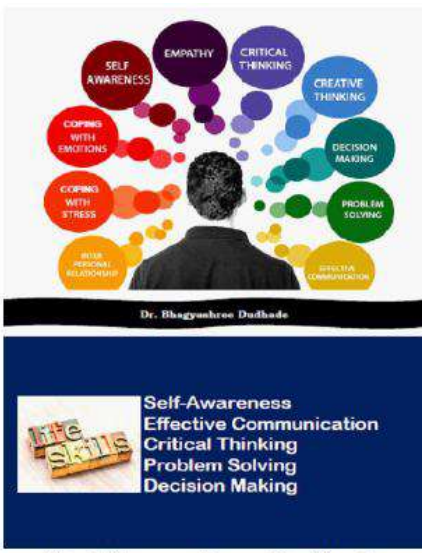

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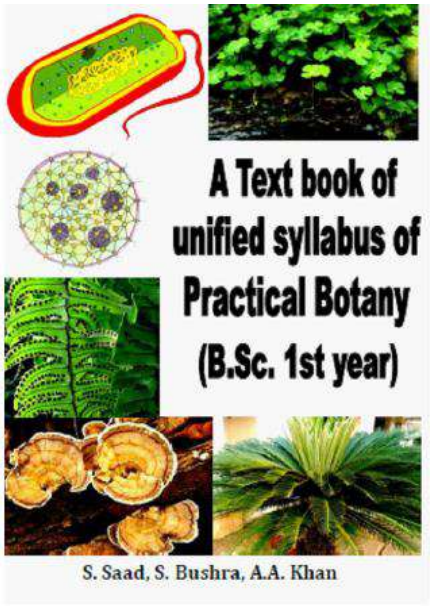

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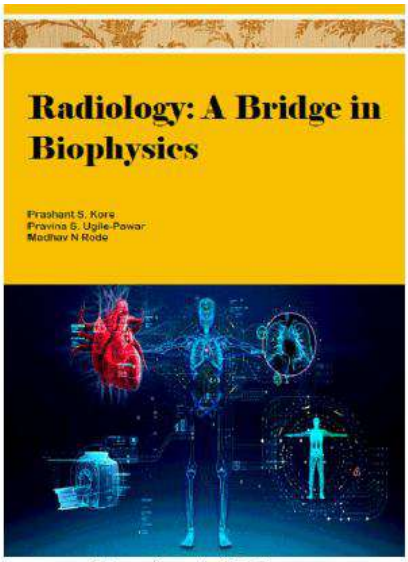

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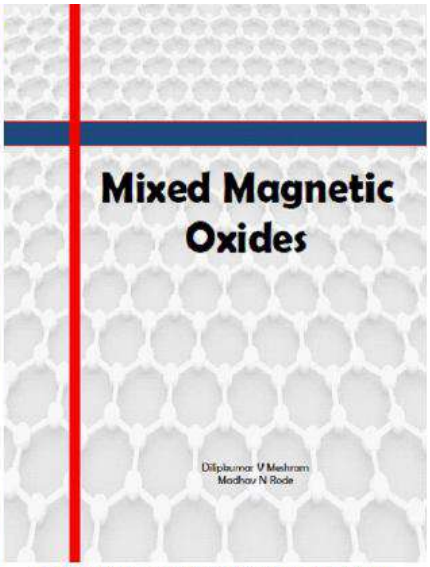

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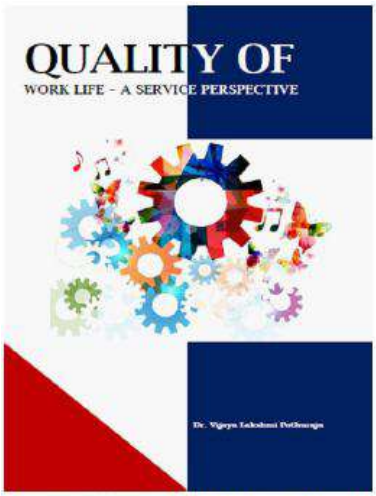

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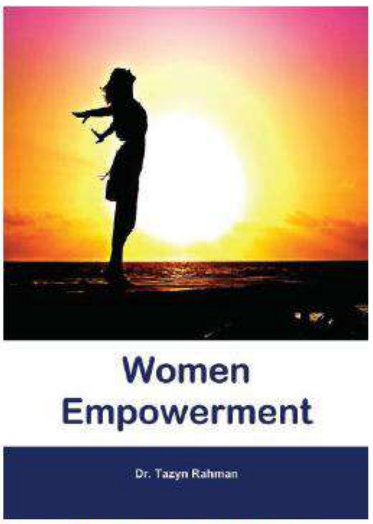

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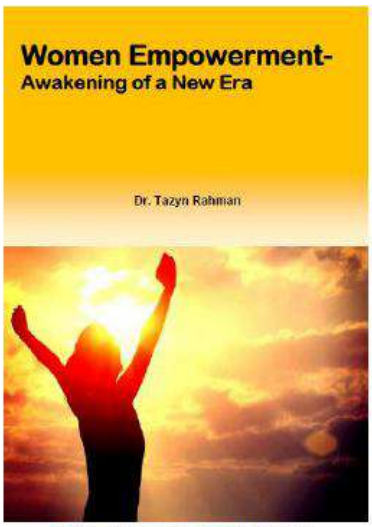

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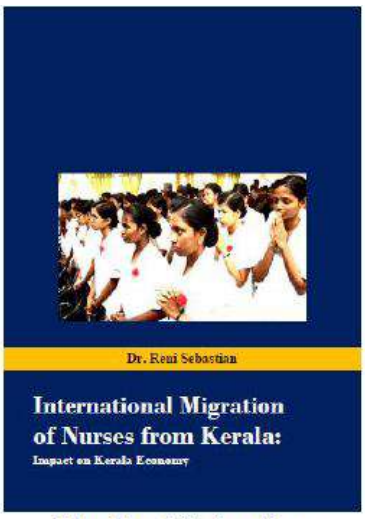

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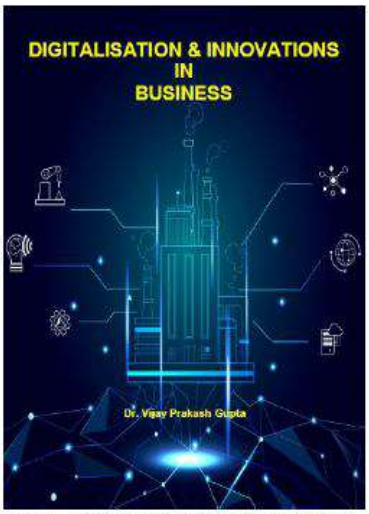

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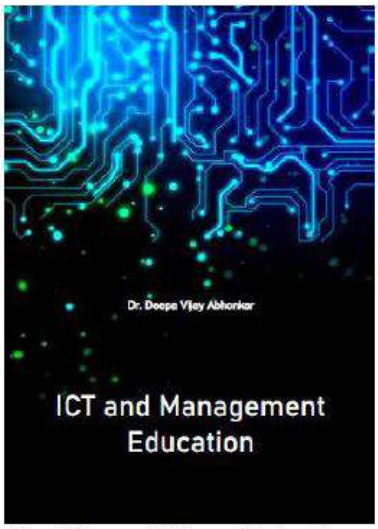

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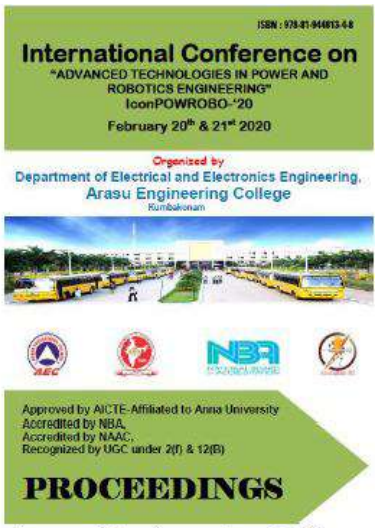

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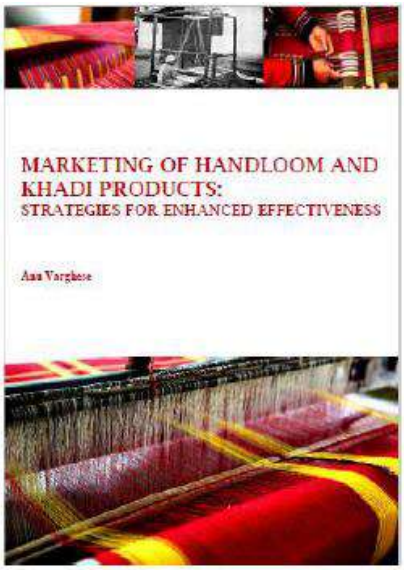

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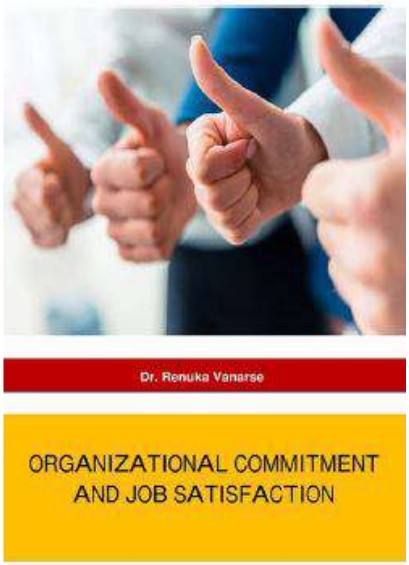

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