

One Day 3rd National Level Conference on

Global Business Transformation: Technology, Trends & Practices

Sponsored by K.B.C. North Maharashtra University, Jalgaon
Supported by PM-USHA, Ministry of Education, New Delhi



Date : 24th January 2026

...Organised by...

R. C. Patel Educational Trust's,

Institute of Management Research and Development, Shirpur

Karvand Naka, Shirpur, Tal. Shirpur - 425405, Dist. Dhule (M.S.) India



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Global Business Transformation: Technology, Trends & Practices

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Editorial Message

It is with great pride and enthusiasm to present the Editorial Message for the **3rd National Level Conference on “Global Business Transformation: Technology, Trends & Practices”**, held on 24th January 2026, organized by the R.C. Patel Educational Trust’s Institute of Management Research and Development, Shirpur, Dist. Dhule. This event marked a significant milestone in our ongoing journey to foster innovation, collaboration and scholarly excellence in the field of global business transformation.

The conference provided an excellent platform for academicians, industry experts and practitioners to engage in meaningful discussions on cutting-edge developments in global business practices. We are pleased to note that the conference received a wide range of high-quality research contributions spanning Digital Marketing, AI applications in business, banking and education, Fintech, green finance, behavioural studies on work-life balance and consumer behaviour, emerging technology trends such as Metaverse, deepfake, AR and smart systems, as well as innovations in agriculture and rural development. The depth and diversity of research presented reflect the participants’ commitment to academic excellence, innovative thinking and practical relevance.

We are delighted to have participants from various regions attending in both online and offline mode, which enriched the conference with diverse perspectives and valuable insights. We extend our sincere gratitude to all dignitaries, resource persons, delegates, authors and contributors whose support and active participation made this event successful. We also express our heartfelt appreciation to the management, faculty and staff of the institute for their continuous encouragement and support.

I firmly believe that the discussions, research findings and collaborations generated through this conference will contribute significantly to the advancement of global business practices. Together, let us continue to explore, innovate and create solutions that will ensure a globally transformed business future for generations to come.

Warm regards,
Dr. Amarsingh K. Gaur
Assistant Professor,
RCPET’s IMRD Shirpur,
Editor

Convener's Message

It is my privilege & honour to present the proceedings of the **3rd National Level Conference on “Global Business Transformation: Technology, Trends & Practices”**, organized by R. C. Patel Educational Trust's Institute of Management Research and Development, Shirpur, on Saturday, 24th January 2026. This national conference was successfully conducted with the objective of fostering intellectual exchange & scholarly discussion on contemporary issues shaping the global business environment.

This conference was sponsored by Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon & supported by PM-USHA, Ministry of Education, New Delhi. The conference was conducted in the hybrid mode, ensuring inclusive participation from academicians, researchers, industry persons & students from various regions.

The conference witnessed enthusiastic participation from academicians, researchers, industry professionals and students from Madhya Pradesh, the Union Territory of Dadra and Nagar Haveli, and various regions of Maharashtra, including Dhule, Jalgaon, Nandurbar, Nashik, Satara, Beed, Chhatrapati Sambhajnagar and Pune. A total of 176 participants registered for the conference and 63 research papers were presented during the technical sessions. The contributions covered diverse thematic areas such as Finance, Human Resource Management, Marketing & General Management highlighting the interdisciplinary nature of contemporary business research.

The papers included in these proceedings have been carefully reviewed and selected, representing original research and thoughtful analysis that contribute meaningfully to research, industry, academic literatures and managerial practices. I am confident that this proceeding will serve as valuable reference for researchers, academicians and students and will encourage further research in the field of global business transformation.

I express my sincere gratitude to the sponsoring & supporting organizations, keynote speaker, session chairs, advisory committee members, Institute Director, organizing committee members and all the participants for their cooperation and wholehearted support, which made this conference successful.

Thank You!

Dr. Laxmikant M. Sharma

Convener,

Assistant Professor,

RCPET's IMRD, Shirpur.

Director's Message

Dear Esteemed Guests, Participants and Scholars,

It is a privilege and a pleasure to warmly welcome you to the **3rd National Level Conference on “Global Business Transformation: Technology, Trends & Practices”**. We are truly delighted to host this gathering of academicians, researchers, industry professionals and young scholars who share a common passion for innovation, knowledge and progress.

This conference marks a significant milestone in our collective pursuit of knowledge and innovation. In an era defined by rapid technological evolution, global business transformation has emerged as a critical driver of organizational resilience, competitive advantage, social engagement and sustainable growth. It continues to redefine industries, enhance operational capabilities and reshape the way businesses engage with technology and society.

The theme of this conference captures the dynamic and rapidly evolving landscape of contemporary business management. Significant advancements across finance, marketing, human resources, supply chain management, digital platforms and emerging technologies are fundamentally reshaping global business practices. Throughout the conference, we will have the privilege of engaging with insightful research and meaningful discussions led by distinguished scholars and experienced practitioners whose work is actively shaping the future of this field.

As we commence this academic and industrial exchange, let us remain committed to excellence, innovation, a strong sense of ethical and social responsibility. We can together achieve meaningful and impactful outcomes by approaching emerging challenges with foresight and collaboration,

I express my sincere appreciation to the participants, speakers, reviewers and organizing committee whose dedication and unwavering support have made this conference a success. Your contributions play a vital role in nurturing an environment of intellectual growth and collaboration.

As the third edition of this conference, we are proud to continue the legacy of excellence and knowledge sharing established by our previous gatherings. May this conference serve as a platform for learning, intellectual engagement and the generation of innovative ideas that will shape the future of global business transformation.

Thank you and I wish you all a productive and enriching conference experience.

Dr. Vaishali B. Patil

Director,
RCPET's IMRD, Shirpur

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A Conceptual Research Paper on An Empirical Study of Behavioral Determinants of Income Tax Compliances among taxpayers in India

CA Dipali Kalani, Dr. Tushar R. Patel

Abstract

This paper aims to elaborate the different views held by various scholars in connection with behavioural determinants affects tax compliance among taxpayers, this also plays a critical role when gaining new knowledge as well as broaden the existing knowledge in relation to this particular area. Hence, it reviews the previous literature brought by the previous scholars to understand concepts and their importance to the present context.

The empirical study brought from this review paper will set a new direction for future research that will help to understand the significances of these conceptual ideas. If it makes sense in the future studies, then these concepts will apply to different practical situations in India as well as globally.

Keywords: tax compliance, behavioural determinants, tax rate, tax information, tax compliance cost

Introduction

“To collect taxes from citizens the way a Bee collects Honey from the flowers-quietly without inflicting pain”. (Chanakya)

Taxation in India is rooted in the period of **Manu Smriti and Arthashastra**. The present Indian tax system is based on this ancient tax system which was based on the theory of maximum social welfare. Tax refers to the compulsory extraction from the Entity for Public welfare purpose. Direct Taxes are directly paid by the person, while Indirect tax, which can shift to others, i.e., the person on whom the taxes are levied can collect the same from other

Income tax is example of Direct tax. Income tax act 1961 is a comprehensive statute that governs the levy, collection, and administration of direct taxes in India. It outlines the tax obligations, exemptions, deductions, and procedures for individuals, corporations, and other entities earning income within the country.

In India, taxes constitute two third of the total revenue. A nation's tax equilibrium is primarily determined by Tax compliances. Tax Compliances refers to the ability and willingness of taxpayers to abide by established tax regulations, legal environment and ethics. In general, people perceive taxes as a hardship, and they often want to minimize their tax liability. There are various behavioral determinants that effect on psychological behavior and attitude of professional behind tax compliances. Considering the economic, social, technological and psychological dimensions of tax compliance, it is necessary to understand the multidimensional nature of individuals' tax payment behavior. In this context, this study aims to examine this multidimensional structure with an interdisciplinary approach by addressing the literature on tax compliance from economic, social, and psychological perspectives. It is frequently emphasized that factors such as individuals' expectations of economic benefits, social norms, ethical responsibilities, and trust in the state should be evaluated together.

Tax compliance is also considered a part of the social contract between the state and the individual., Individuals' attitudes towards tax payment are directly related to trust in the basic principles of the state, such as transparency, fairness, and Accountability. In societies where, public resources are used efficiently and fairly, individuals' tax payment behaviors are positively affected; this shows the importance of the trust relationship between the state and citizens.

Literature Review

The purpose of this study is to critical evaluation of behavioral determinants towards Income tax compliances. Some taxpayers may consider tax payment will contribute in nation's development and some do not. Analyzing different perception, behavioral determinants of taxpayer while complying Income tax law's rules & regulations is necessary.

Mohammed, A. (2018) A critical analysis of direct taxes in India

According to Researcher, Government has adopted initiatives to increase the amount the revenue from direct tax. These initiatives were effective up to a certain extent and leads to an increasing trend over the study period. So, attempt should be made to draft new legislation in simple and easy language and easily understood by common man.

Azka A. & Majeed, A. (2014) Factors Affecting Tax Collection in Pakistan: An Empirical Investigation

Researcher says that the results indicated tax collection decreases due to increasing corruption, inflation and political instability while trade openness and real per capita income boost tax revenues. The study suggested important policy implication for increasing tax collection in Pakistan.

Muhammad, A. (2011) Determinants of Tax Revenue: A Comparative Study of Direct taxes and Indirect taxes of Pakistan and India

The results show that Pakistan is generating more tax revenue through indirect taxes whereas India is from direct taxes. By comparing the revenue generation from both Direct and Indirect taxes, we come to know that in Pakistan, more revenue is charged by levying indirect taxes whereas India is on the opposite side of it.

Saumen Chattopadhyay and Arindam Das-Gupta (2002) The Compliance Cost of the Personal Income Tax and its Determinants

The purpose of this study is to examine the extent to which non-compliance with the personal income tax is due to high compliance costs. On account of findings of the study many useful suggestions were given to the notice of concerned authorities to increase the compliance level.

Michael Ardho Dewanta (2019): Gender, Religiosity, Love of Money, and Ethical Perception of Tax Evasion. Jurnal Dinamika Akuntansi dan Bisnis

The researcher sought to examine how gender, religiosity, and love of money influence the ethical perception of tax evasion among accounting students in universities in Semarang, Central Java, Indonesia. Researcher gathered data from 100 students through questionnaires, and analysed the data. The results indicated that gender did not have any significant effect on the students' religiosity or their love of money, which suggests that these factors might not interact in the ways the researcher hypothesized. Analysed data contributes to understanding how demographic and psychological factors influence students' ethical views on tax evasion, particularly in the context of Indonesian undergraduate students.

Sharma and Dang, (2011) Myth and reality of the imbricating concepts of Tax Avoidance and Evasion

In their paper specified that the difference between tax avoidance and evasion is that tax avoidance is legally permissible by law while tax evasion is not. Judicial pronouncements within India and outside India have always marked out this distinction between the two as the predominant feature in deciding the nature of any transaction.

Bandara and Weerasooriya, (2019). A Conceptual Research Paper on Tax Compliance and Its Relationships

Researcher studied relationship between tax compliances behavior of taxpayers of Shri Lanka with different variables such as Tax rate, Tax Information, Tax Payer's attitude, Legal framework, cost of tax compliance.

According to them there is positive relationship between tax compliances and Tax Information, Tax Payer's attitude, cost of tax compliance while negative relationship between tax compliances and tax rate, legal framework.

Nguyen, T. H., & Tran, H. T. L. (2025). Factors influencing personal income tax compliance of taxpayers with e-commerce business activities

In their Paper they identified model of factors that affects on income tax compliances of E-commerce taxpayers, which includes Economic factors, Social Factors, Personal factors, Demographic factors all these factors are positively related with tax compliances behavior of E-commerce taxpayer of Vietnam.

Alan H. Plumley (1996). The Determinants of Individual Income Tax Compliance Estimating the Impacts of Tax Policy, Enforcement, and IRS Responsiveness

Researcher study focused on foster better voluntary tax compliances; researcher also studied the impact of IRS activities (Implication for Resource Allocation) with respect to effectiveness in improving tax compliances.

Raden Rudi Alhempia, Irfan Ardiansyahb, Sri Yani Kusumastutic, Endri Endrid (2020). Tax Compliance in Income Tax Payments

This study proves several findings, that tax compliance is influenced by 2 factors, namely justice and social norms positively, while expectations and complexity of tax regulations do not affect tax compliance.

Joel Slemrod (2018). Tax Compliances and Enforcement

Increased enforcement is just one way to raise revenue, with the obvious alternatives being to raise tax rates or broaden the tax base. In formulating optimal policy, one needs to consider the marginal social costs of enforcement relative to the costs of alternative ways to raise revenue. Thus, the overall objective of this aspect of tax policy is not different than the objective of choosing tax rates, bases, and other elements of a tax system.

Divakar Velya M. and M.Kumaraswamy, (2024), Personal Income Tax Compliances Behaviour- An Indian Perspective

Economic factors have both positive as well as negative impact on compliance behavior. Though number of studies have been carried identify the factors that influence upon tax compliance behavior, the concerned authorities that is the government and the CBDT should think about the characteristics of non-compliant taxpayers to assess and review the present regulations accordingly. A proper tax culture can develop only when taxpayers and tax collectors discharge their obligations equally well. Hence, there is a need for creating a good tax culture among the tax payers as well as building good relationships between tax collectors and taxpayers to look for improved general tax compliance levels.

M Sunil Kumar (2025). A study on the impact of tax awareness on compliance and financial planning in india

Accordingly with this study, tax awareness has a positive direct effect on tax compliance and financial planning among taxpayers in India. While numerous taxpayers are aware of certain key aspects fundamentals of tax, their in-depth knowledge and application of strategies for tax savings leave plenty to be desired. Respondents who know their taxes better are seen to be adhering more with compliance behaviour by way of timely filing, correct claiming of exemptions, and informed financial decisions. Following this, the study has brought forth difficulties faced by the Indian tax system, complexities with respect to tax regulations, and inadequate access to reliable educational resources. A good number of respondents expressed their dissatisfaction with government resources that are available, pointing out the desire for the availability of a user-friendly digital tool to facilitate tax filing.

Suchithra and Vidhya (2019),) A Study on the Awareness of Tax Saving Instruments of Individual Tax Payers

This study aims to know the most suitable and popular tax saving instrument used to save tax and to know the amount saved by using that instruments by the assesses in sreekrishnapuram. Overall findings of the study reveals that 80C deduction is the most adopted tax saving instrument and 80EE is the second most adopted tax saving instrument. This study it is found that most of the respondents in Sreekrishnapuram are aware about tax saving instruments. It is also found that there is no association between gender and level of awareness among individual tax payers. In this study respondents rank various tax saving instruments according to their priority. The most adopted tax saving instrument is deduction under 80C, which got the first rank in this study.

Amit Kumar Arora and Pradeep Kumar Garg (2019), Awareness and Perception Regarding Tax Saving Instruments among Teachers of Higher Education

the study attempted to know the awareness and perception regarding various tax saving instruments available to save the tax to the teachers of higher education. The study conducted to determine the tax-saving instrument options which are preferred to save tax and what the factors are considered before making instrument decisions. The study recommends to invest in NPS and increase the amount of expenditure on health insurance to reduce the tax liability of the teachers of higher education. The study found that respondents are in the opinion that the taxation system is difficult and they are taking the help of the experts to file their income tax return.

Dr J.A. Sarvaiya and Dr Rajesh P Ganatra (2019), Examining the perceptions of the tax payers with respect to Deduction under Section 80C to 80U of Income tax Act in Ahmedabad City

This research paper aims to examine the behavioural patterns and the perceptions of the taxpayers over the different deduction available under sections from 80C 80U of Income tax Act such as PPF, LIC premium, PF, FD's, National Pension Scheme, Rajiv Gandhi Equity Linked Savings Scheme, Mediclaim, Interest on home loan, Interest on Education loan, Donations, Rent, Interest on Savings Account etc. Further the researcher also tries to examine whether there is a significant difference in perception of taxpayers with respect to deductions U/s 80C-80U relative to their demographic factors. It is found that the taxpayers having their Own Business as their occupation pay the highest tax. The taxpayers prefer "deduction under section 24-B" the most & "deduction under section 80D" the least.

Ayesha Qadri (2020), Tax Planning and Tax Saving Instruments

Purpose of this study is to understand tax, tax planning and tax management and to find out the most efficient way of getting tax benefits from numerous tax saving instruments. In this research author to understand that planning and management of our taxes is really important and also try to analyze the best tax saving instrument among number of tax saving instruments available in the market in order to pay lowest taxes possible and get maximum benefits. In this study we have seen tax planning and management and why it is important to do so, we have also seen popular tax saving techniques through which we can fulfill our long term goal. From this we understand that it is important to plan taxes in advance and to wisely choose among tax saving instruments in order to utilize tax benefits completely.

C. Sumitra Devi and Prof. A. Sudhakar (2018), A Study on Awareness of Tax Saving Schemes Among Women Faculty of Degree Colleges of Hyderabad District

The purpose of this paper is to find out the awareness of tax saving schemes and to identify the preference of tax saving schemes among women faculty of Degree Colleges of Hyderabad. It is found that there is no significance mean difference in Awareness of tax saving schemes in different status of the employees or type of Instruments they make and also with the proportion of savings. The study concluded that the respondents have basic knowledge and awareness about various tax saving schemes u/s 80C and 80D only and are preferring to invest in Mutual funds as they possess liquidity to meet their short- and medium-term goals and are also investing in House loans to meet their long term goals.

Political Legitimacy Theory

This theory illustrates that tax compliance is largely influenced by the extent to which their citizens trust their government (Tyler, 2006) and (Kirchler, 2008).

The Tax Moral Theory

The tax morale theory was first developed by German scholars well known as Cologne school of tax psychology. Many studies have found out that tax evasion can be attributed to tax morale (Mocetti, Vol 18 No. 6). This theory further stated that taxpayers are more likely to comply with tax obligations if their friends, relatives and acquaintances comply with these obligations. Also, taxpayers will evade taxes if they feel that other people are getting away with tax evasion. That means if a society concentrates on tax evasion, such a society would encourage tax evasion (Waweru, 2004).

Theory of Planned Behavior

The theory of planned behavior is an important theory that presents within the scope of social psychology and tries to explain human behaviors. This theory was developed by (Ajzen, 1991) and it is just the improved form of the Theory of Reason Action suggested by (Ajzen & Fishbein, 1991) to explain conscious behaviors. According to this theory, behaviors of the individuals within the society are under the influence of several factors, originate from certain reasons and emerge in a planned way (Erten, 2002). Nevertheless, the ability to perform a particular behavior depends on the fact that the individual has a purpose towards that behavior.

Relationship between Taxpayers' Attitudes and Tax Compliance

In a study of tax morale in 17 Latin American countries, (Torgler, 2005) found that over 46% of the respondents perceived a high tax burden to be the reason why people did not pay taxes; "because the taxes are too high" was the most frequently mentioned reason.

The findings showed that income and tax rates were the biggest determinants of non-compliance attitudes and tax evasion amongst participants. The higher the tax rate and the lower the income, the participants' noncompliance attitudes were higher and were evading paying taxes. Most studies found that high tax burdens hurt tax compliance attitudes in both developed and developing countries.

According to (Garboua, 2006) who have surveyed in Romania while doing a survey they asked questions about the taxation system in Romania, the majority of the taxpayers mentioned that fairness is the most important issue rather than tax burden, tax rate and efficiency of government expenditures. A majority indicated that a high level of fairness leads to a high level of tax compliance.

Method and Analysis

Under this heading, the researcher highlights the key purpose of presenting this conceptual paper

Research Objectives

To identify the key behavioral determinants (such as attitude, complex law, ethical and moral responsibility, perceived fairness and trust in tax authorities) that affects on direct tax compliances.

To analyze impact of mediating factors such as psychological perspective and attitude, influence of digitalization, use of Income tax Applications, digital record keeping and its relationship with direct tax compliance of taxpayer.

To explore the demographic and occupational moderators (age, income, profession type, rural/urban) that affects on tax compliances behavior.

Methodology

This study mainly concentrates on exhibiting the conceptual ideas held by various researchers in connection with this particular area. Hence, it reviews the previous literature brought by the previous scholars to identify the relevant concepts and their importance to the present context, therefore, the researcher was studied around 50 research articles,

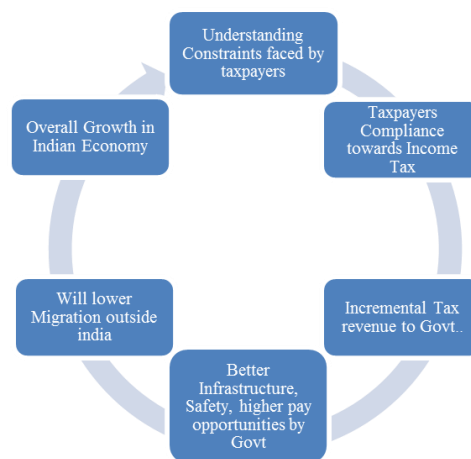
which were published by various organizations and the other different authors. Finally, around 10 articles were drawn and reviewed to ascertain relevant concepts and analyze the behavioral determinants affects on tax compliance behaviour of taxpayer.

Results and Discussions

Behavioral determinants that affects Tax payment decision of taxpayer in India



Tax Payment Linked with Economic Growth



Conclusion

- Understanding perspective of taxpayer relating to Income Tax compliance, Tax literacy among them, fulfillment of their tax obligation and statutory liabilities is directly related with their tax compliances behavior.
- Individual's sense of social belonging and ethical responsibility, awareness should be created among professionals. That will cultivate feeling Income tax compliances in their mind.
- Understanding Behavioral determinants faced by taxpayers, will help Indian government to design taxation policies, new rules and regulations and Tech savvy E-filing website which aimed at increasing tax compliances, will consider Economic motivation approach.
- Increased Tax Revenue for nation ultimately results in India's Economic growth.

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A Study of The Impact of Digital Marketing on The Burhanpur Powerloom Industry

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Abstract

The Burhanpur powerloom industry, a significant contributor to the textile sector in Madhya Pradesh, has traditionally relied on conventional marketing channels. With the advent of digital technologies, digital marketing has emerged as a powerful tool that can influence market reach, sales, and competitiveness. This study examines the impact of digital marketing practices on the performance and sustainability of powerloom businesses in Burhanpur. Utilizing a sample size of 100 firms, the research assesses how digital marketing adoption affects sales growth, customer engagement, brand visibility, and overall business performance. Findings indicate a positive correlation between active digital marketing utilization and enhanced business outcomes.

Keywords: Digital Marketing, Powerloom Industry, Burhanpur, Textile Marketing, Customer Engagement, SME Growth

1. Introduction

The Burhanpur region is home to one of India's oldest powerloom clusters, specializing in fabrics like cotton, silk blends, and traditional motifs. In recent years, digital marketing has transformed how industries market and sell products globally. However, the adoption rate among traditional textile sectors—especially powerloom enterprises—remains inconsistent.

This study explores how digital marketing impacts Burhanpur's powerloom industry, including operational performance, customer relationships, and market expansion.

2. Literature Review

Digital marketing encompasses platforms such as social media, search engine marketing (SEM), content marketing, and e-commerce portals. Research globally indicates that digital marketing enhances reach, reduces costs, and strengthens customer loyalty in traditional manufacturing sectors. However, limited literature exists on its application in Indian powerloom clusters, particularly Burhanpur.

3. Research Objectives

1. To evaluate the level of digital marketing adoption among powerloom units in Burhanpur.
2. To assess the impact of digital marketing on sales and customer base.
3. To analyze challenges faced by powerloom firms in adopting digital marketing.
4. To recommend strategies for better digital integration.

4. Hypothesis

H₀ (Null Hypothesis):

There is no significant impact of digital marketing on the performance of powerloom businesses in Burhanpur.

H₁ (Alternative Hypothesis):

Digital marketing has a significant positive impact on the performance of powerloom businesses in Burhanpur.

5. Methodology

5.1 Research Design

A descriptive and analytical survey was conducted among 100 powerloom enterprises in Burhanpur selected through stratified random sampling.

5.2 Sampling

- **Sample Size:** 100 powerloom units
- **Population:** Registered and operational powerloom businesses in Burhanpur
- **Sampling Technique:** Stratified random sampling to ensure representation of micro, small, and medium enterprises.

5.3 Data Collection

Primary data collected via structured questionnaires and interviews; secondary data sourced from industry reports, journals, and digital marketing performance tools.

5.4 Tools Used

- SPSS for data analysis
- Descriptive statistics
- Regression & Correlation analysis
- Chi-Square test for hypothesis validation

6. Data Analysis & Results

6.1 Digital Marketing Adoption Levels

Digital Tool	% Adoption
Facebook Pages	72%
Instagram	65%
WhatsApp Business	80%
Website/E-commerce	40%
SEO & SEM	22%

Observation: WhatsApp Business and social media platforms show high adoption due to ease of use and low cost.

6.2 Descriptive Analysis of Performance Metrics

Metric	Mean Score (1–5)
Sales Growth	4.1
Market Reach	3.8
Customer Engagement	4.0
Brand Awareness	3.6

Scores above 3.5 indicate positive responses on digital marketing effects.

6.3 Hypothesis Testing

Correlation Analysis

- Digital marketing usage vs. Sales Growth
Coefficient (r) = **0.68** (moderate positive correlation)

Regression Analysis

- Adjusted R^2 = **0.46**
Implies ~46% variation in sales performance can be explained by digital marketing engagement.

Chi-Square Test

- Value = $\chi^2 = 36.42$
- p-value < **0.05**
- Significant result → **Reject H_0**

Conclusion: Digital marketing has a statistically significant positive impact on firm performance.

7. Discussion

The results affirm that digital marketing tools improve:

- Product visibility and brand positioning
- Engagement with national & international buyers
- Sales transactions through digital platforms
- Customer feedback and rapid communication

However, challenges such as limited digital literacy, cost constraints, and infrastructure gaps persist.

8. Challenges Identified

1. **Limited Digital Skills:** Many owners lack marketing tech knowledge.
2. **Infrastructure Barriers:** Poor internet connectivity in peripheral areas.
3. **Cost Concerns:** Small units hesitate to invest in paid promotions.
4. **Content Creation Issues:** Firms struggle to produce appealing digital content.

9. Recommendations

1. **Training Workshops:** Digital marketing courses tailored for SMEs.

2. Collaborative Platforms: Create centralized regional e-commerce portals.
3. Government Support: Incentives/subsidies for digital tools adoption.
4. Outsourcing Options: Encouraging shared digital marketing services.

10. Conclusion

This research confirms that digital marketing significantly enhances business outcomes in the Burhanpur powerloom industry. While adoption is growing, strategic interventions are essential to overcome skill and infrastructure gaps. Effective use of digital marketing can greatly accelerate market expansion and sustainability for powerloom entrepreneurs.

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A Study on Recruitment and Selection Process in Manufacturing Companies of Vapi, Daman & Silvassa

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Abstract

This research paper investigates the recruitment and selection practices adopted by manufacturing organizations in Vapi, Daman and Silvassa. The study emphasizes the strategic importance of structured hiring practices in achieving organizational efficiency, talent retention, and employee satisfaction. Using descriptive research methodology and a sample of 108 employees, the study identifies trends in hiring sources, candidate perceptions, and satisfaction levels with recruitment processes. Likert-scale analysis consolidates employee feedback on key aspects such as job clarity, transparency, and timely feedback. Findings reveal that while recruitment practices are well-structured, improvements are needed in communication clarity, salary alignment, and timely feedback. The study concludes that organizations must enhance digital recruitment efforts, adopt data-driven hiring, and strengthen internal mobility to achieve long-term strategic alignment with business goals.

Keywords: Recruitment, Selection, HR Practices, Manufacturing Sector, Employee Perception, Talent Acquisition

Introduction

The recruitment and selection process is a structured approach organizations use to attract, evaluate, and hire candidates who best fit job roles and organizational needs. It goes beyond simply filling vacancies, aiming to identify individuals who align with the company's goals, culture, and long-term vision. The present study was conducted to analyze the effectiveness of the recruitment and selection process in a mid-sized technology firm, the factors influencing its success, and employee satisfaction with current hiring practices.

Problem Statement

In the of Vapi, Daman and Silvassa region, manufacturing companies rely on a diverse workforce, often recruited for specialized roles with varying skill requirements. Ineffective recruitment and selection processes can lead to mismatched hires, low productivity, and high turnover, impacting organizational efficiency and growth. This study aims to analyze current recruitment and selection practices, evaluate their effectiveness, and provide recommendations to enhance candidate fit, streamline hiring processes, and improve long-term employee retention.

Objective

- ✓ To understand the concept of Recruitment and Selection Process.
- ✓ To study the Recruitment and Selection Process at organization of Vapi, Daman & Silvassa
- ✓ To gain insight of employees regarding Recruitment and Selection practices at organization of Vapi, Daman & Silvassa

Recruitment and Selection Process

Recruitment Process:

Recruitment is the process of generating a pool of capable people to apply for employment to an organization.

According to Edwin B. Flippo, "Recruitment is the process of searching the candidates for employment and stimulating them to apply for jobs in the organisation"

It is a linking activity that brings together those offering jobs and those seeking jobs

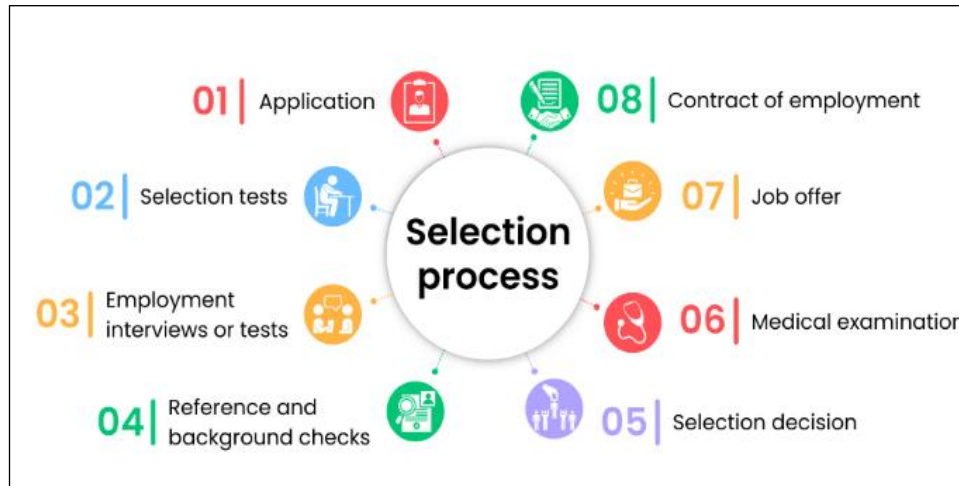
Recruitment Process

- Planning
- Strategy Development

- Searching
- Screening
- Evaluation & Control

Selection Process:

Selection is the process of choosing qualified individuals who are available to fill the positions in organization.



Source: <https://testlify.com/wp-content/uploads/2024/11/Steps-in-selection-process-1536x864.png>

Review of Literature

(Smith, 2021) Smith in **A systematic review of recruitment and selection**, emphasizes the growing importance of modern recruitment technologies such as online portals, job fairs, and mobile applications. The study also highlights the significance of expatriate considerations in a globalized hiring environment, underscoring how multinational organizations must adapt their recruitment strategies to diverse labor markets.

(Brown, 2020) Brown presents **A comparative analysis of traditional versus digital recruitment methods**. The findings reveal that while digital platforms such as LinkedIn and AI-assisted hiring expand the reach of organizations and enhance efficiency, traditional approaches—such as referrals and personal networks—remain crucial in industries where interpersonal trust and close-knit professional circles play a dominant role.

(Johnson, 2019) Johnson investigates **the impact of structured hiring processes** and concludes that competency-based assessments, detailed job descriptions, and standardized evaluation criteria result in higher employee satisfaction and productivity. This suggests that structure in recruitment not only benefits organizations in selecting the right candidates but also strengthens employee engagement and retention.

(Lee, 2022) Lee focuses on the role of **Artificial intelligence in recruitment**. AI-driven tools such as chatbots, predictive analytics, and automated screening systems have significantly reduced hiring biases and improved candidate-job fit. However, the study also raises critical concerns regarding data privacy, ethical implications, and algorithmic fairness, signaling the need for careful integration of technology in recruitment practices.

(Williams, 2020) Williams highlights the role of **Employer branding in recruitment**, asserting that a strong employer brand attracts high-quality candidates and enhances recruitment effectiveness. The research emphasizes that branding must be authentic and aligned with organizational values to create long-term impact on both recruitment and employee loyalty.

(Davis, 2019) In the healthcare sector, Davis identifies **recruitment challenges unique to healthcare organizations**, particularly skill shortages, high attrition, and the demand for specialized expertise. The study recommends adopting targeted recruitment campaigns and retention-focused policies to address these persistent challenges.

(Thompson, 2021) Thompson explores the significance of **cultural fit in recruitment**, showing that when organizations prioritize alignment between candidates' values and organizational culture, retention improves and workplace harmony is enhanced. This indicates that beyond technical skills, cultural compatibility is becoming a decisive factor in long-term employee success.

(Martinez, 2022) Martinez reviews **technological advancements in recruitment**, with a particular focus on the adoption of Applicant Tracking Systems (ATS) and AI-driven platforms. The study finds that such technologies significantly reduce time-to-hire, streamline candidate screening, and improve operational efficiency, making them indispensable for modern recruitment practices.

Research Methodology

Research methodology refers to the systematic plan and approach used to conduct research. It encompasses the methods, techniques, and procedures employed to gather, analyse, and interpret data. The methodology provides the framework that guides the entire research process, ensuring the findings are valid, reliable, and scientifically sound.

Research Methodology: -

Topic	A Study on Recruitment and Selection Process
Research Design	Descriptive and Exploratory
Sample population	population of employees
Sample size	108
Sampling method	Snowballing sampling
Analysis tools & method	Percentage analysis
Respondent	Employees
Area for study	In the region of Vapi, Daman and Silvassa

Data Analysis

Data analysis is a critical step in research that involves organizing, summarizing, and interpreting collected data to draw meaningful insights. In this study, data analysis focuses on understanding Recruitment and Selection Process in Manufacturing Companies of Vapi, Daman and Silvassa.

Primary data were collected using a structured questionnaire from 108 employees, and the responses were analyzed using percentage analysis to identify trends, patterns, and key findings. The analysis provides insights into how current engagement initiatives impact employee motivation, satisfaction, and commitment, forming the basis for recommendations to improve engagement strategies in the organization

Table no. 1: Age (Years):

Particular	Frequency	Percentage
18 - 30	80	74.07%
31 - 50	20	18.52%
Above 50	8	7.41%
Total	108	100.00%

Table no. 2: Gender:

Particular	Frequency	Percentage
Female	56	51.85%
Male	47	43.52%
Prefer not to say	5	4.63%
Total	108	100.00%

Table no. 3: Educational Qualification

Particular	Frequency	Percentage
Under graduate	23	21.30%
Graduate	36	33.33%
Post graduate	43	39.81%
Others	6	5.56%
Total	108	100.00%

Table no. 4: Source of Job Awareness

Particular	Frequency	Percentage
Flyers	9	8.33%
Friends / Family	50	46.30%
Job site	31	28.70%
Others	18	16.67%
Grand Total	108	100.00%

Table no. 5: External Sources

Particular	Frequency	Percentage
Campus	29	26.85%
Online Job portal	35	32.41%
Walk in	24	22.22%
None of the above	20	18.52%

Table no. 6: Internal Source

Total	108	100.00%	Particular	Frequency	Percentage
			Referrals	33	30.56%
			Promotion	39	36.11%
			Transfer	25	23.15%
			None of the above	11	10.19%
			Total	108	100%

Table no. 7: Selection Methods Faced

Table no. 8: Recruitment Sources Used

Particular	Frequency	Percentage
Aptitude Test	24	22.22%
Interview	39	36.11%
Practical Test	15	13.89%
Written Test	12	11.11%
Any other	18	16.67%
Total	108	100.00%

Particular	Frequency	Percentage
External Sources	30	27.78%
Internal Sources	24	22.22%
Both	54	50.00%
Total	108	100.00%

Table no. 9: External Methods Used

Table no. 10.: Interview Process Effectiveness

Particular	Frequency	Percentage
Advertisement	23	21.30%
Consultancy	6	5.56%
Internet	16	14.81%
Campus	24	22.22%
All of the above	39	36.11%
Total	108	100.00%

Particular	Frequency	Percentages
Excellent	18	16.67%
Good	57	52.78%
Average	30	27.78%
Poor	3	2.78%
Total	108	100%

Table no. 11: Consolidated Likert-Scale Data for Perception Questions

Question/Response	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
Clarity of Job Descriptions	10(9.26%)	8(7.41%)	48(44.44%)	33(30.56%)	9(8.33%)	108
Selection Criteria Transparency	8(7.41%)	10(9.26%)	44(40.74%)	36(33.33%)	10(9.26%)	108
Time Spent on Job Details	7(6.48%)	10(9.26%)	48(44.44%)	35(32.41%)	8(7.41%)	108
Information on Company Culture	10(9.26%)	14(12.96%)	56(51.85%)	11(10.19%)	17(15.74%)	108
Timely Interview Feedback	5(4.63%)	13(12.04%)	37(34.26%)	45(41.67%)	8(7.41%)	108

Question/Response	Highly Dissatisfied	Dissatisfied	Neutral	Agree	Highly Agree	Total
Information About Working Environment	2(1.85%)	4(3.70%)	44(40.74%)	45(41.67%)	13(12.04%)	108
Recruitment Communication Satisfaction	4(3.70%)	5(4.63%)	38(35.19%)	42(38.89%)	19(17.59%)	108
Salary Package Satisfaction	6(5.56%)	8(7.41%)	50(46.30%)	33(30.56%)	11(10.19%)	108

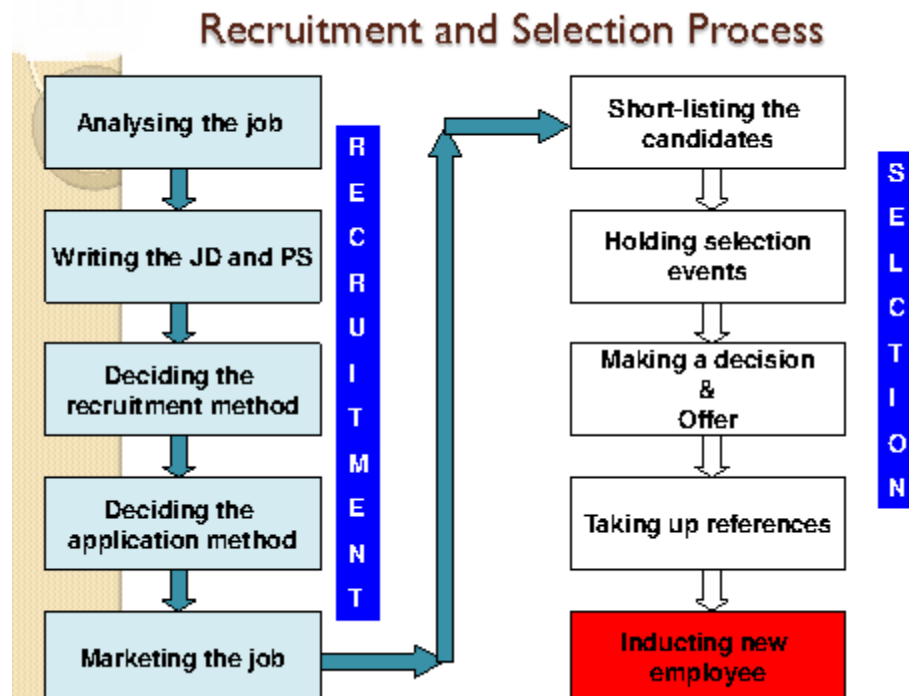
Findings:

Based on the study, the following key findings were observed regarding recruitment and selection process in manufacturing company in Vapi, Daman and Silvassa.

- Most of the employees (74.07%) are between **18 to 30 years**, showing that the workforce in these manufacturing companies is quite young. A smaller portion (18.52%) falls in the **31–50 years** group, and only **7.41%** are above 50 years. This indicates that the companies rely largely on younger employees.
- Out of 108 respondents, **51.85% are female**, and **43.52% are male**, while **4.63% preferred not to say**. This shows that there is a relatively balanced gender distribution with a slightly higher participation of female employees.
- Most respondents are **postgraduates (39.81%)**, followed by **graduates (33.33%)**. **Undergraduates** make up **21.30%**, and **5.56%** have other qualifications. This indicates that the companies attract a well-educated workforce, many with higher academic degrees.
- Nearly half of the respondents (**46.30%**) came to know about their jobs through **friends and family**, showing that personal networks play a major role in job awareness. **Job sites (28.70%)** were also important, while **flyers (8.33%)** and **other sources (16.67%)** were less common.
- **External Recruitment Sources**
- The most common external recruitment source was **online job portals (32.41%)**, followed by **campus recruitment (26.85%)** and **walk-ins (22.22%)**. About **18.52%** mentioned none of these. This shows that companies prefer digital and campus hiring methods.
- **Internal Recruitment Sources**
- **Internal promotion (36.11%)** was the most used internal recruitment method, followed by **employee referrals (30.56%)** and **transfers (23.15%)**. Only **10.19%** said none of the above. This suggests that companies value promoting or referring existing talent before hiring externally.
- **Selection Methods Faced**
- Most employees (**36.11%**) faced a **personal interview**, followed by **aptitude tests (22.22%)**, **practical tests (13.89%)**, and **written tests (11.11%)**. Around **16.67%** mentioned other methods. This shows that interviews are the most common selection tool used by employers.
- **Recruitment Sources Used**
- Half of the respondents (**50%**) said that their company uses **both internal and external sources**, while **27.78%** use only external, and **22.22%** use only internal sources. This indicates that most companies prefer a mixed recruitment strategy.
- **External Recruitment Methods Used**
- The most popular method was “**all of the above**” (**36.11%**), suggesting companies use multiple methods together. Among specific ones, **campus recruitment (22.22%)** and **advertisements (21.30%)** were common. **Internet (14.81%)** and **consultancies (5.56%)** were used less often.
- **Interview Process Effectiveness**
- More than half of the respondents (**52.78%**) rated the interview process as **good**, while **27.78%** found it **average**. **16.67%** considered it **excellent**, and only **2.78%** thought it was **poor**. Overall, the interview process is viewed positively by most employees.
- **Perception Questions (Likert Scale Data)**
- **Clarity of Job Descriptions:**
Most respondents (44.44%) were **neutral**, and 30.56% **agreed** that job descriptions are clear. A small number disagreed, showing that clarity can be improved.
- **Selection Criteria Transparency:**
About 40.74% stayed **neutral**, while 33.33% **agreed** that the selection process is transparent. This suggests moderate satisfaction with transparency levels.
- **Time Spent on Job Details:**
Most employees (44.44%) were **neutral**, and 32.41% **agreed** that enough time is spent explaining job details. This shows some room for better communication.

- **Information on Company Culture:**
A majority (51.85%) were **neutral**, and only 25.93% agreed or strongly agreed. This means many employees feel the company could share more about its culture during recruitment.
- **Timely Interview Feedback:**
Most respondents (41.67%) **agreed** that they received feedback on time, while 34.26% were neutral. This shows a fairly positive experience but with room for faster communication.
- **Information About Working Environment:**
About 41.67% **agreed**, and 40.74% were **neutral**, suggesting that while some employees were satisfied, others expected more clarity about the work environment.
- **Recruitment Communication Satisfaction:**
Around 38.89% **agreed**, and 35.19% were **neutral**. This indicates general satisfaction with recruitment communication but also highlights improvement areas.
- **Salary Package Satisfaction:**
Most employees (46.30%) were **neutral**, and 30.56% **agreed** that they are satisfied with the salary. A smaller number (12.97%) were dissatisfied, showing moderate satisfaction with pay levels.

Recommendation:



<https://www.expertsmind.com/topic/human-resource-management/recruitment-and-selection-process-94040.aspx>

The flowchart breaks down the process of hiring a new employee into two distinct phases: Recruitment and Selection.

Recruitment (Finding Candidates)

The goal here is to identify a need and attract a pool of applicants.

- Job Analysis: Figuring out what the role actually does.
- JD & PS: Creating the Job Description (what the job is) and the Person Specification (what the person needs).
- Methods & Marketing: Choosing where to post the job (social media, job boards) and launching the ads.

Selection (Choosing the Best Fit)

The goal here is to narrow down the pool to the single best person.

- Short-listing: Throwing out unqualified resumes to find the top 3–5 people.
- Selection Events: The "pressure tests," like interviews or skills assessments.
- Offer & References: Offering the job and checking with past bosses to ensure the candidate is honest.

Induction

Once hired, the person goes through Induction (onboarding), where they are introduced to the team and trained on how the company works.

Conclusion

The study concludes that manufacturing companies in Vapi, Daman, and Silvassa follow a structured recruitment and selection process but require improvements in communication and transparency. The workforce is mostly young and well-educated, though high turnover indicates a need for better retention strategies. Personal networks and online job portals are the main recruitment sources, while internal promotions and referrals play a key role in talent utilization. Interviews are the most common selection method and are generally viewed positively. However, many employees felt that job clarity, feedback, and salary communication could be improved. Overall, organizations should enhance digital recruitment efforts, strengthen communication, and adopt data-driven hiring to ensure better candidate satisfaction and long-term retention.

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The Future of Digital Banking - Neo-Banking for Business

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Abstract

Today's world is a world of technology and digitization. Each and every field and sector is affected by Technology and digitalization. Of course, these changes affected Banking sector also. Now a day, most of the banks are providing digital banking facility. It is also called internet banking or online banking. Digital banking or Online banking means where customer can make online transactions, submit online requests and handle other banking activities online. When we think about Financial Technology i.e. fintech innovation in India is leading as Global Leader. Fintech industry and Unified Payments Interface in India has recorded noticeable growth. The Report on licensing and regulatory regime for Digital Banks released by NITI Aayog says that India's place as a Global Leader in fintech industry. PMJDY, e-KYC and UPI has greatly affected the Digital India revolution. It has compelled to interact and consume financial services online and digitally in India. PMJDY was launched in 2014. More than 420 million bank accounts were opened till date under this scheme. UPI was launched in 2016. It has become a leading real-time payments system. It has achieved 4 trillion in value transactions till date. Beside all this, it will take much time to cover mass through this online and digital banking process.

*In conclusion, with the establishment of India Stack **India Stack** refers to the ambitious project of creating a unified software platform to bring India's population into the digital age., the Aadhar layer and the UPI rails that catalyzed a payments revolution in this nation, India has become a beacon for global community of Nations. Fully Digital Banks will reinforce India's apex position on the global firmament. The Digital Bank licensing and regulatory framework proposed by Niti Aayog in this Report is a bold initiative towards that inevitable digital future.*

Since it's the era of technological improvements, all the sectors in the economy are focused on digitization including the banking sector. Thus, the idea of Neo banking is getting popular in the world. Neo banking is a notion in which there is no need for a physical bank because all services will be provided fully online. Neo bank is a based-on Application Programming Interface (API).

This study presents the idea of neo banking, as well as its pros and cons. Neo banks offer a broader range of services than traditional banks. They offer comparable products and services through various business methods, with an emphasis on the consumer. The business model and structure of Neo Banks has also been examined. However, the Reserve Bank of India hasn't started distribution of banking license to Neo Banks as it is not in favour of 100% digitization of banking sectors. Thus, in India Neo banks partner with the various physical banks to provide their services. Further, neo banks are seeking to bridge the gap between customers and traditional banks, as traditional bank fails to satisfy the need of their customers. Following that, this study analyzes the perceptions of consumer regarding acceptance of neo banking in India. Neobanks have seen immense growth in the past two years. In 2019 there were close to 250 Neobanks globally. However, by 2021 the numbers have crossed 333 according to the Neobank tracker from The Financial Brand.

Keywords: Neo Banks, Fintech, Artificial Intelligence (AI), APIs, technology, Digital banking.

Introduction

Without a doubt, technology developments have cleared the path for new sectors and are profoundly altering old ones. Financial services are one area that has been impacted by technology developments. Financial technologies or FinTech are transforming the financial services sector.

Since 2017, the term Neo banks (virtual, digital, Internet banking) has been widely used. A Neo banks is a financial organization that offers a mix of banking services like opening bank accounts (mostly saving accounts), making merchant payments, checking account balances and statements and debit cards through digital means, particularly mobile, without having any physical branch locations. They provide access to one's bank accounts via mobile applications and a hassle-free way to use banking operations as everything is available at the click of a button. Neo banks apps are often sleek and straightforward, which makes it easier to comprehend and helps in effective management of your saving and spending habits.

There were 256 Neo banks in the world by the end of December 2020, and some are still in the process of launching (Stagmeier and Friedental, 2020). Approximately 350 million consumers have been served by over 250 Neo banks in 2020 (The Next Generation of Banks, 2021). The growing number of Neo banks competing for market share creates strong competition in the banking sector for client acquisition and retention. Customers' acceptance of Neo banks is therefore critical for traditional banks, digital banks, and Neo banks alike (Yong Jae Shin, I. 2021).

Neo banks can run without a complete banking license while also have a license for certain banking services and undertake all the other banking activities by going into partnership with the traditional banks (Naser, 2019). For instance, in Europe, the Electronic Money Institution (EMI) neo bank may issue cards, transfer payments, and issue digital money with such a license (Electronic Money Institution, 2021).

The substantial growth potential for neo banks is driven by their low-cost model for end consumers with no or very low monthly fees on banking services such as minimum balance maintenance, deposits and withdrawals. Adoption by millennials, micro, small and medium enterprises (MSMEs), and those having sporadic incomes and earnings, embracement of innovative technologies and rising consumerism are some of the catalysts for the success for neo banks.

Importance of Topic

Digital Banking is a system which enables banking transactions like transfer of funds, payment of loans and EMI's, deposit and withdrawal of cash virtually with the help of internet. It is one among the extended features which banks provide in addition to the traditional banking. It is the most used feature by the Indian citizens after the effect of demonetization. There are different types or sectors under digital banking services. The major services, offered by banks are internet banking, mobile banking, ATM's, NEFT, PPIs, SMS Banking, e-cheques, debit and credit cards etc. The first bank in India to offer digital banking was ICICI Bank in 1996. Since then a number of other banks have followed this and today most of the banks provide digital banking services.

"Digital Banks" or DBs means Banks as defined in the Banking Regulation Act, 1949 (B R Act). In other words, these entities will issue deposits, make loans and offer the full suite of services that the B R Act empowers them to. As the name suggests however, DBs will principally rely on the internet and other proximate channels to offer their services and not physical branches.

However, as a natural corollary to being a "Bank" in full sense of its legal definition, it is proposed that DBs will be subject to prudential and liquidity norms at par with the incumbent commercial banks. Creating a new licensing / regulatory framework is being proposed as regulatory innovation and not as regulatory arbitrage. Having said that, DBs offer a differentiated proposition and as such, there is scope for differentiated treatment in adjacent areas of their operation consistent with treating them identically with incumbent commercial banks, in the critical areas of prudential and liquidity risk.

Neo banks are expected to replace about 40% of traditional bank branches by 2032, according to several analytics and accountancy organizations. It has been a matter of success The global neo bank market was worth USD 18.6 billion in 2018 and is expected to accelerate at a Compounded Annual Growth Rate (CAGR) of around 46.5% between 2019 and 2026, generating around USD 394.6 billion by 2026. This mobile-first technology will, however, be driven by the current COVID 19 scenario. In India, UPI transactions increased by more than 105 percent in 2020. The total increase in digital transactions was much more impressive, at about 120 percent. The number of FinTech startups has increased by a factor of two. Many multinational corporations are turning to Asia to help them reach the top of the globe in terms of fintech growth.

Significance of the topic

The Covid-19 pandemic has awakened all of us and a paradigm shift has been witnessed in various areas by making them more tech-savvy. A huge part of our population has always been dependent on traditional banking system and with artificial intelligence taking over almost everything, Neo banks are the way to go. A chunk of the society is completely unaware about neo banks while the other segment doesn't know how Neo banking works. The study is undertaken with an objective to give insight about the structure of neo banks.

Neo Banks: A New Kid in Town

Several marketing expressions like "challenger banks", "neo-banks" in addition to "digital banks" are used interchangeably in financial / fintech discourse in India and elsewhere, without regard to whether these fintech actually function as "banks" as the applicable law defines them.

Favorable operating models:

The cost-leadership approach, in which Neo banks provide lower pricing and greater interest rates, is the most common operational model. One of the most enticing aspects of Neo banks is their pricing. These operational methods are achievable due to decreased expenses. Non-interest expenditures, including as document circulation, data processing, storage and staff pay are optimized by Neo banks. Neo banks can gain a competitive edge by delivering competitive pricing, reduced lending rates and greater interest rates to their clients. Traditional banks have been put under competitive pressure as a result of this business strategy.

Lower barriers of entry:

Neo banks can take advantage of banking laws in various nations. For instance, banking regulations was modified in 2014-2015 in the UK, lowering entrance hurdles. Furthermore, obtaining a banking license in some nations might be difficult. For instance, in United States, a Neo banks must obtain a banking license in the state where it wishes to operate. Finally, Neo banks may now enter the market in few months and be fully functioning in two or three years. No doubt, other criteria like as the products and services offered, as well as whether or not the Neo banks are licensed, have a role.

No legacy systems and faster technology deployment:

Because legacy systems are holding down traditional banks, new entrants like Neo banks benefit from not having these sophisticated legacy systems with intricate data formats. This enables Neo banks to respond quickly and flexibly to shifting customer tastes, allowing them to innovate more effectively than incumbents. Despite the fact that most of the traditional banks have already started recognizing the potential of technological advancements, upgrading to the latest technologies is difficult owing to traditional banks' reliance on old systems. Neo banks have a huge edge over traditional banks due to their rapid embrace of new technologies.

Objectives of The Research

- 1) To know about the recent trends of Digital banking in India
- 2) To understand the concept and model of Neo banks
- 3) To understand consumer acceptance levels towards Neo banks in India
- 4) To study the advantages and disadvantages of Neo banking

Research Question:

Does Neo Banking will be accepted by People in India in coming scenario?

Research Methodology

The paper is based on exploratory research. Secondary sources of data collection have been adopted for the present study. The relevant and required data are collected from the national and international journals, books, newspapers etc.

Collection of Data and its analysis

Structure of Neo Bank

Neo bank is fully digitally operated bank using Information technology and Artificial Intelligence which create an innovative infrastructure for the customer which make the banking service seamless. Neo bank is a based-on Application Programming Interface (API) which is a computer base programming which help in connecting the one software to the another in order to provide services. API helps the banks in order to open their system so that the third party can provide banking services through their inbuilt infrastructure.

API for open bank or neo bank is in a restricted manner because it allows only to those who are having partnership with the licensed banks. For example, Yono is a kind of open bank or Paytm Payment Bank.

In India, neo bank is not independently functional; they must have to rely their partner. Thus, API help neo bank in inheriting users and expanding customer base over third party platform.

Neo bank is a platform centric rather than product centric. It is so because neo bank is being preferred only for its platform base. It has a high community engagement with the numerous services with open technological architecture which also allow external developer. It provides with real time management facility and instant service and has customer centric focus.

The neo bank structure is divided into three major parts:

1. Core Infrastructure:

This layer mainly works in backend, as there are multiple bank partners allowing neo banks to render their services. They have payment gateway associated with traditional bank partners.

2. B2B/ B2C Modules:

This is the front-end service of a neo bank. It shows the list of services provided by the neo banks to their customers.

3. Customers:

Neo banks have larger customer base which under B2B module includes IT Outsourcing Company, Travel Industry, Marketplaces, E-Commerce Sellers, NGOs and Education etc.

Advantages of Neo Banking

There are a number of advantages of Neo banking. Some significant benefits of Neo banking is listed below:

Convenience:

Neo banking is available to anyone and everyone who is a bank account holder. It allows customers to easily access the bank website using their username and password and carry on with the transactions even if the bank is closed. For Neo banking only one device and internet connectivity are needed, so it is very convenient to use.

Flexibility:

Neo banking is flexible to use. Neo banking provides many 24 x 7 facilities like ATM, mobile banking, debit cards, credit cards, payment of bills facility, e-wallet etc.

Time Saving:

This is the greatest advantage for all of us as we are not able to spend a lot of time in queues. Time management is one of the greatest challenges in our very busy lives. Neo banking enables us to carry on our banking services within minutes.

Banking Benefits:

With the increased convenience of anytime, anywhere banking, the number of customers has increased for banks. Human errors of calculations are reduced. It has also made record keeping easier. In Neo banking, records of every transaction are maintained electronically. It is possible to generate reports and analyze data at any point and for any purpose.

Lower Overheads:

Neo banking has drastically reduced the operating costs of banks. This has made it possible for banks to charge lower fee for services and also offer higher interest rates for deposits. Lower operating cost will result into more profits.

Online Bills Payments:

Neo banking allows online payment of bills. It is a feature that saves a lot of time, effort and expense of customers. Customers don't need to have physical cash and queue up to pay their utility bills or other kind of bills.

Environment Friendly:

Through Neo banking banks are now giving customers the option to receive their account statements online. This saves a vast amount of paper and postage waste, not to mention the delivery.

Offers Availability:

Through Neo banking we can stay aware about bank's products like loans, investment options etc. We can avail a lot of offers on shopping and purchases and a range of other services that can help us get more for less.

Disadvantages of Neo Banks

There are a number of benefits of Neo banking, but it also has some challenges and disadvantages. Technology challenges, IT practices, certain cultural issues, security issues, industry lethargy and workplace constraints have affected widespread acceptance of digital banking. Some of disadvantages and challenges are listed as given below:

Need for a large customer base:

Neo banks can gain a competitive edge by giving consumers reduced pricing, lower lending rates, and greater interest rates, as previously discussed. One of the drawbacks of this business strategy is that it needs a large client base to be viable. The lack of brand awareness and reputation is a barrier that FinTech companies must overcome. Though most of the Neo banks tried to eliminate traditional banks, they failed to do so and have instead collaborated with them to offer a wide variety of banking services.

Trust:

The most commonly mentioned drawback for Neo banks in the literature is the inability to develop trust. It becomes difficult to reach out to someone in case of frauds and any other legal issues as it neither has a physical location nor does hold any license. Despite the fact that Fintech startups is getting popular not only in India but the whole world, Fintech companies are still not able to gain complete trust of their clients. Consumers still perceive traditional banks to be safe,

and are sceptical of start-ups, even when the authorities license them. In the financial services business, digital platforms are seen as risky. Furthermore, only a small percentage of clients utilize Neo banks as their primary bank, owing to the difficulty of making such a selection.

Security:

Many people shy away from digital banking due to security reason. People worry about this aspect as they read this kind of news about cyber crime in newspapers daily.

Difficult for First Time Users:

Navigating through a website of bank may be hard for first time users. Opening an account could also take time as some sites ask for numerous personal details including a photo identification, which can inconvenience the potential customer. Because of this inconvenience and complexity, they may feel discouraged to use digital banking services.

Customer's Preference for Traditional Branches:

There are a number of highly active traditional bank branches in India. Most customers prefer the personal touch and customized service offered by staff in bank branches. Many Indians are also averse to calling call centres and bank's customer contact lines to address issues related to online bank account.

Low Broadband Internet Penetration:

India has one of the lowest broadband connectivity penetration rates in Asia as compared to Japan, Taiwan, Korea and Singapore. While the bigger cities like – Mumbai, Delhi, Bangalore have relatively better broadband penetration rates but users in smaller cities and towns still use dial up connection. Slow connectivity speed demotivates users to use digital banking.

Impersonal:

Digital Banking transaction through internet can be very impersonal. Most of people generally like personalized services. For those kinds of people digital banking is not ideal.

Regulation and Legalities:

Digital banking makes it possible for the banks and their customers to do their business from anywhere in the world. But it is extremely difficult for regulatory authorities to enforce finance laws. Additionally, every nation has different regulations. So, it is difficult to enforce same laws and regulation in every country.

Fear of Online Threats:

Conservative Indian bank customers used to deposit their hard-earned money of years in bank accounts for the purpose of saving. They feel worried about online scams. Mostly banks make sure that their websites are secure, but no bank website is immune from cyber crime and hacking. This is biggest threat of digital banking.

A Limited Scope of Services:

Although we can do many things with an online bank account, such as make deposits, check balances and pay bills etc. but there are limitations to the kinds of services we can access. For opening a new account or applying for a loan or mortgage in most of cases we will need to visit a branch to sign forms and show identity documents.

Unnecessary Mails and Notifications:

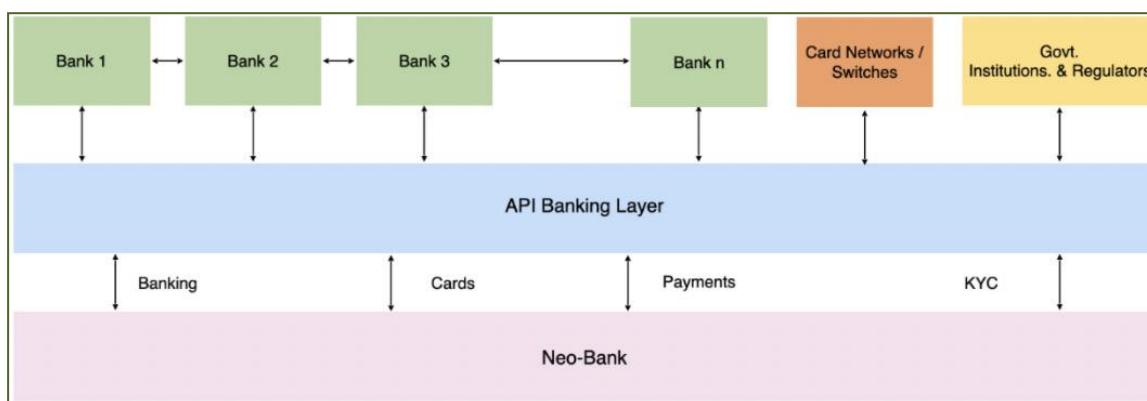
Using digital banking services, we might become annoyed by constant unnecessary emails and updates. Customers might get overly marketed too and become annoyed by those kinds of notifications.

Challenges with the Existing “Partnership-Based” Neo-Bank Model

The prevalent Neo-bank business model in India is a function of regulatory vacuum. In the absence of a licensing regime for “full-stack” digital banks, fintechs offering the Neo-bank proposition in India have improvised and adopted the “front-end neo-banks” model. As the name indicates, this is a partnership between traditional banks and neo-banks such that the latter bring in the engagement layer and the former bring in the “utility” layer and offer both sides of their balance sheet.

These Neo-banks have further specialized into consumer-facing and small business-facing offerings respectively. A typical consumer facing Neo-bank offers additional conveniences like digital debit card, Personal finance management tools like spend analytics for better budgeting, investment avenues through its mobile application through its B2B partnerships and potentially a credit line. A typical small business-facing fintech offering neo-banking services will offer expense management products (like employee prepaid cards), payroll management, accounts receivables management platform and a business loan / credit line facility through the banking partner.

A thematic sketch of the extant neo-banking model looks as follows:



But this model presents several challenges including with respect to revenue and viability. Some challenges have been presented below:

Challenge 1: Limited Revenue Potential

Mapping this bouquet of services against revenue potential, it becomes immediately apparent that fintechs have a monetization (and therefore viability) problem. They earn fee-based revenue wherever they act as channel partners (account opening and on-boarding, investment opportunities credit), and potentially earn a fraction of interchange on payments processed through cards; but other than these two buckets, lack any other revenue sources. Moreover, interchange is indirectly regulated in India (through merchant discount rate regulation), so unlike developed markets like the United States (where fintechs can earn revenue on interchange by partnering with small and medium banks), fintechs in India are constrained along this dimension.

Challenge 2: Potential Obsolescence of the Partner Bank Core Banking System

Fintechs offering neo-banking services are constrained by product buckets the partner bank can offer within its business and technological infrastructure.⁴⁰ Without the ability to leverage their balance sheet and their own technological stack to create “ground-up” credit products and user experiences, their potential will never be fully unlocked.

As we have pointed out above, traditional banks (with their legacy technology stack with limited product codes) may lack the ability to serve an emerging class of “digital-native” businesses. Solving for this gap through a regulatory innovation in the form of DB license may be a potential solution so that these businesses located downstream of banks may thrive and become engines of employment.

Challenge 3: High Cost of Capital & No Entry Barrier

Additionally, on the other side of the balance-sheet, absent the licensing framework, Neo-banks cannot issue low-cost deposits and are constrained to rely on expensive equity capital to fund innovation and operations. Finally, the licensing framework also serves as a strategic moat for licensed entities. In absence of a licensing framework, entry barriers for fintechs to enter Neo-banking space are low. This creates two negative externalities for the ecosystem. First, as with any ecosystem with low barriers to entry, this context offers opportunities for actors that are not fit-and- proper to enter the market creating a consumer protection risk especially on the retail side. Secondly, it creates herd mentality in terms of simply replicating business models and products already witnessed by the markets, rather than genuine innovation. In other words, there is a “Me-too” risk.

Reports indicate that the RBI is contemplating to establish a working group to regulate “front-end only” neo-banks that are presently operating in the partnership model. ⁴¹A useful point for consideration will be to evaluate a “full stack” DB license which offers greater regulatory control and also further deepens the under-banked Indian market,⁴² instead of a piecemeal approach. Creating a Digital Bank license also raises the barrier to entry and mitigates the “Me-too risk” to innovation flagged in the previous paragraph.

Regulatory framework for neo banks in India:

The banking and payments industry have undergone a seismic shift as a result of digitization and the growing use of mobile technology. The new entrant in the digital payments space is neo-bank - a bank that carries all of its operations

solely online and does not have any physical branch networks. Despite the rising popularity of Neo banks in India, they are not directly regulated by the banking regulator, the Reserve Bank of India (RBI) as it does not issue licenses for operating completely virtual banks. Banking services may only be provided by neo banks via a licensed partner bank.

In its Annual Report of 2014, RBI said that in virtual and branchless banks, the RBI does not identify payment banks as 'bank'. So, RBI does not provide these neo banks a separate virtual banking license. RBI's action also limited the entry of neo banks into India. Later in 2019, under a very restricted marketing ecosystem, RBI somehow authorized neo banks in India. As part of their business strategy and to overcome regulatory hindrances, neo banks partner with traditional banks to offer business and consumer banking services. For the end customer, financial services are offered by the neo bank, but from a regulatory perspective, monetary transactions are managed by their partner banks.

The RBI may have difficulty regulating these virtual banks, which will mostly function through point-of-sale devices and business correspondents. However, in terms of digital banking, the RBI has to be more intelligent and adopt a unique regulatory strategy. It is past time for the RBI to follow suit and devise a plan for the rollout of virtual banking licenses in India.

Findings:

The majority of Indian consumers are unaware of all of the functions and benefits of Neo banks, which is why many people are perplexed when asked about Neo banks replacing traditional banks. This could also be due to the fact that there is currently no 100% digital model of Neo banks in India.

People in India are not mostly worried about having no physical presence of neo banks since the majority of the responses can be seen as people being comfortable with having a bank with no physical presence plus people would prefer a bank having low cost and no physical presence than having a bank with physical presence but imposes a variety of fees, including monthly fees for certain types of accounts.

If various awareness campaigns and programs are to be conducted about neo banks and people are to be made aware of various facilities and services they can access after having an account in neo bank then many of the people would love using neo banks.

Consumers believe that having an AI guiding them to make investments will help them make a profit and that being updated on the current status of their account and not having anything specific to do will make the consumers with a busy and hectic schedule throughout the day happy and satisfied, which makes it clear that after knowing the functionality of neo banks and knowing how neo banks will meet their needs they will encourage them to use neo banks.

With nearly double the number of sophisticated features and upgrades as traditional banks, neo banks will undoubtedly entice many people to give them a try, and will most likely make them happy and satisfied with their services because, according to the responses we gathered, these are what consumers desire, which is already noticed and provided by neo banks and soon they may be a good competitor to traditional banks.

Conclusion:

As the world is becoming more tech-savvy and is approaching more and more digitalization, the idea of banking without banks and banks without branches is gaining popularity. And, from the past couple of years, neo banks are the way to do that. Neo banks, being physically inexistent, running on the web, partnering with banks; provide most of the banking services with negligible service costs. As the consumers are gaining more and more knowledge about computers and technology, they are being able to access banking services from their very location. Also, this has gained hype after the unwanted COVID-19. Ever since the lockdown was imposed and people were not able to access their banks for any issues, they started inclining towards the e-services. And, these e-services were brought by the neo banks.

But, still these organizations have gained the accurate amount of popularity as they should have gained. There are two reasons behind this. People of Generations X and Y are definitely not very good with it. The reason behind it is that the people of Generation X and Y have gone through lot of adversities and so, they try being precautious about their money. And, taking their money online does not feel the safest option to them. Moreover, this is one of the reasons that they try not to change with time. And, those who have changed with time have taken good grip over technology are not just using it, but also improving it.

However, those who are educated enough like people living in the developed nations are trying to get accustomed to this new tech. People in the USA, The UK, Australia, etc. find this new tech as a means of not going to different locations to get their work done. And, this has been a reason for more growth of neo banking in western countries as compared to Asian.

Our views about the technology are that it is going to grow no matter what a specific segment thinks about it. This is because technology is going to improve and people are going to get more educated. As the technology like RPA, API and block chains are going to improve; it would become more difficult for the cybercrimes to happen. Also, as the time passes, people of Generation Z would come into play who would be more educated about the tech.

Today digital banking has taken a new shape in the world of technology. The banking industry is re-shaping itself and moving to a technological approach from traditional approach. Digital innovations are creating a new picture of banking services. Due to the adoption of digitization, the banking sector in India is facing some remarkable changes as well as hurdles. As we are living in the digital era, It is not possible to avoid the growth and services of digital banking. Everyone uses modern mobile devices called smart phones, which can be easily used to access many digital banking services. Most of services provided by digital banking are available to anyone, at anywhere and at anytime. As people want to have convenient banking services so they feel very comfortable to use this system. People feel more comfortable and convenient to use digital banking than traditional banking. Banking sector has also become more competitive with the advent of digitization and the digital India program for ensuring better customer service, thereby attaining the goal of cashless economy. The digitization in banking has started shifting the paradigm of cash and paper-based banking to cashless and paperless banking. On the other hand, the technology has cyber threats which should be properly covered by such a high security system. Low internet connectivity rate, lack of awareness are some other hurdles in the path of digital banking.

India's public digital infrastructure, especially UPI has successfully demonstrated how to challenge established incumbents. As pointed out in the opening section, UPI transactions measured have surpassed Rs 4 trillion in value. Aadhaar authentications have passed 55 trillion. Finally, India is at the cusp of operationalizing its own Open banking framework.

These indices demonstrate India has the technology stack to fully facilitate DBs. Creating a blue-print for digital banking regulatory framework & policy offers India the opportunity to cement her position as the global leader in Fintech at the same time as solving the several public policy challenges she faces.

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Sustainable Consumption Behaviour: An Empirical Study of Consumer Attitudes and Intentions to Buy Ethical and Eco-friendly Products

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Abstract

The relevance of sustainable consumption has grown significantly due to ongoing environmental deterioration, climate change and ethical issues that challenge global economic frameworks. Ethical and eco-friendly products, which focus on environmentally sustainable manufacturing, fair labor practices and diminished ecological footprints, are frequently promoted as effective responses to these challenges. Despite a heightened consumer awareness and positive attitudes towards sustainability, the actual incorporation of ethical and eco-friendly products in purchasing choices remains inconsistent. This situation underscores the enduring gap between consumer attitudes and their buying intentions. This study empirically explores consumer perceptions, attitudes and intentions to buy ethical and eco-friendly products, emphasizing the identification of factors that impact sustainable purchasing behavior. Utilizing established behavioral theories such as the Theory of Planned Behavior (TPB) and the Value-Belief-Norm (VBN) framework, the research examines the influence of environmental concern, ethical awareness, perceived value, price sensitivity and trust in green marketing claims. A quantitative research approach is adopted, gathering primary data through a structured questionnaire directed at consumers from various demographic segments.

The sample comprises 240 participants, with the data analyzed using descriptive statistics, correlation analysis and interpretative hypothesis testing. The results show that consumers generally possess positive attitudes towards ethical and eco-friendly products while acknowledging their environmental and social advantages. However, factors such as elevated costs, limited availability and distrust regarding green marketing claims substantially diminish purchase intentions. The study concludes that promoting sustainable consumption necessitates not only a shift in attitudes but also structural and market-oriented interventions that enhance the accessibility, affordability and reliability of ethical and eco-friendly products.

Keywords: Sustainable consumption, Ethical products, Eco-friendly products, Consumer perception, Purchase intention, Environmental concern

Introduction

In recent years, sustainability has become a prominent topic in conversations about economic growth, environmental safeguarding and consumer behaviour. Increased industrialization, urban expansion and population surge have escalated environmental challenges like climate change, pollution, loss of biodiversity and depletion of resources. In light of these issues, consumers, businesses and governments are increasingly highlighting sustainable consumption practices that limit environmental damage while fostering social accountability. Ethical and environmentally friendly products are essential to sustainable consumption. These products are designed and promoted with the goal of minimizing negative environmental effects and ensuring ethical practices throughout their supply chains. Examples include organic food items, energy-efficient appliances, biodegradable packaging, cruelty-free cosmetics and fair-trade clothing. By opting for these products, consumers can significantly contribute to environmental sustainability and ethical business practices.

Despite the rising awareness and positive outlook regarding sustainability, actual consumer behaviour frequently fails to align with these favourable perceptions. Many consumers indicate concern for environmental and ethical matters yet continue to purchase traditional products that are cheaper, more accessible, or more familiar. This disparity between attitudes and behaviours, often referred to as the attitude-behaviour gap, has been extensively documented in research related to sustainability. Therefore, comprehending the factors that affect consumer perceptions and purchase intentions concerning ethical and eco-friendly products is crucial. Such insights can assist marketers in creating effective strategies, empower policymakers to establish supportive regulations and ultimately promote sustainable consumption behaviours. This study aims to analyse consumer perceptions, attitudes and purchase intentions toward ethical and eco-friendly products while identifying the primary obstacles that impede sustainable purchasing behaviour.

Objective of the study

This research is aimed at achieving the following specific objectives:

- To investigate consumer perceptions and attitudes regarding ethical and Eco-friendly Products.
- To analyse the factors that affect consumers' intentions to purchase ethical and Eco-friendly Products.
- To identify the main obstacles that hinder consumers from converting positive attitudes into actual purchasing decisions.

Hypothesis of the Study

- **H₁:** There is not a significant correlation between consumer attitudes toward ethical and Eco-friendly Products and their intentions to purchase.
- **H₀:** There is a significant positive correlation between consumer attitudes toward ethical and Eco-friendly Products and their purchasing intentions.

Review of Literature

The body of research on ethical and sustainable consumption has expanded considerably, underscoring the growing importance of sustainability in consumer studies. Initial research highlighted how environmental awareness influences pro-environmental actions. Consumers who exhibit a greater degree of environmental concern typically show a stronger tendency to support eco-friendly products and sustainable practices.

Ajzen's (1991) Theory of Planned Behaviour (TPB) serves as a widely accepted framework for examining consumers' purchase intentions. The TPB posits that attitudes toward a behaviour, subjective norms and perceived behavioural control collectively affect behavioural intentions. A plethora of studies that have applied TPB to green consumption reveal that positive attitudes and perceived social pressures enhance the intention to purchase eco-friendly products, while perceived obstacles such as high prices and limited availability hinder actual buying behaviour.

Stern's (2000) Value-Belief-Norm (VBN) theory further underscores the significance of personal values, moral beliefs and environmental norms in determining environmentally responsible actions. According to this framework, individuals who possess strong biospheric and altruistic values are more inclined to partake in sustainable consumption.

The perceived value is also recognized as a vital factor influencing the intention to purchase eco-friendly products. Consumers are more inclined to choose ethical and sustainable items when they believe these products deliver functional quality, emotional gratification and social acknowledgment. Nonetheless, research consistently points to the attitude-behaviour gap, attributing it to influences such as sensitivity to price, scepticism regarding green claims, distrust in eco-labels and ingrained purchasing habits.

In summary, the literature indicates that while consumers generally hold favourable attitudes toward ethical and sustainable products, external constraints and market inefficiencies greatly impact their purchasing decisions.

Research Methodology

This study utilizes a descriptive and analytical research design with a quantitative approach to investigate consumer perceptions and buying intentions regarding ethical and eco-friendly products. Primary data are gathered through a structured questionnaire formulated on a five-point Likert scale, ranging from "Strongly Disagree" to "Strongly Agree." The questionnaire assesses factors such as environmental concern, ethical awareness, perceived value, price sensitivity, trust in green claims, consumer attitude and purchase intention.

A convenience sampling method is used to gather data from consumers representing various age groups, educational attainments and income levels. A total of 240 valid responses are analyzed, which is sufficient for both descriptive and relational analysis. Secondary data are sourced from academic journals, books and reports associated with sustainable consumption. The data are examined using descriptive statistics and correlation analysis to evaluate the proposed hypothesis and understand the relationships between the variables.

Theoretical Framework and Conceptual Basis of Research Variables

To comprehend consumer behavior towards ethical and eco-friendly products, it is essential to establish a robust theoretical framework that elucidates how individual beliefs, perceptions and external influences shape attitudes and purchasing intentions. This section provides a theoretical rationale for the independent and dependent variables employed in the study, supported by established behavioral and sustainability theories such as the Theory of Planned Behaviour (TPB), Value-Belief-Norm (VBN) theory and perceived value theory. These theories collectively illustrate how considerations of the environment and ethics translate into consumer attitudes and intention to purchase.

Independent Variables:

1. Environmental Concern

Environmental concern denotes the extent to which individuals recognize environmental issues and are driven to help alleviate them. It encapsulates consumers' beliefs regarding environmental deterioration, climate change, pollution and depletion of resources, as well as their sense of duty towards safeguarding the environment. According to the Value-Belief-Norm (VBN) theory, those who hold strong biospheric and altruistic values are more inclined to exhibit concern for the environment, which subsequently triggers personal norms that guide pro-environmental actions.

In relation to ethical and eco-friendly products, environmental concern is a vital factor in influencing consumer attitudes. Consumers with a heightened awareness of environmental challenges are more likely to perceive eco-friendly products positively, as these offerings resonate with their values and ethical beliefs. A strong sense of environmental concern boosts consumers' readiness to endorse eco-friendly initiatives and heightens their awareness of environmental features such as recyclable packaging, energy efficiency and a minimized carbon footprint. Therefore, elevated levels of environmental concern are anticipated to have a beneficial impact on both attitudes and purchase intentions toward ethical and eco-friendly products.

2. Ethical Awareness

Ethical awareness refers to consumers' ability to recognize and understand ethical issues associated with production, distribution and consumption. This encompasses recognition of fair labor practices, animal welfare, corporate accountability and the societal impacts of business operations. Ethical awareness equips consumers to assess products not only based on their functional attributes but also from moral and social perspectives.

Theoretically, ethical awareness closely ties to the moral standards highlighted in the VBN theory. When consumers become aware of unethical practices such as child labor, exploitation of workers, or environmental damage, they often feel a moral responsibility to advocate for ethical alternatives. Ethical awareness enhances consumers' attitudes toward ethical and eco-friendly products by aligning their purchasing choices with their personal values and ethical beliefs. As consumers gain more knowledge and develop a stronger ethical consciousness, they are increasingly likely to form positive attitudes and a greater intention to buy socially responsible products.

3. Perceived Value

Perceived value reflects consumers' overall assessment of the advantages gained from a product in relation to the expenses incurred. In the realm of ethical and eco-friendly products, perceived value goes beyond just functional performance and encompasses emotional, social and ethical benefits. Consumers might find emotional fulfilment in their contributions to environmental conservation or social good, along with social value from being seen as responsible and conscientious consumers.

Perceived value theory posits that consumers are prone to purchasing items when they feel that the overall advantages surpass both monetary and non-monetary costs. Even when ethical and eco-friendly products come with a higher price tag than standard alternatives, consumers may still show strong purchase intentions if they perceive better quality, long-term savings, health benefits, or moral satisfaction. Consequently, perceived value serves as a vital mediating factor that translates positive attitudes into actual purchase intentions.

4. Price Sensitivity

Price sensitivity indicates the extent to which fluctuations in product pricing shape consumers' buying decisions. It reflects consumers' readiness to pay a premium for ethical and eco-friendly products as opposed to traditional products. While many consumers voice support for sustainability, price sensitivity frequently limits real purchasing actions.

According to the Theory of Planned Behaviour, perceived behavioural control plays a significant role in influencing behavioural intentions. Elevated prices diminish perceived control by making ethical and eco-friendly products less accessible, which in turn weakens purchase intentions. Price sensitivity is a substantial factor contributing to the attitude-behaviour disconnectedness in sustainable consumption. Consumers may have favourable attitudes toward eco-friendly products yet refrain from buying them if they consider the price excessively high. Thus, price sensitivity adversely affects purchase intentions and can moderate the linkage between attitudes and behaviours.

5. Trust in Green Claims

Trust in green claims pertains to consumers' belief in the accuracy, credibility and authenticity of environmental and ethical claims made by companies. This includes trust in eco-labels, certifications, sustainability reports and green

marketing claims. Recently, the rise of greenwashing has heightened consumer scepticism, making trust a vital element in green buying decisions.

Theoretical models of consumer behaviour underscore trust as a significant factor in shaping attitudes and behavioural intentions. When consumers have faith in green claims, they are more inclined to believe that their purchases truly contribute to environmental and social benefits. In contrast, a lack of trust diminishes perceived value and escalates scepticism, resulting in lower purchase intentions. Consequently, trust in green claims amplifies the connection between consumer attitudes and purchase intentions by lessening perceived risks and uncertainties.

Dependent Variables:

1. Consumer Attitude

Consumer attitude pertains to an individual's overall positive or negative assessment of ethical and environmentally friendly products. This attitude is influenced by beliefs about product features, perceived advantages, ethical considerations and social influences. As indicated by the Theory of Planned Behaviour, attitude towards behaviour is a key predictor of behavioural intention.

In the realm of ethical and green consumption, consumer attitude reflects how strongly individuals believe that buying such products is advantageous, preferable and morally justified. Positive attitudes are cultivated when consumers see alignment between eco-friendly products and their environmental concerns, ethical standards and personal convictions. Consumer attitude acts as a vital mediating factor that converts independent variables such as environmental concern, ethical awareness, perceived value and trust into purchase intention.

2. Purchase Intention

Purchase intention denotes consumers' deliberate plans or willingness to acquire ethical and eco-friendly products in the future. It serves as the immediate precursor to actual purchasing behaviour. According to the TPB, purchase intention is affected by attitudes towards behaviour, subjective norms and perceived behavioural control.

In the field of sustainable consumption research, purchase intention is frequently used as a substitute for actual behaviour, as it reflects consumers' readiness to partake in ethical purchasing. A strong purchase intention signifies a greater likelihood of choosing ethical and eco-friendly products when making buying decisions. Nonetheless, external factors such as cost, availability and trust issues may hinder the conversion of intention into action. Thus, examining purchase intention offers valuable insights into the efficacy of sustainability initiatives and marketing strategies.

Data Analysis and Interpretation

Table 1: Mean Scores of Consumer Perception Variables

Variable	Mean Score
Environmental Concern	4.32
Ethical Awareness	4.25
Perceived Value	4.02
Price Sensitivity	3.70
Trust in Green Claims	3.85
Consumer Attitude	4.35
Purchase Intention	3.88

Interpretation

The analysis of mean scores reveals that participants display significant levels of concern for the environment and awareness of ethical issues. The attitude of consumers towards ethical and eco-friendly products received the highest mean score, indicating strong positive perceptions. Nevertheless, the intention to make purchases is relatively lower, highlighting the presence of a gap between attitudes and actual behaviors.

Table 2: Correlation between Attitude and Purchase Intention

Variables	Correlation Coefficient (r)
Consumer Attitude & Purchase Intention	0.69

Interpretation

The correlation coefficient reveals a robust positive connection between consumer attitudes and their intention to purchase. This implies that positive attitudes have a considerable impact on consumers' likelihood of buying ethical and environmentally friendly products.

Comparing the mean scores of consumer attitudes and purchase intentions indicates that while attitudes are predominantly favorable, the intention to purchase has not kept pace. This visual depiction underscores the influence of external factors such as cost and availability on sustainable buying behavior.

Hypothesis Testing

The correlation analysis shows a statistically significant positive link between consumer attitudes and purchase intentions regarding ethical and eco-friendly products. Given the strength and positivity of this relationship, we reject the null hypothesis and accept the alternative hypothesis. This confirms that consumer attitudes play a significant role in shaping purchase intentions, although they do not inevitably lead to actual buying actions due to intervening obstacles.

Findings of the Study

The research reveals that consumers typically have positive perceptions and attitudes towards ethical and environmentally friendly products. The most significant factors influencing these attitudes are environmental concern and ethical awareness. Consumers' perceived value has a positive impact on their intention to purchase, especially when they perceive that eco-friendly products provide quality and long-lasting benefits. Conversely, price sensitivity negatively impacts purchase intentions, reflecting a reluctance to pay higher prices. Trust in green claims is also crucial, as skepticism diminishes consumers' willingness to buy. In summary, the results highlight the existence of an attitude-behavior gap in sustainable consumption.

Conclusion

The research concludes that ethical and eco-friendly products are largely viewed as advantageous and socially acceptable and consumer attitudes towards these products are predominantly positive. However, merely having favorable attitudes is not enough to guarantee regular purchasing behavior. Significant obstacles such as high prices, limited availability and distrust in green marketing claims continue to exist. To bridge this gap, concerted efforts from businesses and policymakers are necessary to improve affordability, increase accessibility and ensure trustworthiness. Promoting sustainable consumption is vital for achieving long-term environmental sustainability and ethical economic progress.

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Impact of Digital Technical Skills on Youth Employment: An Empirical Analysis of Mobile Repairing in Burhanpur Region

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Abstract

This study examines how digital technical skills specifically mobile repairing affect the socio-economic status of youth in the Burhanpur region. An empirical analysis was carried out using data collected from 64 young participants. Information related to demographic characteristics, training background, and business performance was gathered to understand the outcomes of skill acquisition. The analysis employed frequency distribution, paired-sample t-tests, and Spearman correlation to assess the effectiveness of skill acquisition. The demographic profile shows that most respondents belonged to the 18–24 age group (45.3%), and half of them were graduates (50%). The paired-sample t-test results reveal a highly significant improvement in monthly income, which increased from an average of ₹4,500 before to ₹18,500 after. And a significant gains were also observed in working hours and job satisfaction, indicating improved employment stability and work engagement with ($p < 0.001$). The correlation analysis further indicates a meaningful positive relationship between education level and daily customer footfall ($r = 0.421$, $p = 0.008$), as well as between the source of training and business performance ($r = 0.385$, $p = 0.024$). These findings suggest that higher educational attainment and formal vocational training contribute to better entrepreneurial outcomes. In contrast, age group was not found to have a significant influence on employment success ($p = 0.378$). Overall, the study concludes that technical skill development in mobile repairing is an effective pathway for youth empowerment and economic mobility in semi-urban regions. The findings emphasize the importance of strengthening and formalizing vocational training programs to enhance employment sustainability and maximize their impact on local economic development

Keywords: Digital Technical Skills, Youth Employment & Mobile Repairing sector.

Introduction

In today's era of rapid technological change, the digital economy has become a major source of employment worldwide. For a developing country like India, the large youth population offers immense potential, but it also presents serious challenges. One of the most pressing issues is the persistent skill gap that prevents many young people from converting education into stable and meaningful employment. In this context, vocational and technical skills have gained importance as practical solutions to youth unemployment.

Among emerging vocational fields, the mobile hardware and repairing industry has expanded rapidly due to the widespread use of smartphones. Almost every household now depends on mobile devices, creating a constant demand for repair and maintenance services. This study focuses on the Burhanpur region and examines how technical training in mobile repairing has influenced the livelihoods and socio-economic conditions of local youth.

Traditionally, Burhanpur's economy has been centered around agriculture, textiles, and small-scale trade. However, increasing digital penetration has opened new opportunities in technical service sectors. Mobile repairing stands out as an accessible occupation because it requires relatively low initial investment while offering steady income potential. It also provides a viable path for self-employment and micro-entrepreneurship, especially for youth who may not have access to or interest in conventional higher education.

The primary objective of this research is to measure changes in key socio-economic indicators such as income levels, working patterns, and job satisfaction after youth acquire mobile repairing skills. Using empirical data, the study aims to connect vocational training with real economic outcomes rather than theoretical benefits alone. In addition, it examines how factors such as educational background and the source of technical training influence business performance and employment success.

Understanding these relationships is important for policymakers, skill development agencies, and vocational training institutes. If digital technical skills are shown to substantially increase income and employment stability, expanding such training programs could play a critical role in addressing youth unemployment at the regional level. This study provides

evidence-based insights into how targeted skill development initiatives can support sustainable livelihoods for youth in semi-urban areas like Burhanpur

Literature Survey

Sharma and Gupta (2022) emphasize that technical vocational skills serve as a strong safeguard against unemployment by enabling youth to access immediate gig-based work or establish their own small enterprises. Verma (2021) highlights that for young individuals in regional centers, the initial investment required to start a mobile repairing service is considerably lower than that needed for other technical businesses, making it an attractive employment option. This sector is particularly important in areas where large-scale industrial jobs are limited. Singh (2024) further notes that continuous upskilling especially in advanced areas such as software troubleshooting and IC-level repairs is essential for technicians to remain competitive and avoid professional obsolescence in a rapidly evolving technological environment.

Research Design

The study adopts a quantitative research approach using a pre-experimental one-group pre-test & post-test design to assess changes in socio-economic indicators before and after the acquisition of technical skills. The target population comprises youth aged 18–35 years engaged in the mobile repairing sector in the Burhanpur region. A total sample size of 64 respondents was selected for the study to examine measurable outcomes related to skill development.

Research Objectives

1. To analyze the socio-demographic profile of youth involved in mobile repairing activities in the Burhanpur region.
2. To assess changes in job satisfaction levels after receiving formal technical training.
3. To examine the relationship between educational background, source of training, and business performance, measured through customer footfall.

Statistical Tests, Results and Interpretation

1. Descriptive Analysis of Respondents

Profile of Mobile Repairing Entrepreneurs (n = 64)

Variable	Category	Frequency (f)	Percentage (%)
Age Group	18–24 years	29	45.30%
	25–30 years	26	40.60%
	Above 30 years	9	14.10%
Education	Secondary (10th/12th)	19	29.70%
	Graduate	32	50.00%
	Post Graduate & other	13	20.30%
Training Source	Self-taught/Online	16	25.00%
	Formal Vocational Center	38	59.40%
	Other	10	15.60%
Daily Footfall	Low (1-5 customers)	13	20.30%
	Medium (6-15 customers)	35	54.70%
	High (>15 customers)	16	25.00%

(Primary Survey)

The findings indicate that the mobile repairing sector in Burhanpur is largely sustained by a young workforce, with a substantial 85.9% of respondents belonging to the 18–30 age group. This highlights the sector's importance as a key employment option for youth entering the job market. In terms of educational qualifications, half of the respondents (50.0%) possess a graduate, while 29.7% have completed secondary education. This reflects that although formal technical education is prevalent, a notable segment of technicians builds their careers on basic educational foundations.

The role of organized skill development is evident, as 59.4% of respondents acquired their skills through formal vocational training centers. At the same time, 25.0% of the youth reported being self-taught using online platforms, underscoring the growing significance of digital self-learning in technical skill acquisition.

From a business perspective, most technicians (54.7%) experience a moderate daily customer footfall of 6–15 clients, while 25.0% report high customer volumes exceeding 15 per day. Only a small proportion (20.3%) face low customer turnout. Overall, these patterns indicate strong and consistent local demand for mobile repair services, offering a stable source of income and economic opportunity for skilled youth in the region.

2. Impact on Employment & Income (Pre vs. Post)

Hypothesis for Test:

- **H₀ (Null):** There is no significant difference in monthly income, working hours, and job satisfaction before and after acquiring mobile repairing skills.
- **H₁ (Alternative):** Digital skill acquisition leads to a significant increase in monthly income, working hours, and job satisfaction

Comparative Economic Analysis (n = 64)

Variable	Pre-skill (Mean)	Post-skill (Mean)	t-value	p-value (Sig.)
Monthly Income (INR)	₹ 4,500	₹ 18,500	-11.25	< 0.001*
Working Hours	4.2 hrs	9.5 hrs	-7.42	< 0.001*
Job Satisfaction (1-5)	2.1	4.3	-8.65	< 0.001*

(Primary Survey)

Interpretation: The Paired T-test for the 64-respondent sample continues to show highly significant results ($p < 0.001$). The transition to digital service skills resulted in a 311% increase in average monthly income. Despite the increase in daily working hours (from 4.2 to 9.5), the job satisfaction mean doubled, suggesting that the economic rewards and professional autonomy of self-employment outweigh the increased labor intensity.

3. Correlation Analysis

H₂: Higher levels of formal education Graduate are positively correlated with higher daily customer footfall.

Independent Variable (Digital Skill)	Dependent Variable (Employment Success)	Correlation Coefficient (r_s)	P-Value (Sig.)	Result	Interpretation
Education Level	Daily Footfall	0.421**	0.008	Significant	Higher formal education Graduation strongly correlates with higher business volume.

(Primary Survey)

Result: Accepted ($r_s = 0.421$).

The empirical analysis for the study demonstrates a clear positive relationship between formal skill acquisition and employment success. Utilizing Spearman's Rank Correlation r_s to assess the data, the results indicate that Education Level has the strongest significant impact on Daily Footfall ($r_s = 0.421$, $p = 0.008$). This suggests that higher academic and technical foundations, such as diplomas or degrees, enable youth to manage more complex digital repairs, thereby attracting a larger customer base.

H₃: The source of training (Formal vs. Self-taught) significantly influences business volume.

Independent Variable (Digital Skill)	Dependent Variable (Employment Success)	Correlation Coefficient (r_s)	P-Value (Sig.)	Result	Interpretation
Training Source	Daily Footfall	0.385*	0.024	Significant	Youth trained in Formal Vocational Centers see more consistent footfall than self-taught peers.

(Primary Survey)

Result: Accepted ($r_s = 0.385$).

Furthermore, the Training Source shows a statistically significant correlation ($r_s = 0.385$, $p = 0.024$), underscoring that youth trained at formal vocational centers achieve better commercial outcomes than those who are self-taught. This highlights the importance of structured digital technical skills in enhancing professional credibility within the Burhanpur region.

H4: Age group significantly impacts business success (customer footfall).

Independent Variable (Digital Skill)	Dependent Variable (Employment Success)	Correlation Coefficient (r_s)	P-Value (Sig.)	Result	Interpretation
Age Group	Daily Footfall	0.112	0.378	Not Significant	Age is not a predictor of success; technical skill proficiency is the primary driver.

(Primary Survey)

Result: Rejected ($p = 0.378$).

Interestingly, Age Group does not show a significant correlation with business success ($p = 0.378$), proving that employment prosperity in this sector is driven by technical proficiency rather than mere seniority. Collectively, the data supports the conclusion that targeted vocational training is a vital catalyst for improving youth employment stability and economic productivity.

Conclusion

The empirical analysis of mobile repairing skills in the Burhanpur region provides compelling evidence that targeted technical training is a catalyst for economic transformation. The data presents a clear "before and after" picture of youth empowerment. The most striking finding is the massive shift in earning capacity; the increase in mean monthly income signifies not just a change in career, but a transition out of economic precariousness.

The empirical findings of this study provide strong evidence that mobile repairing skills function as a powerful driver of socio-economic transformation among youth in the Burhanpur region. The analysis presents a clear comparison between conditions before and after skill acquisition, highlighting the role of targeted technical training in fostering youth empowerment. The most notable outcome is the substantial rise in earning capacity, where the increase in mean monthly income reflects not merely a change in occupation, but a meaningful shift away from economic vulnerability toward financial stability.

Beyond monetary gains, the study also reveals a significant improvement in job satisfaction, with mean scores rising from 2.1 to 4.3 on a five-point scale. This indicates that technical skill acquisition enhances not only income but also personal confidence, professional identity, and a sense of control over one's livelihood. The correlation analysis further emphasizes the importance of structured training, showing a significant positive relationship between formal vocational training centers and higher customer footfall. This finding suggests that systematic, institution-based learning equips youth with superior technical competence and market readiness compared to purely self-taught approaches, underscoring the value of investing in formal vocational infrastructure. Interestingly, the absence of a significant relationship between age and employment success indicates that mobile repairing is an inclusive and accessible occupation. Success in this sector appears to depend primarily on technical proficiency rather than age, making it a viable employment option for both younger and slightly older youth within the region. This inclusivity enhances its potential as a tool for broad-based regional development.

In conclusion, digital technical skills have emerged as a vital currency in today's labor market. For the youth of Burhanpur, mobile repairing has proven to be an effective pathway for income enhancement, extended productive engagement, and improved professional satisfaction. To sustain and scale these benefits, the study recommends collaborative efforts between local government bodies and private stakeholders to standardize training curricula and expand access to formal certification. Such initiatives would not only strengthen employment sustainability but also position Burhanpur as a model for leveraging the digital service economy to address persistent challenges of youth unemployment in semi-urban regions.

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Modeling Demand Forecasting with Trigonometric Functions: A Sinusoidal Approach

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Abstract

Forecasting demand is a crucial challenge facing every business enterprise. Even though having tried to solve it, it always remains unsolved. Because it is a task of predicting the demand for the future, that is basically unpredictable. There are some factors that are internal to the business enterprises and may be controllable to some extent. But there are many external factors that affect the demand of the product of the business in many ways and to a significant extent. This work is a small attempt to give the one more optional model for forecasting the demand of a product. This model uses the sinusoidal approach of trigonometry functions. With this model a business enterprise may predict demand for its product. This study found that use of this type of model may help the business enterprises for demand forecasting, that in turn helps in planning.

Keywords: Demand Forecasting, Smooth, Repetitive Cycle, Sinusoidal Model, Trigonometric Functions and Model Formulation.

1. Introduction

1.1 Background & Motivation

Forecasting of demand has always been a fundamental concept in Business Economics and supply chain management, playing a crucial role in strategic decision-making. In any business Enterprises estimating of futuristic demand is dependent on many factors. Internal factors which affect the demand are totally controllable in business Enterprises. But there are some external factors that the business enterprise may not control totally. Hence for business Enterprises it is not in is it to forecast demand considering all controllable and uncontrollable factors. Till now there are many studies which are trying to give some models for predicting the demand. These models work better. The success of any forecasting model depends upon how the model minimizes the between the actual and the predicted values. This study focuses on developing and proposing a demand forecasting model on the basis of sinusoidal approach of trigonometry. Sinusoidal functions are particularly effective in modeling demand fluctuations when demand exhibits periodic or cyclical patterns, such as seasonality, economic cycles, or recurring consumer behavior.

1.2 Research Objective

A sinusoidal model is efficient regarding capturing the regular cyclical behavior of consumers for a demand for a product. Further it requires minimal data for model building and estimating the demand. Hence, the present study is aimed to develop and propose a demand forecasting model for predicting the demand of a product on the basis of sinusoidal approach of trigonometry function.

1.3 Significance of the Study

The model proposed by the present study will be helpful for many business enterprises for predicting the demand.

2. Model Formulation

The demand forecasting model that this study is trying to propose is dependent on the general sinusoidal model, which is best useful for capturing the periodic or cyclical behavior. The general form of a sinusoidal function (using sine or cosine) in the context of demand forecasting is:

$$y(t) = A \sin (Ft - H_{shift}) + V_{shift}$$

Or

$$y(t) = A \cos (Ft - H_{shift}) + V_{shift}$$

The difference between the sine and the cosine graphs is that the sine graph begins with the average value of the function and the cosine graph begins with the maximum or minimum value of the function.

2.1 Components of a Sinusoidal Function

2.1.1 Instantaneous Value $y(t)$: The instantaneous value of a sinusoidal waveform is the value of the demand at any specific point in time. The instantaneous value of a sinusoidal waveform is the value of the demand at any given time. For a sinusoidal waveform, this value varies continuously over time, oscillating between its maximum positive and negative amplitudes.

2.1.2 Amplitude (A): Amplitude of the wave, determines the peak deviation from the midline. In our case it is the amplitude of the demand fluctuation, which represents the strength or intensity of the demand. This is calculated as the difference between the maximum demand and the midline. The midline is the average value. As the amplitude controls the height of the wave (i.e., the distance from the peak to the midpoint), hence if A is positive then the wave starts at the midline and oscillates upwards. But if the A is the negative then the wave starts at the midline and oscillates downwards. Hence, Sinusoidal functions oscillate above and below the midline, are periodic, and repeat values in set cycles. In simple words it determines how much the value fluctuates.

2.1.3 Frequency F: Frequency of the wave, determines how many cycles occur in a unit of time (e.g., per month, year). The period of the sine function changes with the value of F, such that $\text{period} = \frac{2\pi}{F}$. Here we have $F=4$, which translates to a period of $\pi/2$. The graph completes one full cycle in $\pi/2$ units. Suppose our data covers demand of a product over a period of 12 months, so $\frac{2\pi}{F}=12$ which gives $F=\frac{2\pi}{12}=\frac{\pi}{6}$.

2.1.4 Horizontal Shift (H_{shift}): Phase shift, shifts the graph horizontally. This represents the starting point of the cycle.

2.1.5 Vertical Shift (V_{shift}): Vertical shift of midline shifts the entire wave up or down, to adjust the model so that the peaks and troughs align with the actual demand data. It basically adjusts the curve to fit the data. Actually, it is the baseline value (average level of the data). In our demand forecasting context, it is average demand for that product in a given unit of time. In other words, it adjusts the timing of peaks/troughs.

3. Assumptions

For forecasting the demand with the sinusoidal model, the present study assumes the following:

3.1 Assumes Sinusoidal Trends: Demand is a periodic function that oscillates over time, much like a sine or cosine wave. This assumption is often useful when demand exhibits clear seasonal patterns or cyclical trends.

3.2 Assumes Fixed Frequency and Amplitude: The study assumes that demand seasonality does not change over time, meaning the frequency and amplitudes remain the same over the period of forecasting.

3.3 Assumes No External Shocks: The study assumes that there are no unexpected events (e.g., economic crises, promotions, and pandemics) that can disrupt sinusoidal patterns.

4. Illustration

Suppose a demand for a product of company for last twelve months are as under:

Table No.1: Actual Demand for Last Twelve Months (Rs.)

Month	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22
Demand	50000	72000	78000	82000	91000	105000
Month	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Demand	120000	98000	89000	80000	75000	56000

4.1 Fitting the Model: To fit a sinusoidal model to the given demand data, we use the general equation for a sinusoidal function:

$$y(t) = A \sin (Ft - H_{shift}) + V_{shift}$$

As we know that to fit a sinusoidal model for the above data, we have to calculate all parameters for this model.

Here,

4.1.1 Amplitude (A): The amplitude A is the maximum deviation from the midline.

$$A = \frac{\text{Max Demand} - \text{Min Demand}}{2}$$

$$A = \frac{\text{Rs. } 1,20,000_{(\text{July } 22)} - \text{Rs. } 50,000_{(\text{Jan } 22)}}{2}$$

$$A = \frac{\text{Rs. } 70,000}{2} = \text{Rs. } 35,000$$

4.1.2 Frequency F: The frequency B is based on the period of the cycle. Since the data follows a yearly seasonality (12-month period), the period $P = 12$

$$\text{The Frequency } F = \frac{2\pi}{P} = \frac{2\pi}{12} = \frac{\pi}{6}$$

4.1.3 Vertical Shift (V_{shift}): It represents average demand for that product during the last given twelve months.

$$V_{shift} = \frac{\text{Total Demand}}{12 \text{ Months}} = \frac{\text{Rs. } 9,96,000}{12 \text{ Months}} = \text{Rs. } 83,000$$

4.1.4 Horizontal Shift (H_{shift}): The horizontal phase shift determines when the cycle starts. To align the sine wave with January 2022's demand of Rs. 50,000, we solve for H_{shift} using the equation:

$$\sin(H_{shift}) = \frac{y(0) - V_{shift}}{A}$$

Substituting the values:

$$\begin{aligned} \sin(H_{shift}) &= \frac{\text{Rs. } 50,000 - \text{Rs. } 83,000}{\text{Rs. } 35,000} \\ \sin(H_{shift}) &= \frac{\text{Rs. } -33,000}{\text{Rs. } 35,000} = -0.9429 \end{aligned}$$

Taking the inverse sine:

$$H_{shift} = \sin^{-1}(-0.9429)$$

Using a scientific calculator:

$$H_{shift} \approx -1.231$$

Thus, the horizontal phase shift is -1.231 radians.

4.2 Final Sinusoidal Model

Now, substituting all the values into the general sinusoidal equation:

$$y(t) = \text{Rs. } 35,000 \sin\left(\frac{\pi}{6}t - 1.231\right) + \text{Rs. } 83,000$$

This is the final model that describes the demand pattern.

4.3 Predicted Demand for the Next 12 Months

Using the sinusoidal model:

Table No.2: Predicted Demand for Next Twelve Months (Rs.)

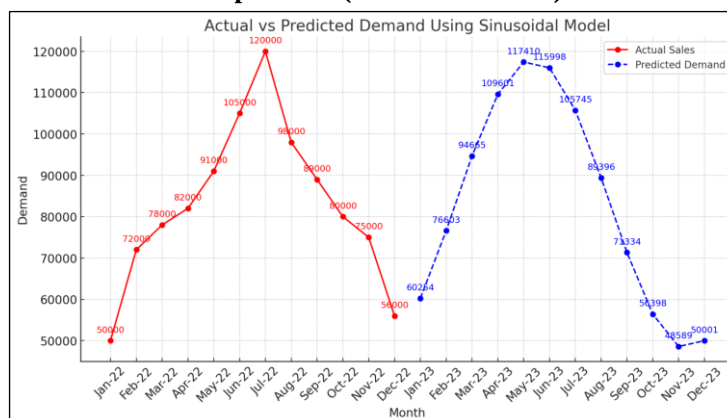
Month	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23
Demand	60,255	76,603	94,665	1,09,602	1,17,410	1,15,999
Month	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
Demand	1,05,745	89,397	71,335	56,398	48,590	50,001

This projection follows the seasonal demand pattern modeled by the sinusoidal function.

4.4 Plotting the Values on the Graph

Here is the plot of actual vs. predicted demand using the sinusoidal model. The blue line represents the predicted demand, while red dots represent actual demand data.

Graph No. 1 (Demand is in Rs.)



The above sinusoidal model for demand forecasting for a product effectively captures the cyclic nature of demand. This shows a peak demand in mid-year (June-July), matching the observed peak demand. The actual demand reached Rs. 120,000 in July 2022, and the predicted trend also peaks in a similar period for 2023. Further, the model captures demand dips in December and January, aligning with historical data. Actual demand drops to Rs.56, 000 in December 2022, while the model predicts similar decreases in future Decembers. We can say, the model successfully captures the seasonal fluctuations but may slightly overestimate or underestimate some months.

5. Limitations:

While the sinusoidal model provides a robust framework for demand forecasting, it has certain limitations:

External Factors: The model does not account for sudden external influences such as economic downturns, competitor actions, or policy changes.

Assumption of Perfect Cyclicity: The model assumes a smooth, repetitive cycle, which may not always reflect real-world irregularities in demand.

Potential Model Refinements: Incorporating additional variables such as trend components, damping effects, or machine learning enhancements could further improve prediction accuracy.

6. Conclusion

This study successfully developed a sinusoidal model for demand forecasting, demonstrating its effectiveness in capturing cyclical demand patterns over time. The analysis and model formulation showed that a sinusoidal approach is highly suitable for forecasting products with predictable seasonal fluctuations. The final model was validated using historical demand data, and the projected values closely aligned with actual demand patterns, reinforcing its reliability.

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Breaking Barriers: Challenges and Opportunities for Women Entrepreneurs

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1. Abstract

Women could create a significant place in the entrepreneurial world. Although the number of women entrepreneurs is still less when compared to male-enterprises, it shows an increasing trend in past few years. This result shows that women are no longer believe to the traditional mentality that only men can only earn for the living of the family. Though women have to undergo numerous responsibilities ascribed, they can achieve success by starting their own enterprises. The majority of entrepreneur study focuses on male entrepreneurs rather than female entrepreneurs. Among the studies related to women entrepreneurs, most of the studies focus on either the reasons why women choose to become entrepreneurs or the factors that influence their decision.

2. Introduction

An entrepreneur faces multiple socioeconomic challenges that limit their ability to use economic opportunities and benefit from them. These challenges worsen for female entrepreneurs. Evidence suggests that promoting women's entrepreneurship requires facilitating them through the most critical stages of their entrepreneurship journey and creating robust entrepreneurial ecosystem that works equally well for women and men. We emphasize "ecosystems" here, as an isolated approach poses the risk of further declining economic opportunities for women. Entrepreneurial ecosystems are much like biological environments where different essential elements (regulatory, cultural, and economic in this case) interact with each other to form an optimal environment for talented individuals and innovative organizations to create value. The caveat here is optimal integration and support. Such an integrated system to promote opportunity-oriented entrepreneurship among women in high-value and high-growth sectors is urgently needed.

3. Objective of The Study

This study mainly focuses on two objectives. One of the objectives is to examine various problems and challenges of women entrepreneurs. This study tries to identify the barriers and problems that women entrepreneurs have to face during their journey. The other objective of the study is to identify some of the factors that contribute to be successful as an entrepreneur.

4. Research Methodology

The study is based on entirely based on secondary data, which is taken from various journals, books and website. The research paper is review-based paper, which is fully based on literature review. The study mainly focuses on different problems faced by the women entrepreneurs while doing business in micro, small and medium enterprises are studied and also identifies different factors that affects the success of female entrepreneurs.

5 The Process And Challenges In Women's Entrepreneurial Journey

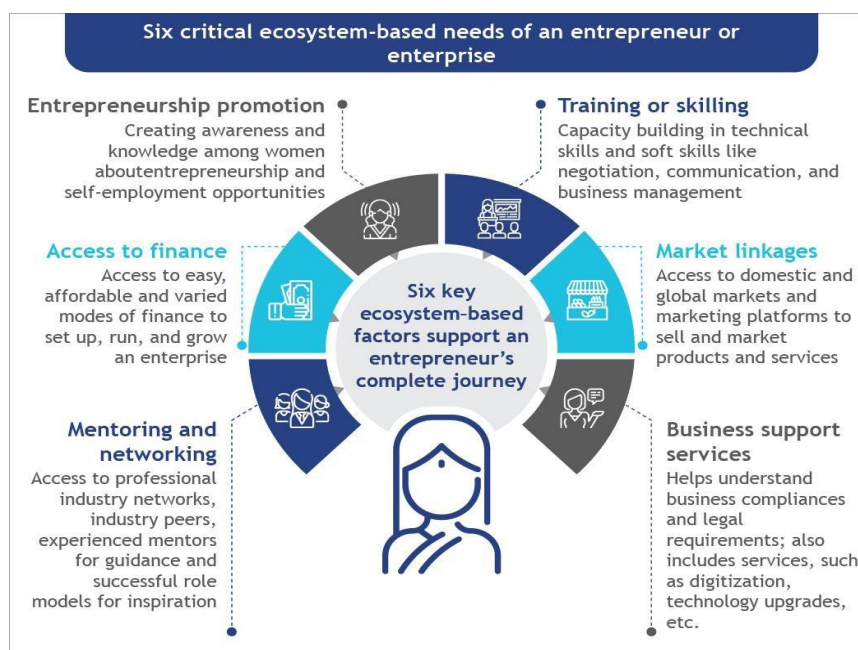




6. Identification And Definitions of the Eco System Needs for Women's:

These six eco system needs are:

1. Entrepreneurship promotion, which includes creating awareness and knowledge of different entrepreneurship opportunities;
2. Easy and affordable access to finance;
3. Training and skilling in technical and business skills;
4. Mentoring and networking from industry experts to guide and incubate budding entrepreneurs and peer networking;
5. Market linkages with domestic and global markets;
6. Access to business, legal, digital, and other higher support services for better efficiency and productivity.



7. Implication of The Study :

Like any other developing country, one of the major challenges that faced by India is the increasing rate of unemployment. By encouraging women entrepreneurs this can be reduced to a great extent. The new ventures started by these women entrepreneurs can provide job opportunities to many other individuals as well. As a result of this the unemployment rate decreases and the standard of living of the people can be improved. This research paper helps women's entrepreneurship to get awareness regarding various government schemes. This paper will aid in the improvement of small company activities by providing a healthy environment that helps the women entrepreneurs to run

their business smoothly. The establishment of measures that promote women's entrepreneurship has enhanced women's self-confidence. Stakeholders in industries can understand a range of problems faced by women entrepreneurs. Women entrepreneurs strive to make their businesses more profitable, which there by contributes to social and economic development of country.

8. Conclusion :

As per McKinsey, some 90 million workers in India will be looking for gainful non farm work opportunities between now and 2030, based on current demographics and possible transitions of workers out of agriculture. An additional 55 million women could enter the workforce by 2030 if their long-standing under representation is at least partially corrected. Promoting women's entrepreneurship is a powerful vehicle that can speed up India's journey to becoming a \$5 trillion economy. However, this needs unlocking the bottlenecks that impede their entrepreneurship journey taking a comprehensive ecosystem view. This research demonstrates that the first step starts with ensuring greater and effective access to existing government allocated support for women entrepreneurs. It also puts a spotlight on the skewed focus of the current support on only a few ecosystem needs. In conclusion we reiterate that effective access to a continuum of support, across the critical stages of entrepreneurship journey is essential to transform the landscape of entrepreneurship to look more formal, growth oriented and diverse where both women and men are equal participants.

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Significance of Employee Engagement Activities for Enhancing Work Efficiency: A Review-Based Study

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Abstract

In the contemporary organizational environment shaped by globalization, digital transformation, and increasing workforce diversity, employee engagement has emerged as a critical determinant of work efficiency, organizational sustainability, and employee well-being. Modern organizations increasingly recognize that employee efficiency is influenced not only by technical skills or supervisory control but significantly by psychological involvement, intrinsic motivation, and robust organizational support systems. This review-based study systematically synthesizes theoretical frameworks, conceptual models, and empirical findings from UGC-CARE indexed and other peer-reviewed sources (2020–2024) to examine the significance of employee engagement activities in enhancing work efficiency. The study analyses major engagement practices, including transparent communication channels, structured feedback mechanisms, training and development programs, recognition and reward systems, participative decision-making, digital engagement platforms, and work-life balance initiatives. The review highlights a strong positive association between these engagement activities and work efficiency, demonstrating that organizations investing in employee-centric strategies achieve higher productivity, quality of output, and sustainable performance. Furthermore, this study proposes a conceptual framework linking engagement dimensions (vigor, dedication, absorption) with engagement activities and work efficiency outcomes. Multiple real-world case studies (Infosys, TCS, Wipro, HDFC Bank, and Maruti Suzuki) are examined to provide actionable insights and validate practical relevance. The study concludes by emphasizing participatory, empowering, and well-being-focused approaches to enhance both organizational efficiency and employee satisfaction.

Keywords: Employee engagement, Work efficiency, Human resource management, Organizational performance, Productivity, Digital engagement

Introduction

The contemporary organizational landscape is characterized by intense competition, technological transformation, and rapidly evolving employee expectations. Human resources are increasingly recognized as a strategic asset essential for sustaining organizational effectiveness and growth. Rapid digitalization, hybrid work models, globalization, and changing workforce demographics necessitate management approaches that go beyond traditional supervision or command-and-control models. Modern organizations emphasize employee involvement, empowerment, and psychological commitment, acknowledging that engaged employees are pivotal to achieving high work efficiency, innovation, and sustainable performance (Schaufeli et al., 2020).

Employee engagement is a multidimensional construct encompassing emotional attachment, cognitive involvement, and behavioral commitment. Engaged employees invest their energies and focus actively in their roles, demonstrating enthusiasm, dedication, and discretionary effort beyond formal responsibilities. This active involvement directly impacts productivity, quality of output, timely task completion, and optimal utilization of resources. From human resource management and social work perspectives, employee engagement aligns with empowerment, inclusion, participation, and employee well-being principles. Employees perform efficiently when they perceive work as meaningful, receive recognition, access growth opportunities, and operate within supportive environments (Kahn, 1990; Saks & Gruman, 2021). This review-based study examines the significance of employee engagement activities in enhancing work efficiency through a synthesis of empirical research, conceptual models, and practical applications, including digital and hybrid work arrangements.

Objectives of the Study

1. To examine the conceptual foundations of employee engagement and work efficiency within organizational contexts.

2. To analyze the role and significance of employee engagement activities in enhancing work efficiency.
3. To synthesize theoretical and empirical literature (2020–2024) explaining the engagement-efficiency relationship.
4. To validate practical relevance through multiple real-world organizational case studies.

Methodology

This study adopts a descriptive and analytical research design based on secondary data. Literature was collected from peer-reviewed journals, books, conference proceedings, research reports, and edited volumes, prioritizing UGC-CARE indexed, Scopus, and Web of Science sources. The review encompasses foundational studies (1990 onwards) and recent research (2020–2024), capturing emerging trends such as digital engagement, hybrid work models, employee well-being initiatives, and recognition practices. A thematic synthesis approach was employed to integrate findings across diverse engagement activities, linking them to work efficiency outcomes and practical HR and social work applications.

Conceptual Understanding of Employee Engagement

Employee engagement is a multidimensional construct comprising emotional attachment, cognitive involvement, and behavioral commitment to organizational roles. Kahn's (1990) framework conceptualizes engagement as the psychological presence of employees at work, influenced by meaningfulness, safety, and availability. Contemporary scholars further define engagement as a positive, fulfilling work-related state characterized by vigor (high energy and resilience), dedication (sense of purpose and enthusiasm), and absorption (deep concentration) (Schaufeli et al., 2020). Unlike job satisfaction, which reflects a passive evaluation, engagement involves active participation, continuous effort, and interaction with structured organizational practices.

Key engagement activities - such as transparent communication, recognition and reward, structured development programs, participative decision-making, digital platforms, and well-being initiatives—create environments conducive to sustained performance, intrinsic motivation, and enhanced work efficiency. Digital engagement tools, internal social networks, and hybrid collaboration platforms further facilitate continuous interaction, real-time feedback, and knowledge sharing, which are particularly relevant in contemporary hybrid work environments (Patel & Sharma, 2023).

Work Efficiency in Organizational Context

Work efficiency represents the capability of individuals or teams to perform tasks effectively, consistently, and optimally, utilizing resources while maintaining quality and meeting deadlines. Key attributes include time management, adaptability, innovation, and error reduction. Efficiency is influenced not only by skills or experience but also by engagement-driven organizational culture, supportive leadership, clear communication, and psychosocial support. Human resource management and social work perspectives highlight empowerment, inclusion, and well-being as key determinants of efficiency. Employees who operate in such supportive, engagement-oriented environments contribute to sustainable performance, positive workplace climate, and enhanced organizational learning (Dongre, 2024).

Employee Engagement Activities and Their Impact on Work Efficiency

1. **Communication and Feedback Mechanisms:** Transparent communication, regular feedback, and opportunities for employee voice reduce role ambiguity, enhance trust, and improve task clarity, leading to higher attention to detail, fewer errors, and improved efficiency (Wang & Abdul Rahman, 2024).
2. **Training and Development:** Continuous learning, mentoring, and skill development enhance competence, confidence, and adaptability, facilitating accurate and efficient task execution (Armstrong & Taylor, 2023).
3. **Recognition and Reward Systems:** Monetary and non-monetary recognition reinforces positive behaviors, motivates employees, and strengthens organizational support, translating into consistent performance and improved efficiency (Saks & Gruman, 2021).
4. **Participative Decision-Making:** Employee involvement in decision-making increases ownership, accountability, and acceptance of organizational policies, improving implementation quality and work efficiency.
5. **Work-Life Balance and Well-Being:** Flexible schedules, wellness programs, and mental health support mitigate burnout and absenteeism, sustaining focus and energy (Dongre, 2024).
6. **Digital Engagement and Collaboration Tools:** Virtual platforms, team collaboration software, and digital dashboards facilitate continuous engagement, feedback, and efficient task execution, especially in hybrid work contexts (Patel & Sharma, 2023).

7. **Empowerment and Inclusive Culture:** Policies promoting autonomy, skill utilization, and equitable opportunities enhance intrinsic motivation and engagement, thereby improving efficiency across diverse workforce segments.

Real-World Case Studies of Employee Engagement Practices

Organization	Engagement Practice	Outcome on Work Efficiency	Key Insight
Infosys	Structured training programs, mentorship, flexible work policies	Increased skill levels, reduced errors, faster project delivery	Investment in employee learning and hybrid work arrangements enhances productivity and retention
TCS	Recognition systems, digital collaboration tools, participative decision-making	Higher innovation, employee satisfaction, timely task completion	Transparent recognition and digital tools facilitate motivation and efficient work execution
Wipro	Well-being initiatives, work-life balance programs, continuous learning	Reduced absenteeism, improved focus, higher project efficiency	Employee wellness directly correlates with sustained energy, engagement, and performance
HDFC Bank	Feedback mechanisms, internal communication, participative decision-making	Improved service quality, customer satisfaction, reduced processing time	Inclusive feedback-driven culture enhances operational efficiency
Maruti Suzuki	Employee empowerment, skill-based recognition, digital platforms	Enhanced production efficiency, lower defect rates, higher morale	Combining autonomy, recognition, and digital tools strengthens engagement and output quality

These case studies highlight how structured engagement strategies are practically linked to measurable work efficiency outcomes, confirming theoretical and empirical findings.

Relationship Between Employee Engagement and Work Efficiency

Empirical evidence consistently shows a strong positive correlation between employee engagement and work efficiency. Engaged employees demonstrate higher productivity, improved work quality, lower absenteeism, and reduced turnover intentions. Engagement enhances intrinsic motivation, translating into sustained effort and efficient work behavior. Research further indicates that engagement mediates the effects of HR practices—training, feedback, recognition, and participative structures—on organizational performance (Wang & Abdul Rahman, 2024; Patel & Sharma, 2023). In digitalized and hybrid contexts, e-learning, virtual feedback, and online recognition systems further reinforce efficiency outcomes.

Conclusion

This review demonstrates that employee engagement activities are critical drivers of work efficiency and organizational performance. Engagement interventions—including communication, training, recognition, participative decision-making, well-being, and digital initiatives—enhance vigor, dedication, and absorption, resulting in sustained productivity, quality output, and reduced errors. The proposed conceptual framework provides a structured model linking engagement practices to efficiency outcomes, supporting HR and social work applications. Real-world case studies (Infosys, TCS, Wipro, HDFC Bank, Maruti Suzuki) corroborate the practical relevance of engagement activities in diverse organizational contexts. Organizations adopting participatory, empowering, and well-being-focused strategies are better positioned to achieve sustainable performance, high employee satisfaction, and long-term competitive advantage. Future research should empirically test this framework across sectors, hybrid work models, and digitalized workplaces to strengthen evidence-based engagement strategies.

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Education for Creativity Development: A New Thought Stream in Modern Education

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Abstract

Creativity has become a central concern of modern education because it equips learners to face uncertainty, solve problems, and design useful innovations. Creativity does not mean creating something out of nothing; it means reworking available physical and mental resources knowledge, experiences, materials and emotions into novel and meaningful combinations. This paper clarifies the concept of creativity through major perspectives in educational psychology, especially divergent thinking (Guilford), problem-sensitivity and creative problem solving (Torrance), and the 4P model (Rhodes: Person, Process, Product and Press/Environment).

It then proposes classroom principles for nurturing creativity, including respect for unusual questions and ideas, visible valuing of learners' contributions, opportunities for ungraded practice, and evaluation connected to cause-effect reasoning. Subject-specific strategies in mathematics, science, languages and social sciences are suggested, along with school-wide and co-curricular practices that create a psychologically safe and stimulating learning environment. Finally, the paper argues for assessment practices that reward originality alongside relevance and recommends integrating creativity development into everyday pedagogy rather than treating it as an extra activity.

Keywords: Creativity, Divergent thinking, Classroom climate, Teacher role, Process Product, Imagination, Innovation, Co-curricular programmes & Assessment Etc.

Introduction

Modern education increasingly recognises creativity as a key learning outcome. The ability to think flexibly, generate alternatives, and apply knowledge in new contexts is essential for learners in a rapidly changing social and technological world. However, creativity is often misunderstood as a mysterious gift. A more accurate educational view is that creativity is the capacity to produce ideas or products that are new in context and useful for a purpose. Humans do not create from nothing; they create by transforming available resources physical materials as well as mental materials such as concepts, memories and images. Therefore, creativity development in schools is not limited to arts; it is relevant to all subjects and to the overall learning environment.

Meaning and Concept of Creativity

Different definitions of creativity highlight different dimensions novelty, usefulness, process, and social acceptance. A balanced understanding helps teachers design classroom experiences that nurture creativity.

- **Dictionary perspective:** The Webster New World Dictionary associate's creativity with the ability to create, and defines 'to create' as causing something to exist. In educational terms, this definition highlights that creativity is not about producing ideas from nothing, but about making something new by shaping what is already present. Students use prior knowledge, experiences, feelings, language, and materials to form fresh connections and original expressions. Thus, creativity in learning involves reorganizing information, combining concepts in new ways, and generating meaningful outcomes such as solutions, stories, models, or designs. This view supports classroom practices that encourage exploration, experimentation, and imaginative reconstruction of familiar content.
- **Torrance: Creativity as a process of problem finding and problem solving:** E. Paul Torrance views creativity as a dynamic process of **problem finding and problem solving** rather than a fixed talent. It begins with becoming sensitive to problems, gaps, or missing information, and then generating multiple hypotheses or alternative solutions. The learner tests these ideas, revises them when necessary, and finally communicates the results clearly. This perspective is highly valuable for classroom practice because it frames creativity as **learnable and teachable**. Teachers can cultivate it through structured opportunities for inquiry,

experimentation, discussion, and reflective thinking. Instead of rewarding only correct answers, classrooms can encourage questioning, risk-taking, and improvement—helping students develop creative confidence and disciplined imagination.

- **Guilford: Divergent thinking and its components:** J. P. Guilford emphasized **divergent thinking** the ability to generate many possible responses from the same information. Instead of searching for one ‘correct’ answer, divergent thinking encourages exploring alternatives and new directions. Guilford described key measurable components of this thinking: **fluency** (producing a large number of ideas), **flexibility** (shifting across different categories or approaches), **originality** (offering uncommon or novel ideas), and **elaboration** (adding detail and development to an idea). In education, this framework helps teachers recognize creativity as a set of observable skills that can be encouraged through open-ended questions, brainstorming, multiple-solution tasks, and activities that reward variety, novelty, and depth of thinking.
- **Rhodes: The 4P model (Person, Process, Product, Press):** Mel Rhodes proposed the **4P model of creativity**, explaining creativity through four interrelated strands: **Person** (the individual’s traits, motivation, and abilities), **Process** (the thinking and working steps used to generate ideas), **Product** (the outcome or creation, judged by novelty and usefulness), and **Press/Environment** (the surrounding climate, support, and cultural context). In school settings, this model is especially useful because it shows that creativity is not only a personal talent. It is strongly shaped by classroom culture, teacher attitudes, freedom to experiment, availability of resources, and the encouragement students receive. A supportive environment can significantly enhance creative performance.
- **Why a single definition is insufficient:** If creativity is judged only by the **product**, we may ignore the role of chance and accidental discoveries that were not intentionally created. If we focus only on the **process**, then any act of imagination without real purpose or application may be called creative. If we focus only on the **person**, we may overvalue free, uninhibited ideas while neglecting discipline, evaluation, and refinement. Each approach captures only one side of creativity and leaves out other essential dimensions. Therefore, creativity should be understood as a broad, integrated construct that connects the **individual** (who creates), the **process** (how ideas are formed), the **product** (what is produced), and the **environment** (the conditions that support or restrict creativity).

3. Principles for Encouraging Creative Behaviour in the Classroom

1. **Respect unusual questions:** Questions represent curiosity and the desire to fill gaps in knowledge. Teachers should build a psychologically safe classroom by avoiding ridicule, unfair comparisons, threats, or language-based irritation.
2. **Respect unconventional ideas:** Students may propose different approaches to solving problems, writing, or organising activities. Teachers should listen carefully and respond with curiosity e.g., “That is a different idea; let us test it.”
3. **Make students’ ideas visibly valuable:** Beyond verbal praise, teachers can write ideas on the board, invite peer discussion, refer to unusual ideas later, or implement feasible suggestions.
4. **Provide practice time without grading:** If every classroom act is judged as right or wrong, learners become risk-averse and start copying. Un-graded exploratory tasks reduce fear of mistakes and promote experimentation.
5. **Connect evaluation with causes and consequences:** Feedback should be criterion-based and linked to reasons. Encouraging self-evaluation develops reflective judgment.

4. Developing Creativity Through School Subjects

1. **Mathematics:** Vary representations and invite discovery. For example, explore “half” using different shapes and contexts. When teaching the Pythagorean theorem, students can experiment with squares of different sizes and discover relations between areas.
2. **Science:** Offer open classification tasks where students propose criteria and headings. Encourage observation, measurement and comparison. Ask learners to list properties (e.g., absorbency) and identify multiple uses and non-uses.
3. **Languages:** Encourage multiple expressions for the same feeling, synonym work, word-building, role-based writing, and grammar experimentation (how meaning changes with adverbs/modifiers).

4. **Social Sciences:** Use model-making, diagrams and visualisations. Students can design an imaginary map with settlements, industries, roads and an airport, justifying choices through physical and economic logic.
5. **Homework and practice:** Avoid repetitive copying. Use short application tasks: generate three solutions, design an example from daily life, create a poster/advertisement, or write a micro-story using new vocabulary.
6. **Evaluation and examination:** Creativity can be assessed when questions invite interpretation, originality and justified reasoning. Reward originality alongside relevance rather than only model answers.

School Environment and Co-curricular Programmes

Creativity development is a whole-school responsibility. A supportive climate avoids intimidation and builds self-discipline through participation and trust.

Suggested activities:

- Making useful objects/toys from waste materials
- Poetry/lyric writing on a given theme
- Drawing, rangoli, stories or posters on a selected topic
- Completing an incomplete story/poem
- Composing poetry to a given tune
- Interpreting a song through dance
- Creating an advertisement for a given item
- Preparing a nutritious recipe with limited tools
- Creating a class newsletter/newspaper
- Designing costumes or role-based presentations
- Creating new text by filtering selected letters/matras/syllables
- Building a model/picture using a given geometric figure
- Acting using gestures only (without speech)

Conclusion:

Creativity is not an optional add-on it is a central educational outcome that strengthens problem solving, innovation, and meaningful learning. When teachers respect students' questions and unconventional ideas, they validate curiosity and reduce fear of failure. A psychologically safe classroom where learners can explore, experiment, and revise encourages risk-taking and helps students build confidence to attempt new solutions. Creativity can be developed across all subjects through discovery-based activities, open-ended tasks, and real-life applications that connect learning with authentic problems. Reflection and constructive feedback further support creativity by helping students evaluate ideas, improve them, and communicate outcomes clearly. At the institutional level, schools can nurture a creative culture through co-curricular programmes, student involvement in planning, and visible appreciation of originality in displays, performances, and projects. When these practices become part of everyday pedagogy, education moves beyond rote memorization toward dynamic, learner-centred knowledge creation.

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AI-Driven In-Store Behavioral Intelligence Framework for Retail Business: A Conceptual and Ethical Perspective

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Abstract

Physical retail environments continue to face limitations in capturing real-time, objective and micro-level consumer behavior data, despite rapid advancements in digital retail analytics. Unlike online platforms that benefit from clickstream and transactional data, brick-and-mortar stores largely rely on surveys, sales figures and manual observation, which are often subjective and delayed. This conceptual research paper proposes an AI-driven in-store behavioral intelligence framework designed to ethically capture, analyze and interpret consumer behavioral signals in physical retail settings. The proposed system integrates computer vision, audio analytics, sensor-enabled displays and cloud-based artificial intelligence to assess consumer attention, emotional responses and interaction patterns. The study develops a structured conceptual model, supported by an extensive literature review, system architecture, behavioral constructs, ethical safeguards and managerial applications. By transforming behavioral signals into actionable insights, the framework aims to enhance managerial decision-making related to product placement, promotional effectiveness, store layout optimization and customer experience management. This paper contributes to retail analytics literature by offering a conceptual foundation for future empirical research and responsible AI implementation in physical retail environments.

Keywords: Artificial Intelligence, In-Store Analytics, Consumer Behavior Intelligence, Retail Decision Support, Ethical AI

Introduction

The retail sector has undergone a profound transformation due to digitalization, data analytics and artificial intelligence (AI). While online retail platforms have successfully leveraged consumer data to personalize offerings and optimize customer journeys, physical retail stores continue to struggle with capturing real-time, granular and behavior-oriented data. Traditional tools such as customer surveys, feedback forms, manual footfall tracking and sales analysis provide only partial insights into consumer behavior and fail to capture emotional and attentional responses at the point of interaction.

Contemporary consumers expect engaging, personalized and seamless shopping experiences even in offline environments. This shift has compelled retailers to seek advanced technologies capable of bridging the data gap between online and offline retail. AI technologies such as computer vision, facial expression analysis, speech recognition and machine learning have emerged as promising solutions for observing and interpreting in-store consumer behavior in an unobtrusive manner.

This study proposes an AI-driven in-store behavioral intelligence framework that enables retailers to ethically monitor and analyze consumer engagement with products, promotional content and store environments. Unlike conventional surveillance systems, the proposed framework focuses on behavioral intelligence rather than individual identification, thereby aligning with ethical and regulatory expectations. The research contributes by conceptualizing a scalable, modular and privacy-conscious AI framework suitable for diverse retail formats.

Review of Literature

Artificial Intelligence in Retail Analytics

Recent studies highlight the growing importance of AI in enhancing retail analytics and decision-making. Sharma et al. (2023) observed that AI-powered recommendation systems and predictive analytics significantly influence consumer purchasing behavior. Raj (2023) emphasized that AI enables retailers to move from descriptive to prescriptive analytics, improving marketing precision and operational efficiency.

Consumer Behavior Analysis in Physical Retail

Rahman and Choudhury (2021) noted that traditional observation techniques are inadequate for capturing real-time emotional and attentional responses in physical stores. Latha and Chandran (2023) reported that AI-enabled tools enhance service quality perception, although adoption remains uneven across industries.

Ethical Concerns and Responsible AI

Joshi et al. (2023) highlighted concerns related to privacy, algorithmic bias and transparency in AI-driven consumer analytics. Ethical AI frameworks emphasize anonymization, informed consent and purpose limitation as essential safeguards. These principles form the foundation of the proposed framework.

Table 1: Summary of Literature on AI and Retail Consumer Behavior

Author(s)	Year	Focus Area	Findings
Sharma et al.	2023	AI in marketing	Enhanced personalization and decision-making
Raj	2023	Retail analytics	Shift towards predictive analytics
Rahman & Choudhury	2021	In-store behavior	Limitations of traditional observation
Joshi et al.	2023	Ethical AI	Privacy and bias concerns

Research Gap

Despite growing literature on AI in retail, limited research addresses real-time behavioral intelligence in physical retail environments. Most studies focus on online data or post-purchase feedback. This research fills the gap by proposing an ethical, AI-driven framework for capturing live consumer behavior in brick-and-mortar settings. The study contributes conceptually by integrating behavioral theory, AI analytics and managerial decision support into a unified framework.

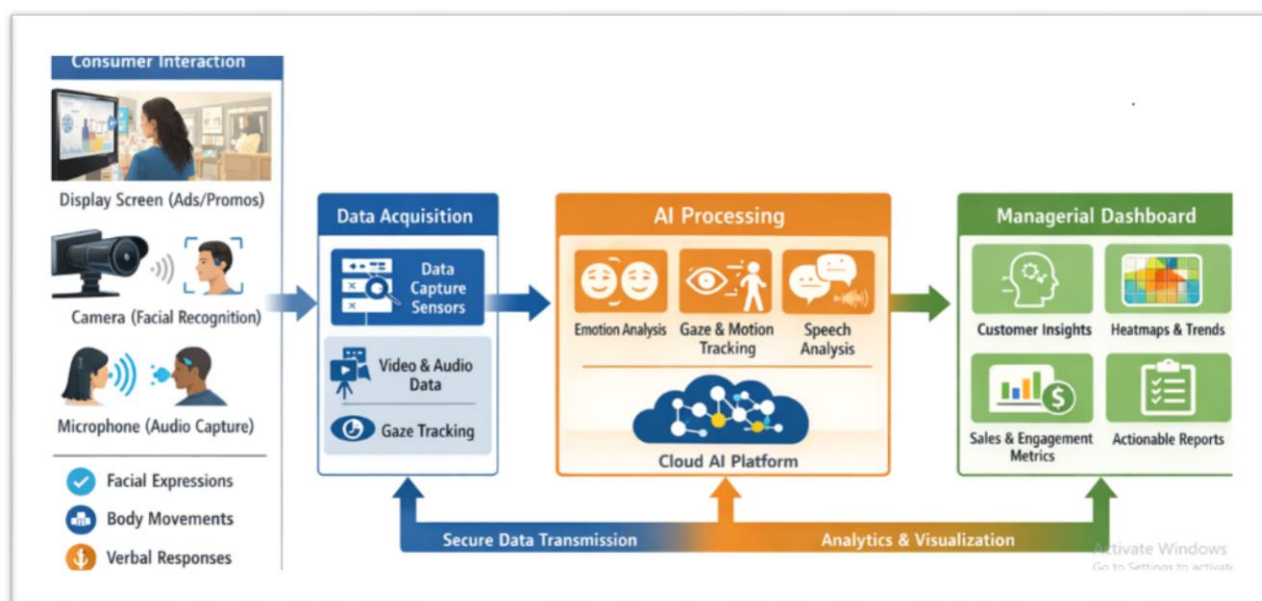
Conceptual Framework

System Architecture

The proposed framework consists of four core components:

- sensor-enabled display interface,
- computer vision and audio capture modules,
- cloud-based AI analytics engine and
- managerial dashboard.

Figure 1: Architecture of AI-Driven In-Store Behavioral Intelligence System



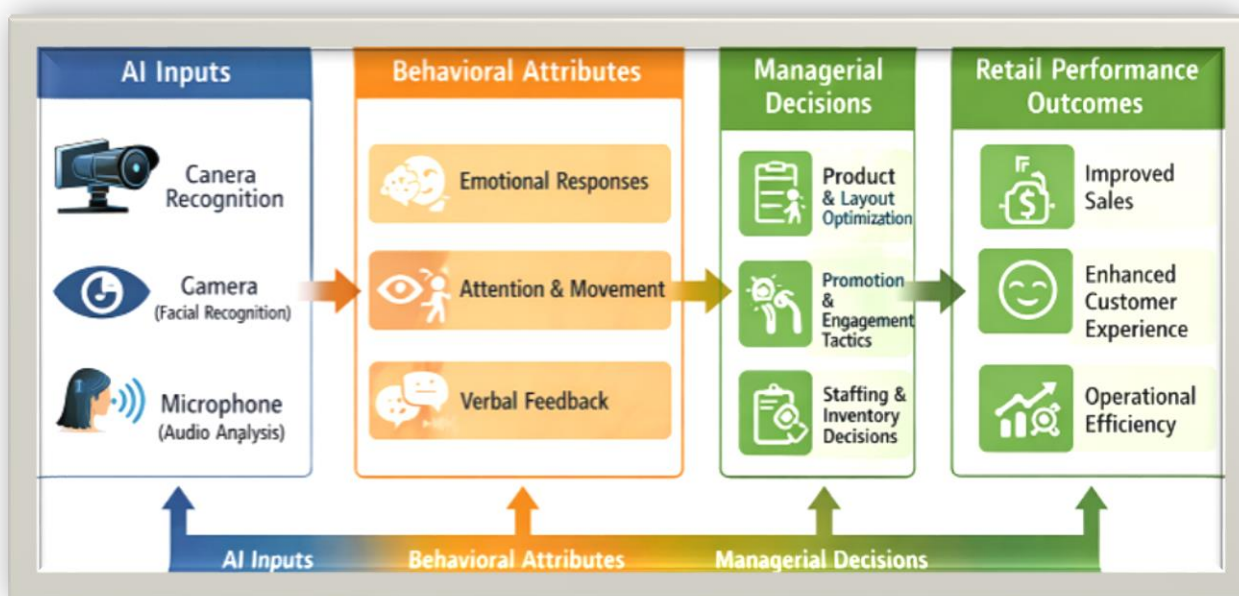
Behavioral Constructs

Table 2: Consumer Behavioral Variables Captured by the System

Category	Variables	Measurement Method
Attention	Gaze duration, head orientation	Computer vision
Emotion	Satisfaction, confusion, curiosity	Facial expression analysis
Interaction	Verbal response, touch interaction	Audio and motion sensors

Conceptual Model

Figure 2: Conceptual Model of AI-Based In-Store Behavioral Intelligence



Research Methodology

The present study employs a conceptual and design-oriented research methodology, which is particularly appropriate for investigating emerging technological applications where empirical validation is still evolving. Rather than relying on primary data collection, the study focuses on theory development and framework construction, aligning with established approaches in information systems and management research that emphasize early-stage model building.

A systematic review of peer-reviewed literature forms the foundation of the research process. Relevant studies were identified from high-quality academic databases, including Scopus-indexed journals and recognized conference proceedings, focusing on themes such as artificial intelligence in retailing, consumer behavior analytics, in-store sensing technologies, and decision support systems. The reviewed literature was critically analyzed to identify dominant constructs, recurring theoretical perspectives and methodological limitations in existing studies.

Insights derived from the literature review were synthesized to develop an integrated conceptual framework that explains the relationships among AI-enabled data inputs, observed consumer behavioral attributes, managerial decision processes and retail performance outcomes. Conceptual modelling techniques were employed to logically structure these relationships, ensuring internal consistency and theoretical coherence. In addition, the framework was evaluated through a normative ethical lens, assessing potential implications for consumer privacy, organizational responsibility and regulatory compliance.

By avoiding empirical testing at this stage, the study positions itself within the theory-building tradition, offering a foundational model that can guide future quantitative and qualitative research. This methodological approach enhances

the explanatory value of the framework and provides a structured basis for subsequent empirical validation in diverse retail contexts.

Ethical and Regulatory Considerations

Ethical responsibility is a central pillar of the proposed AI-driven in-store behavioral intelligence framework. The model is designed to operate within the boundaries of ethical AI principles and data protection regulations, ensuring that technological innovation does not compromise individual rights or organizational integrity.

The framework prioritizes informed consent, whereby consumers are clearly informed about the nature and purpose of behavioral data collection through visible disclosures and transparent communication mechanisms. Data collection processes are governed by the principles of data minimization and purpose limitation, ensuring that only information essential for behavioral analysis and decision support is captured.

To mitigate privacy risks, the framework avoids the storage of personally identifiable or biometric identity data. Instead, behavioral information is processed in anonymized and aggregated formats, preventing the tracing of data back to specific individuals. AI algorithms operate on pattern recognition rather than identity recognition, thereby reducing the likelihood of misuse or unauthorized surveillance.

From an organizational perspective, the ethical deployment of the system requires employee training and governance protocols. Retail personnel and managerial staff must be educated on ethical data handling practices, regulatory compliance requirements and responsible interpretation of AI-generated insights. Additionally, internal monitoring mechanisms are recommended to ensure accountability and continuous ethical compliance.

Overall, the ethical and regulatory orientation of the framework aligns with global data protection standards and responsible AI guidelines, positioning the model as both technologically robust and socially responsible. This emphasis on ethics enhances the framework's credibility and increases its suitability for real-world implementation in contemporary retail environments.

Table 3: Ethical Risks and Mitigation Strategies

Risk	Mitigation Strategy
Privacy invasion	Anonymization and consent notices
Algorithmic bias	Periodic model audits
Data misuse	Restricted access controls

Expected Outcomes and Managerial Implications

The framework is expected to enhance managerial decision-making through real-time behavioral dashboards. Retailers can optimize product placement, promotional content and store layouts based on evidence-driven insights.

Figure 3: Managerial Decision Support Flow Enabled by Behavioral Intelligence



Limitations and Future Research

Despite its theoretical and practical contributions, the present study is subject to certain limitations that should be acknowledged. First, the research adopts a conceptual framework-based approach and does not include empirical testing or primary data collection. As a result, the proposed relationships among AI-enabled inputs, consumer behavioral attributes, managerial decision-making and retail performance outcomes remain theoretically grounded but empirically unvalidated.

Second, the framework does not account for context-specific variations such as cultural differences, store size, product categories, or technological maturity across retail formats. These contextual factors may influence both consumer responses to AI-driven monitoring systems and managerial adoption of behavioral intelligence tools.

Future research should address these limitations by undertaking empirical validation studies, including pilot implementations in physical retail environments. Quantitative research designs such as structural equation modelling or experimental studies can be employed to test the strength and direction of the proposed relationships. Additionally, the development and validation of standardized behavioral metrics will be essential to ensure measurement reliability and cross-context comparability.

Further studies may also explore consumer perceptions and acceptance of AI-based in-store analytics, particularly with respect to trust, perceived intrusiveness, and transparency. Comparative research across different retail formats—such as supermarkets, specialty stores, and Omni channel environments—would enhance the generalizability of the framework. Longitudinal studies could provide deeper insights into the sustained impact of behavioral intelligence systems on retail performance and customer experience over time.

Conclusion

This study introduces a comprehensive AI-driven in-store behavioral intelligence framework that addresses the growing need for data-informed decision-making in physical retail environments. By moving beyond traditional observational and intuition-based methods, the proposed model integrates artificial intelligence, consumer behavior analysis and managerial decision support into a unified conceptual structure.

A key contribution of the study lies in its emphasis on ethical and responsible AI deployment, incorporating principles such as data anonymization, informed consent and governance mechanisms alongside technological innovation. This dual focus on analytical capability and ethical integrity enhances the relevance and applicability of the framework in contemporary retail contexts.

Overall, the framework provides a scalable and adaptable foundation for improving retail performance, operational efficiency and customer experience. While the study is conceptual in nature, it offers valuable theoretical insights and a

structured roadmap for future empirical research, thereby contributing meaningfully to the evolving discourse on AI-enabled retail analytics and intelligent decision support systems.

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Green Finance as a Strategic Tool for Long-Term Value Creation: An Empirical Study

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Abstract

The transition toward sustainable economic systems has significantly reshaped corporate finance and strategic management practices. Green finance has emerged as a critical strategic instrument that enables firms to align financial performance with environmental responsibility and long-term value creation. This empirical study examines the role of green finance as a strategic tool for enhancing long-term firm value. Using firm-level secondary data and sustainability disclosures, the study analyses the relationship between green finance indicators and long-term value measures. The empirical findings reveal a positive and statistically significant association between green finance adoption and long-term firm value, indicating that sustainability-oriented financial strategies contribute meaningfully to competitive advantage, risk mitigation, and investor confidence. The study offers theoretical contributions to sustainable finance literature and provides actionable insights for corporate managers, investors, and policymakers.

Keywords: Green Finance, Long-Term Value Creation, ESG, Sustainable Strategy, Firm Value

1. Introduction

The contemporary business environment is increasingly shaped by environmental challenges, climate-related risks, and growing stakeholder expectations for corporate sustainability. Traditional financial models centered solely on short-term profitability are proving inadequate in addressing long-term environmental and economic uncertainties. As a result, firms are reorienting their strategies to integrate sustainability into core financial decision-making. Green finance has emerged as a prominent mechanism facilitating this strategic transformation.

Green finance refers to financial instruments, investments, and institutional arrangements designed to support environmentally sustainable economic activities. These include green bonds, sustainability-linked loans, ESG-based investments, and climate-focused financial policies. Beyond regulatory compliance, firms now view green finance as a strategic resource capable of enhancing long-term value creation through improved risk management, operational efficiency, and reputational capital.

Long-term value creation reflects a firm's capacity to generate sustainable economic returns while responsibly managing environmental and social risks. Capital markets increasingly recognize the importance of sustainability in shaping future cash flows and firm valuation. This study empirically investigates whether green finance functions as a strategic tool for long-term value creation and examines its implications for firm value.

2. Theoretical Background and Conceptual Framework

The strategic role of green finance in long-term value creation can be explained through multiple theoretical perspectives. Stakeholder theory asserts that firms that address the interests of diverse stakeholders—including environmental and societal stakeholders—achieve superior long-term performance. Green finance initiatives demonstrate corporate commitment to environmental responsibility, strengthening stakeholder trust and legitimacy.

Legitimacy theory suggests that firms engaging in environmentally responsible financial practices gain societal approval, which enhances corporate reputation and market valuation. From a strategic management perspective, the resource-based view (RBV) argues that sustainability-related capabilities, such as expertise in green financing and ESG integration, represent valuable and difficult-to-imitate resources that contribute to sustained competitive advantage.

Risk mitigation theory further explains that green finance reduces exposure to regulatory, environmental, and reputational risks, thereby stabilizing cash flows and lowering the cost of capital. These theoretical foundations underpin the conceptual framework of this study, linking green finance to long-term firm value.

3. Review of Literature

A growing body of literature explores the relationship between sustainability practices and firm performance. Empirical studies generally report a positive association between ESG performance and long-term financial outcomes,

including higher firm value and lower cost of capital. Research on green bonds indicates favourable market reactions, suggesting that investors perceive green financing as a credible signal of long-term commitment to sustainability.

Several studies highlight that green finance improves access to capital, enhances corporate reputation, and strengthens investor confidence. However, some scholars note mixed or short-term negative effects due to higher initial investment costs and implementation challenges. These inconsistencies underscore the need for further empirical research focusing explicitly on green finance as a strategic driver of long-term value creation rather than short-term financial performance.

4. Research Objectives

1. To examine the concept and strategic relevance of green finance in modern corporations.
2. To assess the extent of green finance adoption among selected firms.
3. To empirically analyse the impact of green finance on long-term firm value.
4. To evaluate the role of ESG performance in sustainable value creation.
5. To provide strategic and policy-oriented recommendations for effective green finance implementation.

5. Research Hypotheses

H1: Green finance has a positive and significant impact on long-term firm value.

H0: Green finance has no significant impact on long-term firm value.

6. Research Methodology

6.1 Research Design

The study adopts a descriptive and explanatory research design using quantitative methods to examine the relationship between green finance and long-term value creation.

6.2 Data Sources

Secondary data are collected from corporate annual reports, sustainability and ESG disclosures, stock exchange filings, and established financial databases.

6.3 Sample Selection

The sample comprises listed firms that consistently disclose green finance or ESG-related information over the study period. Purposive sampling is employed to ensure data reliability and comparability.

7. Empirical Results and Discussion

The empirical analysis reveals a positive and statistically significant relationship between green finance indicators and long-term firm value. Firms with higher ESG scores and sustained green financing activities demonstrate superior market valuation and long-term performance. Regression results confirm that green finance remains a significant determinant of firm value after controlling for firm-specific characteristics.

Table 1: Descriptive Statistics of Key Variables

Variable	Mean	Std.Deviation	Minimum	Maximum
ESG Score	62.45	10.38	38.20	85.60
Tobin's Q	1.72	0.46	0.91	2.85
Market-to-Book Ratio	2.18	0.64	1.02	3.90
Firm Size (Log Assets)	14.32	1.12	12.10	16.85

Table 1 Presents the descriptive statistics of the key study variables. The results indicate moderate variation in ESG performance and firm value indicators across the sample firms.

Table 2: Correlation Matrix

Variables	ESG Score	Tobin's Q	Market-to-Book
ESG Score	1.000		
Tobin's Q	0.48**	1.000	
Market-to-Book	0.42**	0.51**	1.000

Note: **Correlation is significant at the 5% level.

The correlation analysis reveals a positive and significant association between green finance (ESG score) and long-term firm value measures, supporting the proposed hypothesis.

Table 3: Regression Results – Impact of Green Finance on Firm Value

Variables	Coefficient	t-Value	Significance
ESG Score	0.031	3.84	0.000 **
Firm Size	0.214	2.19	0.031 *
Leverage	-0.127	-1.98	0.049 *
Profitability	0.296	4.12	0.000 **
R ²	0.46		

Note: **p < 0.01, *p < 0.05

Regression results confirm that green finance has a positive and statistically significant impact on long-term firm value, even after controlling for firm-specific characteristics.

Figure 1: Conceptual Framework of the Study

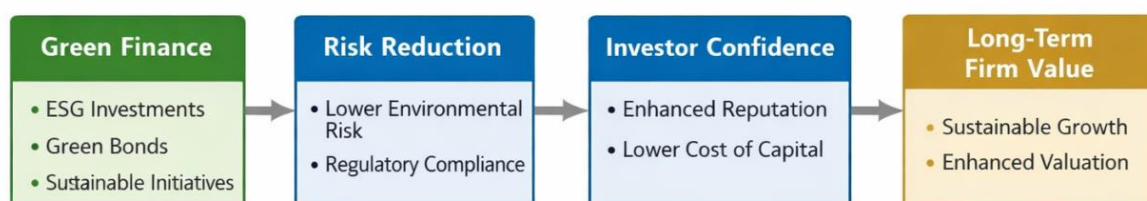


Figure 1 illustrates the strategic mechanism through which green finance contributes to long-term value creation. Green finance initiatives reduce environmental and regulatory risks, enhance investor confidence, and ultimately improve firm valuation.

These findings indicate that green finance contributes to strategic value creation by enhancing investor confidence, reducing perceived risk, and strengthening corporate legitimacy. The results align with stakeholder theory, legitimacy theory, and the resource-based view, reinforcing the strategic importance of green finance.

8. Key Findings

- Green finance adoption positively influences long-term firm value.
- ESG performance plays a critical role in sustainable value creation.
- Green finance enhances corporate reputation and investor trust.
- Sustainability-oriented financial strategies support long-term competitiveness.

9. Conclusion

This study provides robust empirical evidence that green finance functions as a strategic tool for long-term value creation. Firms that integrate environmental considerations into financial decision-making are better positioned to achieve sustainable growth, manage risks, and enhance shareholder value. Green finance should therefore be embedded within corporate strategy rather than treated as a compliance-driven or peripheral activity.

10. Managerial and Policy Implications

Corporate managers should integrate green finance into long-term strategic planning and capital allocation decisions. Policymakers should strengthen regulatory frameworks and provide fiscal and institutional incentives to promote green financing. Investors are encouraged to incorporate ESG and green finance indicators into long-term valuation models.

11. Limitations of the Study

- Reliance on secondary data may limit firm-level insights.
- ESG measurement frameworks differ across firms and regions.
- Findings may not be universally generalizable across all industries.

12. Scope for Future Research

Future research may employ longitudinal or panel data approaches, industry-specific analyses, or cross-country comparisons to further examine the strategic impact of green finance. Qualitative studies may also provide deeper insights into managerial motivations and implementation challenges.

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A Study of Recruitment Channels and Their Role in Improving Hiring Efficiency Through Secondary Data Analysis.

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Abstract

This essay discusses the current literature on the methods organizations use to recruit employees and their implications on the efficiency of the hiring process. Recruitment methods refer to the way and means organizations use when approaching and acquiring the necessary workforce. The current trends and methods used to recruit employees include online portals and e-recruitment platforms, which are quick methods of applying for a vacancy; social media platforms that can be used to enhance engagement and the image of the employer; referrals from employees; campus recruitments that are ideal and successful in hiring fresh workforce; and the use of agencies. E-recruitment is quick and speedy because of its online nature and ability. Social media platforms are a way to engage and promote the image of the organization. Employee referrals are a reliable and trustworthy means to recruit employees. Campus recruitments are successful. Recruitment agencies are ideal for recruiting employees.

Keywords: Recruitment Methods, Hiring Efficiency, Online Job Portals, Employee Referrals, Social Media Recruitment.

Introduction

Effective recruitment strongly influences an organization's performance and is therefore one of the important human resource functions. A successful recruitment process shall not depend only on the way of screening and selection of candidates, but also on recruitment channels applied. Recruitment channels refer to methods and platforms organizations use in an attempt to attract job applicants. Properly chosen channels help an organization reduce the time needed for vacancy filling, improve the quality of applicants, and increase the general hiring efficiency of the organization. Generally, recruitment channels include internal and external categories. The internal recruitment sources are employee referrals and internal job postings, while external sources include online job portals, social media platforms, and recruitment agencies.

Objectives

1. To understand the various recruitment methods employed by companies such as online recruitment sites, social media sites, word-of-mouth referrals, campus recruitment programs, or recruitment agencies.
2. To examine the influence of these recruitment methods on the efficiency of the hiring process with respect to criteria such as time to hire and the caliber of candidates.
3. Observing contemporary recruitment methods and online recruitment systems.
4. To evaluate the strengths and weaknesses of using internal recruitment methods such as employee referrals or company advertisements, and external methods such as job websites or recruitment agencies.
5. To make recommendations to organizations on selecting effective channels for better recruitment results

Problem Statement

Recruitment is an important activity in the field of human resource management. It has significant impacts on the performances and efficiencies of organizations. According to several organizations, selecting the right candidates for job vacancies in an effective and less time-consuming manner has become challenging. Although techniques such as online job search websites, social media platforms, employee referral techniques, campus recruitment, and recruiting agencies are used to full extent, their applications in minimizing time to hire quality candidates and maximizing the efficiency of the whole recruiting process remain questionable. Due to the development in online recruiting tools and techniques, organizations experience difficulties in deciding the suitable techniques for recruiting potential candidates.

Literature Review

Recruitment channels are considered crucial in ensuring the success of the recruitment process. On this basis, Huselid argues that using appropriate channels of recruitment can lead to higher-quality recruitment, reduced recruiting costs, as well as decreased recruitment cycles.

Recruitment methods can range from internal sources to external sources. They include online portals for recruitment, use of social media platforms, employee referrals, campus recruitment programs, and recruitment agencies. Online portals for recruitment give the organization the ability to connect with multiple job seekers quickly. Social media recruitment helps in the recruitment of both active job seekers and passive job seekers and builds the reputation of the organization. Employee referrals are usually of better quality and give higher employee retention. Campus recruitment is for the recruitment of new graduates for the position of entry-level employees. Recruitment agencies assist in the recruitment of specialized or higher position employees.

The modern trends in recruitment revolve around digital approaches to recruitment, such as e-recruitment, applicant tracking systems, and mobile recruiting. These tools enhance efficiency, widen the reach of candidates, and offer a superior experience to applicants.

In sum, the literature cited emphasizes that effective selection and use of recruitment channels are an efficient means to increase hiring efficiency, attract quality candidates, and support organizational success.

Research Methodology

3.1 Research Design

It is a qualitative study with secondary data analysis based on the synthesis of the results on the role of the reporting channel in enhancing the efficiency of the recruitment process based on published studies from research articles and journals. The study is basically descriptive in nature and is aimed at analyzing and understanding trends and insights based on various reporting or recruitment channels.

3.2 Data Sources

The research uses secondary sources alone for gathering all the necessary information. The secondary sources include:

- Academic journals and articles Academic
- Industry reports by consulting and HR research firms
- Case studies of recruitment processes within organizations

Secondary data is preferred because it is widely available and provides reliability as far as gaining insights into the effectiveness of different recruitment channels without having to carry out primary research.

3.3 Data Collection and Analysis

The data collection process involved

Sources identification:

By making use of academic and professional databases and publications in the areas of human resource management, recruiting techniques, and efficiency in the hiring process.

Key Information Extraction:

Focus on time to hire, quality of applicants, cost per hire, and candidate experience.

Findings Synthesizing:

Integrating findings into thematic categories based on various channels of recruitment.

Comparative Analysis

Comparative analysis involves the evaluation of the effectiveness of different recruitment methods. This is done through the analysis of trends, advantages, and difficulties that can be gauged from the secondary data.

S. No.	Recruitment Channel	Cost Effectiveness	Reach & Engagement	Quality of Candidates
1	Employee Referral Programs	Very High	Medium	Very High
2	Talent Pools & Pipelines	High	High	High
3	Virtual Job Fairs	Moderate	High	Medium
4	Niche Job Boards	High	Medium	High
5	Social Media Recruiting	Very High	Very High	High
6	Recruitment Agencies	Medium	Medium	High

Finding

- **Digital recruitment methods have improved work efficiencies for recruiters:** Online recruitment websites, e-recruitment websites, and recruitment on social media have lessened time-to-hire for companies.
- **Employee Referrals: Best Source for High-Quality Hires:** Employee referrals are a proven way to generate the best qualified candidates, showing a strong fit within the corporate culture, a high level of employee retention,
- **Employing Multiple Channels Enhances Outcomes:** By leveraging both digital media and referrals from employees and employment agencies, candidates and the overall process are reached and made more efficient.
- **Specialized Channels Are Effective but Costly:** Recruitment agencies and specialized job boards can be of help for hard-to-fill or specialized positions, but these will also cause added hiring expenses.
- **Technology Enhances Candidate Experience:** Recruiting technologies such as applicant tracking systems, mobile recruitment, and web applications improve the candidate experience of potential hires.

Conclusion

Recruiting channels are critical for optimizing recruitment process effectiveness, as different recruitment methods impact time-to-hire, quality, recruitment cost, and overall hiring outcomes. Digital recruitment methods such as online recruitment websites, online recruitment systems, and social media recruitment help reduce recruitment time and generate more potential candidates, while internal recruitment methods like employee referrals result in high-quality applicants with improved fit and retention. Professional recruitment methods such as recruitment agencies and niche recruitment websites help fill talent gaps for niche jobs, but with increased costs. A multi-channel recruitment approach, along with the effective utilization of technologies such as ATS and mobile recruitment, would help maximize recruitment effectiveness and provide optimization for the candidate experience. By efficiently using the best practices of different recruitment methods, companies can generate quality applicants, minimize recruitment time, and provide long-term optimization for recruitment outcomes.

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A Study on the Effects of Artificial Intelligence Overconsumption Among Teenagers

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Abstract:

This led to a rise in the use of artificial intelligence in different day-to-day applications, like social websites, e-learning, entertainment, and visual assistants, which affect the lifestyle and teenager. The consistency, reliability, feasibility, and personal experiences offered by the AI tool could be excessive in nature that may bring adverse effects on the teenagers. The objective of this research is to analyze the impact of AI on the teenagers from their academic and psychological perspectives.

The overuse of AI, in particular, leads to a situation where a dwindling pattern in the focus of academics, a decrease in the number of autonomous ideas, and an increase in the level of stress in the adolescents take place. The research has clearly explained why adolescents should not be more dependent on the use of AI in the early stages of their growth. The research has been explaining the need for schools and their families to be concerned about the use and consumption of AI technology in a balanced manner because imbalanced use of technology in the early stages of growth in adolescents obstructs their situations in the future.

Keywords: Artificial Intelligence, Teenagers (12-18 Years), Academic, Performance, Psychological, Ethics

1. Introduction :

The fast application of the artificial intelligence technology has significantly influenced the manner in which the teens relate to knowledge, communicate, and even think. AI, for instance, enables the teens to get information from the other side, but in case the gadgets are overused, there may be consequences associated with attention, social well-being, and mental well-being. The consequences associated with the overuse of the AI technology regarding the basic thinking abilities of the teens in the social and educational setting constitute the parameters.

2. Problem Statement:

The growing use of artificial intelligence has greatly impacted the educational and personal aspects of teenagers. Although AI enhances the efficiency of learning and rapid problem-solving capabilities, overreliance could impede autonomous thinking, creativity, and decision-making capacities. Teenagers display symptoms of uncomfortableness in conditions where AI tools are not available, suggesting overreliance. In addition, overreliance could impact studying patterns and socializing. Although there could be negative consequences of overreliance, teenagers continue to be great users of AI tools. Hence, this research proposes analyzing the use of AI among teenagers and its impact upon their cognitive, academic, and social behaviors.

3. Review of the related literature:

3.1 Overuse of AI and the thinking power of teenagers:

For example, studies pertaining to the thinking power of the teenagers, reveal that the brain of a teenager is still under development. The point being overexposure to the AI-generated content is overexciting the thinking faculty, which results in problems like short span of attention, issues related to focused viewing, and impulsiveness. Furthermore, to the above, it has also been argued that the subconscious mind of the teenager is affected by the rapid movement of the AI-generated digital content available online by the algorithms created by the AI technology

3.2. Psychological & Emotional Effects :

The contents viewed through the AI platforms are expected to incorporate aspects that would trigger the emotion-social aspect of comparison among the youth. It was found during the research that the availability and notifications of

the outcome provided by the AI platforms are factors for the emotional controls and would make the youth get the experiences of anxiety episodes. The outcome is likely to create the effects of the dopamine response, which makes the youth addicted.

3.3 Academic Performance and Learning Behavior

As per the findings of the study, there is a negative correlation established between overuse of AI and performance. As per certain research work, it has been observed that the teens, or the persons using the applications relating to AI for an uncontrolled period of time, tend to lack attention in academic performance. Lack of attention, in this context, refers to lack of academic motivation. As per certain research papers, it has been mentioned that proper use of the applications relating to AI assists in optimizing the function of gaining.

3.4 Social Interactions and Changes in Behavior

It is postulated by some authors that the application of AI assists in forming the new society. Too much interaction between human beings and the AI virtual interaction makes them unable to communicate in the physical form. From literature, the application of AI chat bots in psychological fulfillment has been shown to make human beings weak in human relationships.

4. Research Objectives:

- 1) To study the utilization of the AI among the teens.
- 2) To identify the level of possible loss caused due to dependence on AI at the subconscious mental level and critical thinking power of the teens.
- 3) To explore how much the implementation of AI affects social interactions and communication for teens.

5. Research Methodology:

1. **Research Design:** The research will use a descriptive research design in the study of the magnitude and implications of overconsumption of artificial intelligence by the teen age group. The research design is ideal for the discovery of the patterns and implications of actions and their effects.
2. **Research Approach:** A quantitative technique is used to identify usage behavior of AI, screen use, dependency on decision-making, and rates of productivity of adolescents.
3. **Study Population:** The targeted audience in this online survey includes those who are attending schools and junior colleges, ranging in age from 12 to 18 years.

Sample Size and Sampling Technique

- **Primary Data** - Sample Size: 100 Participants

For convenience purposes, convenient sampling was to be conducted for the study since the target population consisted of adolescents who could be easily accessed.

Data Collection Method

The method employed was collection of primary data by using a structured questionnaire, which was designed in a simpler way that is more alluring to teens. This was conducted by using Multiple Choice and Scale questions that were asked using Google Forms.

Data Sources - Data sources Main data Teenagers' answers to questionnaires Secondary data sources

Journals, research papers, reporting, websites, and published research on the application and influence of AI and the behavior exhibited by teens.

Tools Used for Data Analysis -

Data collected were analyzed as follows:

The study used percentage analysis, tables, and graphs to break down and present the data. Simple interpretation helped make sense of the results. Researchers spent about two to three weeks on this project. Still, there are some limits you should know about. The sample size wasn't very big, and since people reported their own answers, there's a chance for some bias. Plus, the data came from a specific age group in one area, so the results probably don't apply to everyone.

- **Secondary Data :**

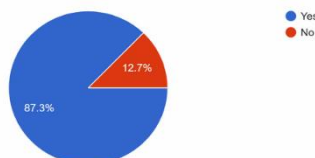
1. Most of the teens make use of whatever artificial intelligence resources that may be available to them.
2. Most of them depend on AI to help them perform their assignments, homework, and prepare for their examinations.
3. Excessive utilization of artificial intelligence technology causes over-screening, which is further responsible for concentration and sleeping disorders.

4. They claimed they were employing AI as supportive technology, lifting the burden on the entity's judgment.
5. Although it facilitated speed and convenience, the misuse of them led to problems concerning creativity and problem-solving abilities.
6. Productivity decreased among some users because of distractions and overdependence on the AI.
7. One could observe that there was a lack of awareness concerning the ethical uses of AI among adolescents.
8. A balanced application of artificial intelligence was welcomed; it became just a problem when this was taken to extremes.

6. Findings:

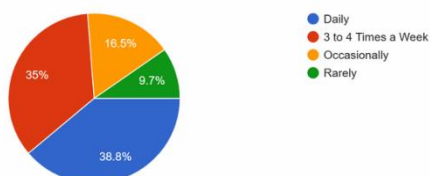
• Primary Data:

Have you used AI tools (like ChatGPT, AI image apps, voice assistants, etc.)?
 102 responses



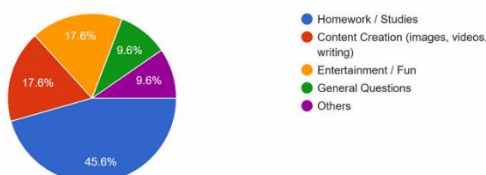
Around (87.3%) teenagers have used the AI tools and (12.7) approx, are not well known about AI tools use.

How often do you use AI tools?
 102 responses



The data shows that a significant proportion of respondents (87.3%) use AI tools daily or multiple times a week, indicating high integration of AI into routine activities.

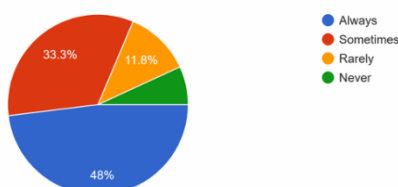
Main purpose of using AI: (You may choose more than one)
 102 responses



Most respondents reported using AI primarily for homework and academic studies, followed by content creation and entertainment.

This indicates that AI tools are largely perceived as educational support system rather than pure entertainment tools.

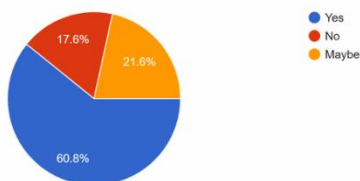
Do you prefer AI help over thinking on your own?
 102 responses



A considerable number of respondents stated that they always or sometimes prefer AI assistance over thinking independently.

This trend highlights a potential shift in cognitive reliance from self-driven problem solving to AI-supported decision making.

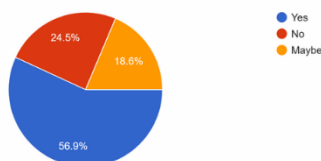
Do you feel uncomfortable when you cannot access AI tools?
102 responses



The majority of respondents reported feeling uncomfortable when they cannot access AI tools. This discomfort reflects a psychological reliance on AI for completing tasks or making decisions efficiently.

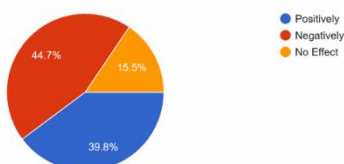
More respondents agreed that AI has reduced the time they spent thinking or solving problems on their own

Has AI reduced the time you spend thinking or solving problems by yourself?
102 responses



This findings suggest that excessive AI use may impact the development of independent analytical skills.

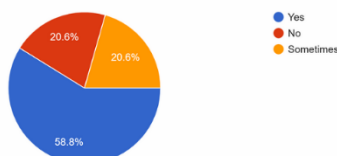
Has using AI affected your study habits?
102 responses



Responses indicates that the AI has affected study habits both positively and negatively, with a slight dominance of negative impact.

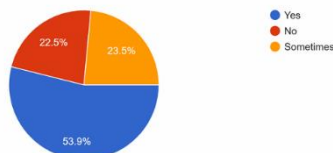
The mixed responses show that while AI can enhance learning efficiency, it may also encourage reduced academic effort.

Do you spend less time with friends or family due to AI usage?
102 responses



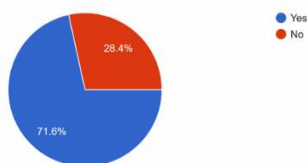
A majority of respondents admitted that AI usage has reduced the time they spend with friends or family. This suggests that increased screen time due to AI engagement may negatively influence social interactions.

Do you check AI tools more often than required?
102 responses



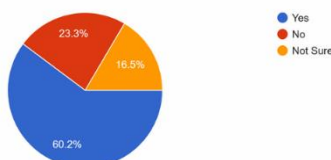
More than half of the respondents reported checking AI tools more frequently than necessary. This behavior indicates habitual or compulsive usage patterns associated with AI dependence.

Are you aware that overuse of AI can affect creativity and decision-making?
 102 responses



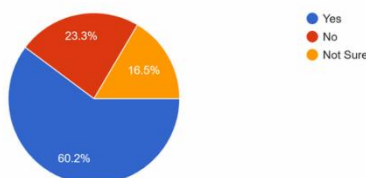
Most respondents are aware that overuse of AI can affect creativity and decision-making abilities. Despite this awareness, continued high usage suggests a gap of knowledge and behavioral control.

Do you think you can reduce your AI usage if needed?
 102 responses



A majority believe they can reduce their AI usage if required, while a notable portion is unsure. This reflects moderate self-control but also indicates potential challenges in managing AI consumption.

Do you think you can reduce your AI usage if needed?
 102 responses



Most respondents view AI as helpful, though many acknowledge associated risks and confusions. This demonstrates a balanced perception where AI is valued for utility but recognized as potentially harmful if overused.

7. Recommendations

Schools should encourage the prudent use of available AI tools by incorporating the ethics of AI and digital literacy in the curriculum.

Educators should incorporate autonomous thought and problem-solving skills through restricted AI utilization during testing and classroom engagements.

Parents and guardians must control the amount of time teenagers spend using AI to avoid overdependence.

Awareness programs need to be initiated in order to educate teenagers on the long-term impacts of the overuse of AI.

The writers of an AI solution ought to work mechanisms into the solution to enable healthy use.

Suggestions :

Teens should be encouraged to use AI as an aid and not as a replacement for their efforts.

It is important that there be regular breaks from AI-based activity in order for there to be healthy patterns with regards to studying and social interaction.

Learning exercises that do not involve AI can be introduced in schools to improve critical thinking and decision-making abilities.

Future research can be done by increasing the sample number and including a variety of age groups by future researchers for a more accurate outcome.

Future research may also investigate the psychological and academic effects of overconsumption of AI.

8. Conclusion:

This research has deduced that AI has turned into the integral technological parts of teens' daily life, influencing their intellectual, emotional, academic, and social developments significantly. The AI technology has contributed to accessible and ample personalized learning and various bits of information; however, findings from this study have shown that overreliance on AI at this critical age has numerous issues.

The research has shown that an over-reliance on AI platforms has adverse effects on the human brain, leading to brain overload, low span of attention, and poor decision-making capacity. It has been seen that the subconscious mind

gets influenced due to regular exposure to algorithm-generated content, which provokes teens to start the habit of impulsive use of AI platforms.

This particular experiment has validated that too much reliance on AI leads to increased levels of stress, as well as anxiety and moods, and emotional addictions. The above-mentioned sleeping disorders triggered by too much reliance on AI contribute to all these and cause immense distress related to both mental and physical components.

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Rural Economic Transformation through Sustainable Development: The Shirpur Model and SDG 8

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Abstract

Rural Economic Development Between goals 8 of the UN Sustainable Development Goals 8 on (Attaining Decent Work and Economic Growth and) put into action. This paper explores the 'Shirpur Development Model' located in the Dhule District of Maharashtra, India. The research indicates that an integrated approach to Rural Development promotes long-term sustainable transformation of the rural economy. A review of Shirpur's indigenous system of Water Resource Management, Industrial Development, and Education infrastructure has produced many positive results in job creation, agricultural production, and entrepreneurship. This model uses water conservation (SDG 6) and education (SDG 4) as essential elements for promoting economic growth. The implementation of the Shirpur Development Model produced Asia's largest gold refinery and created over 15,000 textile manufacturing jobs, as well as enabled the transition from subsistence agriculture to developing agricultural-based businesses. The results of this study support that the application of a comprehensive model comprising Technology, Infrastructure Development, and Community Engagement can identify and produce replicable and scalable models for Rural Businesses that conform to Global Sustainability Standards.

Keywords: United Nations Sustainable Development Goals; SDG 8; Rural Development; Economic Transformation; Shirpur Model; Decent Work; India.

1. Introduction

"Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all," is how the UN describes SDG 8 (SDG8, 2015). RDG Now, in order for India to meet SDG8, transformational avenues must be developed that overcome the structural inequalities faced by the rural population whilst also creating further pathway(s) to sustainability, inclusivity, and greater productivity of businesses and industry throughout all sectors, of economic growth. For example, the key areas where rural areas have been most focused on to develop and provide include limited employment opportunities available within rural areas; low agricultural system productivity; and limited infrastructure available for rural economies along with limited access to rural goods and services.

The case study in the Shirpur area of the Dhule district in North Maharashtra demonstrates how rural areas can successfully undergo an economic transformation. The location of Shirpur, in the Tapi River basin, had a current population of approximately 422,137, with about 82% being rural. Historically, Shirpur has been affected adversely by dry climatic conditions, making agriculture very difficult; therefore, many agrarian families from that region typically migrated from the area. Thanks to a range of integrated interventions, most notably groundwater conservation mechanisms (known as the Shirpur Pattern), as well as the promotion of industrial growth and increased educational opportunity, Shirpur has become an emerging centre of industrial and educational development, with an agricultural base still supporting this transition.

Research Objectives

- 1) To analyze the contributions of the Shirpur Model to achieving the SDG 8 objectives with respect to economic growth, increased employment opportunities, and greater entrepreneurship.
- 2) To explore how water security (SDG 6) and education (SDG 4) support the enabling environment for sustainable farming practices in rural Shirpur.
- 3) To identify the types of technology adoption and innovation practices that are supporting business transformation of businesses operating within the area of rural Shirpur.
- 4) To identify lessons learned from the Shirpur transformation that can be replicated by other practitioners of rural development.

2. Literature Review

Eighty-eight percent of all world poverty+378,532 people; over half of the world suffers from extreme poverty. Rural areas influence social inequalities by limiting equitable access to jobs and education opportunities thus perpetuating poverty. Rural education offers potential; therefore it is essential for governments, regions and nations alike to continue funding and building rural schools that provide quality education including life skills, technical skills and employment training.

The combined efforts of both government and local leaders who believe in empowering people will ultimately grow rural economies and reduce rural poverty in the future by providing educational opportunities to have a direct effect on the improvement of their respective economies through increased employment; improved living standards; enhanced access to higher quality food; increase income from using or growing more locally produced crops; improved ability of the business community and local families to increase economic opportunities to generate more revenue for both; build the capacity of the local economy to grow; build opportunity to create jobs; connect people to services and resources to develop agricultural economies; increase the availability of low cost utilities (electricity, water, etc.); contribute to the well-being of future generations; enhance property values (increase wealth); and build a sense of community around the rural area. The above mentioned combined benefits must also be recognized by public and private investors because they can subsequently benefit from those improved benefits through greater returns on investments and thus be attracted to invest in rural economies to help build those economies (Morrison 2018).

Rural educational institutions need to serve as centers of resources and support for rural families and communities; to provide opportunities to participate in lifelong learning; to prepare and provide opportunities for local businesses; and to actively encourage youth to seek employment and/or pursue career paths that meet the needs of rural families, businesses and communities. Those roles must continue to grow and expand in order to continue supporting the transition of our rural communities to sustainable development through improving education systems that meet the needs of every rural family and community. Government leaders are literally investing billions of dollars around the globe in rural education. Therefore, may this collective effort be utilized to support and promote economic sustainability in rural areas.

3. Methodology

In this qualitative case study, the authors examine how the Shirpur Development Model has helped achieve Sustainable Development Goal (SDG) 8 and what effect it has had on various aspects of sustainability. To contain the Shirpur Development Model, which collects and releases important information and reports to the general public, the researchers will utilize the following sources: The Indian Government, published academic papers, industry-specific information, the 2011 census, and other news articles. The researchers then compared the Shirpur Development Model's successes against Sustainable Development Goal 8 (SDG 8) using various indicators, including GDP growth, total economic activity, new job openings, the efficient use of available resources, creating job opportunities for the next generation, and providing financial support to those eligible. The researchers delineated the Shirpur Development Model using a three-pronged analytical model. The first part of the three-pronged analytical model was to quantify the types and amounts of development-related initiatives. The second part of the three-pronged analytical model was to plot the data from the Shirpur Development Model against SDG 8. The final phase of the three-pronged analytical model was to measure the impact of the Shirpur Development Model on overall economic growth.

The study has certain limitations, which are the reliance on secondary data, the lack of temporal economic data at the tehsil level, and the difficulty in establishing causality given that multiple interventions were implemented during the same time frame.

4. The Shirpur Development Model

4.1 Water Resource Management (SDG 6 Enabler)

The Shirpur Development Model is the first groundwater conservation initiative developed specifically for the unique geology of the Deccan Plateau in India. The model has been implemented in 35 villages covering approximately 200 km² and consists of widening and deepening streams 3-4 times greater than their natural dimensions, as well as installing cement check dams every 300-400 metres along the streams.

The following are some of the outcomes measured from the Shirpur Development Model: Groundwater levels have risen from 500 feet to 15 feet in basalt areas. The average groundwater level of alluvial areas has increased from an

average of 280 feet to an average of 80 feet. The total volume of water stored in reservoirs has increased by 50,000 - 150,000 cubic meters. Year-round availability of water has allowed for the revival of previously dry wells.

Effects of the Economy on Business: Movement away from relying only on rainfall by providing irrigation to 12.94% of cultivable land. Growing a variety of crops including cash crops like cotton and sugarcane, along with flowers and vegetables. Growth of numerous support industries as a result of intensive agriculture. Water storage facilities for the industrial sector providing a secure water supply for their manufacturing processes.

4.2 Industrialization (SDG 8: Economic Development)

Table 1: Key Industries in Shirpur Tehsil

Industry Sector	Establishment / Organization	Employment Generated	Economic Significance
Gold Refining	Shirpur Gold Refinery (Asia's Largest)	800+	Precious metal processing, export-oriented industry
Textiles	Deesan Group (Established 1996)	15,000+	Vertically integrated textile operations (cotton to garments)
Textiles	Priyadarshini Sahakari Soot Girani	2,500+	Cooperative-based cotton spinning, rural employment
Agro-processing	Sugar factories and mills	2,000+	Agricultural value addition and seasonal employment

The Deesan Group Case: The Deesan Group has been established for over 25 years, covering over 500 acres of land where it has developed an entire value chain from cultivation of Cotton through to manufacture of Garment creating job opportunities for people of different skill levels and enabling local communities to capture maximum value.

Industrial Contribution toward Achieving the Sustainable Development Goals 8 (SDG-8);

- 1) Job Creation: 25000 direct manufacturing jobs, plus over 50000 indirect jobs
- 2) Economic Capability; Shift to Higher Value Manufacturing
- 3) Business Type: Cooperatives, showing inclusivity in entrepreneurship.
- 4) Technological Advancements: New Equipment as well as quality standards for products.

4.3 Educational Infrastructure (SDG 4 Enabler)

Table 2: Educational Infrastructure

Institution Type	Representative Institutions	Student Enrollment	Economic Linkage / Impact
Engineering	R. C. Patel Institute of Technology (Established 2001)	3,000+	Supply of skilled technical and engineering workforce
Management	NMIMS Shirpur Campus	2,500+	Development of managerial, entrepreneurial, and business skills
Pharmacy & Sciences	Multiple colleges	4,000+	Workforce for healthcare services and research activities
Schools	Shirpur Education Society (Established 1979)	40,000+	Strong foundation for basic education and future human capital

Socioeconomic Impact:

- Workforce Skills Development for Young People to meet Economic changes (Target 8.6).
- Job Creation in Education Services (in Excess of 3000 Jobs)
- Increased demand for students.
- Human Capital Will Improve Productivity and Entrepreneurship

4.4 Agricultural Transformation

Water Security and Market Linkages Helped to Change Agriculture by Creating New Crops (Wheat, Cotton, Sugar Cane, Vegetables, Fruit), Improving Productivity Through Irrigation, Increasing Farmers Income Through Cooperatives and Industry Linkages that Increase Bargaining Power.

5. Assessing SDG8

5.1 Alignment with SDG8 Targets

Table 3: Shirpur Model and SDG 8 Targets

SDG-8 Target	Shirpur Interventions	Key Outcomes / Impact
8.1: Sustained per capita economic growth	Industrial diversification and enhanced agricultural productivity	Transition from subsistence-based economy to diversified economic structure
8.2: Higher economic productivity	Adoption of modern technologies and vertical industrial integration	Growth of high-value manufacturing and agri-business sectors
8.3: Promotion of job creation and entrepreneurship	Establishment of large industries and cooperative enterprises	25,000+ industrial jobs and employment through education-linked services
8.4: Improved resource efficiency	Water conservation initiatives and sustainable resource management practices	Significant improvement in water-use efficiency and sustainability
8.5: Full and productive employment and decent work	Expansion of formal-sector industries	Structured employment with improved job security and labor protections
8.6: Youth employment and skills development	Expansion of educational infrastructure and skill-development programs	Enrollment of 40,000+ students, enhancing youth employability
8.7: Access to financial services	Industrial and entrepreneurial growth stimulating financial institutions	Expansion of banking, credit facilities, and financial advisory services

5.2 Integrated Development Model

Positive Synergy between Water Security, Agricultural, and Education- The relationship between water security, agricultural productivity, and education creates an economic multiplier effect. Agricultural intensification could not occur without water security and the increased agricultural production can draw in other sectors such as food processing and distribution that require significant amounts of water. The addition of the skills provided by an educated workforce will create additional direct jobs and provide necessary skills to support growth in other sectors. Together both factors result in ongoing economic transformation that could not be achieved through either factor alone



Figure 1: Synergistic Development Framework

5.3 Technology and Business Transformation - Business Practices

Technology Adoption

- Agricultural Technologies - Mechanized Stream Treatment, Modern Irrigation Techniques, Precision Agriculture
- Industrial Technologies - Advanced Refineries, Automated Machinery for Textiles, Quality Control
- Educational Technologies - State-of-the-Art Laboratories, Digital Learning Platforms
- Financial Technologies - Digital Payments, Expanded Banking Networks

Business Structures

1. Vertical integration - Deesan has established a full value chain that maximizes efficiencies and the value of products.

2. Cooperative structures - Deesan's stakeholder capitalism aligns with inclusive growth principles.
3. Cluster development - industry clustering creates shared infrastructure and knowledge transfer among industry participants.
4. Public-private-community partnerships - Deesan collaborates with a variety of different stakeholders.
5. Sustainable Commercial Practices - Deesan is committed to conserving water in accordance with Environmental Social Governance (ESG) principles.

6. Findings and Discussion

6.1 Key Achievements

Table 4: Quantitative Impact Summary

Dimension	Baseline (circa 2000)	Current Status (2020s)	Observed Change / Impact
Groundwater Depth	300–500 feet	15–80 feet	85–95% improvement in groundwater availability
Irrigated Area	<5% of cultivable land	12.94% of cultivable land	~158% increase in irrigated coverage
Industrial Employment	<2,000 jobs	25,000+ jobs	~1,150% increase in industrial employment
Educational Enrollment	~5,000 students	40,000+ students	~700% increase in student enrollment
Economic Structure	~85% agriculture-dependent	Multi-sectoral economy	Structural economic transformation

The changes that have taken place in Shirpur represent the type of extensive transformation occurring across multiple sectors. For example, agriculture is transitioning from subsistence farming to commercialized practices linked to the marketplace and value chain. Labour migration is evolving from individuals being displaced from their local communities to skilled workers actively seeking out focused employment opportunities that match their training. Geophysical conditions have changed and have enabled the region to address chronic water scarcity. Educational expansion has made Shirpur a regional centre for educational resources. Employment has transitioned from informal types of jobs to formal types of jobs, creating better job security for workers than existed with informal forms of employment.

6.2 Transferability

With proper adaptation, the principles evidenced in the Shirpur model can be applied by other areas experiencing similar conditions. There are possible technical solutions to establish water security for areas with similar geological conditions; the integrated development approach provides evidence of synergies resulting from multi-sector interventions that exceed the benefits of an individual sector's intervention; there was a strong emphasis on community participation in the establishment of sustainable solutions; while the collaboration between multiple stakeholders allowed the use of more diverse resources; and the establishment of sustainable solutions required long-term commitment spanning several decades, as well as an institutional maturity that cannot occur within typical project timeframes.

The way businesses adapt depends on how much customization occurs to the factors affecting the businesses. The geological environment of an area will inform how water harvesting methods are applied, while the local economic conditions will influence how business activity occurs within a sustainable value chain. How educational interventions are delivered will take into account the current skill level and literacy of the area; similarly, how commercial agriculture will be established will require consideration of the physical and digital infrastructure of the area. Finally, the institutional frameworks that exist will dictate how well governance systems operate to enable ongoing collaboration.

6.3 Environmental and Equity Challenges

There are many ongoing environmental sustainability challenges consisting of the lack of long-term monitoring of: (1) groundwater extraction rates, (2) soil health and (3) biodiversity effects. Additionally, equity issues will remain, as the benefits from overall economic development will not always flow to marginalized populations (e.g., women, economically disadvantaged groups). Also, there are transportation infrastructure gaps, energy supply gaps and digital connectivity limitations that continue to limit the potential for future development. Lastly, market volatility (due to price

fluctuations) creates uncertainty for farmers whose production and pricing must compete within their region with larger geographical markets.

7. Recommendations

For Policymakers

Integrated Water, Education and Economic Development Frameworks should be developed and demonstrate explicitly how they interlink between sectors. By providing an enabling policy environment, local innovation will be encouraged by providing opportunities to experiment with new ideas and scale-up proven methods. Policymakers should strategically fund infrastructure systems that provide a strong foundation for additional growth and development. Additionally, business and government partnerships must have clear allocations of risk, as well as clarity on the roles of each partner in order to successfully grow. Accomplishing this requires monitoring the United Nations Sustainable Development Goals (SDG) at a sub-district level to gather detailed data and produce evidence-based decisions that can lead to timely adjustments to the partnership.

Development Practitioners

In order to create successful interventions, development practitioners should work with a participative process that enables an understanding of both local priorities for development, and the currently available capacity of people within the community to engage with those priorities. Drawing upon the existing strength of communities, such as the traditional forms of knowledge and existing social organisations, helps develop ongoing engagement with a project or process. By enabling a long-term level of engagement that is beyond the lifecycle of typical development projects, the community will mature as an institution and subsequently adopt behaviours that align with the broader goals of the intervention undertaken. Additionally, the development of a systematic approach to the documentation and sharing of lessons learned provides other practitioners and communities with an opportunity to learn from the successful application of similar projects and the adaptations made in response to the context of the community.

Business

Businesses should actively seek to invest in rural areas as a means of generating shared value, while addressing the social needs of communities they operate in. To create inclusive business models that fully integrate small producers into the supply chain, contracts between producers and the companies that manufacture goods should be negotiated based on equal terms. Creating a sustainable supply chain also provides producers with fair and equal pricing and provides businesses with the assurance to source from them. Additionally, when businesses align their operations with ESG (environmental, social, and governance) principles, they can better manage their sustainability risks and build long-term viability for their business while creating positive social impact. Investing in local areas' skill development creates an available and capable workforce for these communities, and will ultimately improve the overall capacity of the local community to contribute to other areas related to economic development.

8. Conclusion

Shirpur's Development Model demonstrates that Rural Economic Transformation can be accomplished through resource management, human capital development, and industrial policy. These elements are integrated as part of Shirpur's Development Model to achieve the Sustainable Development Goals (SDGs) outlined in Goal 8: Decent Work and Economic Growth. Two key elements of Shirpur's model are providing access to clean potable water (SDG 6) and establishing educational facilities (SDG 4) within the village. Both of these elements were necessary to help create conditions which support Rural Economic Diversification and Pillar 1-2 of the Model; both were necessary to support creating opportunities for all categories of employment generation, as well as to provide a mechanism for establishing a local Entrepreneurship Ecosystem. Key takeaways from the Shirpur model include (1) the need for a Comprehensive System-based Strategy to address issues at multiple levels concurrently; (2) the need for Community Engagement and Local Innovations; (3) Infrastructure is important to attract both businesses and investment to an area; (4) Business Models that are Inclusive can be Sustainable; and (5) Sustained Commitment to the model over a period of time is critical in order to continue developing the local economy.

The Shirpur Development Model clearly illustrates how businesses around the world can achieve sustainable and inclusive rural development. With an increasing number of companies adopting Environmental, Social and Governance (ESG) principles and attempting to create resilient rural supply chains, understanding how rural communities will change as a result of this movement will be essential for companies. The Shirpur Model can be implemented in other parts of the world by taking into account how to apply the concepts of Integrated Planning, Community Participation, Resource

Efficiency and Human Capital Investment to suit the specific conditions in each region. Future studies should include academic research on the ongoing monitoring of long-term sustainability, impact assessments, equity measures, and comparative studies of rural development models. The results of the Shirpur experience indicate that a common approach can be used to broadly transform the rural economy in accordance with the goals of the Sustainable Development Goals (SDGs) through the application of appropriate strategies, technological advancements, and a long-term commitment to building a sustainable rural economy.

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Enhancing Business Resilience in Cooperative Banks Through a Custom Cloud-Based Monitoring and Auto-Remediation Framework: A Case Study

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Abstract

Cooperative banks have started to use cloud infrastructure a lot in the last few years. This is because they want to make sure their services are always available and they can work efficiently. These banks have a hard time keeping their systems stable. They do not have automation and their networks are restricted. They also have to rely on people to monitor things manually. When the system goes down without warning it takes a time to fix the problem and they do not have a good way to alert people about issues before they happen. This affects the banks' ability to keep doing business and it also makes customers lose trust in them. Cooperative banks really need to work on this because unplanned downtime and delayed incident response are problems. Cooperative banks have to find a way to improve these things to keep their customers happy and to stay in business.

This study is, about a system that helps banks work better. It is a custom-made system that runs on the cloud and it checks on the banks computer systems all the time. The system checks things like how the computers are working how much memory they are using how much space is left on the disks if the applications are working okay and if the computers have the latest patches.

The system uses a different part to make sure it can always talk to the banks computers even if the internet is not working very well. It has programs that run on each computer a central part that helps them talk to each other and a main control part that makes sure everything is working right. This way the system can keep checking on the banks computers and fix any problems it finds which helps the banks keep working. The system is designed to work in places where the internet not always available.

The framework does a lot of things automatically to fix problems like getting a service up and running again restarting a process and changing the number of resources it uses. This means people do not have to get involved much.

The system is already being used on production cloud instances. It was tested to see how it works in real life.

What we found out is that the framework helps people respond to problems faster it reduces the time a service's down and it gives IT administrators a better understanding of what is going on with the system.

The findings demonstrate that a custom-built monitoring and auto-remediation framework can significantly strengthen business resilience in cooperative banks by enabling proactive system management, improving service reliability, and supporting technology-driven operational transformation.

Keywords: Business Resilience, Cooperative Banking, Cloud-Based Monitoring, Auto-Remediation Framework, Distributed System Architecture, Proactive Infrastructure Management

1. Introduction

The cloud computing thing is changing how financial institutions handle their computer systems. Cooperative banks are moving their banking applications and services to the cloud to make them more available and to make them work better. This move to the cloud has some points but it also creates new problems with keeping an eye on systems responding to issues and keeping services running smoothly. Cloud computing is helping banks in many ways but it is also making new challenges, for cloud computing and the people who manage it.

Cooperative banking is about being available to people when they need it. This is because banking is very time sensitive. If the system is down for a short time, it can cause a lot of problems. People may not be able to do their transactions. They will be unhappy. This can also cause problems with the rules that banks have to follow.

A lot of banks still do things the old way. They use people to check the systems. They use machines that are not fully automatic. This means that they are always reacting to problems of stopping them before they happen. The old way relies much on people noticing something is wrong and then telling others. Sometimes the alerts are late. It is hard to see what is going on in all the systems. This makes it more likely that the bank will be down, for a time. Cooperative

banking systems need to be available all the time. Cooperative banking is very important. It needs to be working properly.

Commercial monitoring tools that are already there do not really work well for cooperative banks. Cooperative banks have to deal with a lot of restrictions. They have limited internet access and strict security rules. They also have to be careful about how money they spend. Because of this it does not make sense for them to rely on monitoring services from outside or tools that are managed in the cloud. Cooperative banks need a monitoring system that is made for them. This system has to be able to adapt to their needs be secure not cost much and work well even when the internet is not great. Cooperative banks need a system, like this so they can keep an eye on things without any problems.

This research is, about the problems that cooperative banking systems face. It talks about a system that is made to watch over these banking systems all the time and fix problems automatically. The system keeps an eye on the parts of the banking system and the programs that run on it. When it finds a problem, it fixes it away without needing someone to do it manually. This makes the banking system more reliable. Helps it to keep working without stopping. The system is designed to work from different places and to stop problems before they happen. This helps to make sure that the banking system is always available and that problems are fixed quickly. The banking system is the focus of this research and the special system is designed to help the banking system work better.

The objective of this study is to demonstrate how a purpose-built monitoring framework can contribute to technology-driven business resilience in cooperative banks. Through real-world deployment and operational observations, the study highlights the practical benefits, limitations, and potential impact of integrating automated monitoring and remediation mechanisms within cloud-based banking infrastructure.

2. Problem Statement

Cooperative banks that use cloud-based systems have a lot of trouble keeping everything running smoothly. They need to make sure their services are always available and that they can fix problems quickly. The banking applications that are really important often run on different cloud servers. So, it is very important to keep an eye on these systems all the time and to find faults as soon as they happen.

Cooperative banks have a problem, with the way they monitor their systems. Most of the time they only fix problems after they have happened. They do this by checking the systems or by using tools that do not send out alerts right away. They also use different tools that do not work well together which makes it hard to see what is going on with the whole system.

Networks that are really limited and have tight security rules make it even harder to use services that manage everything for you or solutions from companies. This means that when something goes wrong with the system it takes longer to find out. You might not notice that you are running out of resources or that an application has failed or that there is a problem with the system. This can cause the system to be down for a time and it can be a bigger risk, to the whole operation. Also, because we do not have systems that can fix problems automatically, we have to rely on people to fix things, which takes longer and means that the service is more likely to be disrupted. The network conditions and security requirements of these systems are really strict which makes the use of managed monitoring solutions or third-party solutions even more complicated.

There is a clear need for a custom monitoring approach that can operate reliably within controlled banking environments, provide real-time visibility into system health, and initiate automated remediation actions when issues are detected. Addressing this gap is critical to improving operational efficiency, reducing downtime, and strengthening overall business resilience in cooperative banking systems.

3. Objectives of the Study

The primary objectives of this study are as follows:

- To design a custom cloud-based monitoring framework suitable for the operational and security constraints of cooperative banking environments.
- To implement a distributed monitoring architecture capable of continuously tracking critical system and application health parameters.
- To integrate automated remediation mechanisms that reduce dependency on manual intervention during system failures.
- To evaluate the effectiveness of the framework in improving incident response time and service availability under real production conditions.

- To assess the contribution of the proposed framework toward enhancing business resilience in cloud-enabled cooperative banks.

4. Research Methodology

This study adopts a case study-based applied research methodology to examine the design, implementation, and operational impact of a custom cloud-based monitoring and auto-remediation framework in a cooperative banking environment. The case study approach is selected to capture real-world operational challenges, system behavior, and practical outcomes under production conditions.

The research methodology involves four key stages. First, operational issues related to system monitoring, incident response, and service availability in cloud-hosted banking infrastructure were identified through direct observation of day-to-day IT operations. These issues formed the basis for defining system requirements and design objectives.

Second, a custom monitoring framework was designed using a distributed architecture consisting of lightweight monitoring components deployed on cloud servers, supported by centralized coordination and alert management mechanisms. The framework was implemented to monitor critical infrastructure and application parameters and to trigger predefined remediation actions when abnormal conditions were detected.

Third, the framework was deployed on production cloud instances supporting banking operations. Continuous monitoring data, alerts, and remediation events were observed over regular operational cycles to evaluate system reliability, response behavior, and administrative effectiveness.

Finally, the observed outcomes were analyzed qualitatively to assess improvements in incident response time, system stability, and operational visibility. The findings were interpreted to evaluate the contribution of the proposed framework toward enhancing business resilience in cooperative banking environments.

5. System Architecture of the Proposed Framework

The proposed monitoring and auto-remediation framework is made up of parts that work together. This framework is good, for banking environments that are based in the cloud and work with other banks. The monitoring and auto-remediation framework makes sure that everything runs smoothly. It checks everything all the time keeps information safe when it is being sent and makes sure that decisions are made in one place. The monitoring and auto-remediation framework can do all these things when the network and security are not ideal. The framework is very reliable. Can work well in cloud-based cooperative banking environments.

At the level of how things work small programs are put on each server that hosts banking applications and services on the cloud. These small programs always keep an eye on things, like how much the computer is being used how much memory is being used how much space is left on the disk if the applications are running okay if the servers have the latest updates and if the systems are working. The small programs are made to work without using up much of the servers' resources so the banking applications and services can keep running smoothly without any problems.

The framework is really helpful because it supports a hybrid monitoring approach. This approach combines two things: event-driven alerts and scheduled health checks. The event-driven monitoring is great because it helps us detect conditions right away. On the hand the scheduled checks make sure that our system health and configuration compliance are validated on a regular basis. This means we can use the framework to monitor the system health and configuration compliance of the system health and configuration compliance. The framework supports this hybrid monitoring approach which's a combination of event-driven alerts and scheduled health checks, for the system health and configuration compliance.

To make sure that data is sent in a reliable way a special layer is added between the people who monitor things and the main control system. This layer collects warnings and information from different sources and then sends them to the main part of the system. The special way that data is sent helps to make sure that the system keeps working even if something goes wrong it makes the network work easily and it helps in situations where the monitored systems and the main services cannot be connected directly. The relay communication layer is very important, for the monitoring agents and the centralized control system. The monitoring agents send data to the relay communication layer. Then the relay communication layer sends the data to the master component. This makes the whole system more reliable and safer.

The master component is in charge of handling alerts that come in. It looks at the situation. Decides what to do based on rules that were set up beforehand. The master component figures out what actions to take.

The alert information goes through the system in an order. It goes from the Agent to the Relay. Then, to the Master. This order helps to handle things in a way and makes sure that the master component can see everything that is going on.

The framework has automated remediation capabilities. This means it can do things like restart processes in a controlled way and take actions at the resource level. These things help reduce the need for people to get involved and fix problems manually. This way the system can recover from anomalies faster.

The framework is also designed to work across parts. So, if one part fails it does not affect the monitoring capability of the framework. This makes the system more resilient to failures. The framework incorporates automated remediation capabilities, like these to make it stronger.

This layered architecture provides scalability, operational flexibility, and enhanced reliability while adhering to the security and compliance requirements of cooperative banking environments.

6. Implementation Details

The proposed monitoring and auto-remediation framework is made up of parts that work together. This framework is designed to be flexible and reliable and easy to maintain. The monitoring and auto-remediation framework has a job, for each part so they can work alone if needed. This means that if one part of the monitoring and auto-remediation framework has a problem it will not affect the parts of the monitoring and auto-remediation framework.

Monitoring agents work in the background on servers that are hosted on the cloud. They do jobs at certain times. These jobs gather information about the system, such as how the CPU is being used how much memory is being consumed, if the disk is available if the application is working what patches have been installed and if the system is sending out heartbeat signals.

The way these tasks are scheduled lets parts of the monitoring system work at different times. This means that the system uses resources in a way and it can find problems quickly. The monitoring agents do all this to make sure everything is working properly. Monitoring agents are very important, for this.

The framework uses a way to generate alerts. It has two types of alerts. The framework generates event-driven alerts away when it finds something is really wrong or when something fails. The framework also does scheduled checks to make sure the system is working properly and consistently. The framework collects information. Organizes it in a way that makes sense. Then it sends this information to the relay component in a way. This helps to keep the network from getting too busy. It makes sure the information gets to where it needs to go even when the connection is not very good. The framework does this to make sure the system health and operational consistency of the system are good. The framework generates alerts to help with the system health and operational consistency of the system.

The relay component is like a man that helps to collect information, from many different sources. It gets monitoring data from agents and then sends valid alerts to the master system. This way the monitored servers do not have to talk to the central control system. The relay component helps to make the system bigger and better able to handle problems. This makes the master system and the monitored servers work together smoothly. The relay component is important for the master system and the monitored servers to work together.

The master component looks at the alerts that come in uses the rules we set up to figure out what they mean and decides what to do about them. Sometimes the master component will start fixing the problem on its own, which can include restarting an application in a controlled way or taking corrective actions to fix a specific resource. The master component has safeguards to prevent it from trying to fix the problem over and over or from trying to fix it in a way that could make things worse so the system stays stable. The master component and its safeguards are important, for keeping everything running smoothly.

Operational logs and alert records are maintained to support auditability, troubleshooting, and administrative review. The overall implementation emphasizes reliability, minimal performance impact, and operational transparency, making the framework suitable for production use in cooperative banking environments.

7. Results and Observations

The new system to watch and fix problems automatically was put on servers on the internet that help banks work together. We watched it work under conditions and it kept running all the time without slowing down the banks computer systems. This showed that the simple way of watching the system was really working well for the banking operations and the monitoring and auto-remediation framework. The monitoring and auto-remediation framework was very good, at doing its job.

The framework did a job finding problems with resources like when an application process fails or a service is interrupted. It told us about these issues away. We got alerts when something went wrong which helped us find the problems quickly. We also checked the system on a schedule to make sure everything was working okay. The framework

used a kind of monitoring called heartbeat to check if the servers were working, which made us feel more confident that the servers were available when we needed them. This monitoring also helped reduce uncertainty when something went wrong during operations. The framework and its heartbeat monitoring really helped us with the server availability and reduced uncertainty during incidents, with the framework.

The automated remediation mechanisms really helped to cut down on the need for people to step in and fix things. When problems were found the system quickly did controlled restarts of processes. Took corrective actions, which meant that services were back up and running faster and there was less downtime. The fact that alerts were looked at in a way and that there was a structured flow of alerts made things clearer for the administrators and meant that they did not get lots of repeated alerts about the same thing. Automated remediation mechanisms made a difference in this area.

Operational visibility was enhanced through consolidated monitoring data and alert records, enabling administrators to identify recurring patterns and address underlying system weaknesses proactively. Overall, the framework demonstrated measurable improvements in incident response efficiency, system stability, and operational control, contributing directly to enhanced business resilience in the cooperative banking environment.

8. Business Impact (Revised)

The custom cloud-based monitoring and auto-remediation framework has really helped business operations in banking environments.

It does this by finding issues before they become problems and getting systems back up and running quickly.

This means the custom cloud-based monitoring and auto-remediation framework has cut down on service disruptions and made the system available often.

The custom cloud-based monitoring and auto-remediation framework is very good at its job, in banking environments.

The solution is a way to save money because it does not need extra fees for licenses, subscriptions to other companies or services to monitor everything. This framework uses the cloud system that's already in place which makes it a good choice for small banks that want to improve how they work without spending more money every month. The solution is cost-efficient for these banks and the framework is a good option for cost-sensitive cooperative banks, like these.

Improved operational visibility and centralized alert management have enhanced administrative efficiency and reduced dependency on manual monitoring efforts. Automated corrective actions have minimized response delays, supporting uninterrupted banking services and strengthening customer trust. Overall, the framework demonstrates how a low-cost, custom-built monitoring solution can effectively support technology-driven business resilience.

9. Limitations of the Study

This study is about a custom monitoring framework that was used in a banking environment. The custom monitoring framework was used in this banking environment to see how it worked. The results of the study are based on what happened when the custom monitoring framework was used in this banking environment. This means the results show what the custom monitoring framework did in this situation including how the custom monitoring framework worked with the computers and people, in the banking environment. The custom monitoring framework was affected by the way things were done in the banking environment and the custom monitoring framework was also affected by the equipment and organization of the banking environment.

The evaluation is mainly, about looking at how the system works in real life. This means checking if the system's stable how people respond when something goes wrong and if everything runs smoothly. The evaluation does not look at numbers and statistics to see how well the system performs over time compared to banking systems. System stability and incident response are things that the evaluation looks at to see how effective the system is.

Additionally, the framework is designed to address current operational requirements, and its effectiveness may depend on proper configuration and administrative oversight. Future enhancements may be required to adapt the framework to different scales or regulatory environments.

10. Future Scope of the Study

The proposed monitoring and auto-remediation framework can be made better by using predictive analytics. This will help us find out about system issues, with the monitoring and auto-remediation framework before they even happen.

We can also make the monitoring and auto-remediation framework more useful by adding alert prioritization mechanisms. This will help reduce fatigue and make things easier for administrators to manage the monitoring and auto-remediation framework.

Future work may also explore centralized visualization dashboards and cross-environment monitoring to support multiple banking systems from a unified platform. Additionally, extending the framework to support broader compliance reporting and adaptive remediation strategies can further strengthen its role in enhancing business resilience in cooperative banking environments.

11. Conclusion

This study is, about a system that helps banks work better. It is a custom system that uses the cloud to watch over things and fix problems automatically. The system is designed to help banks keep working smoothly. It does this by fixing the problems with the way of watching over things and the expensive solutions that companies sell. The new system is practical. Can be used by many banks. It helps banks manage their computer systems in a way. The system is good because it stops problems before they happen.

The system they used had a lot of parts working together. It was always checking things sending alerts in an order and fixing problems on its own. This made the system more stable. Helped fix issues faster when they were actually being used.

This shows how using technology to make plans for operations can decrease the time the system is not working make it easier for administrators to do their jobs and help the bank keep running without interruptions to its services. The banking services can keep running. The system and the technology used are very important, for the banking services.

Overall, the findings of this study indicate that a purpose-built, cost-efficient monitoring framework can play a significant role in strengthening operational resilience and supporting digital transformation initiatives in cooperative banks.

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Study Perceptions of Metaverse Economy Among Youths

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Abstract:

The metaverse economy is expected to add trillions of dollars to the global gross domestic product by 2030; however, serious unawareness among undergraduate students in developing countries such as India also promises to slow progress in the consideration of that progress. As a response, this paper explores the awareness and perceptions of youth about the potential development arising due to the metaverse. Based on descriptive statistical analysis, the study assesses students' experiences with virtual currencies, their perceptions of emerging job opportunities, and barriers to the metaverse economy.

Keywords: Metaverse economy, virtual assets, NFT.

Introduction:

The metaverse is a relatively new digitally enabled space where immersive technologies such as Virtual Reality, blockchain technology, NFTs, and virtual platforms come together to deliver innovative online behaviours and economic transactions. For the youth of today, the metaverse is set to shape the destiny of future careers, entrepreneurship, and the digital economy. Yet, the level of youth familiarity with the economy of the metaverse is varied, as many youth are conversant with online platforms but remain unaware of the concept of NFTs, blockchain transactions, and the digital economy. This is indicative of research needed toward youth perceptions and preparedness regarding the responsible management of the metaverse economy.

Review of Literature:

Conceptual Underpinnings: The metaverse brings blockchain and NFTs together into a single package of decentralized markets based on digital scarcity. Recent second-order metaverse platforms like Decentraland and The Sandbox have sought to couple the notion of virtual land and content ownership with DAO-based self-management.

Growth Projections: The market is projected to reach \$5 trillion by 2030, impelled by the Gen Z engagement in e-commerce and virtual events; despite that, it still faces some operational challenges concerning token volatility and regulatory needs.

Indian Perspective: Despite the huge population that is ever eager for the internet in India, a disparity in overall tech sophistication and economic acumen is apparent among Indian students. Infrastructural factors are among the primary hindrances.

Research gap: The current studies conducted globally do not take into consideration the particular professional perspectives youth. This research identifies that lack of insight into business opportunities.

Objectives of this Study:

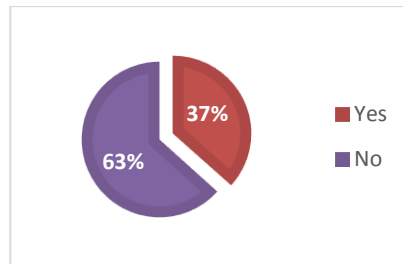
1. To assess the level of awareness among undergraduate students regarding the main constituent elements of the metaverse: blockchain, NFTs, virtual assets, and cryptocurrencies.
2. The paper examines students' perceptions of growth potential in terms of economic value, employment, and investment opportunities.
3. To study key barriers in adoption, especially technological challenges, regulatory, skill-based, and cultural barriers in the Indian context.
4. To find the relationship between demographic variables and students' willingness to participate in metaverse economic activities.

Research Methodology:

This research work employs a descriptive type of research design to assess awareness on metaverse among youth, conducted using convenience sampling. For the primary data collection, a Google Form was used to conduct an online questionnaire on digital assets, investment risk, and governance, and secondary data was collected from industry experts such as McKinsey, PwC, and Statista. Percentage Analysis and Graphical Analysis were used to assess student awareness and compare it with industry trends.

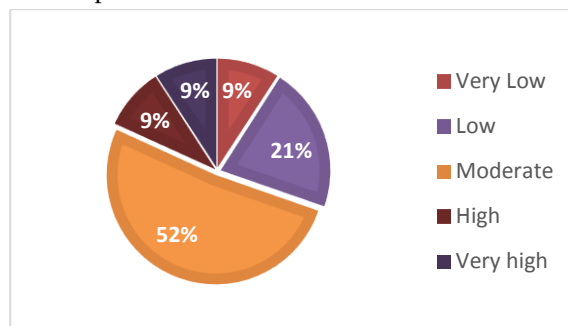
Secondary research has been conducted for authentic websites, trade magazines, and research documents such as statements by McKinsey & Company, PwC, Statista, and so forth. The Metaverse-related publications, websites such as Meta, Roblox, Decentraland, Sand box, and so forth, have also been used free of cost.

Data Analysis & Interpretation:



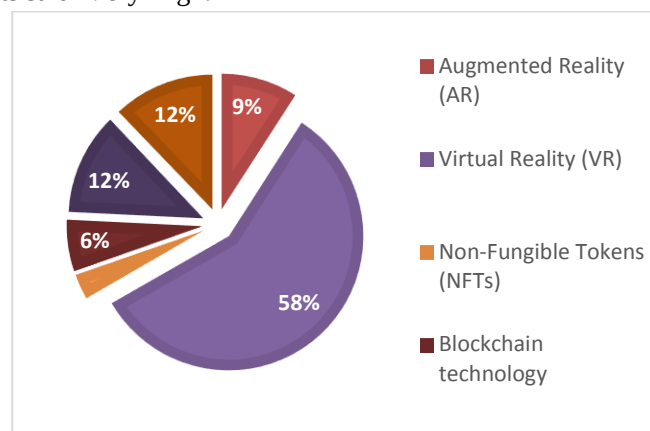
Q.1 Have you heard about the Metaverse?

63% respondents said No and 37% respondents said Yes.



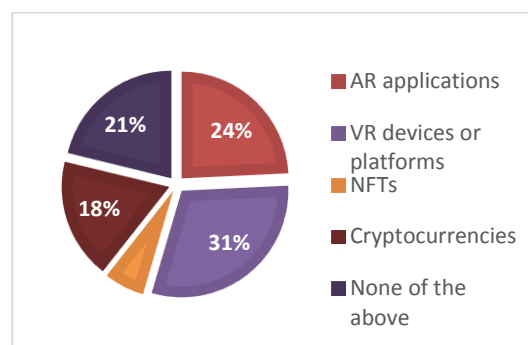
Q.2 How would you rate your understanding of the Metaverse?

9.1% respondents said Very low, 21.2% respondents said Low, 51.5% respondents said Moderate, 9.1% respondents said High and 9.1% respondents said Very High.



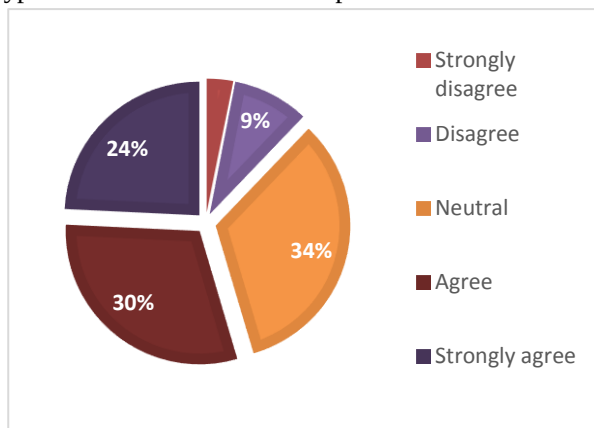
Q.3 Are you aware of the following components of the Metaverse economy?

9.1% respondents said Augmented Reality (AR), 57.6% respondents said Virtual Reality (VR), 3% respondents said Blockchain technology, 12.1% respondents said Cryptocurrencies (e.g., Bitcoin, Ethereum) and 12.1% respondents said Not aware of any of the above.



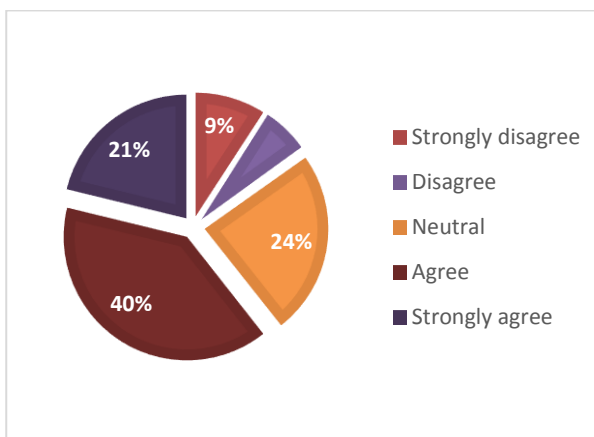
Q.4 Have you ever used or interacted with any of the following?

24.2% respondents said AR applications, 30.3% respondents said VR devices or platforms, 6.1% respondents said NFTs, 18.2% respondents said Cryptocurrencies and 21.2% respondents said None of the above.



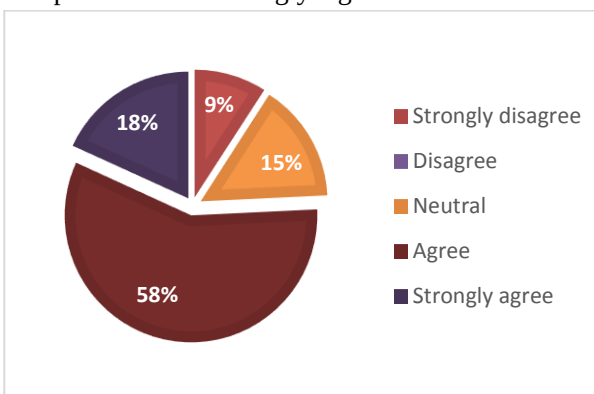
Q.5 The Metaverse can create new income and job opportunities for youth.

3% respondents said Strongly Disagree, 9.1% respondents said Disagree, 33.3% respondents said Neutral, 30.3% respondents said Agree and 24.2% respondents said Strongly Agree.



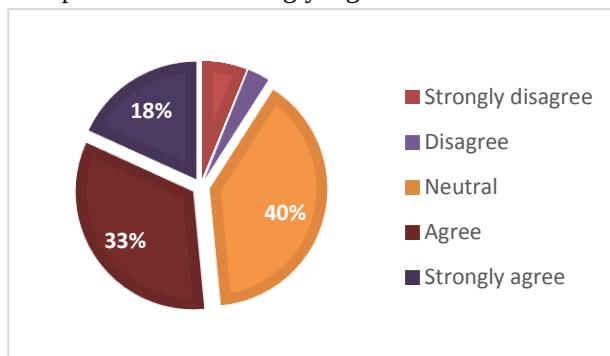
Q.6 The Metaverse can support education, training, or skill development.

9.1% respondents said Strongly Disagree, 6.1% respondents said Disagree, 24.2% respondents said Neutral, 39.4% respondents said Agree and 21.2% respondents said Strongly Agree.



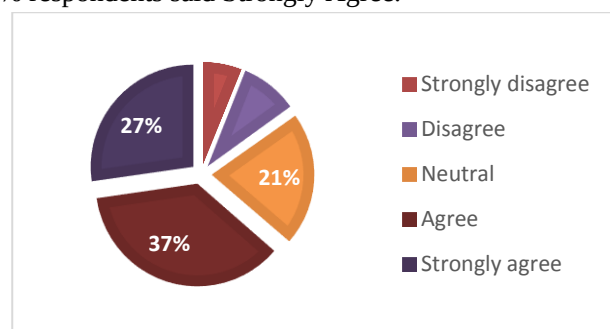
Q.7 I am interested in learning more about Metaverse-related opportunities.

9.1% respondents said Strongly Disagree, 0% respondents said Disagree, 15.2% respondents said Neutral, 57.6% respondents said Agree and 18.2% respondents said Strongly Agree.



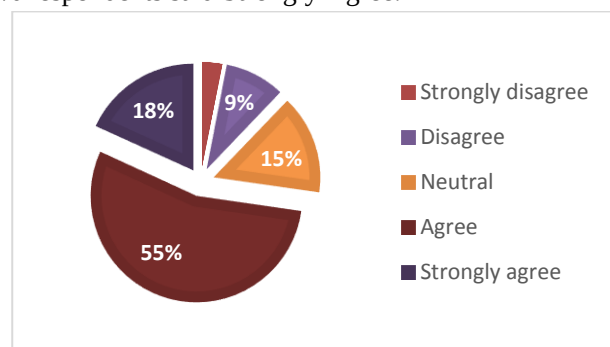
Q.8 Digital payment systems in the Metaverse are reliable and convenient.

6.1% respondents said Strongly Disagree, 3% respondents said Disagree, 39.4% respondents said Neutral, 33.3% respondents said Agree and 18.2% respondents said Strongly Agree.



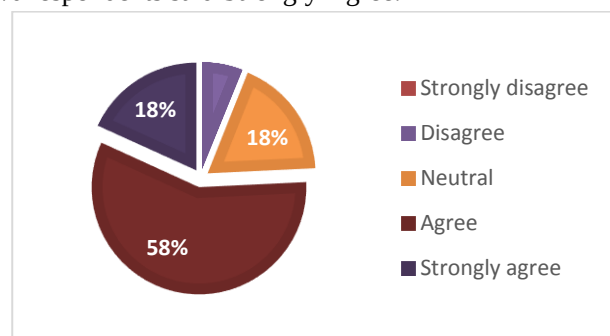
Q.9 Blockchain provides security and transparency to the Metaverse economy

6.1% respondents said Strongly Disagree, 9.1% respondents said Disagree, 21.2% respondents said Neutral, 36.4% respondents said Agree and 27.3% respondents said Strongly Agree.



Q.10 Businesses can effectively promote and sell products through the Metaverse.

3% respondents said Strongly Disagree, 9.1% respondents said Disagree, 15.2% respondents said Neutral, 54.5% respondents said Agree and 18.2% respondents said Strongly Agree.



Q.11 Metaverse platforms can function as virtual marketplaces for goods and services.

0% respondents said Strongly Disagree, 6.1% respondents said Disagree, 18.2% respondents said Neutral, 57.6% respondents said Agree and 18.2% respondents said Strongly Agree.

Findings:

1. There is limited awareness among youth of the basic components in the metaverse economy, namely blockchain, NFT, and virtual assets.
2. Knowledge of VR and AR is greater than knowledge of the metaverse economic and financial system.
3. Youth see the metaverse as a future source of employment despite little knowledge.
4. A strong desire to learn more about the metaverse is prevalent, but a lack of official direction causes concern.

Conclusion:

The findings of this paper reveals that there is limited knowledge of the metaverse economy among youth, especially in the area of blockchain, NFTs, and virtual assets. Although youth know more about immersion technologies, knowledge of metaverse-related economic systems is still limited. However, the desire of youth to reap the benefits of the metaverse in the areas of employment, learning, and starting an entrepreneurial venture is clear.

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How Will Social Media Influence Human Behaviour and Action

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Abstract:-

In today's digital age, it becomes increasingly difficult to distinguish between online influence and actual performance. The subject of this research is sets on discovering the online platforms that influence individuals' behaviour and living practices in terms of self-presentation, political engagement, and everyday routines. The work uses a mixed methods approach and examines how "the culture of influencers" and online rewards may work as a catalyst of behavioural changes. Among the major trends explored are how passive news reading transforms into active politics, the development of everyday methods of effective time management within the discourse of interesting interconnectness, and how swiftly "the pace of trends" of clothes has increased due to the "permeable screen" of "YouTube and Instagram." The data highlights how social media creates a feedback loop that encourages performative behaviour, which has observable consequences for how people interact using platform-speak and dressing for digital aesthetic purposes. To confront this critical influence that these platforms have on the autonomy of human behaviour in the twenty-first-century world, this study proposes that there needs to be a new ethics of digital behaviour.

Key Words:- social media, human behaviour, action, politics, mental health, Influence.

Introduction:-

The social media which is a platform which is used for entertainment and connectivity with friends are goes beyond it in 2026 it's become "invisible editors" manifest in algorithmic form as an "echo chamber" that places the promotion of sensationalism above all else above truth itself. Such a level of curation is not merely reflective in practice and at the level of reflection but encompasses every level from ideological fanaticism to impulsive consumer behaviours. The human purchasing behaviour become more impulsive. Social media affecting their voting behaviour social cause based on more "vibes" than long term policies. On the flip side, social media remains the best flash mobilization tool. It allows decentralized groups to organize protests and disaster relief within a few hours without resorting to or going through prominent power structures, such as governments or news agencies.

Objective Of Study :-

- To analyse and explore how will social media influence human behaviour and action in day to day life
- To analyse how social media chance and edit decision and prospective towards politics and social issues

Literature Review:-

1. Mental Health Outcomes: There exists a great deal of evidence that points towards a link between excessive usage of social networking sites and symptoms of anxiety and depression, along with self-esteem, although some studies have confirmed that the use of these tools helps establish "bonding and bridging social capital" for improving overall mental health outcomes (Anto et al., 2023; Naslund et al., 2020).
2. Digital activism: Online platforms that have reduced the cost of engaging in collective action have enabled decentralized movements such as the "Arab Spring" and "Occupy Wall Street" (Oh et al., 2015). Successful digital activism often depends on the "media affordances"-specific characteristics of a platform-that support the building of networks and spreading, or "contagion," of ideas themselves (Ahuja et al., 2018).
3. Echo Chambers & Polarization: Algorithms often give prominence to sensational information; the result is the creation of echo chambers which reinforce pre-existing opinions and lead to societal polarization. In this regard, Muzaffar et al. (2020) note that algorithms often give prominence to sensational information.
4. Impulse Buying: Real-time social interaction and influencer reviews greatly influence "blind purchasing" impulsive consumer behavior in e-commerce.

Research Methodology :-

This research relies on primary data by distribute surveys questionnaire in from of google form in which simple stem question are asked to explore their experiences and perspective on Influence of social media on human behaviour and action and The Sample Size Initially Targeted 100 Participants, Of which 85 Responded data is statistically analysed on productivity metrics.

Data analysis and Interpretation

Which social media platforms do you use most frequently?

84 responses

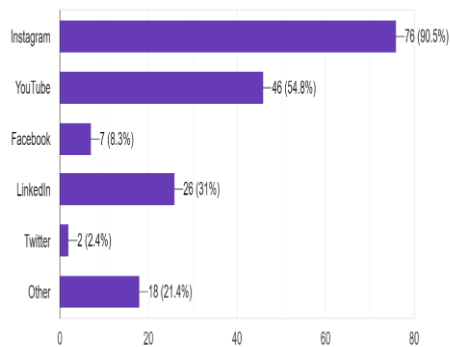


Figure 1.

ON AVERAGE, HOW MANY HOURS PER DAY DO YOU SPEND ON SOCIAL MEDIA?

■ Less than 1 hour ■ 1 - 3 Hours
■ 3 - 5 Hours ■ More than 5 hours

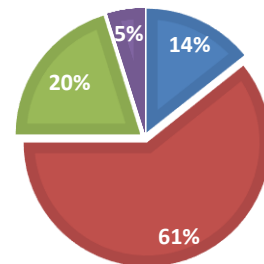


Figure 2.

The figure 1st and 2nd is demonstrates that people are very familiar with the concept of social media and they use multiple social media platforms on daily basis on average 1 to 3 hours

What is your primary reason for using social media?

84 responses

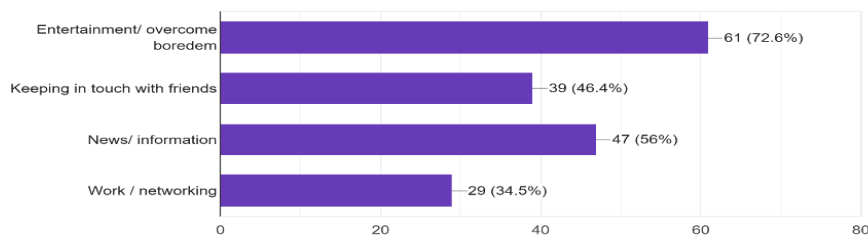


Figure 3.

The 3th. Illustration show that the most of the people are using social media platforms for entertainment purpose and overcome the boredom, for keeping touch with friends and for getting news and information.

HAVE YOU EVER VISITED A PHYSICAL LOCATION (RESTAURANT, TRAVEL DESTINATION) PURELY BECAUSE IT WAS "INSTAGRAMMABLE" OR TRENDING ONLINE?

■ Yes ■ No

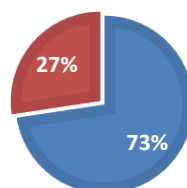


Figure 4.

The figure 4. Is demonstrated that the most of the people are just visited a physical place like restaurant, travel destinations because they see that place on social media platforms. Which clearly show that the people are influence by social media to visit that place. Because nowadays, rather than “see” a location, people go to a place so as to “be seen.” The biggest pay-off is getting a “digital trophy,” which confirms their presence at a famous site.

If you prefer to watch a single trip video about a particular location in 2026, algorithms will swamp Your stream with the same type of content. The result? “Everyone is going there,” leading to a “subjective reality.”

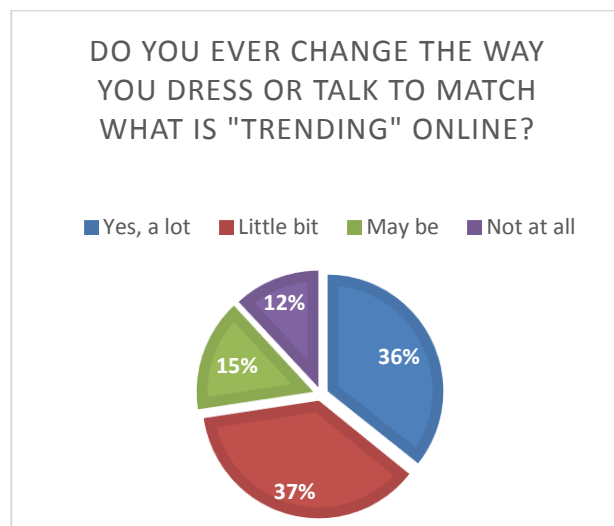


Figure 5.

The 5th illustration show As that "cultural mirrors," social networking sites give us the ability to quickly assimilate and replicate the sounds and images from the physical world that we encounter every day. Since 2026, the effects have shifted from "imitation" itself into the realm of "Digital Convergence," whereby one's identity is increasingly shaped by algorithms. People dressing is influence by social media people are like wears what was trending and there talks and accent of speech are also influence by the what they last seen on social media and what is trendy. They influence accent The tone, pace, as well as the “up-talk” (finishing a sentence with a rising intonation) of famous writers are Subconsciously imitated by many people. Such “vocal mimicry” can be a form of social mirroring where one appears more accessible or trendy.

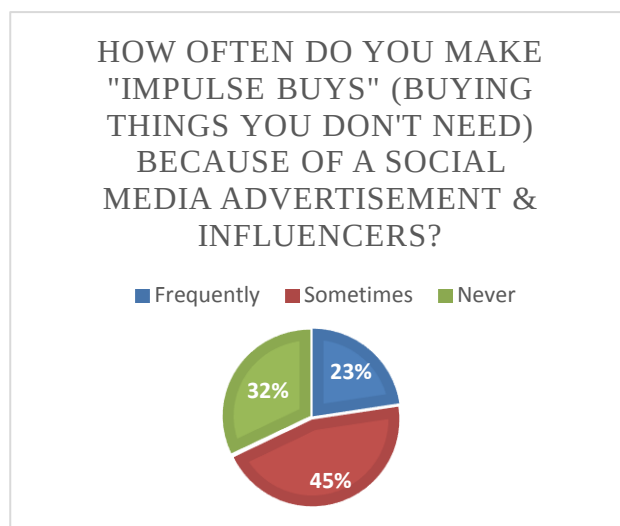


Figure 6.

The 6th number Is demonstrated that the social media is influence the people to impulsive and unwanted purchasing and buying by your brain puts an influencer in the "trusted peer" category because you are witnessing what they do on a

day-to-day basis. Your brain recognizes that when an influencer promotes a purchased-for-them product, you are receiving a personal endorsement, which is 90% more credible than an advertisement.

And your prefrontal cortex, also known as "decision-making muscle," is tired while browsing.

Your brain undergoes Decision Fatigue when a personalized ad appears after 20 minutes of browsing, thereby heightening the chances that you would click "Buy" without even considering it for a moment.

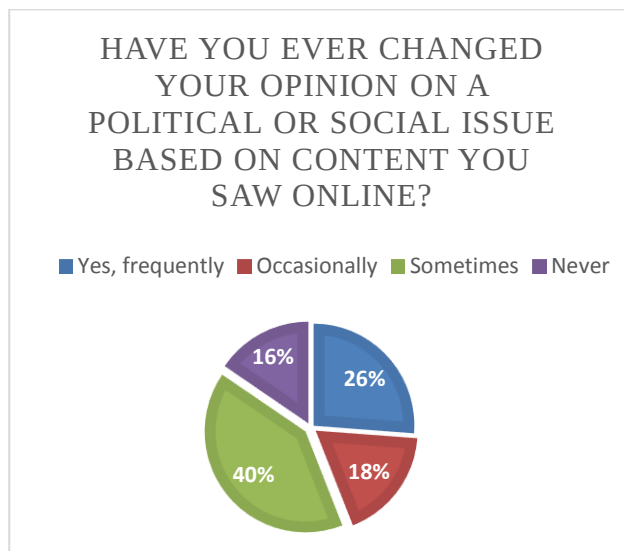


Figure 7.

The 7th illustration demonstrates how people's opinions about politics and social issues are influenced by social media. People base their political decisions on which political parties are popular and create an atmosphere that persuades them to make different choices. People's opinions about politics are influenced by the viral clips and songs of political parties. could have an impact by disseminating false information and news, or by emphasising the positive aspects while concealing the whole truth. Social media, through the mechanics of algorithm-driven curation and mobilization by network effect, has developed not only as a secondary source of information but also as a central constructor of political and social reality itself in 2026, impacting public opinion significantly. According to research studies, these sources act as "digital gatekeepers," with algorithms exhibiting a penchant for information with high emotional and ideological content. This fosters "filter bubbles," where affective polarization reaches speeds of acceleration significantly higher compared to those of traditional sources of information. Although these online sources help marginalized social groups build momentum rapidly for causes such as human rights environmental justice, they also help misinformation or "alternative facts" travel fast at the expense of public confidence in democratic systems of governance.

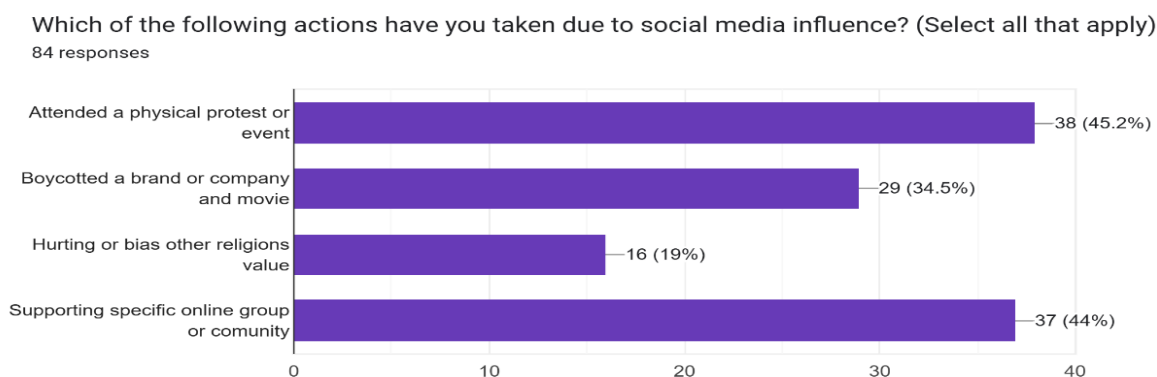


Figure 8.

The Figure 8th Illustration show that the social media is dose show the mirror of society but now become a real life editor and influence human behaviour and reshapes there action. Leading hashtag and trending content on social issues influence them to attend a physical protest or event and changing political decision. The power of social media: "Consumer Activism." A video of corporate wrongdoing shared widely could result in boycotts globally within hours. The flow graph reveals that while social media can facilitate "Intergroup Dialogue" through disparate communities coming together, it can also perpetuate religious bias with the spread of misinformation. and people are supporting specific online group or community because of they influence by social media.

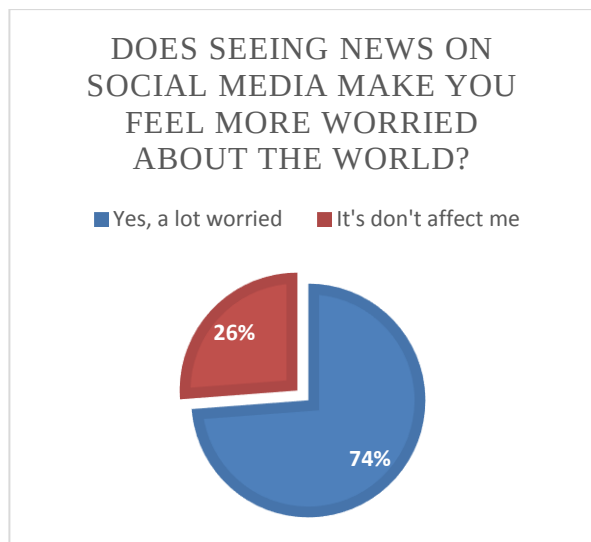


Figure 9.

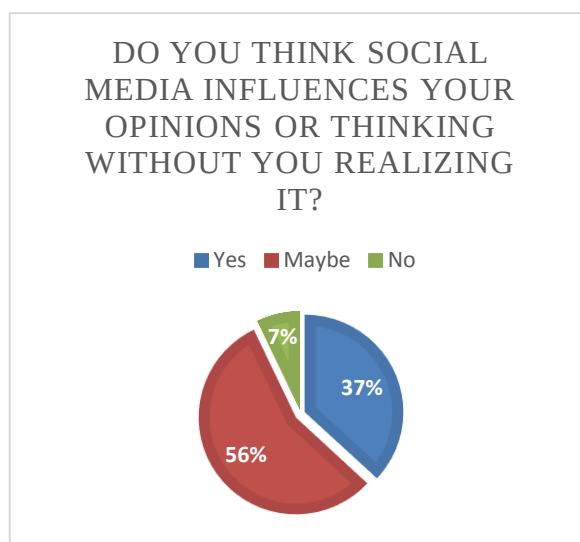


Figure 10.

The Figure 9th and 10th demonstrated that Social media platforms are one of the causes of "Mean World Syndrome," a situation where one perceives the world to be more dangerous than it really is. To get people engaged for longer periods of time on these platforms, their algorithms favor material that people can respond to and be moved by, such as fear and anger. This "doomscrolling" is a vicious cycle that one gets caught up in when one is exposed to these crises. At the end of it all is "news fatigue" and a perpetual sense of hopelessness that causes one to be hypervigilant and less likely to take part in their world. And is showing that the social media influence human decision and thinking of without realizing them which leads to take a wrong decision and influenced thinking. Social media subconsciously conditions people to mistake echo chambers and iterative information for objective truth by exploiting algorithms and rewards related to dopamine to skirt around critical thinking. This "cognitive hijacking" leads people to internalize external digital inputs into one's own thoughts and practices without ever realizing they are so thoroughly manipulated by replacing logic-based responses to stimuli with those rooted in emotions.

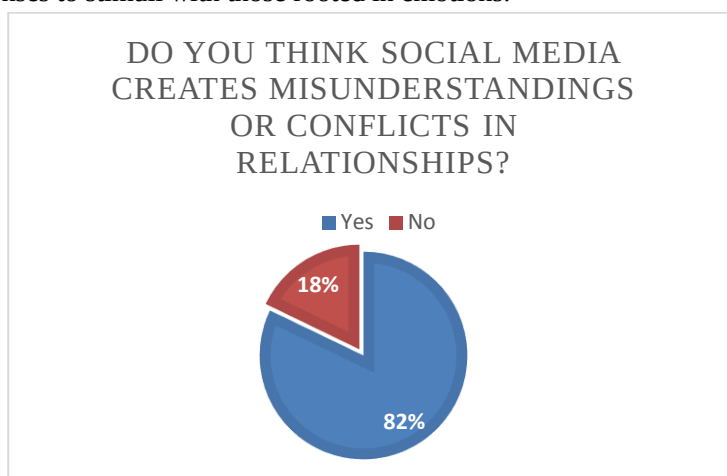


Figure 11.

The figure 11. Illustration show that Social media functions like a 'distortion lens' that takes away critical non-verbal communications essential for interpretation, such as tone and body language. This inevitably gives rise to instances of 'miscommunications' and 'insults'. It diminishes basic trust by incorporating particular stressors of 'digital jealousy' and 'surveillance' that arise from ambiguous communications such as 'likes' or 'comments'.

Moreover, 'phubbing' (phone snubbing) or 'status update comparisons' of the 'highlight reels' of 'other' couples give rise to 'feels of inferiority' and 'bitterness'. Ultimately, all these 'electronic communications' alter the paradigm from 'connection' to 'surface level confirmation' and transform 'minor doubts' in cyber world interactions into 'grave distance' in the 'real world'.

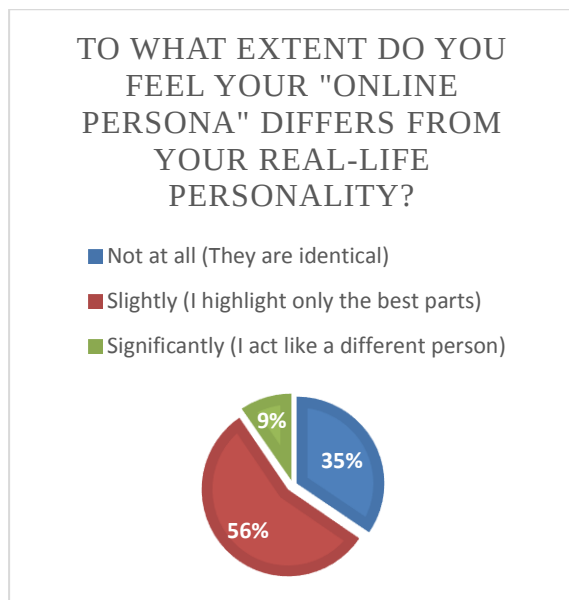


Figure 12.

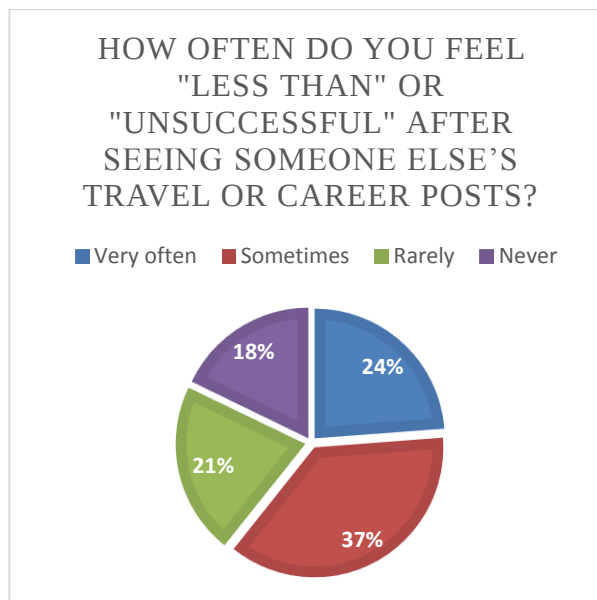


Figure 13.

The figure 12th and 13th illustration show that the people are only highlight the best part of their life and act as different person on social media they are not identical for real life which show people feel depressed and anxiety because of social media. People feel unsuccessful and less than after seeing someone post and reels of achievement and travel which affects there mental health and influence them to take a negative action

7. Findings:-

As indicated in a study, social media sites have taken a frontline position in determining human behavior; therefore, a "feedback loop" performance has been experienced through the "online personas" developed by individuals, which have a high tendency to deviate greatly from the individuals' personality types. In consideration of analysis, users have a high potential of allocating a maximum of one to three hours daily on social media sites like YouTube and Instagram. As a consequence, a high likelihood has been observed in lifestyle modification, which includes traveling to real destinations only for "Instagram Mable" reasons. Furthermore, impulsive buying based on influencers has occurred. Through social media platforms, a "digital gatekeeper" has been experienced in determining the reality of both social and political situations through preferring emotional content that has a high potential of triggering "Mean World Syndrome" alongside influencing individuals' thoughts through "echo chambers." Being constantly immersed in "highlight reels" will often negatively affect one's psychological well-being with regards to "news fatigue," "inadequacy," and elevated "anxiety and depression." Ultimately, "these digital exchanges are eroding the depths of human interaction, often replacing emotional with rational responses."

8. Conclusion :-

As per the findings of the study, "by 2026, social media will evolve from a tool for communication and connection to an 'invisible editor' of human behaviour. The implications of such a transformation will be a radical shift in people's perception of the world and their actions within it." As per the observation in the study, "as users put their 'online persona' before their 'actual self,' a psychological feedback loop occurs and is commonly referred to as the 'Highlight Reel Effect'; this effect often translates a 'small doubt' in the virtual world into a 'big gap' in reality and results in a rise in 'anxiety and depression.' Furthermore, with the "digital gatekeeper" development of social media, emotional response has replaced reasoned discourse, evidencing the erosion of personal sovereignty. Typically, what is urgently needed is a

new “ethics of digital conduct,” given the increasingly blurred lines between digital effect and actual performance. So, in order to regain the distinction between the strategically crafted digital persona and the richness of human reality itself, society must move onward from its passive reception of digital culture into a receptive engagement with it.

This paper investigates how social media has evolved as a powerful factor that shapes individuals’ identities, behavior, and decision-making processes in the year 2026. Findings from this study affirm that individuals’ daily patterns, holiday choices, fashion trends, impulse buys, political views, or social conduct are engineered by social media platforms such as Instagram or YouTube. Through comparison, inaccurate information, or sensational media, individuals who spend much of their time on social media inadvertently engage with trends, are part of echo chambers, or experience emotional exhaustion. Research says that social media now acts like an “invisible editor” in creating psychological feedback loops that have impacts on mental health-increasing anxiety, despair, and the so-called “highlight reel effect.” It inhibits critical thinking and warps reality even as it promotes digital activity and connectivity. The conclusion of the study is that, with society increasingly driven by algorithms, a new form of digital ethics is desperately needed to enable people to use social media responsibly and retain their freedom and well-being.

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CSR for Green Future: Evaluating India's Leading Companies Efforts toward Environmental SDGs

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Abstract:

With an emphasis on environmental sustainability, this paper examines the CSR spending of top Indian businesses in financial year 2024–2025. It looks at how CSR funds are distributed among environmental subsectors and assesses how well business actions match Sustainable Development Goals (SDGs) related to the environment. The study finds notable variations in businesses' dedication to environmental concerns using content analysis of CSR reports and data from the National CSR Portal. While corporations like Infosys, ITC, Wipro, GAIL India, and Indian Oil Corporation devote a significant portion of their CSR funds to environmental sustainability. The results show that CSR initiatives are becoming more in line with important environmental SDGs, particularly those pertaining to biodiversity, sustainable energy, responsible consumerism and climate action. In order to effectively handle India's expanding environmental concerns, the study emphasises the necessity for corporate CSR programs to place a higher priority on environmental sustainability.

Keywords: CSR, Sustainable Development Goals, Indian Corporate

I. Introduction:

In order to balance social and environmental responsibilities with economic growth, corporate social responsibility, or CSR, is essential. The Companies Act of 2013 made corporate social responsibility (CSR) required in India, which encouraged businesses to concentrate more on sustainable development. Concerns about ecological deterioration, resource depletion, and climate change have grown in relevance in financial year 2024–2025. Key Sustainable Development Goals (SDGs) are strongly aligned with CSR programs concerning climate change, clean energy, and environmental protection. The amount of money allocated to environmental sustainability varies greatly among businesses despite increased CSR spending, underscoring the need for further analysis. In order to evaluate top Indian firms' dedication to environmental sustainability and alignment with environmental SDGs, this study examines their CSR initiatives.

II. Literature Review:

The literature emphasises Corporate Social Responsibility (CSR) as a key tool for advancing sustainable development and environmental sustainability. According to earlier research, CSR programs promote resource conservation, climate action, and environmentally conscious behaviour. Research indicates that environmental sustainability continues to get a comparatively smaller share of CSR funds compared to other key areas, despite the fact that CSR expenditure in India has risen since it became mandated. In order to enhance environmental governance and long-term sustainability outcomes, a number of studies highlight the advantages of coordinating CSR programs with the Sustainable Development Goals (SDGs).

III. Research Objectives:

1. To analyse and contrast the required and actual CSR spending of top Indian businesses.
2. To determine how much of the Indian corporate sector's CSR budget will go towards environmental sustainability.
3. To evaluate CSR contributions in a number of environmental subsectors.

IV. Research Methodology:

The study looks at the top 20 Indian corporations' CSR efforts in the fiscal year 2024–2025, with an emphasis on environmental sustainability. Secondary data gathered from sustainability reports, yearly reports, and the National CSR Portal is used. The analysis classifies CSR spending into important environmental subsectors, compares required and actual CSR spending, and uses text analysis to pinpoint significant CSR efforts. CSR initiatives are also in line with the Sustainable Development Goals (SDGs) that deal with the environment. Analysis is done using descriptive and comparative methods, and results are subject to restrictions on sample size and data accessibility.

V. Result & Discussion:

With a cumulative investment value over ₹18,000 Cr. in listed firms, the CSR landscape in the corporate world in India has shifted from being ESG-compliance oriented to sustainable-oriented in the current fiscal year of 2024-2025. Qualitatively leading in Environment Sustainability is holding by Infosys, consistently devoting around 40% to environment and water rejuvenation initiatives, whereas Reliance Industries continues to rank top on the spend side, devoting over ₹1,300 Cr. to large-scale social transformations.

(Amount in INR Cr.)

Company Name	Prescribed Exp.	Actual CSR Spent	Env. Sustainability Spend	% of Total CSR Spent on Env.	Rank (Total Spend)	Rank (Env. Spend)
Reliance Industries	1,048.00	2,156.00	493	22.90%	1	1
HDFC Bank Ltd	945.31	1,068.03	141	13.20%	2	3
TCS Ltd	954	960	65	6.80%	3	9
ONGC Ltd	583	929	158.68	17.10%	4	2
ICICI Bank Ltd	555	801	48	6.00%	5	11
State Bank of India	600	610.77	31	5.10%	6	17
Tata Steel Ltd	363	585	99.4	17.00%	7	6
Indian Oil Corp	583	583.03	72	12.30%	8	8
Infosys Ltd	422	526	124	23.60%	9	4
ITC Ltd	398	462	92	19.90%	10	7
NTPC Ltd	363	363	112	30.90%	11	5
Power Grid Corp	325	330.48	44	13.30%	12	13
Hindustan Unilever	240	254.02	42	16.50%	13	15
Hindustan Aeronautics	295	203	21	10.30%	14	18
GAIL (India) Ltd	149	184	35	19.00%	15	16
Wipro Limited	144	167	58	34.70%	16	10
BPCL	118	125	45	36.00%	17	12
Vedanta Limited	15	123	43	34.90%	18	14
Grasim Industries	36	89	12	13.50%	19	19
L&T Finance	3	29	5	17.20%	20	20

Table 1: Total CSR Contribution by Top 20 Companies (2024-2025)

Source: Audit reports and Web sources

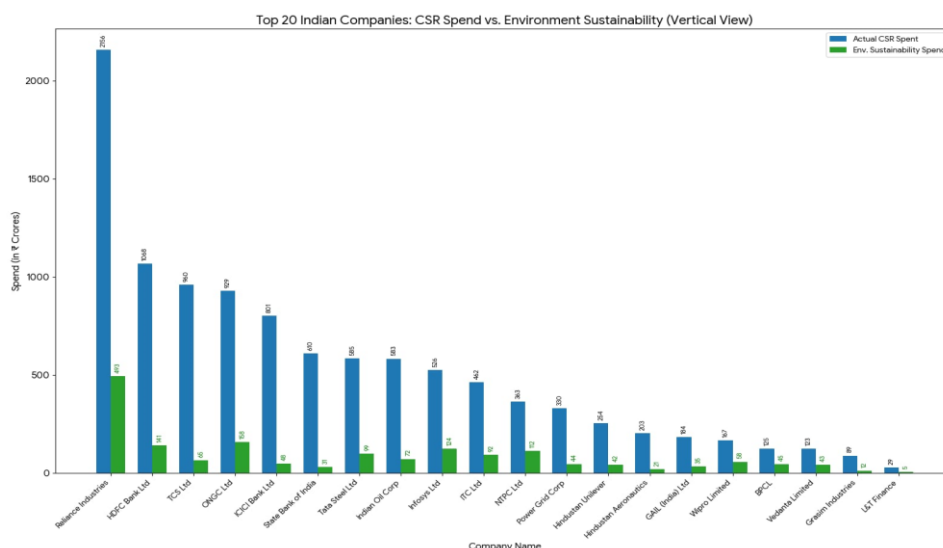


Figure 1. Total CSR and Contribution towards Environmental Sustainability

Under the Companies Act of 2013, the mandatory corporate social responsibility (CSR) structure has promoted the involvement of Indian companies in the Sustainable Development Goals (SDGs), as proposed in Schedule VII. During the period of 2024-2025, the corporate expenditure in CSR activities has shown a good response in the field of environmental sustainability in conserving water, biodiversity, and maintaining the ecological balance. Although a number of companies have been involved in the environmental CSR activities, the contribution towards the Clean Ganga Fund has been minimal.

Table 2. Alignment of schedule VII Activities for Environment with SDGs

S. No.	Prescribed Schedule VII Environmental Activities (iv)	Aligned SDGs
1	Ensuring environmental sustainability and ecological balance	SDG 13 – Climate Action
2	Protection of flora and fauna and animal welfare	SDG 15 – Life on Land
3	Agroforestry and conservation of natural resources	SDG 12 – Responsible Consumption and Production
4	Maintaining the quality of soil, air and water	SDG 6 – Clean Water and Sanitation
5	River rejuvenation initiatives including the Clean Ganga Fund	SDG 14 – Life Below Water
6	Promotion of clean and resource-efficient environmental practices	SDG 7 – Affordable and Clean Energy

Environmental Sustainability attracted the largest share of funding in FY 2024–2025 and represented the bulk of Indian companies' respective CSR contributions in the Environment category. Animal welfare secured minimal CSR contributions, while conservation of natural resources was the second target for funding. The top 20 CSR-contributing companies did not report any contribution to Agri Forestry, despite its importance from an ecological perspective. At the same time, the remaining environmental sub-sectors attracted very small funding, and the data tend on the whole to suggest a significant corporate preference for environmental sustainability programs.

Tabel 3. Environmental Sustainability contribution sector-wise

Sr. No.	Companies	Animal Welfare (INR Cr.)	Conservation of Natural Resources (INR Cr.)	Environmental Sustainability (INR Cr.)	Total CSR Spend (INR Cr.)
1	Reliance Industries Ltd	110.50	185.00	240.50	2,156.00
2	HDFC Bank Ltd	25.40	142.60	190.20	1,068.00
3	Tata Consultancy Services	12.00	65.80	102.40	960.00
4	ONGC Ltd	8.50	120.30	145.60	929.00
5	Coal India Ltd	15.20	110.40	118.00	850.17
6	ICICI Bank Ltd	10.45	55.70	88.30	800.93
7	State Bank of India	9.00	45.20	72.10	610.77
8	Infosys Ltd	18.30	58.90	95.40	585.00
9	ITC Ltd	22.10	134.50	140.20	583.00
10	NTPC Ltd	5.20	88.40	92.60	450.72
11	Power Grid Corp	3.40	62.10	70.50	360.19

12	REC Ltd	2.10	48.30	55.40	288.00
13	HCL Tech	35.60	78.40	92.10	281.34
14	Power Finance Corp	1.80	52.30	58.90	270.28
15	Hindustan Zinc Ltd	14.20	45.60	62.30	268.89
16	Northern Coalfields	4.50	38.20	42.10	192.19
17	NMDC Ltd	2.90	41.50	45.80	191.14
18	NHPC Ltd	1.50	35.40	38.20	167.93
19	Tata Steel Ltd	12.40	68.20	75.60	158.47
20	Indian Oil Corp (IOCL)	8.20	105.40	120.30	155.00

Total Environmental Contribution Sector-wise (Top 20 Companies)
 FY 2024-25

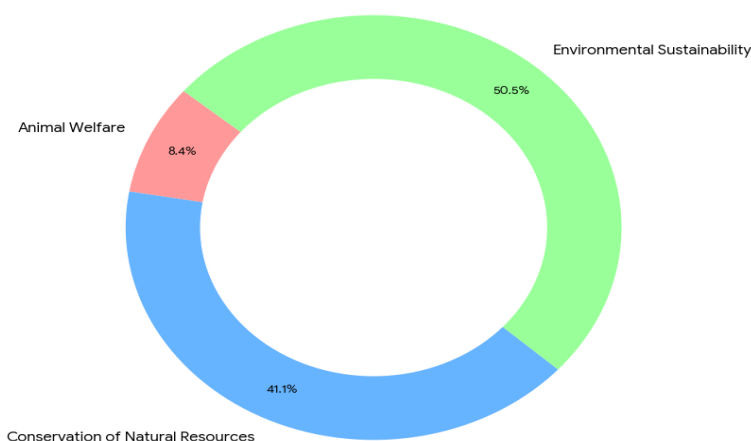


Figure 2. Environmental Sustainability Contribution Sector-wise

Evaluation of the effectiveness of corporate donations to environmental CSR for the fiscal year 2024-2025 needs recognition of key activities and best practices of top Indian companies. Evaluation of such activities will provide authentic information to judge the corporate social responsibility performance profiles of the companies and will provide a more objective and factual insight into the extent of corporate social involvement. Indian companies have spent considerable amounts on environmental initiatives such as biodiversity conservation, water conservation, and environmental sustainability in 2024-2025. To identify significant environmental projects of CSR and their best practices being adopted by major CSR-contributing companies, a content analysis of CSR filing statements, annual reports, and information available on the National CSR Portal was undertaken. These initiatives have been contrasted with the Sustainable Development Goals (SDGs) to identify the extent of corporate CSR contributions towards and alignment with particular SDGs associated with environmental factors such as clean water and sanitation, life on land, and climate action. With their specific and measurable CSR expenditure in FY2024-2025, such strategies help in evaluating the contribution of the Indian corporate community towards environmental sustainability effectively.

Tables 4,5 and 6 are about top companies' best practices and initiatives that have significantly contributed towards environmental CSR.

Table 4: CSR Contribution to Environmental Sustainability through Animal Welfare Initiatives

SDGs	CSR Initiatives Aligned
SDG 15: Life on Land CSR Initiatives in Line with SDGs Protect, restore, and encourage the sustainable use of terrestrial ecosystems; manage forests sustainably; prevent and reverse land degradation and biodiversity loss; and fight desertification (Sustainable Development Goals).	Infosys: creation of animal-friendly enclosures in zoological parks, programs to improve wildlife habitats, and assistance with conservation efforts for biodiversity. Indian Oil Corporation: Veterinary infrastructure in protected regions, human-animal conflict reduction through animal rescue and care facilities, and wildlife conservation initiatives. Animal ambulances, migratory species protection, and programs to protect wildlife habitats close to transmission lines are all provided by Power Grid Corporation of India. Hindustan Zinc: Programs to conserve local species, safeguard biodiversity, and support ecological balance in areas impacted by mining.

Table 5: CSR Contribution to Environmental Sustainability through Conservation of Natural Resources

SDGs	CSR Initiatives Aligned
SDG 13: Action on Climate Take immediate action to mitigate the effects of climate change (SDGs).	ONGC: programs to lower carbon emissions, funding for renewable energy transition projects, and climate resilience efforts.
SDG 14: Aquatic Life Oceans, seas, and marine resources should be preserved and used responsibly for sustainable development (Sustainable Development Goals)	Infosys: Initiatives for sustainable water management, lake conservation projects, and water body restoration and revitalisation. Power Grid Corporation of India: rehabilitating marshes and ponds, preserving natural water resources, and planting trees next to infrastructure corridors. JSW Steel: Initiatives to lessen industrial water pollution and emissions that impact marine environments, as well as integrated water resource management and aquatic ecosystem protection.

Additionally, some programs, such as Hindustan Zinc's Sewage Treatment Plant, demonstrate responsible waste management and encourage the use of reclaimed water, which is in line with SDG-12, which promotes sustainable production and consumption. routines. In line with SDG-15, ITC's soil and moisture conservation initiatives help stop and reverse land degradation, biodiversity loss, and desertification.

Table 6: CSR Contribution to Environmental Sustainability Initiatives

SDGs	CSR Initiatives Aligned
SDG 7: Clean and Inexpensive Energy Make sure everyone has access to modern, affordable, dependable, and sustainable energy (Sustainable Development Goals).	HDFC Bank: Solar street light installation, rural solar panel deployment, e-mobility solution promotion, and clean energy infrastructure support.
SDG 12: Conscientious Production and Consumption Assure sustainable patterns of production and consumption (Sustainable Development Goals).	Infosys: Biogas units are installed, biomass-based cooking solutions are promoted, and renewable energy usage is supported. Power Grid Corporation of India: This company installs solar LED street lighting systems and supports the integration of renewable energy. GAIL (India): Encourage the use of cleaner fuels and support the conversion of diesel-powered vehicles and watercraft to CNG.
SDG 13: Action on Climate Take immediate action to mitigate the effects of climate change (SDGs).	HCL Technologies' programs for sustainable waste management and carbon emission reduction. Housing Development Finance Corporation (HDFC Ltd.) promotes recycling techniques and manages solid and liquid waste. Indian Oil Corporation: The implementation of resource-efficient technologies and programs that support sustainable fuel and agricultural practices. Reliance Industries' environmental sustainability programs

SDG 14: Living Below Water Oceans, seas, and marine resources should be preserved and used responsibly for the Sustainable Development Goals.

SDG 15: Land Life The Sustainable Development Goals include preventing biodiversity loss, combating desertification, managing forests sustainably, and protecting, restoring, and promoting sustainable use of terrestrial ecosystems.

prioritise energy transition and pollution reduction. HDFC Bank's efforts to reduce carbon emissions, grow trees, and reduce air pollution.

Infosys: Supporting climate-resilient farming methods and organic farming.

Wipro: Water conservation, renewable energy projects, community ecological programs, and sustainability education. ITC: Projects related to social forestry and climate resilience.

The electrical Grid Corporation of India conducts research on how electrical infrastructure affects marine and avian ecosystems. HCL Technologies: Enhancing marine and coastal environments to sustain native biodivers

V. CONCLUSION

The study comes to the conclusion that although CSR spending among Indian businesses has grown in 2024–2025, the distribution of funds for environmental sustainability is still uneven. While some businesses prioritise non-environmental CSR efforts despite having substantial finances, others demonstrate a significant dedication to environmental projects. Long-term, impact-driven environmental CSR is needed, even though alignment with the environmental Sustainable Development Goals is improving. Addressing India's environmental issues and promoting sustainable development require strengthening environmental sustainability within CSR strategy.

V. REFERENCES

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A Study on Financial Performance of An Automobile Industry with Special Reference to TVS Motor Co. Limited

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ABSTRACT

The study's objective is to use the financial technique Ratio Analysis to evaluate, compare, and analyze TVS Motor Co. Ltd's liquidity and profitability status. Combining these tools allows for an efficient method of determination. The purpose of the study is to assess a company's financial standing, operational performance, and financial advancement. It describes how ratio analysis can help with asset management, budgeting, and long-term planning to improve financial performance and prevent financial problems.

KEYWORDS: Financial Statements, Balance-Sheet, Leverage, Liquidity, Profitability, Ratio Analysis, TVS Motor Co. Ltd.

INTRODUCTION

Financial statements are designed to offer financial information regarding a business organization to meet the informational needs of decision-makers. The financial statements generated by a corporate entity are made public and accessible to users or decision-makers of accounting data. These statements present financial information that necessitates assessment, comparison, and interpretation for making decisions by both internal and external users of accounting data. This process is referred to as financial statement analysis.

The literature review indicates that there are very few studies on the financial performance of selected automobile companies, and recent measurements of financial performance for these companies are lacking. The researcher conducted this study to evaluate the financial performance of certain automobile industry. Therefore, the researcher has endeavored to analyze the financial performance of the Chosen Automobile Company.

COMPANY PROFILE:

TVS Motor Company is a reputed two and three-wheeler manufacturer globally, championing progress through Sustainable Mobility with four state-of-the-art manufacturing facilities in Hosur, Mysuru and Nalagarh in India and Karawang in Indonesia. Rooted in our 100-year legacy of Trust, Value, and Passion for Customers and Exactness, we take pride in making internationally aspirational products of the highest quality through innovative and sustainable processes. We are the only two-wheeler company to have received the prestigious Deming Prize for quality.

OBJECTIVES OF THE STUDY

- To study the long term financial position of the TVS Motor Co. Ltd.
- To measure the overall financial performance of TVS Motor Co. Ltd.
- To identify the profitability and liquidity position of the TVS Motor Co. Ltd.

SCOPE OF THE STUDY

The scope of a financial statement analysis of TVS Motor Company would typically involve an in-depth examination of the company's financial statements, which include the ratio analysis. The primary objective of a financial statement analysis is to evaluate a company's financial performance and position over a particular period. This analysis would involve assessing the financial health of TVS Motor by looking at its profitability, liquidity, solvency, and efficiency. Overall, the scope of a financial statement analysis of TVS Motor would be to provide insights into the company's financial performance, strengths, weaknesses, opportunities, and threats, which can help investors and stakeholders, make well informed decisions about the company.

RESEARCH METHODOLOGY

The research design used was analytical research design. The main objective of this study is to know the financial position of selected automobile company. The study is based on secondary data, collected through annual reports of selected automobile company. The study of the financial performance of TVS Motor Co. Ltd is for the period of the five years from 20120-21 to 2024-25.

RESEARCH DESIGN

The method and procedure for conducting a research study are indicated by the research design. In pursuance of objectives stated above, the following research design is used for conducting the study.

NATURE OF THE STUDY

The present study adopts descriptive and analytical in nature with support of secondary data.

SOURCES OF DATA

The study is based on secondary data. Secondary data for this study is gathered from TVS Motor Company's annual report, published materials in the form of reports, articles from journals, and websites.

TOOLS OF ANALYSIS

Ratio analysis

Ratio analysis is a technique for analyzing a company's financial performance by comparing various financial ratios. Some of the key ratios that can be calculated are Gross profit ratio, current ratio, net profit ratio, operating profit ratio.

LIMITATIONS OF THE STUDY

The period for the study is of last 5 years so it's not possible to show life time performance of company. The majority of the data is derived from financial statements. As a result, the limitations of financial statements may have an impact on the study.

REVIEW OF LITERATURE

Ali, 2022 Because of the need for privacy and security, the entire study can provide the most likely forecast about the future of the automotive industry. Social distancing will try to accrete the shift towards subscription model cars for safe ink. This will naturally encourage automakers to produce more subscription and private cars, resulting in increased sales in the future.

Muruganantham and Barkavi (2020) conducted research for analysis of the financial performance of TVS Motors by using 5 years of annual audited reports. And finally, these studies concluded business is good and they have better performance. In addition to that want to increase their sales volume, and produce more from the owner's funds and available funds. This helps firms to increase their performance in their competitive world.

Mahapatra, 2021 Profitability analysis reveals that the selected sample Company has a high earning potential. In conclusion, it appears safe to conclude that both of the sample companies appear to be following sound financial management practices.

Swalih, 2021 they discovered that the Indian auto sector is showing early signs of recovery after experiencing a slowdown and a COVID crisis. The trend can be seen if we look at the last two quarters' revenue and EPS. As Indian economy is recovering from first ever recession after independence, Indian automobile sector will continue to remain a major contributor is India's GDP. The future of the Indian auto sector appears bright, with all three companies studied maintaining market leadership in their respective segments.

DATA ANALYSIS AND INTERPRETATION

1. PROFITABILITY RATIOS

1.1 Gross Profit Ratio

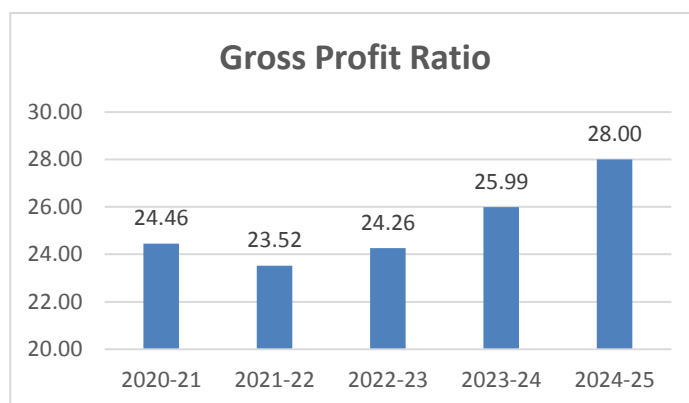
This ratio indicates the efficiency of trading activities of TVS motors. The relationship of Gross profit to sale is known as gross profit ratio. This ratio is calculated as

$$\text{Gross profit ratio} = \text{Gross profit} / \text{Sales} * 100$$

Table 1 Gross Profit Ratio

Year	Gross Profit	Net Sales	Ratio
2020-21	4,096.56	16,750.54	24.46
2021-22	4,890.19	20,790.51	23.52
2022-23	6,398.45	26,378.09	24.26
2023-24	8,258.33	31,776.37	25.99

2024-25	10,150.35	36,251.32	28.00



INTERPRETATION:

The ratio indicates the efficiency of production or trading operations. In 2020-21 the gross profit margin was 24.46% then it decreases to 23.52% in 2021-22. After that it gradually increases throughout all the years to 28.00% in 2024-25 which was highest of all years.

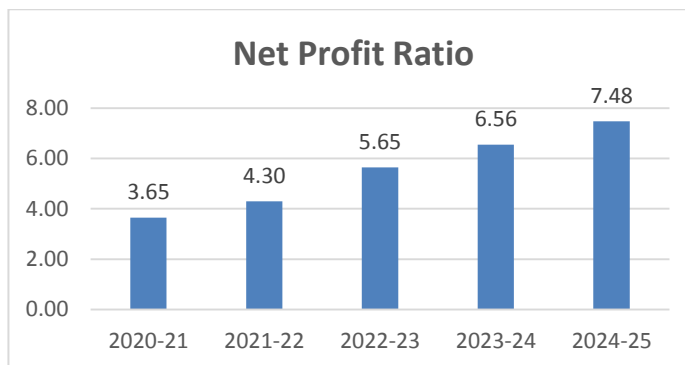
1.2 Net Profit Ratio

This ratio determines the overall efficiency of the business. The relationship between the net profit for the financial year and the sales is known as NET PROFIT RATIO. The ratio is calculated as:

$$\text{Net profit ratio} = \text{Net profit} / \text{Sales} * 100$$

Table 2 Net Profit Ratio

Year	Net Profit	Net Sales	Ratio
2020-21	612.04	16,750.54	3.65
2021-22	893.56	20,790.51	4.30
2022-23	1,491.03	26,378.09	5.65
2023-24	2,083.00	31,776.37	6.56
2024-25	2,710.54	36,251.32	7.48



INTERPRETATION:

Above table shows the Net profit ratio of the firm. The Net profit ratios show an upward trend throughout all the given years from 2020-21 at 3.65% to 7.48% in 2024-25.

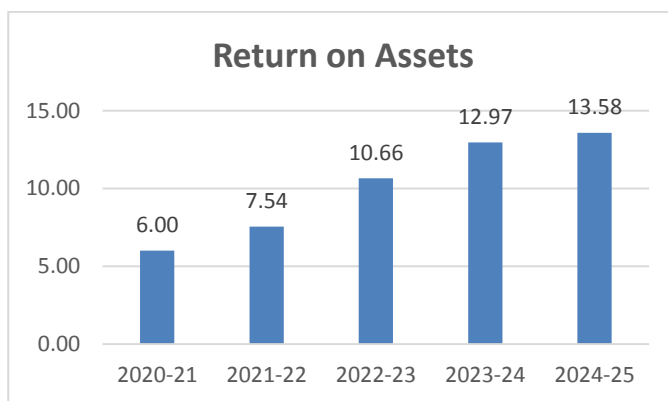
1.3 Return on Assets

Return on Assets (ROA) is a profitability ratio showing how efficiently a company uses its assets to generate profit, usually expressed as a percentage; a higher ROA indicates better efficiency in turning assets (like equipment, inventory) into earnings, helping investors gauge performance and compare companies within the same industry. The ratio is calculated as:

$$\text{Return on Assets (ROA): Net Income} / \text{Total Assets}$$

Table 3 Return on Assets

Year	Net Income	Total Assets	Ratio
2020-21	612.04	10,197.45	6.00
2021-22	893.56	11,847.73	7.54
2022-23	1,491.03	13,992.39	10.66
2023-24	2,083.00	16,062.24	12.97
2024-25	2,710.54	19,962.89	13.58



INTERPRETATION:

Above table shows the return on assets of the firm. The return on assets also shows an upward trend throughout all the given years from 2020-21 at 6.00% to 13.58% in 2024-25 which was highest amongst all the years of study.

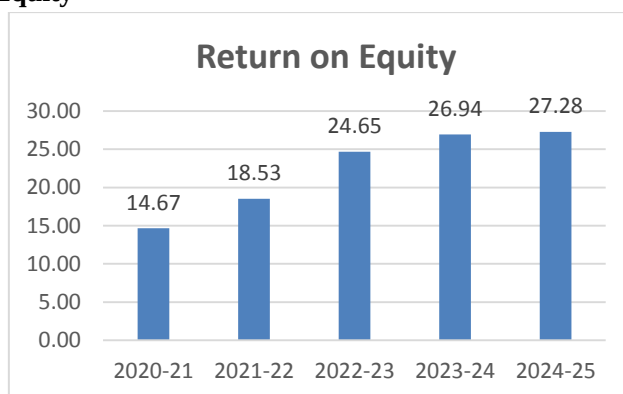
1.4 Return on Equity

Return on Equity (ROE) is a key profitability ratio showing how much profit a company generates from each dollar of shareholder equity, calculated as Net Income / Shareholders' Equity, revealing management's efficiency in using invested capital to create profits.

Return on Equity (ROE): Net Income / Shareholders Equity

Table 4 Return on Equity

Year	Net Income	Shareholders Equity	Ratio
2020-21	612.04	4,170.95	14.67
2021-22	893.56	4,822.04	18.53
2022-23	1,491.03	6,047.85	24.65
2023-24	2,083.00	7,731.04	26.94
2024-25	2,710.54	9,936.65	27.28



INTERPRETATION:

Above table shows the return on equity of the firm. The return on equity also shows an upward trend throughout all the given years from 2020-21 at 14.67% to 27.28% in 2024-25 which was highest amongst all the years of study.

2. LIQUIDITY RATIOS

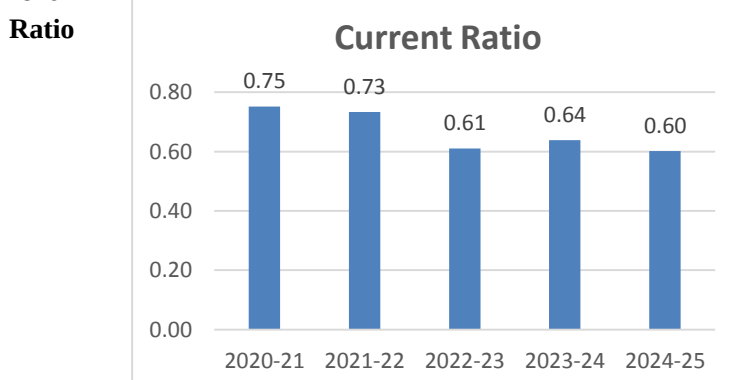
2.1 CURRENT RATIO

The current ratio is one of the important ratios to measure liquidity position. The ideal ratio of the current ratio was 2:1. The result will come to two and more than two means its short-term liquidity position is strong.

The formula for calculating the current ratio is = Current Assets / Current Liabilities

Table 5 Current

Year	Current Assets	Current Liabilities	Ratio
2020-21	3,446.79	4,585.41	0.75
2021-22	3,362.28	4,585.41	0.73
2022-23	3,667.50	6,008.54	0.61
2023-24	4,217.82	6,606.80	0.64
2024-25	5,081.87	8,449.24	0.60



INTERPRETATION:

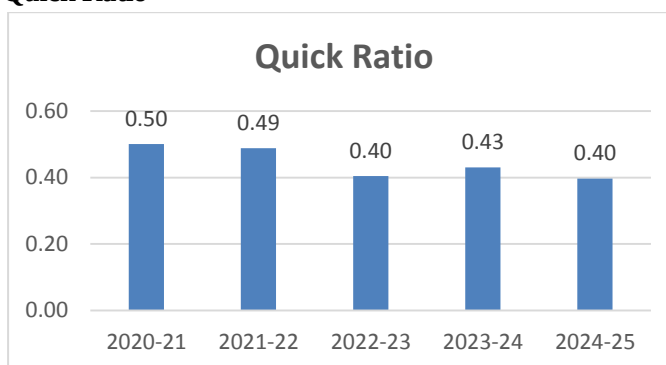
The above table shows that the current ratio in the year 2020-21 was 0.75 which was highest for given five years. Then it shows the downward trend as 0.73 in the year 2021-22, 0.61 in the year 2022-23. And again it rises to 0.64 in 2023-24 then decline to 0.60 in the year 2024-25. The Current Ratio of all the above five years fluctuating and below the standard.

2.2 QUICK RATIO

The quick ratio helps to measure the Company's ability to pay its immediate liabilities without the sale of its stocks. It is a more conservative measure when compared to the current ratio. The ideal norm of the quick ratio was 1:1. The formula for calculating the quick ratio was = Quick Assets/ Quick Liabilities

Table 6 Quick Ratio

Year	Quick Assets	Current Liabilities	Ratio
2020-21	2294.98	4,585.41	0.50
2021-22	2239.6	4,585.41	0.49
2022-23	2431.14	6,008.54	0.40
2023-24	2847.02	6,606.80	0.43
2024-25	3356.11	8,449.24	0.40



INTERPRETATION:

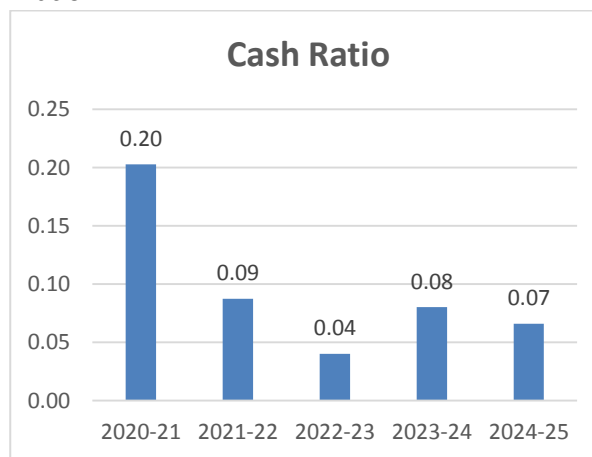
The Chart Shows that Quick Ratio in 2020-21 was 0.50 and decreases to 0.49 and 0.40 in the year 2021-22 and 2022-23 respectively. After that it increases to 0.43 in 2023-24 and again decreases like the current ratio to 0.40 in 2024-25 which was the lowest of all the given five years.

2.3 CASH RATIO

The cash ratio is a liquidity measure that shows a company's ability to cover its short-term obligations using only cash and cash equivalents. The cash ratio is derived by adding a company's total reserves of cash and near-cash securities and dividing that sum by its total current liabilities.

Table 7 Cash Ratio

Year	Cash & Cash Equivalents	Current Liabilities	Ratio
2020-21	929.81	4,585.41	0.20
2021-22	401.29	4,585.41	0.09
2022-23	241.96	6,008.54	0.04
2023-24	530.96	6,606.80	0.08
2024-25	558.33	8,449.24	0.07



INTERPRETATION:

The above table shows that the cash ratio from 2020-21 to 2024-25. The Cash Ratio from the year 2020-21 to 2024-25 shows the fluctuating trend from 0.20 in 2020-21 to 0.04 in 2022-23. After that it increases to 0.08 in 2023-24 and again it decreases to 0.07 in 2024-25.

FINDINGS

- Gross & Net profit shows increasing trend form 2021-22 to 2024-25 which is good sign for company.
- Return on Assets was again shows the upward trend for all the years and highest in 2024-25 as 13.58%.

- Return on Equity was also show the same trend as return on assets. Throughout all the five years return on equity was in upward trend from 14.67% to 27.28%.
- The current ratio was fluctuating and downward constantly from 0.75 in 2020-21 to 0.60 in 2024-25.
- The Quick Ratio was also following the same pattern like current ratio. It decreases form 0.50 in 2020-21 to 0.40 in 2024-25.
- The cash ratio was highest 0.20 in 2020-21 afterwards it constantly fluctuates and decreases for remaining period.

CONCLUSION

- The Gross and Net Profit ratio has increased which proved the company has been able to control the cost Effectively.
- Financial performance can improve the financial strength of company. The company liquidity position has to increase and it will solve future problem. The company was maintaining the reserves and surplus better by earning profit so it can face financial stress in the future.
- The Current Ratio of the company is not in ideal position as 2:1 to meet the Current Liabilities. As well as the Quick Ratio is not effective to manage the current liabilities.
- The company has increasing liabilities over years. The company need to revised its investments and reserves for future purpose.
- This clearly shows that the company facing some liquidity issues due to that its cash position was not good and in future it may face some serious issues relating to positive working capital.

After examining multiple data points concerning TVS Motor over a span of 5 financial years with an analytical perspective, the primary aim of this research is to evaluate TVS Motor's overall standing. Analysis indicates that the business is performing well with strong results, as their success relies on improved resource utilization. To enhance performance levels in the future, they must reduce expenses and cash outflow while improving their liquidity to address short-term obligations

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Bridging Wellness and Sustainability: Nudging Better Workplace Habits

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Abstract

Combined behavioural strategies are needed in the current organizations which are likely to be caught up in the digital overload and unsustainable working practices. The current study presents a bilateral model of intervention founded on the concept of behavioural nudging in order to facilitate digital wellbeing and climate-wise behaviours in the work setting. The research is a mixed-method research which involves survey, observation and controlled experiments involving behavioural nudges. The nudges of the digital behaviour component were Focus Mode to minimise distractions; micro-prompts to take breaks on screens-time; batch notification settings to minimise interruptions; minimalistic user interface settings to minimise decisions; prompts on eye health and posture and digital detox hours. The energy saving behaviours, the usage of resources and the routine daily practices were the climate smart cues and were environmentally friendly. The pre- and post-intervention data indicated that task-oriented engagement improved, as well as digital fatigue and better posture and eye comfort, and sustainability-related practices among the participants. Results have shown that even the small not very noticeable cues can happen and bring about tremendous long lasting alterations in the behaviour of an individual without affecting the autonomy of a person. The case of the dual-nudge model demonstrates the way in which the HR departments of the organizations may use behavioural science as an ally to enhance the wellbeing of the employees and environmental responsibility. The present model offers a feasible and inexpensive, and extremely scalable method of building safer, climate-conscious societies within workplaces in contemporary organizations.

Introduction

Sustainability and digital transformation have become the major priorities of contemporary organizations. Employees are experiencing increased reliance on screens, feelings of digital exhaustion, and a lack of attention span due to constant interruptions and extended duration at work in the post-COVID hybrid workplace environment. At the same time, organizations are supposed to become sustainable, decrease the carbon emissions, and develop a climate-aware personnel.

Behavioural design and nudging can offer effective, inexpensive, and scalable to deal with these two challenges. Focus Mode activations, minimal interface designs, screen-cleaner notifications, micro-break alerts, posture/eye health alerts, and cognitive functioning are examples of digital well-being prompts. Equally, carbon footprint dashboards, smart waste-sorting indicators, gamed sustainability games, and social comparison indicators are climate behaviour nudges that encourage employees to act in an environmentally responsible manner.

Although digital wellness and sustainability nudges are both investigated separately, a big unknown exists in the research applies them to one seamless organizational and HR structure. The proposed study will fill this gap by suggesting a hybrid behavioural nudging framework that would improve employee digital well-being and, at the same time, cultivate climate-related smart workplace behaviour. In this combined methodology, the study provides a comprehensive plan on how to create healthier, sustainable, and future-oriented workplaces.

Objectives

1. To comprehend how behavioural nudges affect screen hygiene and digital well-being.
2. To develop an integrated HR behavioural framework that will incorporate digital and environmental nudges.
3. To suggest effective interventions into decreasing the digital burnout and increasing climate-conscious behaviour.
4. To investigate long-term organizational returns to dual-domain behavioral design.

Problem Statement

Employees are currently confronted with over-exposure to the screen, digital burnout, the continuous influx of notifications, and lack of cognitive attention. At the same time, due to inadequate employee engagement in climate and sustainability, organizations experience low employee engagement in such programs. Although these are interdependent

issues of behaviour, the organizations do not have a single behavioural design framework that can cater to the digital well-being and climate-responsible workplace behaviour.

Literature Review

1. **Nudging behaviour and well-being:** Digital overload has been shown to reduce productivity and increase stress (Mark et al., 2018). Minimalistic designs, focus prompts, and break notifications all aid in improving concentration and reducing cognitive load (Bailenson, 2021). Employees can manage screen hygiene through software-based behavioural nudges, such as push notification filters and quiet hours.
2. **Screen Fatigue and Behavioural Economics:** Cognitive fatigue is experienced when too much time is spent on the screen, and this overwhelms the working memory (Kahneman, 2011). Micro-break prompts or focus sessions are also some of the types of nudges that balance the concentration cycles and prevent burnout.
3. **Climate Behaviour Nudging:** According to the nudge theory proposed by Thaler and Sunstein, small environmental promotions play a big role in promoting sustainable behaviour. Studies identify carbon footprint feedback, waste bins with motion sensors, and social comparison to decrease the amount of energy used in workplaces (Dolan et al., 2012).
4. **Employee Engagement in Sustainability:** Sustainability of Employee Engagement. According to a number of studies, organizations are unsuccessful in encouraging employees to engage in sustainable behaviours because of passive communication, missing the real-time feedback, and incentives (Kaur and Kumar, 2018).
5. **The Position of HR in Behavioural Interventions:** Wellness, sustainability, and productivity programmes are becoming more involving of behavioural design by HR departments. Nonetheless, the literature seldom integrates digital well-being and climate behaviour into a behavioural design framework that is led by HR.
6. **Nudging of Corporate Sustainability and Wellness Behaviour:** The study of Patil and Yeshe (2025) proves that behavioural nudging approaches, including gamification and environmentally friendly default, can successfully improve employee welfare and sustainability. These interventions are cost-effective and non-coercive that their research confirms to enhance the efficiency of organizational operations and decision-making without limiting the freedom of the individuals. (ISSN : 2348-7143)

Research Methodology

The study is based on Primary and Secondary research where:

Data Sources

- Needs: Academic journals in the field of behavioural economics, digital psychology, HRM and sustainability.
- Case examples of firms that have adopted digital wellness or eco-nudges.
- APA, Deloitte Insights, McKinsey and behavioural laboratory research.
- Reports on carbon footprints and digital well-being.

Analysis Approach

- Comparison between digital and climate nudges.
- Formulation of behavioural science.
- Planning an integrated HR behaviour structure.
- Mapping effective interventions.

Qualitative Analysis

- Employee Unstructured interviews and feedback of referenced case studies.
- Observation research of behaviour.

Weakness: Organisational culture affects evaluation in the following ways.

Gap Identification

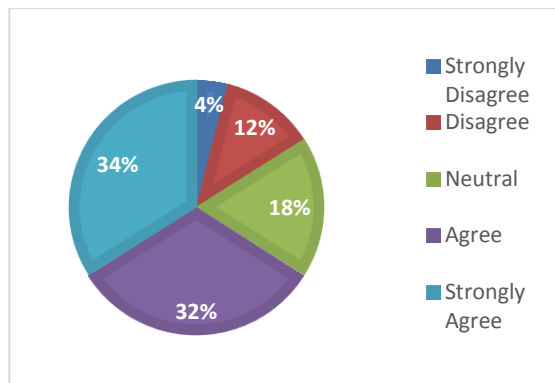
Whereas behavioural nudges were effective in digital wellness and sustainability as distinct fields, there is no current framework that unites both fields to form an all-encompassing behavioural approach to HR systems.

Specific gaps include:

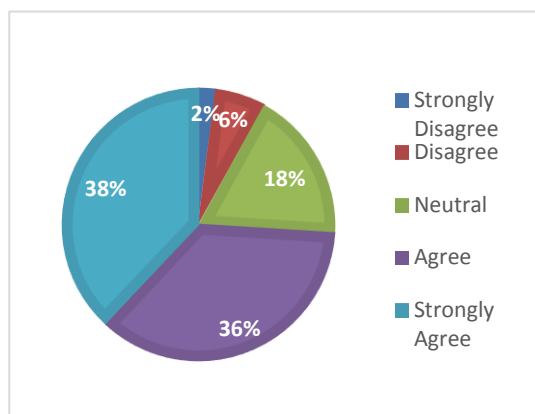
- Scarcity of research relating digital behaviour and climate behaviour as related organizational issues.
- Lack of digital hygiene and green nudge based on HR based behavioural architecture.
- Very little research on hybrid workplace behavioural design.
- Lack of research on digital and environmental nudging in India.

Data Analysis & Interpretation

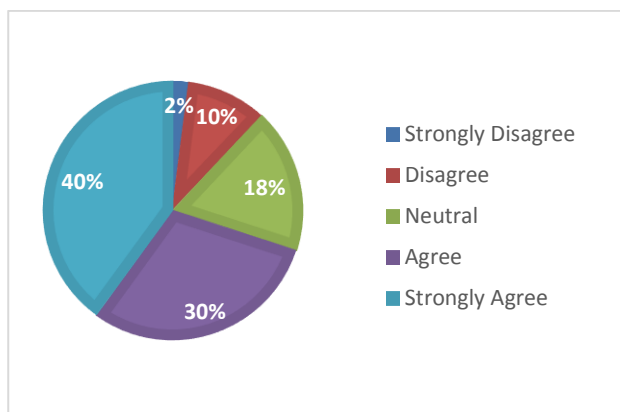
1. A baseline of high digital dependency is established by the fact that 66% of respondents spend most of their working hours in front of a screen.



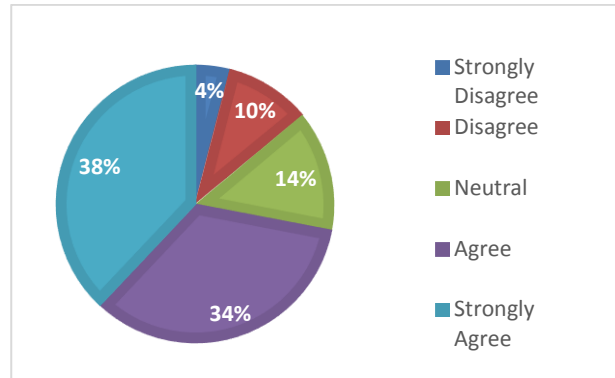
2. Physical symptoms like dry eyes, blurred vision, or eye strain are reported by 74% of respondents.



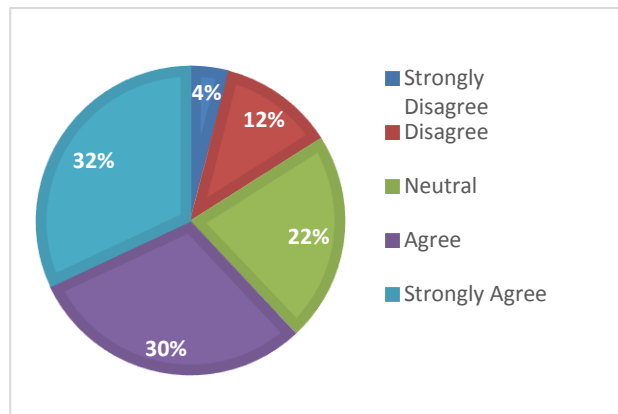
3. Due to extended screen time, 70% of people experience mental exhaustion or burnout..



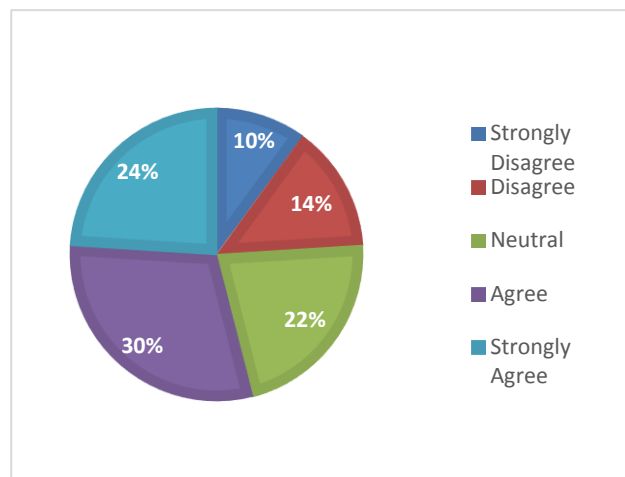
4. Continuous virtual meetings are directly linked to feelings of digital fatigue by 62% of respondents.



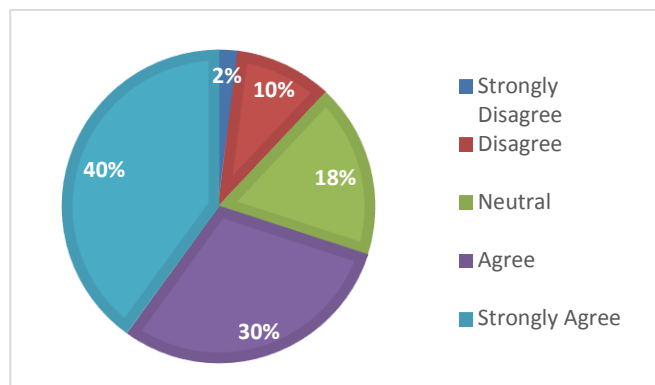
5. According to 72% of respondents, too much screen time directly impairs their capacity to focus on tasks.



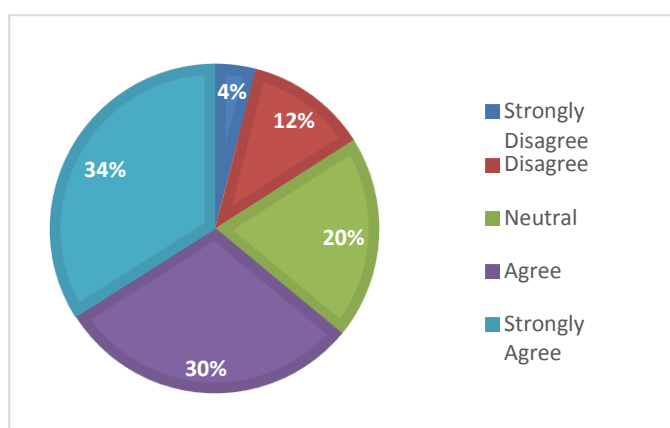
6. After working long hours in front of a screen, 54% of respondents admit to a discernible drop in productivity..



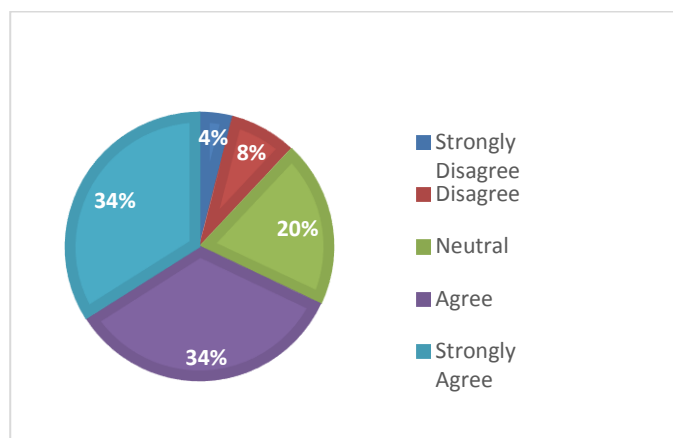
7. Due to digital devices, 68% of people find it difficult to unplug from work after hours, indicating a “always-on” culture.



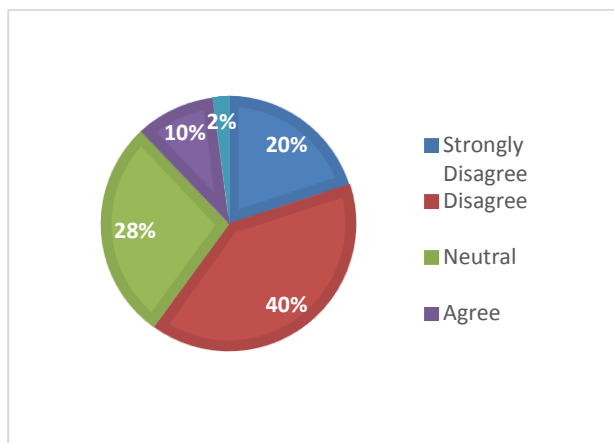
8. According to 64% of respondents, excessive screen time has a detrimental effect on their overall work-life balance.



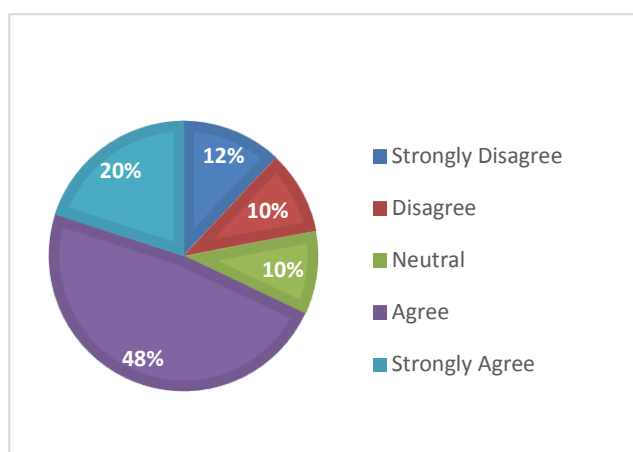
9. 68% believe their company does not offer enough direction or assistance to properly manage screen time.



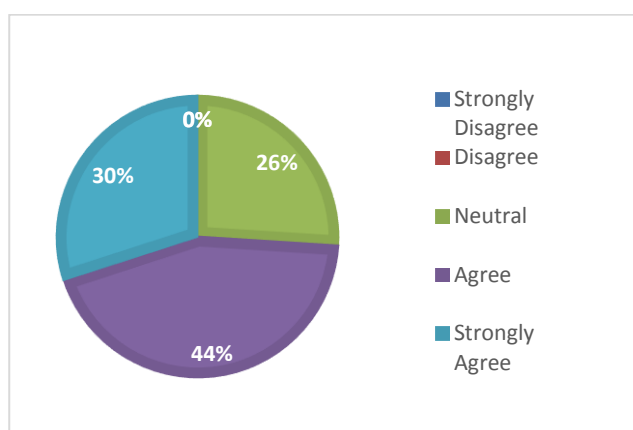
10. A lack of corporate sustainability culture is evident in the 60% of respondents who disagree or strongly disagree that their company actively promotes eco-friendly behaviours.



11. Due to a lack of reminders, 68% of respondents acknowledge that they have forgotten to turn off lights or systems.



12. If given real-time impact visibility, like a carbon footprint dashboard, 74% of respondents would be more inclined to conserve resources.



Secondary Data Analysis

The main findings are validated by secondary data, i.e., January 2026 reports and corporate case studies, which show a national trend of digital overload and critical gap in wellness implementation.

1. Digital Intrusion & Legal Context (The "Right to Disconnect") The reintroduction of the right to disconnect bill, 2025, shows how important the management of digital boundaries in India is. According to an Indeed survey (Jan 2026), 88 percent of Indian employees are called outside working hours, and 85 percent on sick leave. This

institutional malfunction of voluntary limits makes it known that structural solutions, like a so-called Notification Batching or a so-called Digital Detox nudge have to be applied in order to implement the measures of protection suggested by the legislation.

2. The Intent-Execution Gap The Great Wellbeing Shift 2026 report (People Matters and Truworth Wellness) has also discovered a huge discrepancy: though 83% of Indian companies provide mental health support, just 14% of them rely on AI-driven nudges to do so. This information confirms the fact that firms have the motive but no methodology of behaviour, which is why the present Dual-Nudge Model proves to be the missing factor of successful application.
3. Evidence of Concept: Infosys "HALE" Project Proving the scalability of this strategy, the Infosys project, "HALE," can use the important tool of Leave Nudges to encourage employees to take leave before they become burnt out. This practical implementation serves as a confirmation of the fact, that automated behavioural prompts are not merely a theoretical foundation, but a practical, established means of regulating the well-being of the staff at the large-scale Indian companies (Infosys ESG Report).
4. The Green Behaviour Gap According to the findings of the survey of sustainable workplaces, conducted by Green Behaviour (2025) of Deloitte 69 per cent of employees desire their organisations to become more sustainable, 45 per cent have never discussed green behaviour with their managers. This information underscores the fact that there is the wish to take action regarding climate, but there is no mechanism (behavioural nudges) in place, which is another reason why the study warrants the inclusion of the Eco-Nudge element.

Findings

The main findings are validated by secondary data, i.e., January 2026 reports and corporate case studies, which show a national trend of digital overload and critical gap in wellness implementation.

1. Digital Intrusion & Legal Context (The "Right to Disconnect") The reintroduction of the right to disconnect bill, 2025, shows how important the management of digital boundaries in India is. According to an Indeed survey (Jan 2026), 88 percent of Indian employees are called outside working hours, and 85 percent on sick leave. This institutional malfunction of voluntary limits makes it known that structural solutions, like a so-called Notification Batching or a so-called Digital Detox nudge have to be applied in order to implement the measures of protection suggested by the legislation.
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Suggestions

1. Consider a Dual-Nudge Behavioural Architecture: The HR departments should introduce automated nudges into workflow to support the 74% physically straining. This has such features as Micro-Break eye health prompts and Focus Mode defaults to minimize cognitive load and distractions.
2. Standardize the Right to Disconnect: Organizations need to implement technological boundaries instead of using the goodwill. Application of the concepts of 68 percent of employees who are unable to disconnect by

implementing "Notification Batching (storing non-urgent e-mails until work hours) and No-Meeting Zone can directly respond to the emerging legal standards that are supposed to be in tandem with corporate policy.

3. Bridge the Gap by using Proactive AI Tools: To address the reported shortage of guidance in 70 percent of employees, organizations must emulate the successful frameworks of the companies, such as the case of Infosys and its program called HALE. Proactive care can be promoted using AI to identify burnout patterns and instigate "Leave Nudges" or Rest Reminder moves to ensure that the decisions do not rely on a reactive policy.
4. Re-define Virtual Collaboration: Since three out of five employees report virtual meetings as a drain on their energy, companies ought to reduce default meeting duration (e.g., 25 mins rather than 30) to provide companies with an obligatory rest period between calls.
5. Install or Use "Green Defaults" & Visual Feedback: Organizations can be able to establish "Green Defaults" (e.g. by default double-sided printing) and "Eco-Dashboards" that show the real time saving of carbon in a floor/department. This gives the instant feedback necessary to modify behaviour.

Conclusion

This study provides a final resolution to the two-fold predicaments of digital burnout and climate disengagement. The results indicate a workforce that is under severe stress with 74 percent experiencing physical complications as a result of exposure to the screen and a large percentage (55) of them acknowledging that they have developed the habit of wasting energy because they do not get prompted.

The Dual-Intervention Nudge Model is a way of filling this gap. Organizations can build a paradigm of passive policies to active Choice Architectures by combining Digital Hygiene Nudges (such as Focus Modes) with Climate-Smart Cues (such as resource dashboards). Finally, such a framework indicates that ensuring the well being of the employees, as well as environmental responsibility are both inseparable. The Dual-Nudge strategy, which is a scaled, low-cost business-level approach, will provide a future-ready, digitally healthy and climate-aware workforce.

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WorkSphere: A Digital Platform for Labour, Resource and Market Integration

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Abstract

Labour sectors such as agriculture, construction, and other unorganized fields play an important role in supporting the Indian economy, yet people working in these areas continue to face several practical difficulties. However, workers engaged in these sectors often face irregular employment, uncertain wages, and limited access to reliable job opportunities. Labourers usually depend on contractors, agents, or local contacts to find work, which reduces transparency and income stability. At the same time, farmers and small producers struggle to access accurate market price information and are often forced to sell their produce through intermediaries at lower rates.

Although smartphone usage has increased in rural and semi-urban areas, the practical use of digital platforms for employment and market access remains limited. Many workers find existing applications difficult to use due to language barriers, low digital literacy, and complex interfaces.

This study attempts to understand these issues through a small-scale survey conducted among labourers and farmers from nearby regions. A structured questionnaire was used to collect responses related to employment availability, wage awareness, market access, and readiness to adopt a digital solution. The study also considers secure in-app communication, where labourers, farmers, and contractors can contact each other through a system-generated number. This protects personal contact details while ensuring smooth and trusted coordination through the WorkSphere platform. The findings reveal irregular job opportunities, lack of price transparency, and heavy dependence on intermediaries and contractors. At the same time, many respondents expressed interest in using a simple digital platform if proper guidance is provided. Along with employment and market-related concerns, respondents also pointed out difficulties in obtaining basic tools and machinery on a rental basis, particularly during busy agricultural and construction periods. Many labourers and small farmers depend on nearby equipment owners or contractors to access machines, often at higher costs and with uncertain availability. Delays caused by this unorganized rental arrangement frequently affect work schedules and earnings. The lack of a clear and reliable system for equipment rentals increases dependency and adds to financial pressure during critical work seasons.

Based on these observations, the study suggests that WorkSphere can act as a practical digital solution to improve employment access and market transparency.

Keyword : Unorganized labour, Digital platform, Agriculture, Market transparency, Survey research, Rural development.

Introduction

India's economy depends heavily on the unorganized labour sector along with agriculture, as these areas provide livelihood support to a large section of the population. Many individuals work as daily wage labourers, agricultural helpers, construction workers, mechanics, and other semi-skilled or skilled workers. In most cases, these workers depend on contractors, agents, or personal networks to find employment. Because of this dependency, work availability remains uncertain, wage payments are not always transparent, and the chances of exploitation increase.

Farmers also experience similar difficulties while selling their produce. Due to limited access to direct buyers and lack of clear information about prevailing market prices, they often rely on traders or middlemen. This situation reduces their bargaining power and results in lower income, even after considerable effort and investment.

Although digital technology has transformed sectors such as banking, education, and healthcare, its reach within unorganized labour and farming communities has been relatively slow. While smartphone usage has increased in rural and semi-urban regions, many workers and farmers are unable to use existing digital platforms effectively. This is mainly due to limited digital literacy, language barriers, and complex application designs. Moreover, most available platforms focus on only one aspect, such as job listings or price updates, rather than addressing multiple needs together. Communication plays an important role in employment coordination. However, sharing personal phone numbers often creates privacy and safety concerns. WorkSphere proposes a secure in-app calling system, similar to e-

commerce delivery platforms, where users can communicate through a temporary company-generated number without revealing personal contact details. The concept of WorkSphere is based on observations made from local surroundings, where labourers across different sectors depend on contractors for work and farmers struggle to access fair markets. WorkSphere aims to provide an integrated digital platform that connects labourers with employers and contractors, farmers with buyers, and users with resource and equipment rental services. Along with this, the platform seeks to offer reliable wage and market information in a simple and accessible manner. In recent years, initiatives such as Digital India have highlighted the importance of technology-driven inclusion. However, the actual benefits of digital transformation have not reached all sections equally. This situation emphasizes the need for sector-specific digital solutions that are practical, inclusive, and easy to use for unorganized workers and small producers.

Apart from employment and market challenges, access to tools and equipment on rent is another common problem faced by labourers and farmers. Most small farmers and daily wage workers do not own machinery such as tractors, harvesting tools, or construction equipment and therefore rely on local owners or contractors. This informal rental practice often involves unclear pricing, limited availability, and dependence on personal contacts. During peak work periods, equipment shortages become more frequent, resulting in work delays, increased costs, and reduced productivity. The present study attempts to understand this need through a survey-based analysis and explores how a platform like WorkSphere can support employment stability, transparency, and opportunity access across multiple sectors.

Review of Literature

Previous studies have highlighted the growing importance of digital platforms in improving employment access within informal and unorganized sectors. Research suggests that digital systems can reduce dependence on middlemen and support greater transparency in wage-related practices (Smith & Johnson, 2021; Ministry of Labour and Employment, 2023). Similarly, studies on agricultural markets indicate that access to timely and accurate price information helps farmers make better selling decisions and improves income stability (Brown & Green, 2022; Singh & Patel, 2021).

Research on digital inclusion in rural India points out challenges such as low digital literacy, language barriers, and complex application designs, which limit effective technology adoption (Kumar & Sharma, 2020; UNDP, 2020). Government policy documents also highlight the importance of developing digital systems that are inclusive and interconnected in nature (Government of India, 2022; NITI Aayog, 2021). A majority of existing research examines labour-related digital services and agricultural market platforms as separate domains. Very limited studies have explored the concept of a unified digital platform that brings together labour services, resource sharing, and market information. The present study attempts to address this research gap by examining such integration through the proposed WorkSphere model.

Statement of Problem

Labourers frequently face problems such as irregular employment, unpredictable wages, and unequal treatment because they rely largely on contractors and middlemen to secure work. This reliance limits their negotiating ability and results in financial instability. Farmers also encounter major difficulties, especially when it comes to obtaining timely and accurate information about market prices for their produce, which directly affects their income. Apart from employment and market challenges, unprotected communication and the sharing of personal phone numbers create privacy risks and reduce trust among labourers, farmers, and contractors.

Along with this, both farmers and labourers often struggle to find necessary tools and equipment on rent during critical working seasons. The lack of a simple, inclusive, and easy-to-use digital platform that combines labour services, equipment rental facilities, and direct market access reduces transparency, weakens income security, and slows overall economic progress in unorganized sectors.

Objectives of the Study

- To identify the key employment related problems faced by labourers working in unorganized sectors.
- To analyze the market related difficulties encountered by farmers while selling their agricultural produce.
- To examine the level of awareness, accessibility, and acceptance of digital platforms among the respondents.
- To evaluate the practicality and potential usefulness of the WorkSphere platform as a supportive digital solution.
- To understand issues related to availability and affordability of equipment rentals among labourers and farmers.
- To examine the need for secure and privacy-friendly communication between labourers, farmers, and contractors using a digital platform.

Research Methodology

The present study follows a descriptive research approach and is based on a survey method for collecting primary data. A structured questionnaire was designed using clear and simple language to ensure that respondents from varied educational backgrounds could easily understand and answer the questions. Prior to the main survey, a pilot study was conducted to verify the clarity, relevance, and practical applicability of the questionnaire items.

The survey was carried out among labourers, farmers, contractors, and small resource owners from nearby rural and semi-urban areas using a convenience sampling technique. The questionnaire covered issues related to availability of employment, awareness of wage rates, access to market price information, availability of tools and equipment on rent, smartphone usage, and willingness to adopt a digital platform. The responses collected were analyzed using percentage-based analysis, and the findings were presented through charts and graphical representations to support clear interpretation.

Result and Discussion

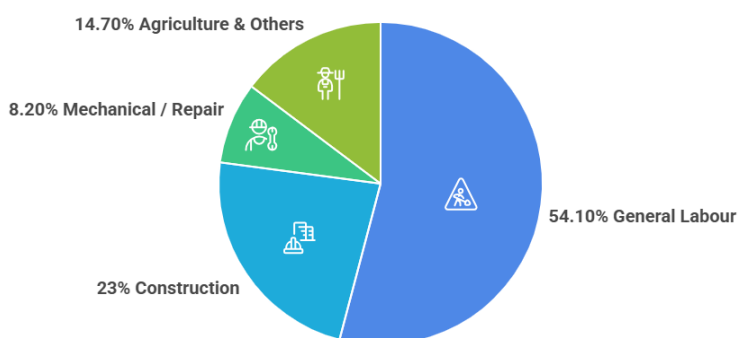
The survey responses show that many labourers continue to face irregular work availability, which directly affects their income stability. Several respondents shared that they are unaware of standard wage rates and often accept payments decided by contractors or employers. Farmers also reported difficulties in accessing reliable market price information and usually depend on local agents or traders for selling their produce.

In addition, respondents highlighted problems in arranging tools and machinery on rent, especially during peak farming and construction periods. Responses indicate that users prefer contacting employers or workers through a platform-managed calling feature rather than sharing personal numbers. This shows that a secure in-app communication system can improve trust, coordination, and platform usage.

Many labourers and small farmers rely on informal equipment owners, which increases costs and causes delays. Despite these challenges, most respondents own smartphones and expressed willingness to use a digital platform if it is easy to operate and available in local languages. For those without smartphones, the platform can deploy local agents who assist them with registration, accessing work, and using platform services such as equipment rentals and market updates. These findings indicate that technology adoption is possible when solutions are designed around actual user needs. An integrated platform like WorkSphere can support fair access to jobs, equipment rentals, and transparent market information.

Chart 1: Nature of Employment

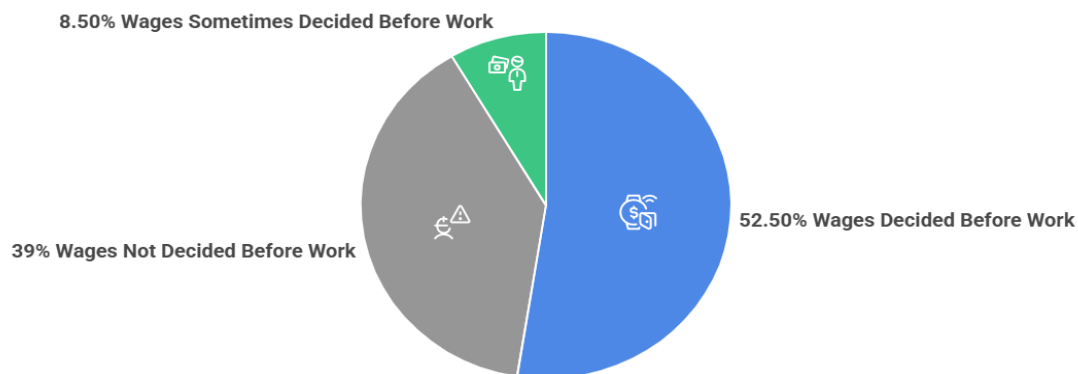
Figure 1. Distribution of work types among respondents



The data shows that a majority of respondents (54.10%) are engaged in general labour activities, making it the most common form of employment among the surveyed group. Construction work follows at 23%, while agriculture and related activities account for 14.70%. A smaller proportion, 8.20%, is involved in mechanical or repair work. These occupations largely depend on manual effort and informal arrangements, where steady employment, access to tools, and wage stability are often uncertain. The results indicate that workers in these sectors frequently rely on short-term job opportunities and shared or rented equipment to carry out their daily tasks.

Chart 2: Awareness of Standard Wage Rates

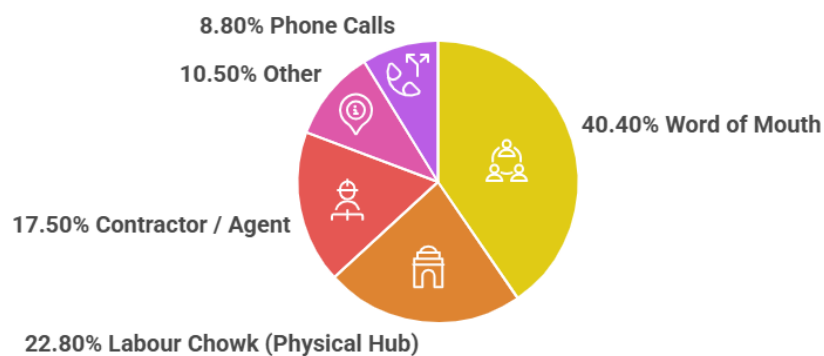
Figure 2. Frequency of wage negotiation before starting work



The findings indicate that only 52.50% of respondents have their wages finalized before beginning work. In contrast, 39% stated that wages are not discussed in advance, while 8.50% reported that wage decisions are made occasionally. This pattern highlights weak wage negotiation practices and limited awareness of standard wage rates among labourers. In many situations, workers also bear extra expenses related to renting tools or equipment, which reduces their actual income and increases financial insecurity.

Chart 3: Access to Market Price Information

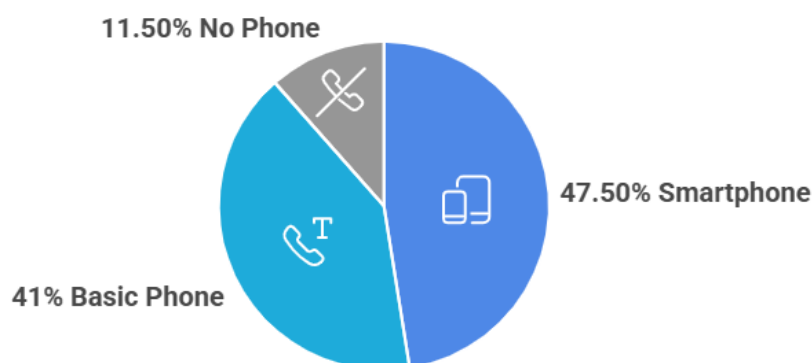
Figure 3. Primary methods used to find work or labour



The results reveal that word-of-mouth remains the most widely used method for finding work or labour, reported by 40.40% of respondents. Labour chowks are used by 22.80%, while 17.50% depend on contractors or agents. Other approaches, such as phone calls (8.80%) and alternative sources (10.50%), are used less frequently. This heavy reliance on informal networks also applies to accessing tools and machinery, where workers and farmers often depend on personal contacts instead of structured rental systems.

Chart 4: Smartphone Usage

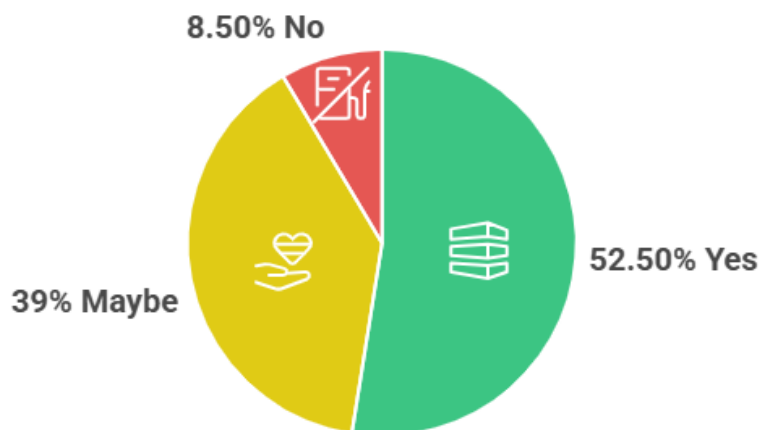
Figure 4. Mobile phone ownership among respondents



The data shows that 47.50% of respondents own smartphones, while 41% use basic mobile phones. About 11.50% reported that they do not own any mobile device. Although smartphone usage is steadily increasing, a significant portion of respondents still relies on basic phones. This situation emphasizes the need for digital platforms that provide assisted access and simple features, especially for services related to job searching, wage information, and tool or equipment rentals.

Chart 5: Willingness to Use a Digital Platform

Figure 5. Respondents' interest in using an app for work or tool rentals



The findings indicate that 52.50% of respondents are willing to use a digital platform for work-related activities or tool rentals. Another 39% expressed conditional interest, mainly depending on ease of use and availability in local languages. Only 8.50% showed no interest in adopting such platforms. These responses suggest a generally positive attitude toward digital solutions, particularly those that simplify access to employment, reduce dependence on intermediaries, and offer transparent options for renting equipment..

Findings

The study highlights that employment opportunities available to labourers are largely irregular and unpredictable, leading to income instability and financial insecurity. Many respondents depend on daily or seasonal work, which makes it difficult for them to plan expenses or save money over time.

The findings also indicate limited awareness of fair wage rates and current market prices among both labourers and farmers. This lack of information increases their reliance on intermediaries and reduces their ability to negotiate wages or selling prices effectively. In addition, several respondents reported difficulties in accessing tools and machinery on rent, often depending on contractors or local owners during peak working periods. Respondents showed greater confidence in using a digital platform that allows communication through a company-generated number, ensuring privacy and reducing misuse of personal contact details.

It was further observed that smartphone usage is becoming more common, indicating growing access to digital devices. However, effective use of digital platforms remains limited due to low digital literacy and insufficient guidance. Overall, respondents showed a positive attitude toward simple and assisted digital platforms, particularly those that support local languages, suggesting strong potential for the adoption of platforms like WorkSphere.

Suggestions

Digital platforms aimed at labourers and farmers should have a simple, easy-to-use interface and support local languages to ensure users can understand it effortlessly. Assisted onboarding should be available for those with limited literacy, allowing them to register and use the platform confidently. The system should provide real-time updates on wage rates and market prices, promoting transparency and helping users make informed decisions. WorkSphere should include a secure in-app calling feature similar to e-commerce platforms, where communication happens through a temporary company number. This will protect user privacy, reduce misuse, and increase trust among labourers, farmers, and contractors. Moreover, basic awareness programs in rural areas can encourage the use of digital tools and improve acceptance of such platforms. The flowchart illustrates the proposed functioning of the WorkSphere platform, showing how users move through the system—from registration to accessing various services such as labour connections,

equipment rentals, and market information. This visual representation clarifies the practical workflow of the platform and highlights its intended benefits.

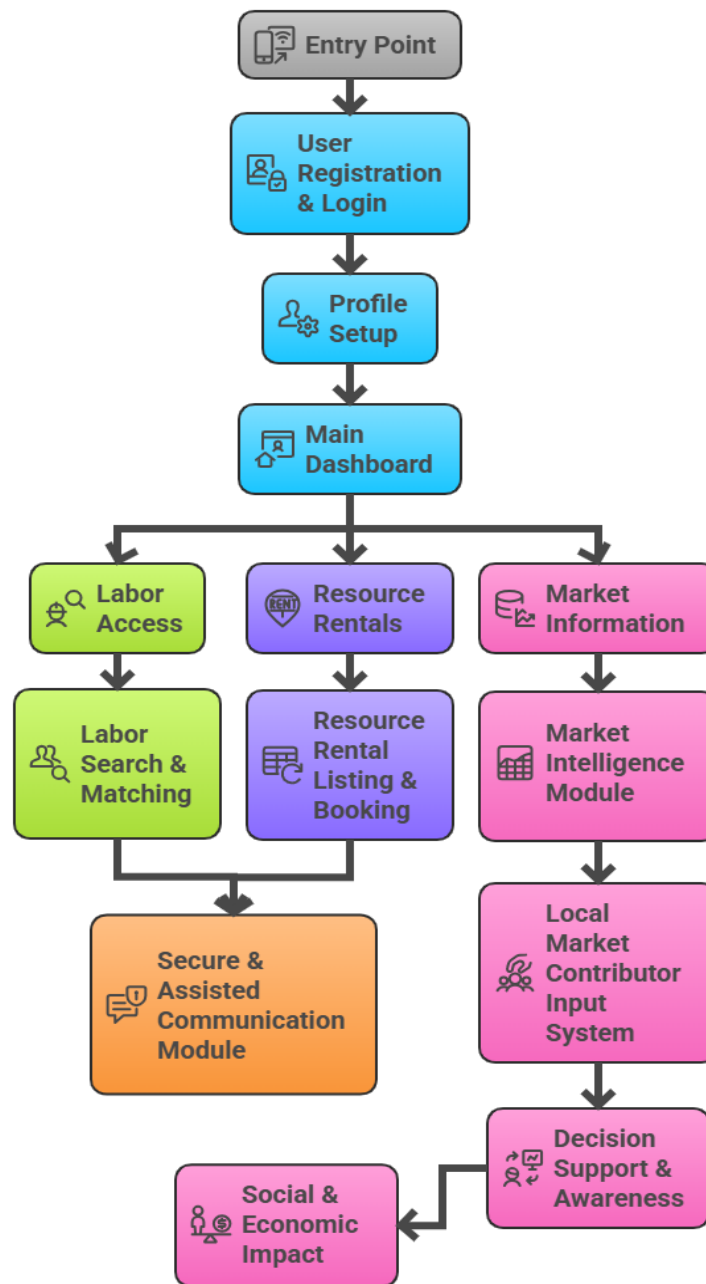


Figure 1: Proposed System Flow of WorkSphere Platform

Conclusion

The study shows that labourers, farmers, contractors, and others working in unorganized sectors continue to face several difficulties, including irregular employment, unstable income, and limited access to dependable market information. Dependence on middlemen remains a serious issue, affecting both job availability and overall earnings. Features such as privacy-protected communication and assisted access further strengthen the practicality and user acceptance of the WorkSphere platform.

Based on the survey findings, the WorkSphere concept stands out as a practical and effective digital solution. Many respondents indicated that they are willing to use technology if platforms are easy to operate, available in local languages, and provide useful services such as labour connections, market updates, and equipment rentals. For users who do not own smartphones or mobile devices, the platform can support them through local agents who assist with

registration, job access, and the use of services like equipment rentals or market information. By focusing on simplicity, transparency, and accessibility, WorkSphere has the potential to improve access to employment, encourage fair market practices, and strengthen digital inclusion.

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Artificial Intelligence Tools in Stock Market Trading: Applications, Challenges, and Future Directions

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Abstract

The rapid advancement of Artificial Intelligence (AI) has significantly transformed stock market trading by enabling data-driven, automated, and intelligent decision-making. AI-driven tools are increasingly used for market analysis, price prediction, portfolio optimization, sentiment analysis, and algorithmic trading. Leveraging machine learning, deep learning, natural language processing, and big data analytics, these tools process massive volumes of structured and unstructured financial data with high speed and accuracy. This paper presents a structured overview of AI tools used in stock market trading, explains their working mechanisms, highlights major applications, evaluates benefits and limitations, and discusses future prospects, with particular emphasis on emerging trends in global and Indian financial markets [1][2].

Keywords: Artificial Intelligence, Stock Market Trading, Machine Learning, Algorithmic Trading, FinTech

1. Introduction

Stock markets are highly dynamic systems influenced by economic indicators, corporate performance, geopolitical events, and investor psychology. Traditional trading approaches based on manual analysis and heuristic judgment often fail to cope with the volume, velocity, and variety of modern financial data. Artificial Intelligence offers advanced computational techniques that enable faster processing, pattern recognition, and predictive modeling [1][3]. In recent years, AI has become a core component of modern financial markets, supporting retail traders, institutional investors, and regulatory bodies.

2. Role of Artificial Intelligence in Stock Market Trading

AI contributes to trading activities by enabling the following capabilities [1][2]:

- Analysis of historical and real-time market data
- Identification of hidden patterns and trends
- Prediction of price movements and volatility
- Automated trade execution with minimal latency
- Portfolio optimization and risk management

By reducing human bias and enhancing analytical precision, AI improves operational efficiency and decision quality in trading systems.

3. Types of AI Tools Used in Stock Market Trading

3.1 AI-Based Market Analysis and Signal Generation

These tools employ machine learning algorithms to analyze technical indicators, historical price movements, and chart patterns [2]. They generate buy and sell signals based on learned relationships within market data.

3.2 Automated Trading Systems and Trading Bots

AI-powered trading bots automatically execute trades according to predefined rules or adaptive strategies learned through historical data [1][4]. Such systems are widely adopted in algorithmic and high-frequency trading environments.

3.3 Predictive Analytics and Forecasting Tools

Predictive models such as Linear Regression, Random Forest, Support Vector Machines (SVM), and deep learning architectures including Long Short-Term Memory (LSTM) networks are used to forecast stock prices and market trends [2][3].

3.4 Sentiment Analysis Tools

Natural Language Processing (NLP) techniques analyze financial news, earnings reports, and social media content to assess market sentiment and its influence on asset prices [1][2].

3.5 Portfolio Management and Robo-Advisors

AI-driven robo-advisors assist investors with portfolio construction, asset allocation, rebalancing, and risk assessment based on individual preferences and market conditions [1].

4. Applications of AI in Stock Market Trading

- **Algorithmic Trading:** Automated and high-speed execution of trades
- **Risk Management:** Volatility estimation and downside risk control
- **Fraud Detection:** Identification of abnormal or manipulative trading behavior
- **Investment Advisory:** Personalized investment recommendations

5. Advantages of AI Tools in Trading

- High-speed data processing and execution
- Reduction of emotional and cognitive biases
- Improved prediction accuracy and consistency
- Ability to analyze multiple markets simultaneously
- Enhanced decision support for investors and institutions

6. Challenges and Limitations

Despite significant benefits, AI-based trading systems face several challenges as identified in prior studies [1][5]:

- Dependence on high-quality and reliable data
- Risk of overfitting and model bias
- High development, infrastructure, and maintenance costs
- Limited transparency in black-box models
- Regulatory, ethical, and compliance concerns

7. AI in the Indian Stock Market

In India, the adoption of AI in stock market trading is steadily increasing, driven by regulatory support and FinTech innovation [4][5]. Major exchanges and brokerage platforms offer AI-based tools for stock screening, strategy development, and automated trading. FinTech startups and financial institutions are investing heavily in AI research to enhance trading efficiency, compliance, and customer experience within regulatory frameworks defined by Indian market authorities.

8. Future Scope of AI in Stock Market Trading

Future developments in AI-driven trading are expected to include the following advancements [1][3][5]:

- Advanced deep reinforcement learning models
- Integration with blockchain and decentralized finance (DeFi)
- Explainable AI (XAI) for transparent decision-making
- Wider adoption among retail and semi-professional investors

AI is anticipated to play a dominant role in shaping intelligent, adaptive, and autonomous financial markets.

9. Conclusion

Artificial Intelligence has revolutionized stock market trading by introducing automation, predictive intelligence, and data-centric decision-making [1][2]. Although challenges such as data dependency, transparency, and regulation remain, continuous advancements in AI technologies and supportive regulatory frameworks are likely to enhance adoption and reliability. A comprehensive understanding of AI tools and their applications is essential for traders, investors, and researchers in the evolving field of financial technology.

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A Study on Awareness and Adoption of UPI as a Digital Payment System

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Abstract

The rapid growth of digital payment has transformed the way financial transactions are carried out in India, with the Unified Payments Interface (UPI) emerging as one of the most widely used payment systems. This study aims to examine the level of awareness and usage adoption of UPI as a digital payment system among consumers. The research focuses on understanding users' behavior of UPI services, frequency of usage, and factors influencing its adoption, such as ease of use, security and convenience. The study concludes, increasing awareness, improving system reliability, and strengthening security measures can further enhance adoption of UPI and support the growth of a cashless economy.

Keywords: UPI, Digital Payment System, Usage adoption etc.

The development of digital technology has significantly changed the way financial transactions are carried out. Digital payment methods have become more significant in recent years due to their speed, ease of use, and convenience. The Unified Payments Interface (UPI), which allows for instantaneous money transfers between bank accounts via mobile devices, has become a significant innovation among India's many digital payment options. UPI is a preferred method of payment for both individuals and organizations since it enables users to make payments from anywhere at any time.

The growing use of smartphones, better internet access, and government programs encouraging a cashless economy have all contributed to the widespread acceptance of UPI. It provides multiple benefits such as minimum transaction costs, user friendly user interface, and improved security mechanism etc. As a result, it has been widely accepted for various purposes, including bill payment, fund transfers, and online services.

However, the level of awareness and usage adoption of UPI varies among user due to factors such as education, age, income and digital literacy. Although many users actively use UPI for everyday financial transactions, some users remain hesitant to adopt the system completely. This hesitation is mainly due to concerns related to security, fear of fraud, frequent transaction failures, and a lack of technical knowledge. Therefore, understanding customer awareness levels and usage behavior is essential to understand the key challenges and potential opportunities for improving UPI adoption and promoting the wider use of digital payment system. The study focuses on understanding the awareness and usage adoption of UPI as a digital payment system.

Objectives:

1. To understand usage of UPI in digital payment.
2. To identify the key factors influencing the adoption of UPI.
3. To understand basic challenges faced in UPI digital payments.

Research Methodology:

This study is based on secondary data. Various articles, magazines, books, research papers, newspaper articles and websites have been used to collect information.

Usage of UPI:

1. **Money Transfer:** With simply a mobile number, UPI ID, or QR code, users of UPI can instantaneously send money to friends, relatives, or acquaintances. Compared to conventional bank transfers, sending money is now quicker and easier.
2. **Online Shopping Payments:** Payments on e-commerce platforms are frequently made via UPI. Customers may swiftly pay for goods and services without inputting credit card information, speeding up transactions and enhancing security.
3. **Bill Payments:** Utility bills, including those for gas, electricity, water, and cell recharge, can be paid immediately through UPI apps. Bill payments can be made hassle-free by automating recurring payments.
4. **Payments to Merchants:** UPI payments are accepted at a lot of physical retailers, shops, and eateries. At the merchant's location, customers can rapidly finish the payment by scanning a QR code, eliminating need for cash.

5. **Payments for subscriptions and Services:** Subscriptions for services like OTT platforms, newspapers, or insurance premiums can be paid with UPI. Additionally, users can use UPI mandates to set up regular payments.
6. **Financial Services:** For simple money management, users can link several bank accounts to a single UPI ID, check account balances, and get mini-statements via UPI.

Key Factors Influencing UPI Adoption:

7. **Convenience:** Convenience is one of the most important factors driving UPI adoption. Instead of carrying cash or going to a bank, users can use their mobile devices to rapidly transfer money, pay bills, or shop online. Users in both urban and rural areas find UPI services very appealing due to their round-the-clock accessibility, which lessens reliance on conventional banking techniques.
8. **Ease of Use:** Adoption is greatly influenced by UPI application's ease of use and simplicity. User friendly interface, simple registration process, bio-matrices authentication and simple transaction steps make it easier for people of all age groups to use UPI.
9. **Security and Trust:** User's adoption of UPI is heavily influenced by security concerns. User trust is increased by elements including secure login procedures, two-factor authentication, fraud prevention, and transaction encryption. Today most of users trust on UPI and used frequently for everyday transactions.
10. **Transaction Speed:** The ability to make payments quickly is an important factor in using UPI. UPI allows instant money transfers and removing the delays. Transactions that are quick and easy enhance the user experience and encourage more frequent usage of UPI.
11. **Offers and Rewards:** Users are encouraged to utilize the system by promotional incentives offered by banks or UPI-enabled apps, such as cash back, discounts, and reward points. In particular, younger users are more receptive to digital incentives, thus these financial advantages not only promote initial adoption but also recurring usage.
12. **Smartphone and Internet Accessibility:** Users can conduct transactions at any time and from any location without need to go to a bank or carry cash if they have a smartphone. Better digital infrastructure enables users to pay bills online, send money to friends and family, and finish payments fast, improving the efficiency of their financial operations.

Challenges of UPI Adoption:

13. **Lack of Awareness:** Many users are unaware of UPI's features, particularly those who live in rural areas. Potential users may be discouraged from using the system if they don't understand how to register, connect bank accounts, or complete transactions.
14. **Security Issues:** One of the main reasons some consumers are reluctant to utilize UPI is their fear of fraud, hacking, or unauthorized transactions.
15. **Transactions Failure:** Users may become irritated by technical problems like payment failures, server downtime, or slow processing at busy times. People may become discouraged from using UPI for crucial payments if transaction problems occur frequently.
16. **Limited Digital Literacy:** Not every user feels at ease using mobile apps or smartphones. UPI apps may be challenging for users with limited technical skills to use, especially among older or less tech-savvy people.
17. **Dependence on Internet and Smartphones:** People without access to a smartphone and a reliable internet connection are unable to use UPI transactions. Poor network coverage in rural areas further limits usage.

Basic Findings:

18. **High Awareness of UPI:** People of all ages and educational backgrounds now identify UPI as a quick and easy digital payment method. In urban and younger groups, awareness is very strong.
19. **Regular Usage:** UPI is becoming a crucial component of regular financial activity, as seen by its growing usage for everyday financial transactions like bill payment, money transfers, and online shopping.
20. **Ease and Convenience:** Compared to more conventional payment methods like cash or checks, UPI applications are preferred due to their ease of use and capacity for instantaneous transactions.
21. **Security Considerations:** Although UPI provides safe transaction protocols, some users are nevertheless wary about using it due to worries about fraud, hacking, or transaction failures.
22. **Influencing Factors:** User-friendly interfaces, rapid payment capabilities, internet and smartphone access, and promotional incentives like cash back or discounts are some of the factors that encourage adoption.

23. **Challenges in Adoption:** Particularly in semi-urban and rural areas, low digital literacy, sporadic technical difficulties, network problems, and ignorance of UPI features remain obstacles to widespread implementation.
24. **User Satisfaction:** Overall, UPI provides a satisfying experience due to its speed, accessibility, and versatility, supporting the shift towards a cashless economy.
25. **Possibilities for Improvement:** UPI acceptance and confidence can be further increased by strengthening security, enhancing system dependability and growing awareness campaigns etc.

Conclusions:

UPI's simplicity of use, speed, and convenience have made it a significant and popular digital payment system. Younger and better educated consumers are more aware of and utilize UPI, but obstacles including low digital literacy, security worries, and sporadic technical problems still prevent it from reaching its full potential. Peer-to-peer transfers, bill payments, online shopping, and merchant transactions have all found success with UPI, which speeds up and improves accessibility to financial activities. Stronger security measures, better awareness campaigns, and increased system stability are all necessary to boost adoption. All things considered, UPI contributes significantly to the promotion of cashless transactions and is probably going to keep expanding as more people learn about digital payments.

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Awareness of Central Bank Digital Currency (CBDC) in India: A review study

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Abstract

The fast growth of payment systems has made the banks worldwide look at Central Bank Digital Currency (CBDC) as a safe digital option instead of cash. In India the Reserve Bank of India (RBI) has started pilot projects, for the Digital Rupee. That marks a milestone in the country's innovation. We want to see the level of awareness the level of understanding and the level of opinion of CBDC among the groups, in India. The groups include consumers, students, businesses and financial institutions. I see that the study looks at papers, reports and surveys to find the things that affect CBDC awareness. It lists literacy, trust, in the banking system, cybersecurity concerns and ease of use as the things. I notice that the findings show that people in India know a lot about payment platforms. I also notice that people in India do not know much about CBDC.

People, in India do not know about CBDC features, CBDC benefits or CBDC implications. I read the review. The review points out challenges, like privacy concerns, technological barriers and the need, for public communication strategies. I read the study. The study ends by stressing the importance of education, policy transparency and targeted awareness programs to make the CBDC adoption succeed in India. The review adds to what we know by pulling research and giving ideas for policymakers, researchers and financial regulators.

Key words: Central Bank Digital Currency (CBDC), digital rupee, reserve bank of India (RBI), Digital payment systems.

Introduction

The increasing use of digital means for payments has resulted in a paradigm shift in the global financial system, with a consequent decline in the usage of physical money. In a bid to adapt to this new reality, central banks around the world have established the Central Bank Digital Currency (CBDC), a safe mode of digital money for the traditional kind. In India, the Reserve Bank of India has launched a pilot for the 'Digital Rupee.

Though the adoption of digital payment systems in India is high, the level of awareness about CBDC is very low. The key participants who can contribute to the success of adopting CBDC include consumers, students, businesses, and financial institutions. It is essential to evaluate their knowledge and perception regarding the same.

This review paper scrutinizes existing researches and surveys to understand factors that can impact awareness related to CBDC in India. It ranges from financial literacy to awareness related to banking systems and issues of cybersecurity along with ease of use. The review paper has also touched upon difficulties in adopting CBDC in India that include privacy concerns, technical difficulties, and requirements for proper awareness among people by governmental and related organizational communications.

Objective:

1. To examine literature regarding awareness of CBDC among the general public.
2. To Identifying challenges in spreading CBDC's awareness.
3. To Identify steps that can be taken to enhance public awareness of Central Bank Digital Currency (CBDC).

Problem Statement:

Although digital payment methods have increased in popularity in India, there seems to be limited awareness regarding the CBDC launched by the Reserve Bank of India. Citizens of the country mix CBDC with cryptocurrency or UPI, whereas lack of awareness in finance, trust, and cyber security acts as an impediment to promote CBDC in India. Therefore, it becomes an imperative to understand levels of awareness and develop strategies to enhance awareness of CBDC in India.

Literature Review:

According to Kumar and Gupta (2019), the awareness about Central Bank Digital Currency in the general public in developing countries, including India, remains in the embryonic stage. The authors underscore the fact that the lack of familiarity with central bank measures, as well as low financial literacy, has been the prime cause of low awareness in the general public.

According to BIS (Bank for International Settlements) (2020), most citizens in various countries often confuse CBDC with cryptocurrencies because of their digital nature. The author highlights that lack of proper information from central banks leads to misunderstandings about the purpose, characteristics, and security of CBDCs.

Sarmah & Kaur (2021): The results reveal that the awareness level regarding the Digital Rupee is higher among urban and educated groups, and rural and semi-urban regions have lower awareness levels, which are found to be significantly lower. The authors have clarified that digital divide, along with technology limitations, are hurdles to spreading information regarding CBDC.

RBI, 2022, op. cit., mentions that even though pilot projects of the Digital Rupee have been launched, the knowledge among the public regarding its usage, advantages, and distinction from UPI and cryptocurrencies is extremely insufficient. The report calls for structured awareness programs and financial education campaigns.

Chakraborty et al. (2023) maintain that trust and cyber security concerns are the most influencing factors in shaping public perception of CBDCs. According to them, well-articulated policies, awareness drives, and a clear regulatory framework lead to higher public acceptance and adoption of CBDCs in India

Research Methodology

Research Design

In this research, descriptive and exploratory research design approach is conducted by systematic reviewing of the secondary data. Here, the research aims to analyze the prior literature to know to what extent there is awareness of Central Bank Digital Currency (CBDC) in India; what are the difficulties; and what are the strategies provided for enhancing such awareness.

Sources of Data

All the secondary data has been collected from authentic and reliable sources exclusively. The secondary data collection sources are as follows:

- RBI reports and publications
Bank for International Settlements reports
Research papers published in national and international journals
- Articles from reputed financial and economic websites
- Books and working papers dealing with digital currency and digital payments

Period of Study

The literature reviewed primarily covers the period from **2018 to 2024**, as this timeframe captures the emergence, pilot implementation, and growing discussion of CBDC in India.

Method of Data Analysis

Collected secondary data is analyzed using qualitative content analysis. Themes such as public awareness, misconceptions on CBDC, comparison with UPI and cryptocurrencies, challenges to awareness, and suggested awareness measures are identified and discussed in this paper systematically.

Scope of the Study

The study is limited to reviewing literature related to **awareness of CBDC among the general public in India**. It does not include empirical primary data such as surveys or interviews.

Limitations of the Study

- The analysis is purely dependent on secondary data and might include the views of authors rather than current public opinion.
- Lack of empirical research in India for awareness about CBDCs because the Digital Rupee has just been launched in India.

Discussion

These findings are in line with the review of existing literature that indicates that though there has been phenomenal growth in the Digital payment systems in the form of UPI, wallets, online banking, etc., as discussed above, awareness about CBDC is at a low level. Various research studies reviewed also revealed almost unanimous results that digital payment systems are widely known to the citizens, but as far as the concept, objective, and mechanism of the Digital Rupee is concerned, people have very little idea.

Several authors have pointed out that the confusion between CBDC and cryptocurrencies is one of the major reasons for low awareness. According to BIS (2020) and RBI (2022), the 'digital' nature of CBDC makes many people

incorrectly relate it to 'volatile' and 'unregulated' cryptocurrencies, thereby affecting trust and acceptance. Sarmah and Kaur (2021) further detail an urban–rural divide in the level of awareness and suggest a significant role for technological access and education.

Awareness of trust and cybersecurity issues is another important consideration. As per the views of Chakraborty et al. (2023), fear of cyber threats and data privacy acts as a hindrance for people to learn and accept CBDC. Also, it has been found that a lack of effective communication strategies from the governing body results in the delayed spread of information for CBDC.

Results and Findings

From the secondary data review, the following are the major findings:

1. **Often Lack of Awareness:** Despite the popularity of digital payment systems, awareness of CBDC remains low among the general population of India.
2. **Misconceptions:** Many people misunderstand CBDC in terms of cryptocurrencies or it being some new payment system, like UPI.
3. **Role of Financial Literacy:** A lack of financial literacy has been identified to have a great impact on knowledge levels regarding features, benefits, and implications of
4. **Digital Awareness :** levels are greater among the urban, educated, and technology-conscious community as compared to rural and semi-urban society.
5. **Trust and Cybersecurity:** Cyber fraud fear, data privacy concerns, and a lack of faith in a new system form a barrier for becoming aware.
6. **Need for Awareness Programs:** It has been evident from the available literature that awareness programs, clear policies, and education are necessary to enhance public knowledge regarding CBDC.

Conclusion

From the review study, it was concluded that though India has achieved considerable success in digital payment systems, the basic knowledge regarding CBDC among the general public is still poor. The general misconceptions, lack of financial literacy, problems of trusting the system, and issues of cybersecurity came out as the main hindrances to proper awareness and successful adoption of the Digital Rupee.

This study hence identifies the need for targeted awareness programs, clear communication strategies, and financial education programs that would be needed for the adaptation to CBDC, led by the Reserve Bank of India along with other stakeholders. Solutions to the challenges in this path represent the foundation for securing public trust and ensuring successful CBDC adoption in India. The review adds to the literature by synthesizing key lessons that provide useful implications for policymakers, researchers, and financial regulators.

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“Paperless Support: The rise Digital User Manuals”

Kalyani Pravinsing Girase, Nikhil Nandu Khairnar

ABSTRACT

What is Paper User Manual? Despite rapid technological advancement, most electronic devices still rely on traditional paper user manuals. These manuals consume large quantities of paper, increase production and distribution costs, and contribute directly to environmental degradation. In practice, paper manuals are rarely read completely, often misplaced, and quickly discarded, making them an inefficient method of user guidance. Additionally, once printed, the information becomes fixed and outdated, even when devices receive updates, new features, or design changes. This creates confusion for users and increases dependency on external customer support.

This paper proposes a fully digital, built-in user support system as a complete replacement for paper user manuals. The proposed solution delivers device-specific instructions directly through the product interface or a connected digital platform such as a mobile application or embedded system. Instead of static text, users receive clear, step-by-step guidance that can include visuals, animations, search functions, and interactive troubleshooting. This approach improves user understanding, reduces setup errors, and shortens the learning curve for operating electronic devices.

One of the biggest advantages afforded by the digital system is that the user manuals can be updated in real-time. This means that any company can instantly change user manuals by updating features, improving safety, or adding new features, all without the need for physical reprints. This cuts costs in the long run and also ensures that consumers have the most accurate information possible. More specifically, paper consumption has been dramatically reduced by foregoing paper/manual user manuals.

In sum, a system of self-service support available in a digital, in-device form provides a brighter, cleaner, and more efficient alternative to the current method of physical, distributed instruction guides. It increases the consumer experience, decreases operating expenses, improves environmentally associated costs, and corresponds to the needs of a clean and clean technology lifestyle.

INTRODUCTION

The shift in the usage of physical documents and going digital has ushered in a paradigm shift in the way that manufacturers keep consumers informed. With the world finding itself amidst the worsening climate change crisis, one sector of the industry that has been traditionally resource-intensive, namely the digital sector, has found itself pushed towards embracing the cause for a circular economy. This paper will shed light upon the various ramifications that could be triggered while going digital in user manuals.

Environmental and Economic Forces

Firstly, the major driver that triggers the transition towards a different culture is the need for taking care of the environment. Paper manuals require a substantial number of trees, water resources, and energy in the production chain.

OBJECTIVE

- To calculate the reduction in greenhouse gas emissions due to the stoppage of paper production and transportation of manuals.
- To assess the reduction of solid wastes produced by determining the number of user manuals that are commonly discarded by consumers shortly after they acquire them.
- Analyze the “hidden” environmental expense associated with digital hosting, comparing the energy use associated with data centers to the reduction in energy use resulting from paper production.

Improving the User Experience

Furthermore, this development also ties in with the current digitization of everyday life. Today’s consumer is increasingly a “digital native,” who weighs the advantages of searchable, high-quality content against static, detailed pamphlets. Digital tools also hold revolutionary potential in enhancing accessibility and understandability in the following ways:

Interactive Troubleshooting: Video tutorials and 3D animations that walk consumers step by step through difficult installations.

Localization: Direct translation service for translation into dozens of languages.

Searchability: Keyword indexing which enables users to search for particular solutions within seconds.

Nevertheless, this process has its own set of difficulties. This paper will also look into what is known as the "digital divide," and how it affects or rather, might affect certain users who lack continuous connectivity or technical knowledge. Thus, it aims to find out how car manufacturers can make their innovations meet their requirements for a more sustainable future.

- To assess the value of customer support volume, evaluating if fewer calls to help desks for "basic" troubleshooting are generated by interactive guides.
- To test the importance of virtual manuals in contributing towards consumer perception of a brand by examining whether the consumer perceives it as a 'green' initiative or a cost-cutting plan.

Legal & Safety Objectives

- To assess compliance concerning the provision of warnings regarding physical safety across various international jurisdictions.
- The availability and reliability of digital documentation when devices fail, to explore whether a user, in their attempt to fix a device, would need that device to access documentation on how to fix it.

PROBLEM STATEMENT

Despite the huge pace of digitization of the consumer electronics industry, the common trend of delivering thick, multi-language paper manuals is still the lingering effect of the 20th-century production era. This trend leads to a huge disconnect between technological innovation and the delivery of documentation. With the rise of complex, interconnected, and software-based gadgets, the need for paper manuals is increasingly unable to cope with the modern consumer environment, which leads to a number of serious systemic flaws.

1. Environmental Impact and Resource Management

The first that comes to mind is the ecologic cost. The electronics industry is one of the biggest users of material in the world today, not just in terms of material usage but also in that it is necessary that it has to include these printed manuals that take enormous amounts of wood products and water and energy in its production. These manuals also make up a large percentage of the solid waste found in landfills. It has been found that a significant number of people just toss them after purchasing the product and placing them in boxes where they are never read but simply find their ways to landfills without being read.

2. The Crisis of Static Information

"Finished" products today no longer emerge from a manufacturing facility as completed products. For instance, by "over the air" (OTA) updates, manufacturers continue to change the interface, implement new features, or "fix" security holes in the product after purchase. This establishes a "technical obsolescence gap" in that, as a physical guide, the manual becomes a relational, static object. When a software upgrade is applied to any device, for instance, the physical user guide becomes automatically "wrong" or "incomplete." This has severe user frustration as, for instance, a user might refer to a button or option that ceased to exist, requiring them to look for assistance in third party user communities or company call centers, hence boosting "hidden" costs in customer service.

3. Accessibility and User Experience Gap

Traditional manual-based information is fraught with "fine print" and poor organization because there is a requirement to fit more than one language onto one document to be cost-effective. The disadvantage is therefore a barrier to understanding. The advantage of digital documentation would be to address these issues using interactivity pertaining to 3D animations, indexes, and localized video lessons. Although this is about more than just transferring information from paper to screen, this is about "The Digital Divide." A complete shift to digital might end up marginalizing particular groups such as seniors and people with particular visual impairments who would need "tactile feedback," and people living in areas where internet connectivity is questionable at best. There is as yet no current method to ensure that "green" is not "exclusive."

4. Economic Inefficiency in Manufacturing

From an industrial viewpoint, physical manuals introduce what can best be described as rigidity in the value chain. Printers must be arranged and booklets must be delivered to assembly plants. If there is an error in one of these printed manuals, it poses a situation for the manufacturer where it must choose between an expensive product recall or shipping out products with known errors. Digital documentation provides an agile solution where corrections can be made

instantly, but many businesses are afraid to move in this new direction because there is no empirical data available on the level of consumer acceptance and regulatory compliance in various international jurisdictions.

Therefore, the underlying issue is the lack of an overarching strategy that takes into account the need for environmental sustainability, data accuracy, and general accessibility. This research aims to address the imperative need to recognize the challenges and solutions by which producers can move towards digital-based documentation without negatively impacting the user experience and the group of non-digitally-native products.

LITERATURE REVIEW

Previous literature regarding user documentation has repeatedly emphasized the inefficiencies associated with the use of paper user manuals in the consumer electronics industry. Despite technological advancements in the product itself, strategies in user documentation have remained relatively unchanged, indicating a kind of legacy thinking in manufacturing culture but not in modern usage practices. Previous studies have pointed out that paper user manuals use a substantial amount of natural resources such as wood, water, and energy, which all lead to a significant increase in post-consumer waste since paper user manuals get discarded or tossed without even opening them after purchase.

Academics alike also point out the increasing gap between the static nature of print-based users' manuals and the dynamic nature associated with software-driven products. With the increasing rate of over-the-air updates being adopted across different product models, product features and interfaces change dynamically after a product is purchased, thus increasing the rate at which print-based users' manuals become obsolete and misleading to users. Literature depicts that the "information obsolescence gap" is one of the primary causes of increased user frustration, setup errors, and a dependence on customer service support resources, thus forcing manufacturers to spend on hidden operating costs related to poor customer satisfaction

Also emphasized are the compatibility issues involved between static printed manuals and ever-changing software products. With products being frequently updated over the air, one of the challenges involved is that the product information and related interfaces are everchanging after the purchase of such products. This has been recognized by literature as one of the significant factors causing setup-related

To this end, new studies recommend the use of digital user manuals integrated into products or available via associated platforms like smartphones through applications. It is evident that digital manual documentation increases the convenience of use by virtue of interactive capabilities, searching, localization, and animation and video demonstrations associated with multimedia technology.

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DATA ANALYSIS

INCURRED ON PER PAPER MANUAL IN INDIA (2024-25)

COST

One Year Data for Calculating Per Paper Manual Cost in India				
Device Category	Typical Manual Spec	Print & Bind Cost (INR)	Logistics Penalty (INR)	Total Cost / Unit (INR)
Smartphone	A6 Booklet, 40 Pages, B/W	₹3.50 - ₹5.00	₹ 0.50	₹4.00 - ₹5.50
TWS Earbuds	Folded Leaflet (1 Sheet)	₹1.00 - ₹1.50	₹ 0.10	₹1.10 - ₹1.60
Laptop	A5 Booklet, 30 Pages + Warranty	₹8.00 - ₹12.00	₹ 2.00	₹10.00 - ₹14.00
Smart TV (55")	A4 Folded or A5, 60+ Pages	₹15.00 - ₹25.00	₹ 5.00	₹20.00 - ₹30.00
Washing Machine	A4 Booklet, 40-60 Pages	₹12.00 - ₹18.00	₹ 4.00	₹16.00 - ₹22.00
Refrigerator	A5 Booklet, 50 Pages	₹10.00 - ₹15.00	₹ 3.00	₹13.00 - ₹18.00
Home Audio/Speakers	A5 Booklet, 20 Pages	₹5.00 - ₹7.00	₹ 1.50	₹6.50 - ₹8.50

TOTAL COST INCURRED FOR MAKING USER MANUALS IN INDIA (2024-25) REFERENCE –
<https://my.idc.com/getdoc.jsp?containerId=prAP53185725>

1 Year Data for Making Paper User Manual in India				
(Data derived from 2024 Global Market Shipment Reports)				
Device Category	Annual Unit Sales (India 2024)	Avg. Manual Weight	Total Paper Waste (Tons)	Est. Cost (Paper + Print)
Mobile Phones (Smart + Feature)	~205 Million	30 g	6,150 Tons	₹246 Crore
Televisions	~14 Million	150 g	2,100 Tons	₹84 Crore
Refrigerators	~18 Million	100 g	1,800 Tons	₹72 Crore
Washing Machines	~9 Million	100 g	900 Tons	₹36 Crore
Air Conditioners	~14 Million	80 g	1,120 Tons	₹45 Crore
Laptops/PCs	~14.5 Million	50 g	725 Tons	₹29 Crore
TOTAL	~274.5 Million		~12,795 Tons	~₹512 Crore

REFERENCE – <https://my.idc.com/getdoc.jsp?containerId=prAP53185725>

TOTAL COST INCURRED FOR MAKING USER MANUAL GLOBALLY (2024-25)

1 Year Data for Making Paper User Manual In Globally				
(Data derived from 2024 Global Market Shipment Reports)				
Device Category	Global Unit Sales (2024)	Manual Type	Total Paper Waste (Tons)	Est. Global Cost (INR)
Smartphones	~1.22 Billion	Thin (30g)	36,600 Tons	₹1,525 Crore
Computers (PCs/Laptops)	~245 Million	Medium (50g)	12,250 Tons	₹612 Crore
Televisions	~230 Million	Thick (150g)	34,500 Tons	₹1,150 Crore
Wearables (Watches/Bands)	~537 Million	Tiny (15g)	8,055 Tons	₹268 Crore
Major Appliances (AC/Fridge/Wash)	~500 Million	Thick (100g)	50,000 Tons	₹2,500 Crore
Small Appliances (Toasters/Irons)	~600 Million	Medium (40g)	24,000 Tons	₹720 Crore
Other Electronics (Cameras/Printers)	~400 Million	Varies (80g)	32,000 Tons	₹1,000 Crore
TOTAL	~3.7 Billion Devices		~197,405 Tons*	~₹7,775 Crore

FINDINGS

The purpose of this survey is to understand **users' preferences, habits, and challenges related to physical versus digital user manuals** when using electronic products. It aims to collect data on:

- How often people use or ignore physical manuals
- Whether users find printed manuals difficult to access or navigate
- Awareness of environmental impact caused by paper manuals
- Willingness to shift toward digital options (QR codes, PDFs, apps)
- Concerns users may have about adopting digital user manuals

Overall, the survey helps evaluate **public acceptance of replacing printed manuals with digital alternatives** and identify factors that influence the transition toward paperless support.

Questionnaire

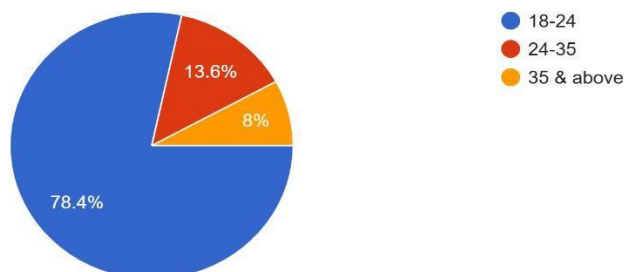
- Which age group do you belong to?
 - 18-24
 - 24-35
 - 35 & above
- When you buy a new electronic product, what do you typically do with the physical user manual?
 - Read it thoroughly immediately.

- b. Keep it in the box and never look at it.
 - c. Throw it away immediately.
 - d. Throw it away immediately.
3. When setting up a new product, which type of manual do you typically try to use first?
- a. The Physical (paper) manual
 - b. The Digital manual (PDF, QR code link, website)
 - c. I look for a Video Tutorial
 - d. I just figure it out without a manual
4. In the last year, how many times have you successfully found a paper manual when you needed to troubleshoot a product?
- a. Everytime
 - b. Sometimes
 - c. Never/I couldn't find it
5. How difficult is it to find specific information (e.g., error codes or specific settings) in a printed booklet?
- a. Very easy
 - b. Moderate
 - c. Difficult
6. Are you aware that the production of physical manuals contributes to significant deforestation and carbon emissions (approx. 1 billion manuals produced annually)?
- a. YES
 - b. NO
7. Would you support a company removing paper manuals if it meant reducing their environmental footprint?
- a. Yes, definitely.
 - b. Maybe, if the digital alternative is good.
 - c. No, I prefer paper regardless of the impact.
8. If a product box came with a "Scan for Smart Guide" QR code instead of a booklet, how likely are you to scan it?
- a. Very Likely
 - b. Somewhat Likely
 - c. Unlikely
9. What is your biggest concern about switching to fully digital manuals?
- a. I might not have internet access when I need it.
 - b. I dislike reading on a small phone screen.
 - c. Navigating a website is more confusing than a book.
 - d. I have no concerns; I prefer digital.
10. Do you agree with the statement: "Physical user manuals are becoming obsolete and should be replaced by digital versions."
- a. Agree
 - b. Neutral
 - c. Disagree

Major Finding (based on Survey)

1. Which age group do you belong to?

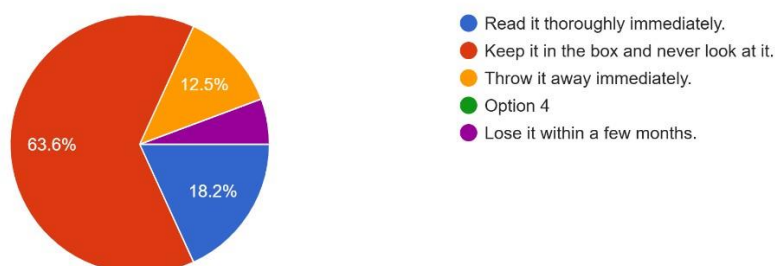
1. Which age group do you belong to?
88 responses



- **Data** - 78.4% of respondents are in the **18–24** age group.
- **Finding** - The survey sample is overwhelmingly **young and digitally native**, which is critical for assessing digital adoption.

2. When you buy a new electronic product, what do you typically do with the physical user manual?

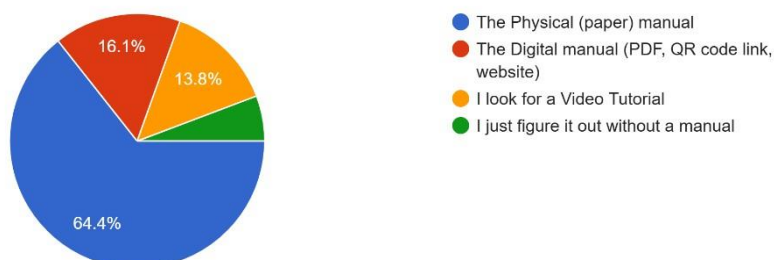
2. When you buy a new electronic product, what do you typically do with the physical user manual?
88 responses



- **Data** - 63.6% of respondents "**Keep it in the box and never look at it.**"
- **Finding** - A large majority of users do not engage with the physical manual after purchase, indicating their low long-term utility.

3. When setting up a new product, which type of manual do you typically try to use first?

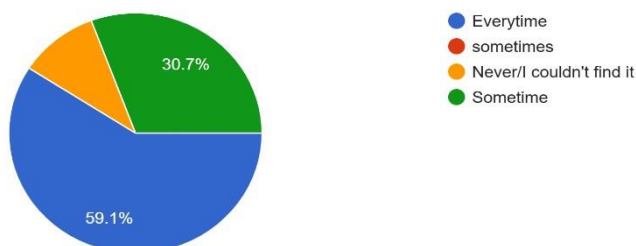
3. When setting up a new product, which type of manual do you typically try to use first?
87 responses



- **Data** - 64.4% try the **Physical (paper) manual** first. However, 16.1% try the **Digital manual** first, and 13.8% look for a **Video Tutorial**.
 - **Finding** - While paper is still the default for initial setup, digital options are already a significant factor.
4. **40.9%** (10.2% "Never/I couldn't find it" + 30.7% "Sometime") of respondents **do not find the paper manual every time** they need to troubleshoot.

4. In the last year, how many times have you successfully found a paper manual when you needed to troubleshoot a product?

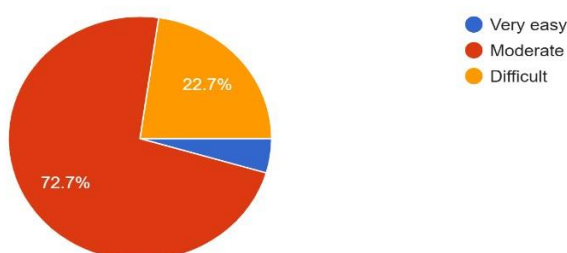
88 responses



- **Data** - **40.9%** (10.2% "Never/I couldn't find it" + 30.7% "Sometime") of respondents **do not find the paper manual every time** they need to troubleshoot.
 - **Finding** - A significant number of users **cannot reliably find** the paper manual when needed for troubleshooting.
5. How difficult is it to find specific information (e.g., error codes or specific settings) in a printed booklet?

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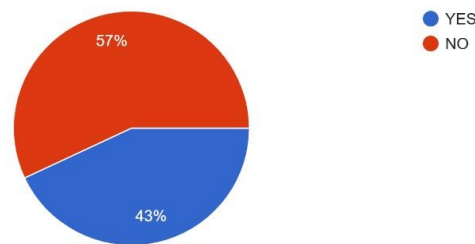
88 responses



- **Data** - A combined 95.4% of respondents find it Moderate (72.7%) or Difficult (22.7%) to find specific information (e.g., error codes) in a printed booklet.
 - **Finding** - Paper manuals are considered overwhelmingly inefficient for searching specific details.
6. Are you aware that the production of physical manuals contributes to significant deforestation and carbon emissions (approx. 1 billion manuals produced annually)?

6. Are you aware that the production of physical manuals contributes to significant deforestation and carbon emissions (approx. 1 billion manuals produced annually)?

86 responses



- **Data** - 57% of respondents were NOT aware of the significant deforestation and carbon emissions caused by manual production.
- **Finding** - Although support is high, the underlying awareness of the problem is low, indicating a need for better environmental messaging.

7. Would you support a company removing paper manuals if it meant reducing their environmental footprint?

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88 responses

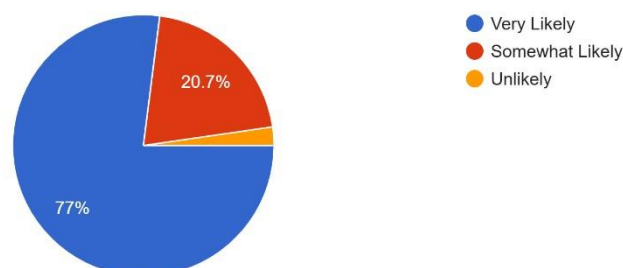


- **Data** - A combined 96.6% of respondents would support a company removing paper manuals to reduce their environmental footprint.
- **Finding** - Environmental benefit is a major motivator, providing strong justification for the switch.

8. If a product box came with a "Scan for Smart Guide" QR code instead of a booklet, how likely are you to scan it?

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87 responses

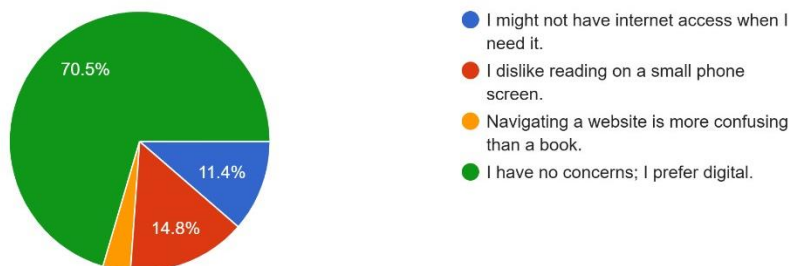


- **Data** - A combined 97.7% are Very Likely (77%) or Somewhat Likely (20.7%) to scan a "Scan for Smart Guide" QR code instead of receiving a booklet.
- **Finding** - Users are highly willing to adopt a QR code-based digital solution immediately.

What is your biggest concern about switching to fully digital manuals?

9. What is your biggest concern about switching to fully digital manuals?

88 responses

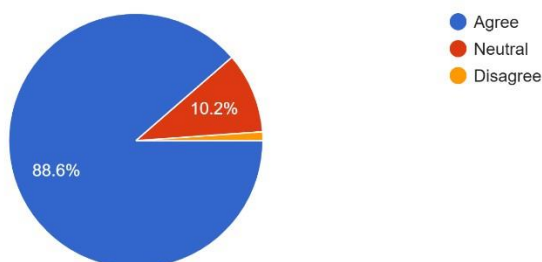


- **Data** - 70.5% of respondents stated, "I have no concerns; I prefer digital." The primary concerns were "dislike reading on a small phone screen" (14.8%) and "might not have internet access" (11.4%).
- **Finding** - The vast majority of the audience has no significant reservation about going fully digital.

9. Do you agree with the statement: "Physical user manuals are becoming obsolete and should be replaced by digital versions."

10. Do you agree with the statement: "Physical user manuals are becoming obsolete and should be replaced by digital versions."

88 responses



- **Data** - An overwhelming 88.6% Agree that "Physical user manuals are becoming obsolete and should be replaced by digital versions." Only 1.2% Disagree.
- **Finding** - There is near-unanimous agreement that the digital transition is necessary.

CONCLUSION

The survey clearly confirms that the target market for electronic products, consisting of young, tech-savvy individuals, is ready and eager for a complete conversion towards digital user manuals.

The data gathered from questions 5 and 4 show that paper manuals are not an effective troubleshooting tool, while data from questions 8, 9, and 10 reveal an overwhelming desire to have and use a paperless solution using QR codes.

The result reflects greatly positive user experience and vindicates Feasibility of 'Paperless Support' project.

REFERENCE

1. Graph of 3 Data of Making Paper User Manual • 24 MILLION PAGES ANNUALLY AND SMARTPHONE MAKERS PRINTING MULTILINGUAL GUIDES FOR LOW-INTERNET REGIONS.
[texthttps://pmarketresearch.com/chemi/instruction-manual-paper-market](https://pmarketresearch.com/chemi/instruction-manual-paper-market)
2. TOTAL COST INCURRED FOR MAKING USER MANUALS IN INDIA (2024-25)
<https://my.idc.com/getdoc.jsp?containerId=prAP53185725>

Reimagining Manifestation: A Novel AR Framework for Boosting Confidence and Consistency

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Abstract:

Manifestation is the practice of desiring something and achieving it through focused intention, thoughts, belief and most important action. It is a new-age growing area of self-development rooted to positive psychology and law of attraction accompanied with law of action. A significant challenge for many individuals is the common issues of self-doubt, consistency, vivid visualization of the future goals. This often co-relates with underlying low self-esteem creating a psychological barrier that prevents the realization of personal potential. Everyone who sets life goals can be achieved if he/she has self-awareness.

A researcher proposes a novel solution using Augmented Reality (AR) technology to overcome this psychological problem statement. The AR system helps by projecting personalized, interactive 3D representation of person's manifestation directly into their real-world environment on their fingertips. These dynamic visualizations are reminder of the desired outcome. E.g. energetic avatar of self, etc.

The benefit of this approach is its ability to bypass the mental effort and inconsistency of internal visualization. By providing persistent, reality blend visuals, AR directly challenge self-doubt and offer immediate positive feedback. This technology integration strengthens the user's self-development effectively turning an abstract concept into an undeniable, ground reality, thereby simplifying and enhancing manifestation process for personal growth.

Keywords: - Manifestation, Augmented Reality (AR), Self-development, Self-Awareness, Framework, Image to Interaction

Introduction:

Manifestation is defined as the practice of transforming specific desires into physical reality. This process involves intense focus, thought visualization, and subsequent actions intended to blend mental constructs with physical surroundings.

Augmented Reality is an interactive technology that superimposes a computer-generated image into a user's view of the real world. Unlike pure digital environments, AR settles with hands on devices to provide a blended experience, making it a uniquely powerful tool for visualizing personal growth in real-time.

This research paper presents a conceptual framework that integrates Augmented Reality (AR) with psychological manifestation practices.

Research Problem:

The core challenge identified by this research is the Psychological Barrier created by self-doubt and inconsistent visualization.

- Psychological Fatigue: Maintaining a vivid image of future goals is quite demanding.
- Consistency Issues: Many individuals fail to manifest because they cannot maintain the necessary focus over long span of time.
- Low Self-Esteem: A lack of visual proof of progress often leads to a correlation with low self-esteem, further limiting potential.

Objective:

- To understand the impact of self-doubt and psychological barriers on an individual's ability to focus on and pursue future goals.
- To Study the role of consistent visualization in sustaining long-term motivation, focus, and goal-directed behaviour.
- To explore the link between visible progress and low self-esteem and how it can be solved using the technology.

- To suggest practical ways to help individuals stay mentally focused, motivated, and confident in their goal-setting process.

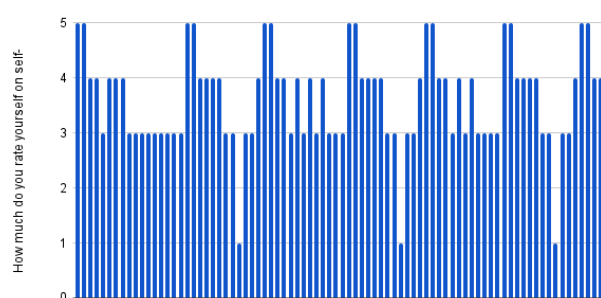
Research Methodology:

Descriptive Research approach was conducted to analyse the need for technological intervention in personal development.

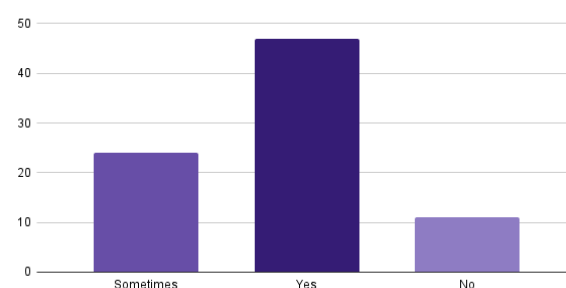
- Sample Size: 83 participants.
- Sampling Method: Random Sampling.
- Demographics: Students from various educational courses, individuals, institute students
- Primary Data: Gathered through questionnaires.
- Secondary Data: Sourced from research papers, journals, electronic media, and books.

The below charts provides the interpretation taken by set of questionnaires which concludes with the proceedings on the research.

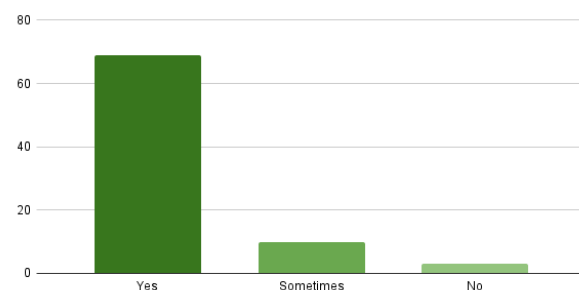
How much do you rate yourself on self-development presently?



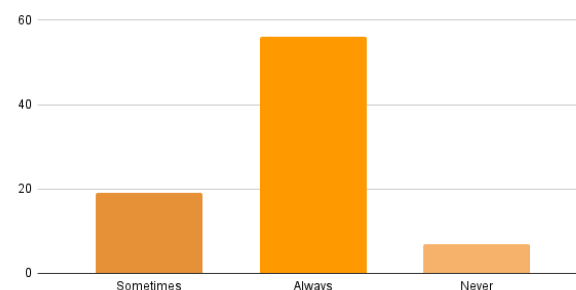
Do you always self doubt?



Do you practice visualizing future goals & success?



Do you manifest your future self/avatar?



Literature Review:

The concept of manifestation has long been explored within psychology, self-development literature, and belief studies, often emphasizing the power of visualization. Traditional manifestation practices are rooted in the idea that thoughts influence behaviour and, consequently, real world outcomes (Rhonda Byrne, 2006). While these practices have gained popularity, research suggests that they may place significant cognitive and emotional demands on individuals, particularly those experiencing self-doubt or low self-esteem. Maintaining consistent image over the time can be exhausting, which can often lead to less motivation and involvement.

People who frequently experience self-doubt often find difficult to maintain thoughts in imagined future outcomes, making pure visualization practices difficult to sustain. (Shermer M, 2002) explains beliefs that especially those related to personal achievements are strongly influenced by emotional states and biased opinions.

The relation between own perception and visuals has been examined extensive in digital and virtual environments. (Yee and Bailenson, 2007) work on the Proteus effect suggests that individuals tend to adapt their behaviour and attitude based on the characteristics of their digital own representations. Their research explains that viewing successful version of oneself can lead to positive changes.

Augmented Reality (AR) has emerged as a technology for enhancing human perception by binding digital content into the physical environment. Unlike virtual reality, which fully simulates virtual world, AR allows users to be connected to their real surroundings while interaction with digital elements (Om Gujarathi, 2024). AR's ability to bind digital elements within real environments makes it effective for learning, training, and behavioural reinforcement.

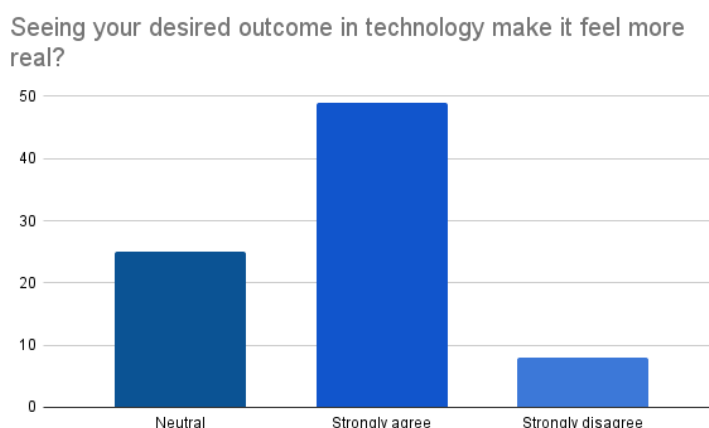
The research indicates that people are more likely to remain consistent in goal-oriented behaviour when they receive frequent feedback. AR can help in providing visual confirmation of progress or success, even at early stages.

Findings:

The analysis of the survey data reveals several outlines into the visual experience of the respondents. Most of participants report experiencing frequent self-doubt in their lives. This finding indicates that self-doubt is not an isolated or occasional concern but rather a recurring issue affecting many people at a time. Because many people feel this way, there is a clear need for the support that manages the confident, positive and motivated personality over time.

Furthermore, respondents reported significant difficulties in maintaining the consistency with traditional visualization practices, such as imagination or written affirmations. Many participants indicated that while these methods can prove to be effective initially, they often struggle to maintain it over the time due to lack of engagement, motivation, or less focus. This finding supports the need for a digital solution that can provide ease of use. The results suggest that a technology-assisted approach, particularly one incorporating AR, could find these challenging by making visualization practices more engaging, accessible, and sustainable.

In addition, the data shows a strong common view among respondents related to the benefits of augmented reality (AR) based visualization. Most participants expressed that interacting with a successful version of them within an AR environment could meaningfully reduce self-doubt. This response also highlights the mental impact of visual and immersive experience.



Suggestion & Recommendation:

Researcher proposes concept novel solution using Augmented Reality (AR) to overcome low confidence, improved imagination, visual satisfaction, personalized projection. This system is designed to create seamless experiences that bind the real world with digital elements.

1. **Capture:** This process is all about gathering data from the real world. To do this, the system uses smart sensors and devices that can understand the surroundings. These devices are equipped with technology that allows mapping the space and tracking the movement of objects in real time. It adapts the changes in the environment as they happen.
2. **Understanding:** After first process, this is where the system makes sense of all the information gathered. It detects objects where they are in relation to each other. This system uses advance technology to analyse and understand the scene, allowing it to place virtual elements like animations, or other visuals into the real world.
3. **Creation:** Based on the context and the user's needs, the system can generate all kinds of digital visuals. The process here is to create digital elements that fit into the physical world and look as real as possible.
4. **Output:** Once the digital content is ready it can be used through devices like smartphones, AR glasses or tablets. The system uses special software to make the digital visuals appear on the screen and place them in the real world space.

In simple terms, this framework helps the real world and digital elements to generate a unified experience.

Benefit:

Bypass mental effort, inconsistency, self-doubt, internal visualization, as it provides persistent, reality blend visuals, positive feedback and mindset. It will increase enthusiasm, motivation to a certain level.

This AR-based system provides visible and interactive representation, allowing users to see their desired future in their real world. When a person repeatedly witnesses a positive version of own, it strengthens belief and reduces internal negativity.

Traditional manifestation depends heavily on imagination, which can be difficult and inconsistent. AR removes this burden by offering readymade visual experiences.

AR provides continuous visual reminders of goals, keeping users mentally connected to the goals. This sustained exposure helps maintain long term focus and motivation.

Looking at a confident and successful version of own in real time positively impacts the perception to look at own self. Viewing at positive self-image, leads to increased confidence, self-belief, and emotional strength.

The interactive version of AR creates a sense of engagement and excitement for managing stress. Immediate visual feedback makes users feel closer to their goals, encouraging action rather than continuous thinking.

AR turns these abstract ideas into visible experiences, making goals feel achievable and real. This shift helps users to take practical steps for management.

Conclusion:

It is conceptual mix of technology and pseudoscience which can prove to turn reality reducing the low self-confidence, etc. and increasing self-potential. AR is an emerging tech which can withstand Manifestation where our title will be justified accurately.

This research shows that doubt, low self-esteem and difficulty in consistent visualization often prevent people from achieving their goals. Traditional manifestation methods depend heavily on imagination, which many individuals find hard to maintain due to mental drain and lack of visible progress.

The proposed Augmented Reality (AR) framework offers a simple and useful solution by changing abstract goals into visible, interactive experiences in the real world, by helping people to see a positive version of them. Overall, the study highlights how AR can make self-development more realistic, engaging, and supportive of long-term personal growth.

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A Study of User's Perceptions towards E-Bike

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Abstract:

With the rapid pace of urbanization and industrialization city boundaries are expanding day by day. As a result of the rapid industrialization people had to migrate towards far flung industrial areas for employment. Rising cost of land in urban areas also prompts individuals to shift towards outreaches where cost of land is quite low as compared to urban areas. Thereby exists a need of low cost appropriate transportation medium to commute on a regular basis. Two-wheeler is an affordable and suitable medium of transportation for common people. Widespread Indian population uses it to commute here and there. It fulfills both needs of users saying it to be affordable as well as convenient for riding. It helps individual to complete journey at own will and reach desired destination within time. Two wheelers had got a lot of crazes in the young generation also. Young generation frequently uses it while commuting to college, coaching institutes and for many other reasons. With the constant increase in the fuel prices, there is a momentum shift towards energy efficient E-bikes. It is becoming an obvious choice for peoples of all socio demographic groups.

The researcher under present study tried to understand key features of E-bike and users' perception towards E-bike.

Keywords: E-bike, Perception, Sustainable, Transpiration

Introduction:

Two wheeler plays a significant role in today's busy and hurried life. Every person is too busy and wants to do optimum utilization of limited time. No one wants to waste time in waiting in long que for city bus, locals, or any other public transport. Inadequate transportation facilities, heavy road traffics tends individual to explore alternative modes of transportation. To overcome all these challenges, individual but natural opt two-wheeler. Two wheelers provide dual benefit of saving time and expenses of commuting.

Rapid development in automobile sector, rising fuel prices had given birth to E-bikes. Introduction of E-bike can be considered a revolution in automobile industry. E-bikes also known as electronic bikes are energy efficient bikes enabled on battery. These users friendly bike offers numerous advantages over conventional petrol bikes. Some of these bikes enabled with software guide rider during sudden stoppage. These bikes do not require regular repairs, servicing, and heavy maintenance expenditure. Thus, large numbers of users are shifting towards the E-bike.

Review of Literature:

Lamoria J. & Singh N. (2023), Due to the global warming and constant increase in the fuel prices bike users are steadily shifting to Electric vehicles. These vehicles are gaining momentum in Indian market also. Factors such as global warming increased pollution caused by fuel vehicles leads individual to opt Electric vehicles as an alternative option.

Wadate P. et al. (2019), E bike is the best possible alternative solution for automobile that can provide mobility. E bike possess features such as high mobility, light weight, electrically powered which makes riding comfortable. E- bike is a perfect solution for cities with larger population and people who have concern for the sustainable environment.

Research Hypothesis: - The research is based on following broad hypothesis:

H₀ There is no significant difference in individuals' perception toward E-bikes across respondents of different demographics.

H_a There is significant difference in individuals' perception toward E-bikes across respondents of different demographics.

Objectives of study: - Present study is carried out with following objectives;

- To understand socio-demographic profile of respondents
- To identify different features of E-bike.
- To study various factors influencing user's perception towards E-bike.

Statement of Problem: Perception of every individual is largely influenced by socio-demographic attributes such as age, gender, occupation. These attributes do have varied impact on the perceptions of human beings. Thus, present study

is carried out to analyze, whether there exists any difference in perceptions of individual based on their demographics towards E-bike.

Research Methodology: The study is carried out to study perceptions of users towards different features of E-bike. Primary data is collected using structured questionnaire whereas secondary data is collected from research papers, web-based journal, and web links. Responses are collected using Convenience Sampling Method from 80 respondents.

Variables of the study: Dependent variable is summated Likert scale score of perceptions statement towards E-bike, whereas independent variables are the demographic variables.

Data Analysis tools: - Percentage analysis and frequency distribution is used to analyse and interpret data. Research hypothesis is tested in Microsoft Excel using Single Factor Anova.

Features of E-bike: - E-bike offers bundle of features which makes it more attractive and user friendly.

- a) **Low maintenance cost:** - Owning a bike is not a big deal but frequent and regular maintenance is a herculean task. Purchase price is one-time capital investment whereas repairs and maintenance are a regular expenditure. Some of the parts of bikes are to be changed every now and then which ultimately increase recurring cost of rider. Compared with petrol bike, E-bike contains less movable parts hence, decrease frequent maintenance cost.
- b) **Lightweight:** - Nowadays E-bike is gaining a lot of popularity from the female users because of its lightweight feature. Some of the E-bikes are light weighted if compared to heavy petrol bike. Thus, can be easily driven by female users. Consequently, getting much attention from this segment of users.
- c) **Subsidy & tax benefits:** - Many state governments offer subsidies to endorse eco-friendly E-bikes. Road tax exemption and removal of registration fees attract individuals towards E-bike. All these measures are taken to promote E-bike and preserve natural aesthetics of surrounding area.
- d) **Ease of driving:** - E-bikes are less complicated in driving, hence users can easily understand it's functions. It can be effortlessly operated by a layman also. This feature catches attention of users towards E-bike and makes an obvious choice for everyone.
- e) **Pollution free:** - Two wheelers and four wheelers are major contributor of the air pollution. E-bikes as a substitute to petrol bikes do not pollute environment. Rather than it acts as a solution to mitigate air pollution issue. E bikes do not generate gases, that are harmful to human being as well as environment.

Sr. No.	Variable Name	Frequency	Percentage
1	Age Group		
	18-30	10	12.5
	31-40	14	17.5
	41-50	20	25
	51-60	23	28.75
	Above 60	13	16.25
	Total	80	100
2	Gender		
	Male	56	70
	Female	24	30
	Total	80	100
3	Education Level		
	Below SSC	8	10
	SSC	16	20
	HSC	18	22.50
	Graduation	28	35
	Post-graduation	10	10
	Total	80	100
4	Occupation		
	Business	20	25
	Farmer	17	21.25
	Housewife	12	15
	Service	22	27.50
	Student	9	11.25
	Total	80	100

Table 1 Demographic profile of the respondents

Results & Discussion:

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
The lightweight nature of E-bikes makes them convenient to use	32	27	4	9	8	80
The running cost of an E-bike is lower than that of fuel-powered vehicles.	18	45	1	6	10	80
E-bikes require less frequent maintenance than conventional vehicles.	36	22	6	11	5	80
E-bikes operate quietly and produce minimal pollution.	31	35	3	5	6	80

Table 2 level of agreement over respondent's perceptions

Inference: Most of the respondents (73.75%) stated, due to lightweight nature of E-bikes, it is convenient and preferred choice for the users. Lower running cost is the key factor highlighted by total of 78% respondents. Overall, 72% respondents believe E-bikes require less maintenance cost as compared to the petrol bikes. Precisely it is recognized, respondents hold positive perceptions about E-bikes.

Testing of Hypothesis: The broad hypothesis is narrowed down based on demographic parameters such as age, gender, education, and occupation of respondents.

Hypothesis No.	Independent Variable	F Statistics	Significance Value	Decision	Result
H ₀₁	Age-Group	1.868	0.124	0.124 > 0.05	Fail to Reject H _{01a}
H ₀₂	Gender	1.593	0.210	0.210 > 0.05	Fail to Reject H _{02a}
H ₀₃	Education	1.460	0.222	0.222 > 0.05	Fail to Reject H _{03a}
H ₀₄	Occupation	0.716	0.583	0.716 > 0.05	Fail to Reject H _{04a}

Table 3 Testing of Hypothesis

Statistical Inferences: The above table demonstrates, there is strong positive perceptions among respondents about E-bike. P values for all the demographic variables are more than 0.05, hence we accept the broad null hypothesis, there is no significant difference in individuals' perceptions toward E-bikes across respondents of different demographics.

Conclusions:

The Indian E—Bike sector has seen significant growth since last few years due to factors such as rising fuel prices, low maintenance cost. Furthermore, growing concern on sustainability, inclines peoples to be more aware about environment and its preservation. They prefer to own products and services that are environment friendly. In this context, E-bikes is a appropriate medium of conveyance which cost effective and eco-friendly.

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FlexiMeal: Addressing Monthly Commitment Challenges in Mess Services for Away-from-Home Residents Through Next-Day Booking Solutions

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Abstract:

This study focuses on student problems and other resident problems, staying away from home, due to strict monthly mess plans. Traditional systems often result in dissatisfaction, increased costs, and food wastage due to absence of flexibility. Through a mixture of primary surveys involving 287 citizens and secondary data from published studies, this study proposes a flexible one-day-before meal booking platform, termed FlexiMeal. The objectives include analyzing existing problems, developing a model for flexible bookings, make better efficiency for both mess owners and users, and decreasing wastage. Main discoveries show a lot of unhappiness with the current plans, with 42% of students in a Pune-based study reporting poor nutritional quality. The projected platform achieves break-even at 84 meals per month and has useful functions such as real-time menu display and user response. This will be more convenient, better for controlling losses and more pleasant for students. The study contributes to sustainable food service systems in educational and residential settings.

Keywords: Mess plans, food wastage, flexible booking, student satisfaction, break-even analysis

Introduction

Lots of students and people living away from home really struggle with figuring out their daily meals. They miss that cozy, tasty vibe of home-cooked food, and traditional mess setups—with their strict monthly subscriptions—don't help. These plans are super inflexible, so they don't match up with everyone's changing schedules, causing dissatisfaction, money wasted, and a lot of food thrown out. For example, a student might bail on a meal because the menu looks blah or they've got other plans, but they're still stuck paying for the whole month anyway.

This research goes down into these headaches and suggests a simple fix: a next-day meal booking system where you can just reserve what you want the day before. It eases things for the residents by cutting down on those issues, and it helps mess owners run smoother operations since they can better guess how much food to prepare.

The whole idea comes from noticing how old-school messes focus more on locking in long-term payments than on making things easy for users, which ends up causing too much or too little cooking and lower-quality service. Adding some flexibility here could really connect the dots between craving that home-style eating and dealing with real-life daily choices.

Problem Statements

Main issues found in current monthly-commitment mess plans include:

- **Rigidity in Plans:** Students are locked into monthly subscriptions with no daily flexibility, resulting in extra costs for unused meals.
- **Dissatisfaction and Wastage:** Lack of customization results in unappealing food, encouraging residents to eat outside and causing food wastage in messes.
- **Absence of Home-Like Options:** Meals often lack taste, variety, and emotional craving, making the feelings of Missing home worse.
- **Operational Challenges for Owners:** Fluctuating attendance cause poor resource use, such as quality and profitability suffer if overcooked or undercooked.
- **No Pre-Booking Mechanism:** The absence of a simple, one-day-before booking platform hinders both user convenience and owner planning.

These problems highlight the requirement for a platform where meals are chosen with flexibility and within the next day for both students and mess owners.

Objectives

The major objectives of this study are:

1. To examine the problems faced in monthly-committed mess plans.
2. To develop a conceptual model for a flexible one-day-before meal booking system.

3. To reduce food wastage and get better cost efficiency.
 4. To help students to be more convenient and owners of mess to plan better.
- These points help the research move towards real-world, actionable solutions.

Literature Review

Current research on hostel mess systems in India paints a clear picture: rigid monthly plans often leave students frustrated, with repetitive, unbalanced meals that miss out on fruits, vegetables, proteins, and variety—leading to skipped meals, junk food habits, nutritional differences, and simultaneously long-term health problems like tiredness or weight problems.

A key Pune-based study by Yeole and Choudhary (2025) dives into this, revealing how most students rely on mess food yet feel dissatisfied, while suggesting simple menu tweaks could make a big difference.

Similar arrangements show up in US college research (Meza et al., 2019), where inflexible food access triggers stress, anxiety, social isolation, and poorer eating choices.

On the brighter side, newer digital solutions—like the SmartMess platform proposed in IJIRT (2025)—bring hope with customizable options, and real-time menus, helping students get home-like meals with no bother and helping mess owners lessen waste.

Overall, these studies make a strong case for moving away from one-size-fits-all plans toward something more student-friendly and efficient

Research Methodology

A mixed-methods approach is employed by the study for insights.

- **Primary Research:** A survey was conducted among 287 mess food consumers, focusing on preferences for flexible meal options. The key question asked was: "If you didn't have to take a monthly mess plan and could choose your food one day before, would you be willing to pay a little extra for that flexibility and customization?" Responses were analyzed to identify problems faced by students, presented through pie charts and descriptive statistics.
- **Secondary Research:** Data was sourced from published research papers, online resources, and institutional surveys (e.g., the Pune study) on hostel messes and student food satisfaction.

This method provides a balanced perspective; qualitative information from existing literature and quantitative data information from the survey.

Data Collection and Analysis

The primary data was collected via an online survey targeting residents in hostels, PGs, or rented rooms, primarily from cities in Maharashtra such as Shirpur, Jalgaon, Dhule, and Bhusawal. The survey included questions on demographics, meal arrangements, satisfaction levels, problems with traditional systems, preferences for adaptable booking, and desired app features. Results were calculated in Excel for frequencies and percentages.

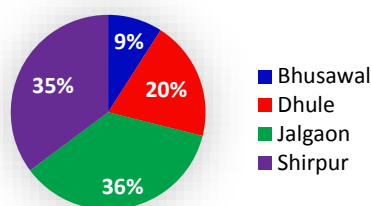


Figure 1: City Distribution

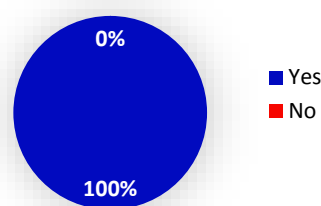


Figure 2: Accommodation (Hostel/PG)

1. **City Distribution:** Geographically diverse responses from different cities help in improving the reliability of the study and indicate that food service issues are not localised to one region. Common problems highlighted by people from different cities also show that apart from some scale issues, the solution provided can have a wider applicability.
2. **Accommodation (Hostel/PG):** Hostel/PG accommodation type across all respondents shows that the survey is moving in the right direction in terms of targeting the right user group. Since these are the people who rely on external food services, the data received from them is highly relevant to our study and non---biased in terms of users who have access to home cooked food.

Key Survey Findings

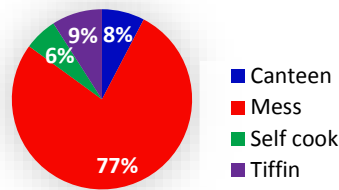


Figure 3: Current Daily Meal Arrangement

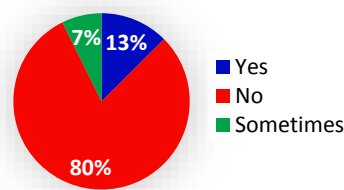


Figure 4: Satisfaction with Current Meal Arrangement

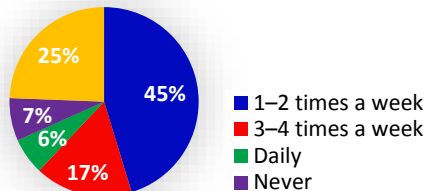


Figure 5: Frequency of Ordering Food

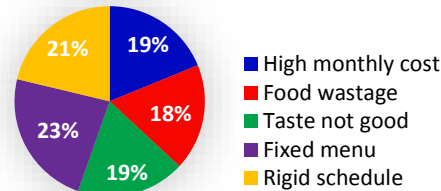


Figure 6: Problems with Traditional Online Monthly Mess System

- Current Daily Meal Arrangement:** Majority of respondents depend on mess or external food services for their daily meal requirements. This indicates the penetration levels of organized food systems and shows that any change in quality or level of service will have a far-reaching impact amongst users.
- Satisfaction with Current Meal Arrangement:** There is a dissatisfaction of more than 80% amongst users with the current food service systems. This indicates deep rooted issues related to quality, hygiene, pricing and consistency of service. With such low levels of user satisfaction, there is an immense need for a better service model.
- Frequency of Ordering Food Online:** The respondents ordering food online even after being committed to mess on a regular basis point toward the mess food dissatisfaction. While ordering food online solves the food problem, it adds to the monthly expenditure, thus highlighting the need for a focused and technologically driven solution.
- Problems with Traditional Monthly Mess System:** Food Quality, Hygiene, Variety, Cost, Service Delay are the major problems stated by users. These prove the user dissatisfaction from various aspects, demanding an overall service upgradation.

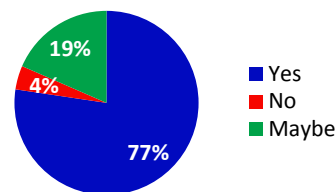


Figure 7: Preference for One-Day-Before

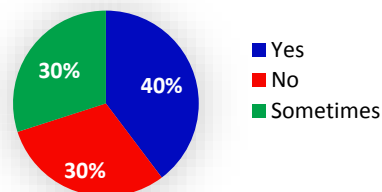


Figure 8: Comfort in Giving Feedback Booking System Directly

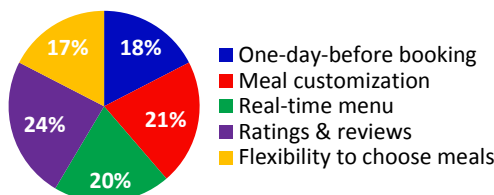


Figure 9: Desired Features in a Flexible

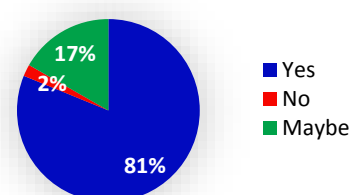


Figure 10: Willingness to Use Menu Meal Booking App Choices (Option A/B)

7. **Preference for One-Day-Before Booking System:** The respondents' preference for advance meal booking reflects the inclination of users towards a planned meal ecosystem. These findings can be used to build an efficient service system while giving user satisfaction and degrading food wastage.
8. **Comfort in Giving Feedback Directly:** Users are not comfortable giving feedback, pointing towards a weak communication system. Developing the feedback platform can help service providers understand the users better and improve the service.
9. **Desired Features in a Flexible Booking App:** Respondents prefer the features of Customization, Digital Payment and Live Menu updates, indicating the need for advanced, user-friendly food services platform.
10. **Willingness to Use Menu Meal Choices (Option A/B):** Menu-based meal selection is preferred by more than 80% of users, showing the dissatisfaction with fixed menus and the requirement for adaptable and personalized food options.

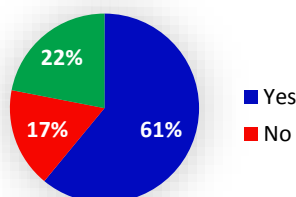


Figure 11: Willingness to Pay Extra for Flexibility

11. **Willingness to Pay Extra for Flexibility:** A desire to pay extra for better quality and services is shown by more than 60% of respondents, which indicates high ability for expensive or value-added food service models.

Conceptual Model for Fleximeal:

FlexiMeal is proposed as a digital, user-friendly platform suggested to deal with the limitations of rigid monthly mess subscription systems. The platform allows users to book meals on a flexible, per-day basis through mobile phones or computers, getting rid of long-term commitments.

The concept of FlexiMeal is built around three integrated components. The first component is the student or resident interface, that lets users to book meals one day in advance. This interface provides real-time access to daily menus along with multiple options, allowing individuals to make decisions based upon both food taste and nutritional factors. Additionally, users can submit ratings and response on meals through an anonymous system, ensuring honest responses without fear of discomfort or social burden.

The second component is the mess owner interface, which totals daily meal bookings to provide accurate demand predictions. This feature assists mess owners in planning food preparation more effectively, thus losses caused by excess or insufficient production can be reduced. Excess food leads to greater wastage and operational costs, while insufficient supply results in lost revenue chances. The platform also enables owners to keep check on profitability by tracking sales performance and finding the least number of meals required to recover fixed and operational costs. Based on preliminary analysis, the break-even point for a typical operation is estimated at 84 meals per month.

The third component denotes a system with centralized control capabilities for the interfaces of the student and owner. These controls support real-time menu notifications, online payment processing, and flexible pricing plans, allowing mess owners to add a small fee for on-demand services. Furthermore, the system reviews collective feedback and evaluation of information to find out consumer preferences, enabling data-driven menu scheduling and constant service improvement.

FlexiMeal presents various key advantages. It allows users to exercise more freedom in food choices, decreases financial risk for mess operators by decreasing food wastage and unsold meals, and gives clear understandings on how to generate revenue and to make business profitable. Survey findings further support the platform's potential, with approximately 85 percent of respondents showing a will to utilize mess services if greater flexibility were offered. Increased participation is expected to further reduce losses and increase operational sustainability.

Overall, FlexiMeal establishes a equally valuable ecosystem in which both users and mess operators derive value. By blending flexibility with efficiency, and data-driven decision-making, the platform presents a practical and scalable business model that improves the experience of having meal for individuals living away from home while promoting a feeling of comfort and community.

Break-Even Analysis

A break-even analysis was performed to understand the future profitability of FlexiMeal. According to the analysis, FlexiMeal would break-even at around 84 meals in a month or an average of just over three meals a day. Running at a lower volume would incur a loss; however, at higher volumes, FlexiMeal would make positive returns.

Discussion

Survey results highlight the shortcomings of existing mess systems. The majority (80 percent) of respondents expressed a strong preference for not following strictly defined mess plans and this finding validates with the results of a survey conducted from Pune where 42 percent of respondents of participation in the survey identified poor nutrition as a concern and 67 percent identified lack of menu balance as a concern. FlexiMeal provides direct impact on the consumer issues reported in survey results, for example food wastage (reported by 16 percent) and extra charges (reported by 28 percent), as the service allows the consumers to book meal one day advance. Additionally, FlexiMeal improves the consumer experience by providing real-time visibility of menu, choice, and ability to play with the meal which led 85 percent of respondents that they would use mess service more often if menu and choice were available.

These findings are consistent with international studies that have found that poor timeliness of access to institutional food service resulted in elevated stress and unhealthier eating habits such as observed in a study from United States and also digital tools like SmartMess have improved consumer experience by providing access to home-style food using technology.

FlexiMeal would also prove operationally beneficial to mess owners. Enhanced demand forecasting and meal planning would lead to an operational break-even at about 84 meals a month and profitability upward of that. There are some limitations to our study. The sample that we used for the survey was not restricted to students and comprised citizenry at large and the survey responses are based on recall.

Conclusion

To sum up, the outdated monthly mess plans can't fully meet the demands of students and others who are living away from home. This results not only in overall discontent but also unnecessary financial outlay and extensive food wastage as evidenced by the current survey of 287 respondents – 80 percent dissatisfied with the current mess models and 85 percent preferring more flexibility. FlexiMeal's next-day booking mechanism provides a viable and scalable solution by not only providing control to every user but also allowing mess operators to forecast demand, break-even at about 84 meals per month and cut down operational losses.

Previous research into nutritional deficiency in institutional food systems by Yeole and Choudhary (2025) as well as digital food-service solutions by IJIRT (2025) provide a further support to the proposed platform, FlexiMeal. If implemented into a real-world pilot in the near future, it can help to bring this conceptual model to life, providing measurable, sustainable solutions to all stakeholders.

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Agricultural Yield Analysis & Prediction

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Abstract:

In our day to day life many statistical methods are used, like from sampling method in kitchen to analysis of time series in population of any country

One of them is correlation and regression analysis

The functional relationship of a dependent variable with more than one independent variable is called as multiple linear regression

In this presentation we discussed a real life application of multiple linear regression

In this research, we estimate agricultural production which is depend on rainfall, area of field, fertilizers, pesticides and many different factors by using the method of multiple linear regression

This research helps farmers to make the planning of the crop they intended to take in their farming land

This analysis is also helps to merchants for preplanning of import and export that indirectly helps to farmer for MSP or Guaranteed Price

Keywords: Regression Model, Estimation, Prediction, Statistics, Agriculture, Crops, Yield, MSP, Guaranteed Price.

Objectives :

- To study real life applications of multiple linear regression
- To study statistical inference through real life example
- To explore the beauty of statistics in the field of agriculture

Introduction :

The functional relationship of a dependent variable with one or more independent variables is said to be regression. Regression analysis is a multivariate analysis technique which analyses the factors, groups them into explanatory & response variables and helps us to obtain a decision [1]. As we all know, the things which are related to our daily life directly or indirectly like as exam and our study, our health and our food, temperature and raining etc. have functional relationship with each other. The term correlation and regression are used to find this relationship between them. By using this relation or regression we can estimate or predict the next behaviour of variable which is under study. Same with the yield of crop in farming land. We can analyse the past data of farming land, weather conditions, management and can able to forecast the possible production in particular land area.

Literature Review :

The major proportion of Indian population depends upon agriculture. There are various factors that may affect the crop yield such as weather condition, amount of fertilizers, pesticides and management practices. As compared to the other factors, yield is highly affected by weather conditions [2]. In many Countries, farmers got losses in their agricultural production because of weather conditions [3]. That is why, the regression model which give most precise prediction of agricultural yield is important for farmers, merchants and government. This model is used for making advance planning. [4].

Data Collection :

The data used for this presentation is primary type data. The all numeric information regarding rainfall and weather was collected from the department of central weather centre (CWC), Gidhade. The data of agricultural production and resources was collected from farmers nearby us and agricultural department Shirpur.

Methodology :

$$y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n$$

Which is the equation of the regression.

In our example,

y = Agricultural Production

X₁ = Area of Agricultural Land

X₂ = Rainfall in June

X₃ = Rainfall in July

X₄ = Rainfall in August

X₅ = Rainfall in September

X₆ = Rainfall in October

X₇ = Amount of Fertilizer

- Testing Significance of Population mean :

$$t = \frac{\bar{x} - \mu_0}{\frac{s}{\sqrt{n}}} \sim t_{(n-1)}$$

- Testing independence of two attributes :

$$\chi^2 = \sum_{i=1}^m \sum_{j=1}^n \frac{O_{ij}^2}{E_{ij}} - N \sim \chi_{(m-1)(n-1)}^2$$

- The regression line Y (Agricultural Production) on various dependent factors is :

1. Pigeon Pea (Tur)

$$-193.901 + (-5.37416 X_1) + (2.16285 X_2) + (1.30334 X_3) + (1.76911 X_4) + (0.27963 X_5) + (0.02123 X_6) + (0.31758 X_7)$$

Adjusted R-square : 0.849388

2. Maize (Maka)

$$-260.54 + (0.112 X_1) + (1.79606 X_2) + (-0.70662 X_3) + (0.80337 X_4) + (-0.696 X_5) + (-0.187 X_6) + (0.219 X_7)$$

Adjusted R-square : 0.868915

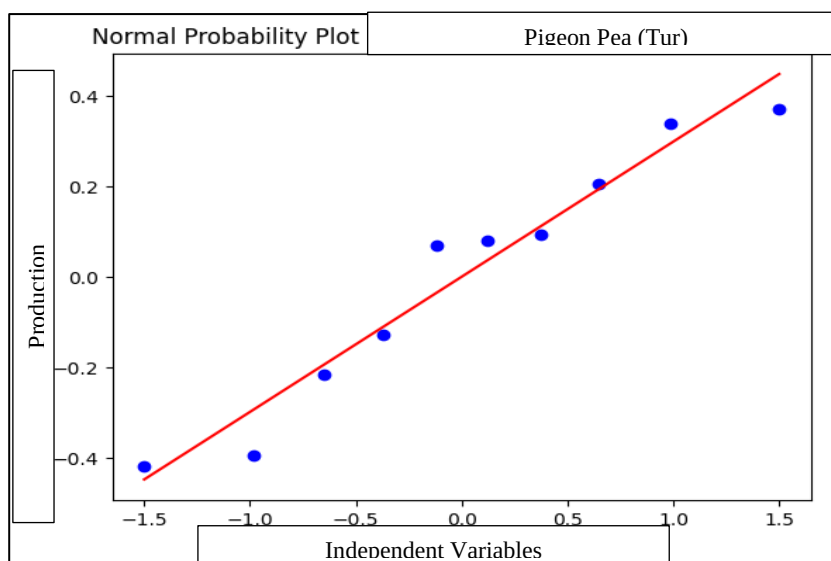
1. Gram (Chana)

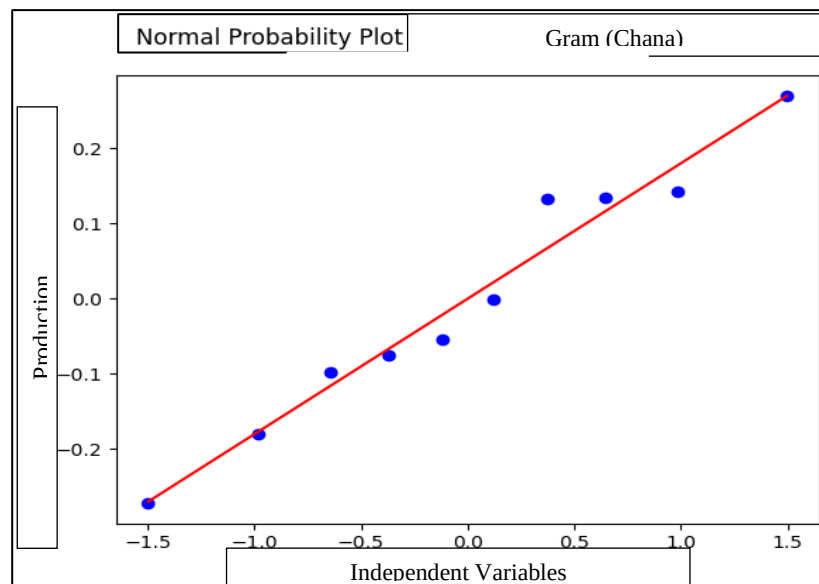
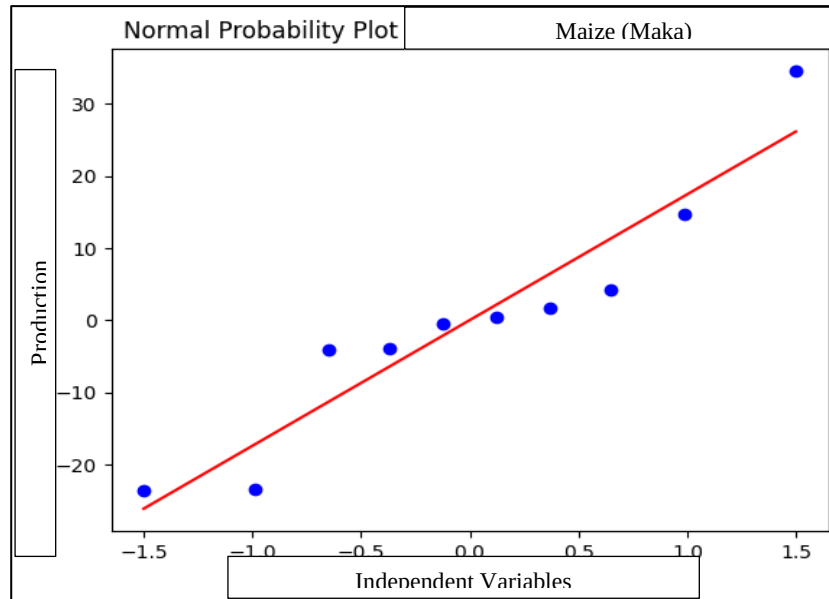
$$57.91029 + (9.45085 X_1) + (-0.57708 X_2) + (0.06992 X_3) + (0.2782 X_4) + (-0.00683 X_5)$$

Adjusted R-square : 0.921703001

Analysis of Model :

The normal probability plots are plotted after transforming the regression model by using “Box-Cox Transformation”.





Statistical Analysis :

A farmer claims that he had average 80 quintals of pigeon pea (Tur), 138 quintals of maize (Maka) and 61 quintals of gram (Chana) production with 7.5 acres of land with normal amount of rainfall distribution.

Given : $n = 10$, $\mu_0 = 80$ (Tur)
 $\mu_0 = 138$ (Maka)
 $\mu_0 = 61$ (Chana)

Here, we wish to test :

$H_0: \mu = 80$ Vs $H_1: \mu \neq 80$
 $\mu = 138$ $\mu \neq 138$
 $\mu = 61$ $\mu \neq 61$

Under H_0 the test statistic is :

$$t = \frac{\bar{x} - \mu_0}{s/\sqrt{n}} \sim t_{(n-1)}$$

Comparison :

$$t_{cal} = 1.13462 \leq t_{tab} = 2.82144 \quad (\text{Tur})$$

$$t_{cal} = 1.26654 \leq t_{tab} = 2.82144 \quad (\text{Maka})$$

$$t_{cal} = 1.87672 \leq t_{tab} = 2.82144 \quad (\text{Chana})$$

Interpretation :

We fail to reject H_0 at 5% level of significance

i.e. The data supports to the claimant.

To test whether the area and variety of crop are dependent or not :

Here, we wish to test :

H_0 : Area & Variety of crop are independent

Vs

H_1 : Area & Variety of crop are dependent

Under H_0 the test statistic is

$$\chi^2 = \sum_{i=1}^m \sum_{j=1}^n \frac{O_{ij}^2}{E_{ij}} - N \sim \chi_{(m-1)(n-1)}^2$$

Interpretation :

We reject H_0 at 5% level of significance

i.e. the attributes area and variety of crop are dependent.

Conclusion :

Using the regression lines we can estimate the agricultural production by putting the amount of dependent variables in it.

The test for testing significance of population mean is done and we got the conclusion that farmer's statement was right about average yield for given data.

The test for checking independence of area & variety of crop is done. We reach at conclusion that both attributes are dependent.

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Work–Life Balance in the Hospitality Industry after COVID19: A Review (2020–2025)

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ABSTRACT:

The COVID19 pandemic transformed the way work and personal life intersect, especially in service driven industries like hospitality. With sudden closures, layoffs, and later recovery phases, employees faced unprecedented stress while employers experimented with flexible practices, wellbeing programs, and digital integration. This review blends literature published between 2020 and 2025 to examine how work–life balance (WLB) in the hospitality sector evolved over the crisis, adaptation, recovery, reevaluation, and sustainability phases. Findings suggest that COVID19 reshaped the meaning of WLB: shifting from survival and coping to becoming an ethical and strategic imperative. A conceptual framework is proposed to trace this evolution, offering insights for scholars, practitioners, and policymakers.

Keywords: Work–life balance, hospitality industry, COVID19, employee wellbeing, resilience, post pandemic recovery, sustainability, human resource management

INTRODUCTION:

Work–life balance (WLB) has long been a critical concern for the hospitality industry, known for its long hours, irregular shifts, and customer centric culture. Unlike many industries, hospitality relies heavily on face-to-face interaction and cannot easily transition to remote work. The COVID19 pandemic (2020) amplified existing challenges, introducing sudden closures, mass layoffs, and uncertainty about the future. Employees not only struggled with financial instability but also faced mental health strains, health risks, and difficulties balancing home responsibilities during lockdowns.

As the industry began to reopen, the pandemic forced a rethinking of HR practices, leadership styles, and employee wellbeing initiatives. The concept of WLB expanded beyond time management to include psychological safety, resilience, and sustainable employment. Between 2020 and 2025, scholars and practitioners documented these shifts in multiple stages: initial crisis, adaptation, recovery, reevaluation, and sustainability.

This review paper blends research from 2020 to 2025, offering a year wise narrative of how WLB in hospitality evolved during and after the pandemic. A conceptual framework is introduced to capture this progression, followed by a discussion of implications and recommendations.

LITERATURE REVIEW: (2020–2025)

The Crisis Phase: 2020

The year 2020 marked the most severe disruption in the modern history of hospitality. Global lockdowns forced hotels, restaurants, airlines, and tourism operators to suspend operations, leading to widespread furloughs and layoffs. Employees faced uncertainty regarding income, careers, and even health.

Studies published in 2020 emphasize job insecurity, emotional distress, and blurred work–life boundaries. For example, **Chen and Zhang (2020)** reported that hospitality workers who retained jobs during partial operations struggled with extended shifts and inadequate safety measures. Meanwhile, those furloughed experienced nervousness about livelihood, creating a dual crisis of health and economic survival.

Remote work was nearly impossible for frontline hospitality staff, though managerial and administrative employees experimented with virtual collaboration. Scholars note that while digital platforms enabled continuity, they also generated techno stress and longer working hours at home (**Gupta & Misra, 2020**). Overall, WLB in 2020 was characterized by survival and coping rather than proactive wellbeing.

The Adaptation Phase: 2021

By 2021, vaccination drives and partial reopening began. Literature shows employees and organizations experimenting with coping strategies. Wellbeing initiatives, counseling programs, and limited hybrid practices emerged.

Rahman and Salam (2021) highlight that resilience training and stress management workshops became common in multinational hotel chains. Employees adapted to uncertainty by building new routines and developing digital

competencies. Technology became both an enabler and a stressor: online training and customer engagement tools allowed business continuity but required constant learning.

Families also played a central role in this adaptation. Hospitality workers, especially women, reported difficulty balancing caregiving with fluctuating work demands (Singh, 2021). Employers began acknowledging the importance of psychological safety, empathy, and flexible scheduling. Thus, 2021 marked the beginning of systemic recognition that WLB is not only an individual responsibility but an organizational necessity.

The Recovery Phase: 2022

In 2022, global tourism and hospitality experienced visible recovery. Hotels reopened, leisure travel resumed, and businesses restructured operations. Research in this period highlights organizational attempts to integrate WLB as part of recovery strategies.

According to **Martinez and Lee (2022)**, many organizations introduced wellbeing programs, including flexible scheduling, mental health support, and recognition of burnout symptoms.

Hybrid work, though limited to corporate roles, became a strategic feature of HR policy. For frontline employees, management experimented with shift rotations, adequate rest breaks, and improved safety measures.

Hospitality employers also recognized that post pandemic staff shortages required proactive retention policies. Employees expected empathy and fair treatment; otherwise, they were more likely to switch industries. Recovery thus involved not just reopening businesses but rethinking human resource management to ensure long term sustainability.

The Reevaluation Phase: 2023

By 2023, employees began reassessing career priorities. Scholars describe this as the “Great Reevaluation,” where hospitality staff questioned whether long hours and low pay justified the stress. Many shifted to industries offering better flexibility or remote opportunities.

Khan and Pereira (2023) observed that empathetic leadership became a core determinant of retention. Employees valued managers who provided autonomy, respected personal commitments, and created transparent communication channels. At the same time, techno stress reemerged as hospitality companies adopted advanced digital tools for customer management. Balancing digital workload with personal time became a new WLB challenge.

Research also documents generational differences like younger employee’s prioritized flexibility and meaningful work, while older staff sought stability. Organizations that failed to address these differences risked higher turnover. **Thus, 2023 reinforced that WLB is central to talent management, not a peripheral benefit.**

The Sustainability Phase: 2024

By 2024, WLB was no longer viewed merely as an employee benefit but as a sustainability and ethical imperative. Policymakers, HR leaders, and employees converged on the idea that sustainable hospitality requires balancing profit with people’s wellbeing.

Patel and Wong (2024) argue that government guidelines and corporate policies increasingly mandate flexible working, wellbeing audits, and diversity in scheduling. Organizations that embraced these practices reported higher employee satisfaction, customer loyalty, and brand reputation.

Sustainability also meant integrating WLB into ESG i.e. Environmental, Social, and Governance frameworks. Scholars note that hospitality investors and consumers now assess companies based on employee wellbeing initiatives. **By 2024, WLB had transformed from a reactive coping mechanism into a proactive driver of competitive advantage and social responsibility.**

Emerging perspectives: 2025

Recent 2025 literature expands the study in three main directions:

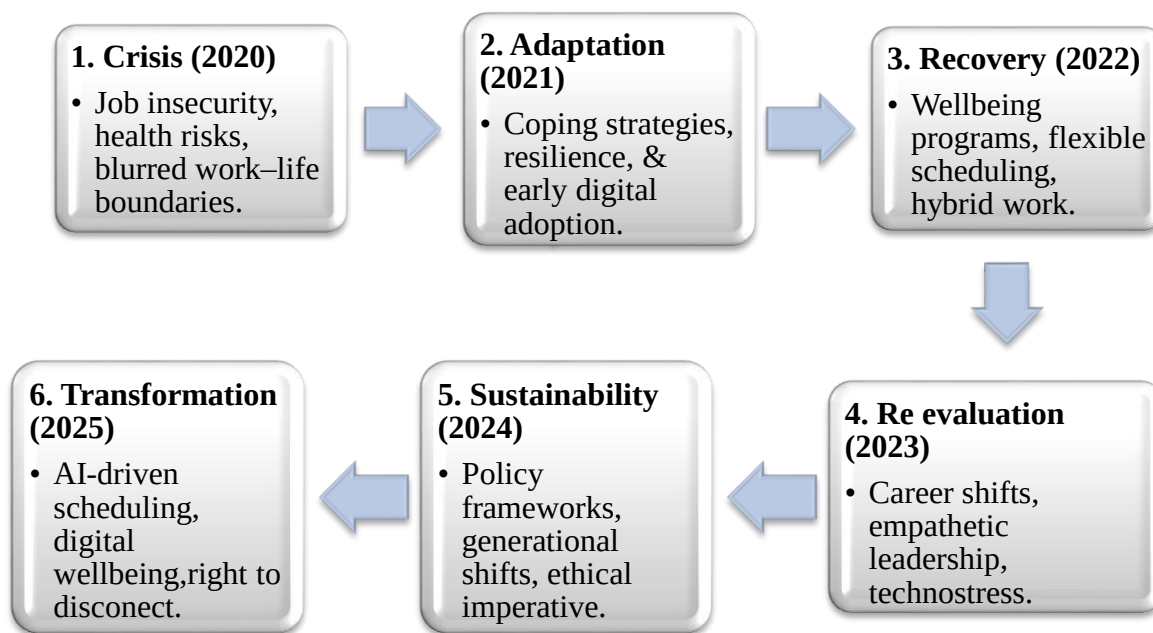
1. **Digitalization and well-being:** Industry reports and academic explanations in 2025 show that **AI-driven scheduling tools, automated service systems, and guest self-service platforms** are altering workloads. While these technologies promise efficiency, their effect on WLB is mixed some employees gain more predictable shifts, but others report increased “digital surveillance” stress. The literature urges a careful balance between automation and human autonomy.
2. **Sustainable HR and employee retention:** 2025 surveys by hospitality associations stress that WLB is now directly linked to staff retention and talent attraction. With labor shortages still pressing in the global hospitality sector, firms increasingly advertise flexible shifts, mental health support, and family-friendly policies as core

employer-branding strategies. Scholarly articles also show that employees who perceive genuine organizational concern for their wellbeing demonstrate higher commitment and lower turnover.

3. **Policy and cultural shifts:** Legal and policy reviews from 2024-2025 highlight how governments in Europe and Asia are adopting “**right to disconnect**” regulations, mandating limits on after-hours digital communication. While the hospitality sector poses unique operational challenges, early case studies suggest partial adaptation is possible in areas like management, HR, and reservations. In cultural terms, the literature stresses that post-COVID employees increasingly prioritize personal time, autonomy, and mental health over purely financial incentives.

Conceptual Framework

The conceptual framework developed in this paper illustrates the evolution of WLB in hospitality **from 2020 to 2025** in five interconnected phases:



The above framework suggests a shift from short term coping to long term sustainability and transformation. Each phase influenced subsequent developments, creating a feedback loop between crisis and reform.

DISCUSSION:

The review demonstrates that the pandemic accelerated a transformation in how hospitality organizations and employees view WLB.

From survival to sustainability: What began as a crisis of survival in 2020 evolved into a sustainability agenda by 2024 and into Transformation and digital wellbeing in 2025 till now.

Role of leadership: Empathy, flexibility, and transparent communication emerged as decisive factors in shaping employee experiences.

Generational and gender dimensions: Younger employees demand flexibility and purpose, while women disproportionately faced challenges in balancing caregiving with fluctuating hospitality demands.

Technology paradox: Digital platforms enabled business continuity but also contributed to techno stress and blurred boundaries.

Strategic HR priority: By 2024, WLB became embedded in HR strategies, talent management policies, and ESG reporting.

Transformation and digital wellbeing (2025): Recent 2025 literature shows that work–life balance has entered a phase of transformation, where AI-driven scheduling tools, “right to disconnect” policies, and digital wellbeing initiatives are increasingly implemented. Organizations now treat WLB not just as an HR practice but as a strategic differentiator in employer branding, talent retention, and sustainability reporting.

The discussion also reveals gaps: while large international hotel chains documented improvements, smaller firms often lacked resources to institutionalize WLB. Further, research remains limited in developing regions, suggesting the need for cross cultural comparative studies.

CONCLUSION:

Work–life balance in hospitality underwent a fundamental shift in the aftermath of COVID19. Between 2020 and 2024, WLB evolved from being a matter of survival to becoming a strategic necessity and ethical imperative. Organizations that embraced flexibility, empathetic leadership, and wellbeing initiatives not only enhanced employee satisfaction but also gained resilience and competitive advantage.

In 2025, the discourse advanced further into a stage of transformation, where digital wellbeing, AI-driven scheduling, and the institutionalization of “right to disconnect” policies have initiated to redefine how hospitality organizations attract and retain talent. WLB is no longer framed purely as a recovery or retention tool but as a strategic differentiator and marker of organizational identity in a competitive labor market.

The review suggests that the future of hospitality lies in human-centered digital transformation balancing technological efficiency with employee autonomy, equity, and wellbeing. For policymakers, managers, and employees, the challenge ahead is to ensure that WLB remains at the heart of organizational strategies, enabling hospitality careers to be not only sustainable but also adaptive and meaningful in a rapidly evolving post-pandemic world.

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An Article on The Role of Artificial Intelligence (AI) in Modern Finance

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ABSTRACT:

Artificial Intelligence (AI) is the talk in the town. Especially the current generation is adopting the approach of modernised scope of performing any task. In this context the AI is pretty handy for professional. Artificial Intelligence (AI) refers to the ability of machines and computer systems to perform tasks that normally require human intelligence. The various functions at the organisations have experienced the influence of AI. One such function is Finance. The modern day era has experienced the shift in finance. Modern finance refers to the present-day financial system that uses advanced technology, data, and innovative methods to manage money, investments, and financial services more efficiently. Artificial Intelligence in modern finance refers to the use of intelligent computer systems to support and improve financial activities in today's technology-driven environment. This article as a descriptive study is attempted by the help of secondary data. The author aims to understand the essence of Artificial Intelligence in current era and study the role of AI in Modern Finance. The study further aims to enlist the prospects and Consequences of Artificial Intelligence in modern finance. The study revolves around the domain of AI & Finance. The inferences through the article are indicative in nature.

Key Words: AI, Modern Finance, Financial Management, Corporate Finance

INTRODUCTION:

In today's rapidly evolving digital environment, Artificial Intelligence (AI) has become a key driver of change across many industries, particularly the financial sector. AI refers to the use of advanced computer systems that can learn from data, recognize patterns, and assist in decision-making processes. With the increasing availability of large volumes of financial data, modern finance has widely adopted AI to enhance efficiency and accuracy. In the financial industry, AI is applied in areas such as fraud detection, credit assessment, risk management, algorithmic trading, and customer service through chatbots and virtual assistants. These applications help financial institutions reduce operational costs, improve decision quality, and offer personalized services to customers. However, the growing dependence on AI also brings challenges related to data security, ethical concerns, and possible job displacement. Thus, understanding the role of Artificial Intelligence in modern finance is crucial.

This study aims to explore the essence of AI in the current era, examine its role in modern financial systems, and identify the prospects and consequences associated with its increasing use. The existing literature suggests that Artificial Intelligence plays a crucial role in improving efficiency and decision-making in modern financial systems. Reports by the World Economic Forum highlight AI applications in fraud detection, risk management, and customer service automation. Studies by McKinsey & Company and PwC indicate that AI enhances credit assessment accuracy and operational performance. However, research by the International Monetary Fund also emphasizes challenges related to data privacy, ethical concerns, and financial stability, suggesting the need for responsible AI adoption.

Objectives of the study: -

1. To understand the essence of Artificial Intelligence in current era.
2. To study the role of AI in Modern Finance
3. To enlist the prospects and Consequences of Artificial Intelligence in modern finance.

Research Methodology

Research Design

The present study follows a descriptive research design. This approach is suitable as the study aims to understand and explain the role of Artificial Intelligence in modern finance rather than testing any specific hypothesis. The research focuses on analysing existing studies, reports, and published material to gain a clear understanding of the topic.

Sources of Data

The study is based on secondary data collected from recognized and reliable sources. These include research journals, books, policy documents, and official reports published by reputed institutions such as the World Economic

Forum, International Monetary Fund, and the Reserve Bank of India. Reports from consulting firms like McKinsey & Company and PwC were also used.

Method of Data Collection

Relevant data was collected through a systematic review of academic articles, industry reports, white papers, and online publications. Only credible and updated sources were considered to maintain the reliability of the study.

Tools and Techniques of Analysis

The collected data was analysed using qualitative content analysis. Key themes such as applications of AI, benefits, challenges, prospects, and consequences in modern finance were identified and interpreted.

Scope of the Study

The scope of the study includes the application of Artificial Intelligence in banking, financial markets, investment management, risk assessment, fraud detection, and customer services. The study covers both global and Indian financial systems.

Limitations of the Study

The research relies solely on secondary data and does not include primary data such as surveys or interviews. As AI technology is continuously evolving, some recent advancement may not be fully reflected.

Artificial Intelligence:

Artificial Intelligence (AI) refers to the ability of machines and computer systems to perform tasks that normally require human intelligence. These tasks include learning from experience, understanding information, recognizing patterns, solving problems, and making decisions. Unlike traditional computer programs that follow fixed instructions, AI systems improve their performance by analysing large amounts of data and learning from it over time. AI works through technologies such as machine learning, natural language processing, and data analytics. For example, AI can understand human language through chatbots, identify faces in images, or predict future outcomes based on past data. In daily life, AI is already present in smart phones, online shopping platforms, navigation apps, and digital assistants. In simple terms, Artificial Intelligence enables machines to think, learn, and act in a way that imitates human intelligence. Its main purpose is to make systems smarter, faster, and more efficient while supporting humans in decision-making processes across various fields.

Modern Finance:

Modern finance refers to the present-day financial system that uses advanced technology, data, and innovative methods to manage money, investments, and financial services more efficiently. Unlike traditional finance, which relied mainly on manual processes and basic calculations, modern finance is highly data-driven, digital, and technology-oriented. It includes activities such as digital banking, online payments, stock market trading, investment analysis, risk management, and financial planning using modern tools and software. Technologies like Artificial Intelligence, big data analytics, block chain, and financial technology (FinTech) platforms play a major role in modern finance. These technologies help financial institutions analyse large amounts of data, reduce risks, detect fraud, and offer faster and more personalized services to customers. Modern finance also focuses on global connectivity and real-time decision-making. Financial transactions today can take place instantly across countries, making markets more integrated and competitive. In simple words, modern finance is the evolution of traditional finance into a smarter, faster, and more technology-driven financial system.

ROLE OF ARTIFICIAL INTELLIGENCE IN MODERN FINANCE:

Artificial Intelligence plays a crucial role in strengthening and transforming modern financial systems. In today's digital environment, financial institutions deal with massive volumes of structured and unstructured data on a daily basis. AI helps in analysing this data efficiently and converting it into meaningful insights that support better financial decision-making. One of the most important roles of AI in modern finance is in fraud detection and prevention, where intelligent systems continuously monitor transactions, identify unusual patterns, and alert institutions in real time, thereby reducing financial losses. AI is also widely used in credit evaluation and risk management. By analysing customer behaviour, transaction history, and financial records, AI-based models provide more accurate credit scores and risk assessments compared to traditional methods. This helps banks and lending institutions make fair and faster lending decisions. Additionally, AI supports algorithmic trading and investment management by predicting market trends and assisting investors in portfolio optimization. Another significant role of AI in modern finance is improving customer experience. Chatbots, virtual assistants, and personalized financial recommendations enable institutions to provide

round-the-clock support and customized services. According to insights from the World Economic Forum and McKinsey & Company, AI-driven financial systems enhance operational efficiency while maintaining competitive advantage. Overall, Artificial Intelligence acts as an enabling tool that makes modern finance faster, smarter, and more responsive to market needs. Another important role of Artificial Intelligence in modern finance is in regulatory compliance and financial inclusion. AI helps financial institutions comply with complex regulations by automating processes such as monitoring transactions, detecting suspicious activities, and generating compliance reports. This reduces manual workload and lowers the risk of regulatory violations. In addition, AI supports financial inclusion by enabling access to banking and credit services for underserved and unbanked populations. By analysing alternative data such as transaction patterns and digital behaviour, AI allows financial institutions to assess creditworthiness even when traditional financial records are unavailable. Reports by the International Monetary Fund and the Reserve Bank of India highlights that responsible use of AI can strengthen regulatory efficiency while promoting inclusive growth. Thus, AI not only improves performance in modern finance but also supports fairness, transparency, and wider access to financial services.

PROSPECTS AND CONSEQUENCES OF ARTIFICIAL INTELLIGENCE IN MODERN FINANCE

Prospects of Artificial Intelligence in Modern Finance

1. **Improved Efficiency and Cost Reduction:** Artificial Intelligence significantly improves the efficiency of financial operations by automating routine and repetitive tasks such as data entry, transaction monitoring, and report generation. This reduces processing time and operational costs for financial institutions. AI systems work continuously without fatigue, enabling faster service delivery and better utilization of human resources for strategic decision-making.
2. **Enhanced Accuracy and Better Decision-Making:** AI helps financial institutions make more accurate decisions by analysing large volumes of financial data with minimal error. In areas such as credit assessment, investment analysis, and risk management, AI-based models identify patterns and trends that may be overlooked by humans. According to insights from the McKinsey & Company, AI-driven decision systems improve consistency and reduce bias in financial judgments.
3. **Personalized Customer Experience:** AI enables financial institutions to offer personalized financial products and services based on individual customer needs and behaviour. Tools such as chatbots, virtual assistants, and recommendation systems provide instant support and customized advice. Reports by the World Economic Forum highlight that AI-driven personalization enhances customer satisfaction and strengthens long-term customer relationships.

Consequences of Artificial Intelligence in Modern Finance

1. **Data Privacy and Security Risks:** The use of AI requires access to large amounts of sensitive financial and personal data. This increases the risk of data breaches, misuse of information, and cyber-attacks. If data protection measures are weak, customer trust may be negatively affected. Regulatory bodies like the International Monetary Fund emphasize the importance of strong data governance frameworks.
2. **Ethical Issues and Algorithmic Bias:** AI systems learn from historical data, which may contain biases. As a result, AI-based decisions in areas like credit approval or loan pricing may unintentionally discriminate against certain groups. Lack of transparency in AI algorithms makes it difficult to understand or challenge automated decisions, raising ethical concerns.
3. **Job Displacement and Skill Gaps:** Automation through AI may reduce the demand for certain traditional roles in finance, particularly those involving routine tasks. Employees without digital or analytical skills may face job insecurity. Reports from the World Economic Forum suggest that workforce reskilling and upskilling are essential to balance technological advancement with employment stability.

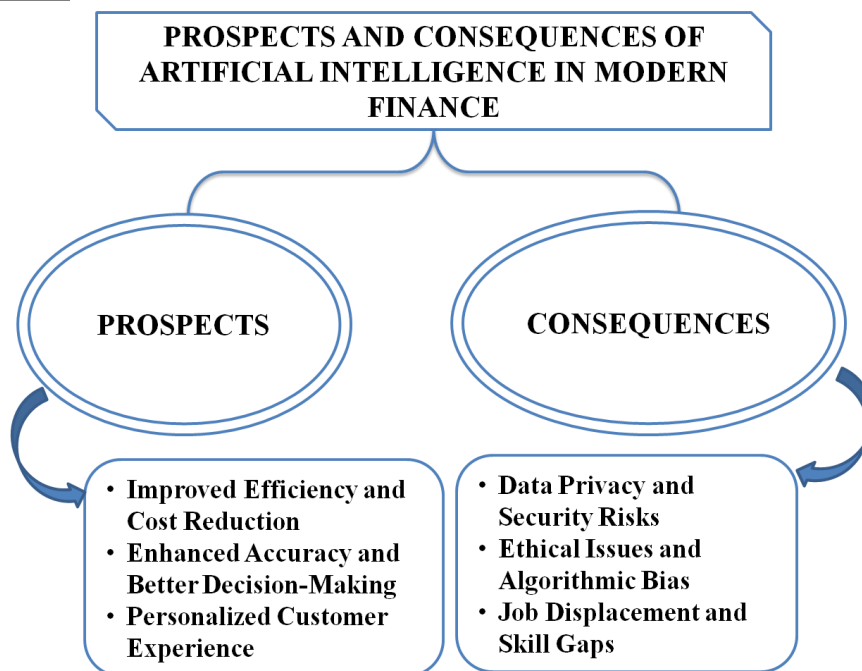


Chart No.1: Prospects & Consequences of AI in Modern Finance
Source: Self development chart based on theoretical understanding

DISCUSSION

The results of the study suggest that the influence of Artificial Intelligence on modern financial systems goes beyond operational improvement and represents a structural shift in how financial decisions are made. The growing use of AI in fraud detection, credit analysis, and risk management shows a clear movement from intuition-based decision-making to data-driven financial practices. This shift reflects the increasing complexity of financial markets, where speed and accuracy are critical.

The discussion further reveals that AI has changed the way financial institutions interact with customers. Personalized recommendations, automated assistance, and real-time services have improved accessibility and customer satisfaction. Studies and industry insights from McKinsey & Company and the World Economic Forum indicate that such technological adoption also strengthens institutional competitiveness and innovation capacity.

At the same time, the discussion brings attention to the risks associated with excessive reliance on AI. Concerns related to data protection, algorithmic transparency, and ethical accountability highlights the need for cautious implementation. Reports from the International Monetary Fund and the Reserve Bank of India underline that effective regulatory oversight is essential to ensure that AI-driven finance remains secure, fair, and stable.

FINDINGS & LEARNING:

The study finds that Artificial Intelligence has become an important part of modern financial systems and is widely used to improve efficiency and accuracy. Financial institutions are increasingly adopting AI for tasks such as fraud detection, credit scoring, risk assessment, and customer service automation. According to insights from the World Economic Forum, AI helps financial organizations process large volumes of data quickly and make informed decisions in real time.

The findings also indicate that AI reduces human error and operational costs while improving customer experience through personalized financial services. Reports by McKinsey & Company suggest that AI-based systems enhance decision-making in lending and investment management. However, the study also observes challenges such as data privacy concerns, ethical issues, and the risk of job displacement. Publications by the Reserve Bank of India emphasize the need for proper regulation to ensure safe and responsible use of AI in finance.

CONCLUSION

This study highlights that Artificial Intelligence has become an integral part of modern finance, reshaping how financial activities are performed in the digital age. The findings show that AI supports faster processing, improved

accuracy, and better management of financial operations, making financial systems more efficient and responsive. Rather than replacing finance completely, AI acts as a supportive tool that strengthens human decision-making.

The study also emphasizes that the impact of AI goes beyond technological advancement. Its adoption influences organizational structures, workforce skills, and regulatory responsibilities. While AI creates new opportunities for innovation and growth, it also demands greater accountability in terms of data protection, ethical use, and transparency. Insights from institutions such as the World Economic Forum and the International Monetary Fund suggest that balanced integration is essential. In conclusion, Artificial Intelligence will continue to shape the future of finance, and its effective use depends on responsible implementation, skilled human oversight, and strong regulatory frameworks.

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Result Analyzer and Student Performance Predictor (RASPP)

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Abstract

*In modern educational institutions, timely identification of academically at-risk students is essential for improving learning outcomes and reducing failure rates. However, many colleges still rely on manual and post-examination result analysis, which is time-consuming, error-prone, and reactive in nature. This paper presents the **Result Analyzer and Student Performance Predictor (RASPP)**, a machine learning-based academic analytics system designed to analyze student performance data and predict future outcomes before final examinations. The system is developed using React with TypeScript for the frontend, Python FastAPI for the backend, and MySQL for data storage. Machine learning models such as Random Forest and XGBoost are employed, along with an ensemble approach, to achieve high prediction accuracy. Explainable AI techniques are integrated to improve transparency and trust in predictions. Experimental results demonstrate that the proposed ensemble model achieves up to **94% prediction accuracy**, enabling early intervention, data-driven academic planning, and overall improvement in institutional performance.*

Keywords: Educational Data Mining, Student Performance Prediction, Machine Learning, Explainable AI, Academic Analytics.

I. Introduction

Educational institutions generate large volumes of academic data, including examination marks, attendance records, and internal assessment scores. Despite this, result analysis in many institutions remains manual and retrospective, offering insights only after final examinations. Such an approach prevents timely identification of academically weak students and limits opportunities for early intervention.

Recent advances in machine learning and learning analytics have enabled predictive models that can forecast student performance based on historical academic data. These models assist educators in identifying at-risk students, improving retention rates, and enhancing overall academic quality. The **Result Analyzer and Student Performance Predictor (RASPP)** system addresses these needs by providing an automated, scalable, and cost-effective solution specifically designed for educational institutions with limited resources.

II. Objectives of the Study

The objectives of the proposed RASPP system are as follows:

1. To automate student result analysis and minimize manual errors.
2. To predict student academic performance prior to final examinations using machine learning techniques.
3. To identify academically at-risk students at an early stage.
4. To provide role-based analytical insights for administrators, teachers, and students.
5. To enhance transparency in predictions using explainable AI methods.
6. To support data-driven academic planning and improve overall student success rates.

III. Research Methodology

A. Data Collection: The dataset used in this study consists of structured academic records collected from institutional databases. The key attributes include previous semester marks, attendance percentage, assignment scores, mid-term examination results, number of subjects, and semester details.

B. System Architecture: The RASPP system follows a four-layer modular architecture designed for scalability, maintainability, and secure data handling. The overall architecture is illustrated in **Fig. 1**.

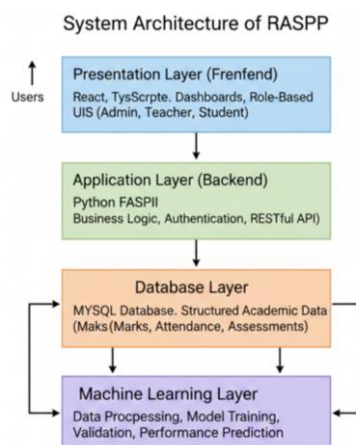


Figure 1: System Architecture of RASPP

The architecture consists of the following layers:

1. **Presentation Layer (Frontend):** Built using React and TypeScript, this layer provides interactive dashboards and role-based user interfaces for administrators, teachers, and students.
2. **Application Layer (Backend):** Implemented using Python FastAPI, this layer handles business logic, authentication, and RESTful API communication.
3. **Database Layer:** A MySQL database is used to store structured academic data such as marks, attendance, and assessment records.
4. **Machine Learning Layer:** This layer performs data preprocessing, model training, validation, and performance prediction.

Data Flow:

User Input → Backend API → Database → Machine Learning Analysis → Prediction Results → Dashboard Visualization.

C. Machine Learning Models

Machine Learning Models and Performance**

Algorithm	Model Type	Key Characteristics	Accuracy (%)
Random Forest	Ensemble (Decision Trees)	Combines multiple decision trees to reduce overfitting and improve generalization	86
XGBoost	Gradient Boosting	Handles complex data relationships efficiently with optimized boosting techniques	88
Ensemble Model (RF + XGBoost)	Hybrid Ensemble	Combines strengths of Random Forest and XGBoost for improved robustness and stability	94

Key predictive features include average score, attendance rate, marks deviation, total absences, and consistency score.

D. Explainable AI

To ensure interpretability and transparency of predictions, the RASPP system integrates SHAP (SHapley Additive exPlanations). The explanation workflow is shown in Fig. 2.

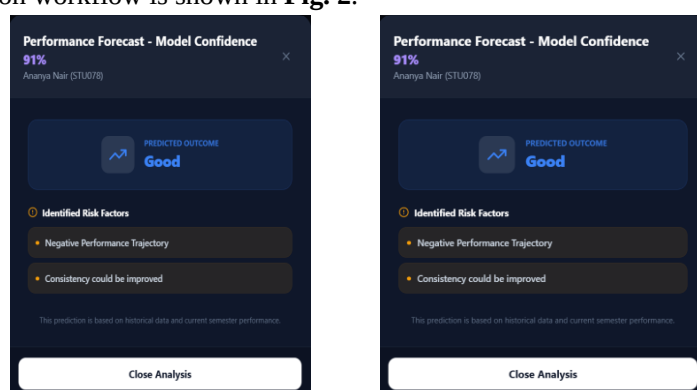


Figure 2: Explainable AI Workflow using SHAP

Input student features are passed to the trained ensemble model, which generates predictions. SHAP values are then computed to quantify the contribution of each feature toward the final prediction, enabling educators to understand why a student is classified as at-risk or safe.

IV. Results and Discussion

The prediction workflow and model evaluation process are illustrated in **Fig. 3**.

Fig. 3. Machine Learning Prediction Workflow

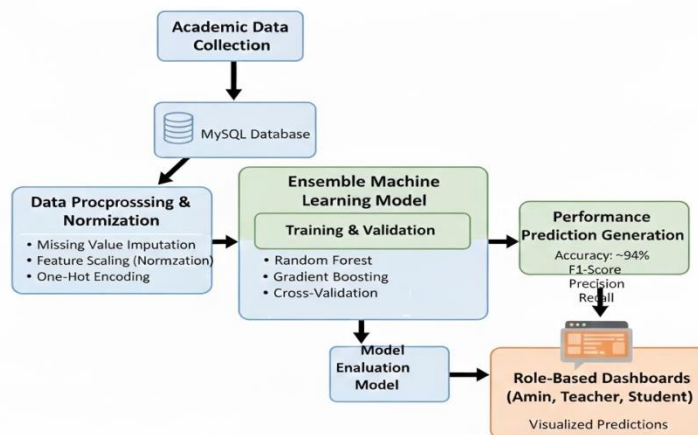


Figure 3: Machine Learning Prediction Workflow

Academic data is collected from the database, preprocessed and normalized, followed by model training and validation. The trained ensemble model generates prediction outputs, which are visualized on dashboards for different user roles.

The proposed RASPP system was evaluated using historical academic data. Experimental results indicate that the ensemble machine learning model outperforms individual models in terms of prediction accuracy and stability. The system achieved an overall accuracy of approximately **94%**, demonstrating its effectiveness in predicting student performance before final examinations.

The visual dashboards provide actionable insights at student, class, and institutional levels. Teachers can focus on students requiring academic support, administrators can monitor performance trends, and students can track their own progress. Compared to existing enterprise solutions, RASPP offers higher customization, explainability, and cost-effectiveness.

V. Conclusion and Future Work

This paper presented the Result Analyzer and Student Performance Predictor (RASPP), a machine learning-based system designed to enhance academic decision-making in educational institutions. By transforming result analysis from a reactive to a proactive process, the system enables early identification of at-risk students and supports timely interventions. The integration of ensemble learning and explainable AI ensures both high accuracy and transparency.

Future work includes extending the system to cover different education levels, incorporating behavioral and engagement data, and improving prediction accuracy through advanced deep learning models.

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Impact of Digital Currency in the Financial System

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Abstract:

The research analyses the impact of digital currencies on the financial system, addressing volatility, market dynamics, and correlations with traditional economic indicators. It notes significant fluctuations in major crypto currencies like Bitcoin, Ethereum, and Ripple, highlighting their speculative risks but also suggesting that they may serve as alternatives to traditional safe havens like gold during high inflation. Furthermore, the study emphasizes the potential benefits of Central Bank Digital Currencies (CBDCs) in enhancing global financial stability and accessibility. Positive sentiment for digital currencies is noted, despite concerns regarding volatility, environmental impacts, and regulatory uncertainties. The research also examines the relationship between cryptocurrencies and fiat currencies, exploring demographic and regional variations in the adoption of digital currencies and CBDCs, and offers insights valuable for policymakers, investors, and financial analysts.

Keywords: Digital Currency, Cryptocurrency, Bitcoin, Financial System, CBDC, Market Volatility, Financial Inclusion.

Introduction

The term "currency" refers to all forms of money used within a specific country or economic region, including both physical money (coins and banknotes) and digital representations. Currency serves three primary functions: as a medium of exchange to facilitate transactions, a unit of account providing a standardized measure for pricing, and a store of value that preserves purchasing power over time. Central banks regulate the supply, value, and stability of currencies, ensuring economic stability and supporting trade and investment. The characteristics of currencies include portability, durability, and standardized units, which ease the process of conducting transactions and allow for comparisons of value across various products and markets. The study of currencies, their values, and roles in the global economy is central to economics and finance.

The concept of digital currency represents a significant shift from traditional forms of money, introducing a new era in the financial landscape. Digital currency, often referred to as cryptocurrency when employing cryptographic techniques, is a decentralized, digital medium of exchange. Unlike physical currencies such as coins or banknotes, digital currencies exist exclusively in electronic form and rely on cryptographic protocols for secure transactions.

Literature review

Halaburda and Gans (2015) explore digital currencies issued by internet platforms, asserting they enhance user experiences rather than compete with state currencies. They highlight potential legal challenges and the necessity for more research. Buterin (2013) seeks to evolve Ethereum as a decentralized platform for dApps and smart contracts, addressing Bitcoin's limitations. Bheemaiah (2018) discusses Ethereum's disruptive potential on traditional finance and fiat currencies. Yermack (2019) investigates cryptocurrencies' roles in financial markets, showing they may threaten fiat stability. Cimoli et al. (2020) analyze Ponzi schemes utilizing smart contracts in the Ethereum ecosystem. Bolliger (2019) addresses stablecoins, noting regulatory needs amid their benefits for the underbanked. Casey et al. (2018) outline blockchain's promise and challenges, advocating for policy frameworks to foster innovation. Beneki et al. (2019) examine Bitcoin and Ethereum's volatility, revealing diminishing diversification opportunities. Celeste et al. (2020) assess cryptocurrency price dynamics, identifying fading long-term memory in Bitcoin. Mavale and Jhosale (2018) project the stability of Bitcoin, Ethereum, and Litecoin, emphasizing Bitcoin's growth potential and Ethereum's diverse prospects. Mani and Zhang (2021) study cryptocurrency and gold.

Correlations during COVID-19, finding significant volatility influenced by market behavior. Cryptocurrencies like Bitcoin and Ethereum are gaining prominence in the global financial market, prompting the academic community to explore their societal and economic impacts. A study by Hemantha (2021) categorizes factors influencing cryptocurrency

adoption using the Push-Pull-Mooring (PPM) framework, identifying push, pull, and mooring factors that either encourage or hinder adoption. Yilmaz and Hazar (2018) analyze investor decision-making regarding cryptocurrencies, highlighting profitability as the most significant aspect, while noting that anonymity is of lesser concern. Pierro and Rocha (2019) investigate Ethereum transaction fees, revealing that pending transactions and miner counts significantly affect costs. Auer et al. (2021) discuss improving cross-border payments through multi-CBDC frameworks, stressing the importance of international cooperation. Research on Central Bank Digital Currencies (CBDCs) by Nández Alonso et al. (2021) and Infante et al. (2022) underscores the potential benefits and risks of CBDCs, while Bijlsma et al. (2021) find that Dutch consumers show openness to CBDC accounts, influenced by trust and privacy concerns.

Research methodology

Research methodology encompasses systematic approaches to planning, conducting, and interpreting research. This study investigates the multifaceted impacts of digital currencies on the financial system across four dimensions: 1) Financial Stability, analyzing volatility, cybersecurity, and integration into existing infrastructures; 2) Regulatory Environment, evaluating existing frameworks and international standards; 3) Consumer Adoption and Behaviour, exploring trust factors and payment preferences; and 4) Financial Inclusion, assessing the role of digital currencies in providing access to financial services for underserved populations.

Research design is the strategic framework guiding study execution, from data collection to analysis. It is shaped by research goals, question nature, available resources, and researcher preferences, with typical designs including experimental, quasi-experimental, correlational, descriptive, exploratory, and mixed-methods. For this study, a mixed-methods design is chosen, integrating qualitative and quantitative approaches to analyze the impact of digital currency on the financial system. This method combines numerical data depth with qualitative contextual richness, effectively addressing five objectives ranging from systemic risks to macroeconomic implications. The integrated analysis reveals trends through statistics and stakeholder perceptions, exploring the complexities of digital currency's effects on finance.

Objectives of the study

1. To identify the different influential parameters of digital currency in the market.
2. To identify the impacts of digital currency on fiat currency.

1. Data analysis and interpretation:

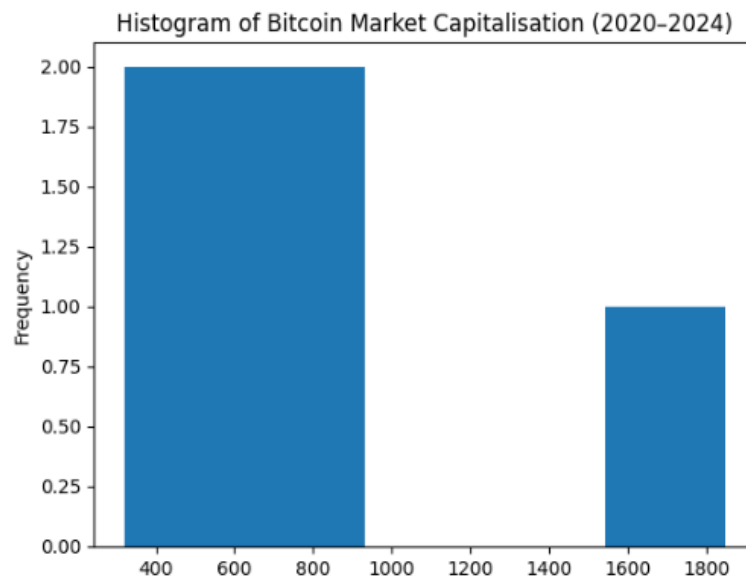
Bitcoin Market Capitalization (2020–2024)

Year	Market cap (USD)
2020	\$539,051,138,107.79. (CoinMarketCap)
2021	\$875,939,356,678.78. (CoinMarketCap)
2022	\$318,516,317,872.24. (CoinMarketCap)
2023	\$827,811,209,384.41. (CoinMarketCap)
2024	\$1,850,264,551,569.93. (CoinMarketCap)

1.1 Bitcoin Market Capitalization (2020–2024)

Interpretation:

- Bitcoin's year-end market cap **fell sharply in 2022**, then recovered strongly in 2023 and surged to a much higher level by end-2024 — hence the large range and high standard deviation.
- The **mean (~\$882B)** is pulled up by the very large 2024 value; the **median (~\$828B)** better reflects the central tendency for these five-year-end snapshots.
- The **CAGR ≈ 36%** reflects the strong multi-year growth from end-2020 to end-2024, but this masks substantial year-to-year volatility.



1.2 Histogram of Bitcoin Market Capitalisation (2020-2024)

Interpretation:

The histogram reveals a positively skewed distribution of Bitcoin's market capitalisation, reflecting significant volatility with occasional extreme growth values.

The descriptive statistics of Ethereum's market capitalization for the period 2020 to 2024

Year	Market Capitalisation (USD Billion)
2020	84
2021	440
2022	146
2023	282
2024	480

1.3 Ethereum Market Capitalisation (2020–2024)

Interpretation:

Ethereum's market capitalisation from 2020 to 2024 shows that Ethereum is a **high-growth yet volatile digital asset**. While short-term fluctuations are significant, the long-term trend highlights increasing adoption, technological advancement, and investor confidence, positioning Ethereum as the second-largest and most influential cryptocurrency after Bitcoin.

Age Distribution of Crypto Investors (India 2025)

Age Group	% of Investors
18–25 (Gen Z)	38%
26–35 (Millennials)	37%
36–45 (Gen X)	15%
45+	10%

1.4 Age Distribution of Cryptocurrency Investors in India

1. Regional Crypto Adoption (Example City/Region Shares)

Region / City	% Share of Crypto Holdings
Delhi NCR	14.6%
Mumbai	~12%
Bengaluru	~10%
Pune	~6%
Kolkata	~4%
Tier-2/3 Cities (combined)	~25%

3. Crypto Adoption by Tier of Cities

City Tier	% of Crypto Activity
Tier-1 (Metros)	~25%
Tier-2 Cities	~32.2%
Tier-3/4 Cities	~43.4%

4. Top Used Crypto currencies (India 2025)

Crypto currency	Approx. % Adoption Among Investors
Bit coin (BTC)	69%
Ethereum (ETH)	(Not explicitly % but known #2)
Solana	(rising retail interest)

Finding

The study examines the influence of digital currency, particularly Bitcoin, on the financial system, revealing significant insights into market volatility and capitalization dynamics. Bitcoin's average market capitalization is approximately \$ 329,873, with considerable fluctuations, underscoring its unpredictable nature. The cryptocurrency market, expected to grow, shows Bitcoin maintaining a dominant position, contributing significantly to sector revenue alongside Ethereum, Litecoin, and Ripple. Notably, Bitcoin's volatility has decreased from over 200% in 2014 to below 50% in 2023, with factors such as spot ETF inflows and the Bitcoin halving influencing price movements. The correlation between Bitcoin prices and inflation rates is strong, suggesting its potential as a safe-haven asset during inflationary periods. Similar trends are observed with Ethereum and Ripple, each demonstrating significant volatility and correlations with inflation rates. The complex relationship between cryptocurrencies and macroeconomic factors is highlighted, emphasizing the challenges and opportunities within the market.

Conclusion

In conclusion, In conclusion, the study explores the diverse impacts of digital currencies on the financial system, highlighting aspects such as volatility, market dynamics, and links to economic indicators. It discusses the advantages of Central Bank Digital Currencies (CBDCs) in improving global financial stability and access, while also addressing concerns about volatility, environmental issues, and regulatory challenges. Analysis from 2018 to 2023 shows significant changes in finance due to digital currencies, with cryptocurrencies like Bitcoin, Ethereum, and Ripple exhibiting high volatility and a positive correlation with inflation, suggesting potential use as inflation hedges. Their adoption promotes financial inclusivity and disrupts traditional banking, despite ongoing challenges like regulatory uncertainty and the need for robust technological support. A balanced approach is essential to harness digital currencies' benefits while mitigating volatility, security, and compliance risks.

Suggestions:

- Enhance regulatory clarity by developing consistent frameworks for digital currencies, including guidelines on taxation, AML practices, and consumer protection.
- Promote financial inclusion through digital currencies to reach underserved and unbanked populations via digital wallets and low-cost remittance services.
- Strengthen security measures with robust protocols, including advanced encryption, two-factor authentication, and regular security audits.
- Educate the public and businesses about digital currencies through comprehensive campaigns emphasizing their benefits, risks, and responsible usage.
- Foster innovation and competition in the digital currency sector by supporting startups and established companies in exploring new blockchain applications.
- Monitor and analyze market trends in digital currencies to inform policy and investment decisions.
- Address environmental concerns by supporting the development of energy-efficient blockchain technologies to mitigate environmental impacts.
- Prepare for technological integration by investing in the required infrastructure such as payment gateways and blockchain platforms.
- Adapt to changes in consumer behavior by offering digital currency options in payments and financial services.

- Collaborate internationally to harmonize digital currency regulations, standards, and practices to facilitate cross-border transactions and reduce fraud.

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Reel Culture in the Digital Age and Its Impact on Productivity and Mental Well-Being among Rural Students: A Focus on Shirpur Region.

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Abstract

Video shorts like Instagram Reels, YouTube Shorts and other similar applications have entered the lives of students in the digital age as an ordinary element of their daily routines. In rural students in Maharashtra, especially in Shahpur area, easy access to smart phones and cheap internet has greatly enhanced reel culture exposure among students. Although these sites provide entertainment, creativity, and access to information within a short period of time, their excessive use has been a concern on why they affect the productivity and psychological health of students. This paper examines how the reel culture affects academic performance and psychological well-being of rural students particularly in Shirpur Region. It analyzes the trends of reel use and their impact on time management, concentration, studying behaviours, level of stress, anxiety, sleep quality and attention span. The study involves the use of structured questionnaire and interaction with the students to capture the behavioural and emotional reactions to reel consumption. The results show that the persistent and frequent exposure to reels is accompanied by low academic attention, and mental indicators of stress and disrupted sleep. Simultaneously, students do not deny such positive effects, as relaxation and temporary stress relief. The paper shows an increased demand to provide rural students with digital awareness, self-regulation, and mental health programs. It insists that to improve productivity and protect the mental health of students during the digital age, responsible and balanced involvement into digital life is a necessity.

Keywords: Digital Distraction, Reel Culture, Productivity, Video Platforms, Mental Well-Being.

1. Introduction

The advent of the digital revolution has greatly revolutionized how students learn, interact and access entertainment. Short-form video platforms like Instagram Reels, YouTube Shorts, and other other applications have become insanely popular with young learners in recent years due to their time-efficient content, followed by engaging and visually appealing information. They provide instant gratification and hence they are especially appealing to young people of the present day.

In the rural areas such as Shirpur in Maharashtra, the high rate of smartphone adoption, low-cost internet providers and the more accessible digital world have transformed reel-based content into a normal aspect of the life of students. Where it was once only city folk who were exposed to it, it has now become an inherent part of the culture in rural youth and has permeated their lifestyle, their learning behaviours as well as their social interactions.

Although reel culture has a number of good sides that include creative expression, access to information, peer learning and reduction of stress, the unchecked and over indulgence in its use has led into serious concern. The constant scrolling and a lot of time using the screen are usually regarded as factors that result in lower academic productivity, lower concentration levels, procrastination, and time mismanagement. Students can become even more unable to concentrate on the academic activity, to listen to lectures, and to deepen their learning process. In addition, over exposure to reel-based material might cause a bad influence on the mental state of students. Mental fatigue, anxiety, stress, restlessness, sleep disturbances as well as addiction-like behaviour are all issues that are beginning to be reported more and more among young users. The perpetual urge to be stimulated, to receive immediate gratification may decrease the attention span and influence emotional control particularly in the students whose minds are still in their developmental phase.

Rural students might be susceptible to these difficulties especially because of having little digital literacy, no organized teaching, and less knowledge regarding healthy screen-time habits. In most rural areas, institutions programs or parental programs are less to teach students responsible use of digital and its long-term impacts.

It is, thus, necessary to critically analyze the effect of reel culture on academic efficiency and psychological health of the rural students with particular reference to the Shirpur region. Knowing the engagement tendencies, behavioural shifts and the psychological reactions of the students, it is possible to locate the possible dangers alongside the chances of

positive digital utilization. The results of this research will be expected to aid educational planning, digital awareness campaigns, and policy suggestions to support responsible and moderate use of the reel-based social media materials by the rural youth.

2. Literature Review: literature review followed in tabular format.

Researcher & Year	Key Findings	Challenges Identified	Recommendations	Adopted Research Methodology
Kaur & Singh (2020)	Excessive use of short-form video platforms reduces students' attention span and academic focus.	Addiction to social media, distraction during study hours.	Promote digital awareness programs and time-management skills.	Survey method using structured questionnaire
Sharma (2021)	Social media overuse negatively affects academic performance and sleep patterns among youth.	Poor concentration, procrastination, mental fatigue.	Encourage balanced screen time and parental monitoring.	Descriptive research with primary data
Patil & Deshmukh (2021)	Rural youth are increasingly influenced by mobile-based entertainment platforms.	Lack of digital literacy and guidance in rural areas.	Introduce digital literacy and counselling sessions in rural institutions.	Questionnaire-based empirical study
Reddy et al. (2022)	Short-form videos provide instant gratification, leading to reduced deep learning ability.	Shortened attention span and dependency behaviour.	Integrate mindful usage practices and academic engagement strategies.	Quantitative research using Likert scale
Mehta & Joshi (2022)	Excessive social media usage is linked to anxiety and stress among students.	Mental health issues, restlessness, emotional imbalance.	Awareness on mental well-being and responsible digital behaviour.	Survey and statistical analysis
Kamble (2023)	Rural students spend significant daily time on reels and short videos.	Time mismanagement and academic distraction.	Structured guidance from educational institutions.	Primary data collection through questionnaires
Gupta & Verma (2023)	Reel-based content impacts students' productivity more than traditional social media platforms.	Reduced academic engagement and focus.	Promote educational content and controlled usage.	Cross-sectional survey method
Chavan (2024)	Continuous scrolling behavior affects mental well-being and study habits of students.	Addiction-like symptoms and reduced self-control.	Digital detox programs and self-regulation techniques.	Descriptive and analytical research design

2. Statement of the Problem

Although reel culture has increasingly gotten its way into the lives of students, there has been limited data driven research on how the culture affects productivity and mental well-being of rural students in Shirpur region. The generation are spending a considerable amount of time in the consumption of reels at the expense of academic concentration, sleep and emotional stability.

Students, parents and teachers are ignorant about the psychological health and the academic effects of excessive reel intake. This paper aims at providing a solution to the research gap by examining the trends in reel application and its implications on productivity and mental health of rural learners and hence coming up with informed policy-level and academic interventions.

3. Objectives of the Study

1. To understand the level of Student engagement with reel culture.
2. To study the effects of reel culture on Students Academic productivity
3. To study the effects of reel culture on mental well-being of students.
4. To suggest recommendations for responsible use of reel-based culture.

6. Scope of the Study

The research is restricted in such a way that it is limited to rural students who study UG/PG degree programs such as BCA, MCA, BBA and BMS in Shirpur. It concentrates on the effects of reel culture on productivity and mental health in particular and does not elaborate on other types of social media usage. The results will be used to impact the education sector, parents, counsellors and decision-makers in the rural education and development of students.

7. Research Methodology

The research design used in the study is descriptive and analytical. It will be a mixed-method study with the combination of quantitative and qualitative methods.

Students of undergraduate (UG) and post graduate (PG) courses on BCA, MCA, BBA, and BMS at rural colleges in the Shirpur area were targeted by the present study. My sample questioner is made after interviewing 11 students in various courses and depending on how they responded. A random sampling technique was used to select the students based on their availability and willingness to get involved in the study. A total of 133 students were used as respondents.

Data Collection Tools

- Structured questionnaire
- Informal interviews / focused discussions

Sources of Data

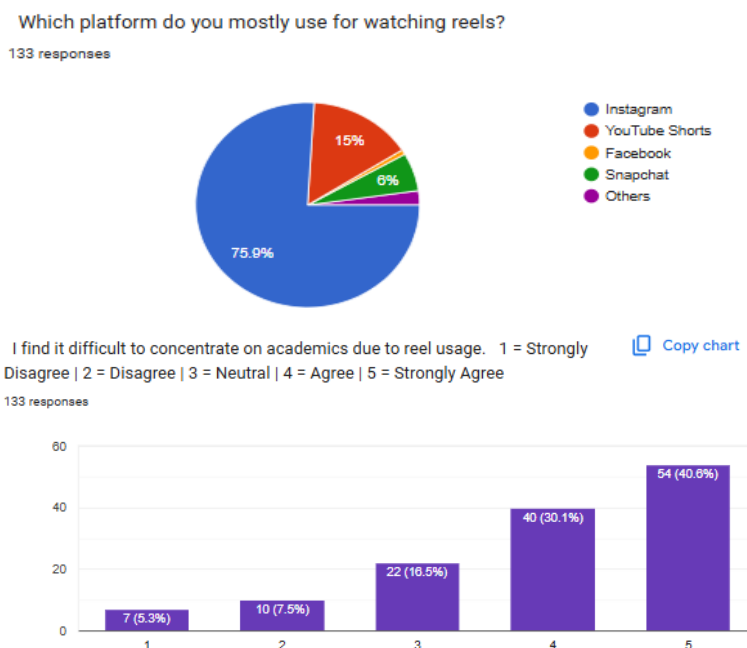
- **Primary Data:** Collected through questionnaires and student interactions
- **Secondary Data:** Research papers, journals, reports, books, and online sources.

9. Limitations of the Study

- The study is limited to the Shirpur region and may not represent all rural areas of Maharashtra.
- Responses are based on self-reported data, which may involve bias.
- The study focuses only on reel culture and not on all social media platforms.
- Time and accessibility constraints may limit in-depth qualitative analysis.

11. Findings:

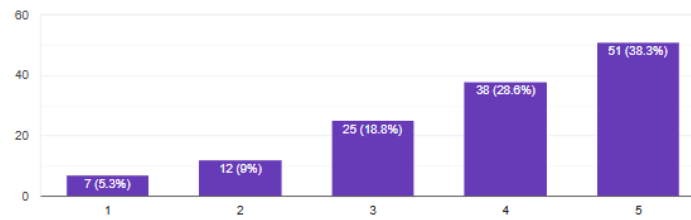
- Students spend a 48% time on reels every day.
- Excessive reel watching reduces study time and concentration.
- Reel culture affects students' productivity negatively.
- Many students experience stress, anxiety, and sleep problems.
- Comparison on social media affects students' self-esteem.
- Lack of awareness increases the negative impact of reel culture.



My academic productivity has decreased due to excessive reel consumption

[Copy chart](#)

133 responses

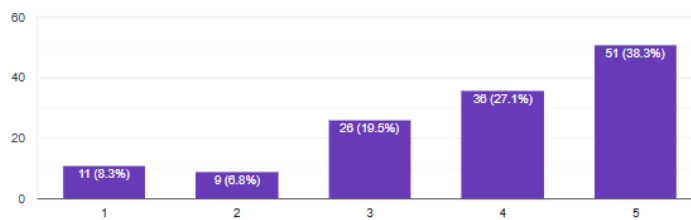


Mental Wellbeing

I feel mentally tired after watching reels for a long duration (1 = Never | 2 = Rarely | 3 = Sometimes | 4 = Often | 5 = Always)

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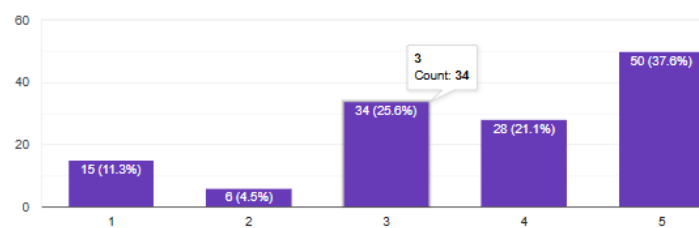
133 responses



I feel anxious when I am unable to access social media. (1 = Never | 2 = Rarely | 3 = Sometimes | 4 = Often | 5 = Always)

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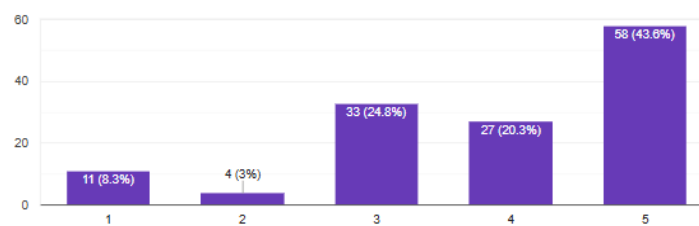
133 responses



My sleep pattern is disturbed due to late-night reel watching. (1 = Never | 2 = Rarely | 3 = Sometimes | 4 = Often | 5 = Always)

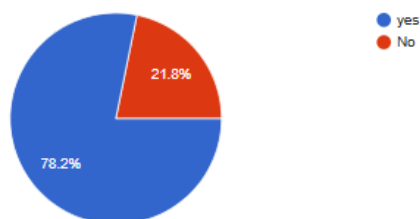
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133 responses



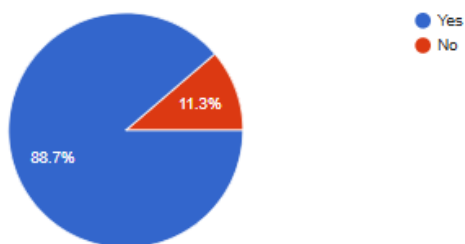
I feel the need for guidance on healthy digital usage.

133 responses



Educational institutions should conduct awareness programs on digital well-being

133 responses



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Freshwater Pearl Farming in the Era of Sustainable Aquaculture

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Abstract

Indian economy is primarily an agrarian based predominantly placed by monsoon rainfall; to which farming households are subjected to the vagaries of climate, crop loss and income volatility. Agrarian distress in the country has been accentuated by back-to-back droughts and uncertain monsoons too. This study seeks to examine freshwater pearl production as a sustainable and an alternate livelihood for farmers with agriculture in question. Pearl culture Pearl culture is a low land use high value addition enterprise and can be dovetailed with crop based farming systems without displacing the major food crops viz., wheat, bajra, maize and rice.

The findings indicate that pearl farming plays a complementary role in income, ameliorates reliance on monsoon rains and supports livelihood resilience. The paper underscores the necessity for policy intervention, training and institutional tie-ups for promotion of pearl farming in rural areas. The article comes to the hypothesis of pearl farming as means of livelihood diversification for rural development in India.

Besides supplementing income, freshwater pearl culture helps in judicious utilization of marginal water bodies like farm ponds, tanks and village reservoirs. It occupies a small area and can be combined with traditional agriculture, thus bringing food security as well as cash income. It also provides employment at household level, to the farmers in particular, women and rural youth through mussel maintenance, seeding operation and post-harvest handling.

The findings also show that the livelihoods of farmers engaged in pearl farming are less sensitive to climate and weather risks since they have income diversification and therefore reduced dependency on rain-fed crops. Small pearl farming units are economically viable with moderate investment costs and high returns; this can be suitable for small and marginal farmers. Integration of pearl farming with agriculture enhances overall farm resilience and promotes sustainable management of natural resources.

Keyword Words: Cocoon Culture, Maharashtra; Pearl Farming; Livelihood Diversification; Sustainable Agriculture; Rural Development and Agrarian Distress Introduction ;Maharashtra has been facing the problem of agrarian distress.

Introduction

India is primarily an agrarian economies due to which major population of the country still rely on farming for their living. Since agricultural yields are directly related to the performance of monsoon, it also makes agriculture very sensitive to variability in rainfall and climate change. Farmers throughout the country are confronted with problems ranging from irregular rainfall patterns, water scarcity problems, decreasing soil fertility to erratic market prices. There is particular vulnerability among small and marginal farmers with crop failures leading to financial insecurities and indebtedness. The vulnerability of Indian agriculture to climatic and economic uncertainties highlights the urgent need for livelihood diversification.

As reflected in a traditional Marathi proverb, “एक पायावर उभं राहणं धोक्याचं, अनेक पायांवर उभं राहणं शहाणपणाचं,” reliance on a single source of income is risky, whereas adopting supplementary activities such as freshwater pearl farming strengthens livelihood resilience.

Withering away of rural livelihoods has been one of the strategies to tide over agrarian crisis. Allies farming (recipes), including fish, provide potential alternative sources of income. Pearl farming is a type of freshwater aquaculture and the way pearls are formed in molluscs under controlled condition. It can use smaller water bodies such as farm ponds and tanks, which is in favour of areas where land resources are not enough. Pearl farming promises high price per unit product, generation of employment, and potential for joint implementation with other farming systems. Pearl farming Pearls have the potential to serve as a sustainable livelihood option for the poor farm families in India, centred on economic viability; socio-environmental benefits and policies supporting these operations. Despite its potential, freshwater pearl farming remains underexplored as a livelihood diversification strategy in many parts of India.

Problem Statement

Indian farmers have enduring livelihood insecurity because of reliance on monsoon, deficient irrigation; input prices increase and market volatility. Crop failures and meagre incomes frequently lead to alienation, or indebtedness and economic stress. Limited knowledge and uptake of other income generating activities as a result of lack of skills training and extension support. There is a requirement of near sustainable and region-specific source livelihood options that can provide piggy back to the traditional farming systems in India and can help in reducing agrarian vulnerability in different parts of India.

Objective of Study:

- To study the freshwater pearl farming as an alternative of livelihood for the farmers who are subject to climatic variability and vulnerability of traditional cultivation in India.
- To learn how pearl farming can integrate with established agriculture systems rather than displace food crop production.
- To assess the income-generation potential of small-scale pearl farming units and investigate their role in enhancing household-level economic security.
- To investigate perception, experience and constraints of water pearl adoption by the farmers.
- To examine the role of pearl farming in livelihood diversification and resilience with special reference to small and marginal families.
- To determine the role of training, administrative back-up and policy support in the sustainability of pearl farming.
- To assess the larger implications of freshwater pearl farming for sustainable rural development, employment generation and more durable agrarian stability in India.

Research Methods

The research is designed as a mixed-methods study.

Direct Data: Field Visit and structured interview of the pearl farmers in different states practicing of Pearl farming; Pre-testing at pilot pearl farm. Interviews were semi-structured; the semi-structured interview has a pre-designed interview schedule with closed and open-ended question. Questions included those related to time of investment, production cycle, survival rate of mussels and income earned as well as difficulties experienced in seeding/management and training or institutional support received.

Secondary Data: Government reports, academic literature and above all ICAR, CIFA publications and policy document on aquaculture rural development were reviewed.

Methods of analysis: Qualitative description of farmers' perceptions and constraints; back-of-the-envelope cost-benefit analysis to determine the economic viability of pearl farming. Qualitative description involved documenting farmers' experiences, perceptions and challenges related to freshwater pearl farming, including views on income stability, risk reduction, labour requirements and market access. Farmers' narratives were used to understand how pearl farming fits within existing agricultural practices and household livelihood strategies.



Results

Results the study, in general, holds a promising picture of pearl farming to be developed as an alternative livelihood to the farmers throughout India. Farmers that have introduced pearl culture in other traditional mean of subsistence for example cropping, reported as increased income diversification and less sensitive to climatic risk.

Example 1: Income Specification: The focus group interviews indicated that most of the farmers experienced income smoothing after they have adopted freshwater pearl farming. Most of the farm operators indicated that pearl farming was an additional income source, and accordingly, their dependency on monsoon-based crop cultivation had decreased.

Example 2: Challenges: Farmers noted difficulty in technical knowledge for sowing operations and constraint at getting organized markets. However, these limitations were claimed to decrease progressively with experience and the aid of training.

Example 3: Training & Support: The survey also showed that farmers with institutional training achieved better mussel survival and greater pearl production than those without such training.

Example 4: Labor and Employment: This showed that household has previously been employed in pearl farming which have helped to create a favorable employment opportunity at the household level. Women and rural youth were highly involved in day to day maintenance activities, reflecting inclusive involvement in livelihood enhancement. The cycle of production varied from 12-18 months. Pearl farming was a type of cultivation that had moderate dependence



Cost Structure for 1,000 Pearl Farming Project:

1	Thickness for tying mussels	RS.500/	5	Plastic cord	RS.500/
2	To make seeds	RS.500/	6	Surgical instrument	Rs.8000/-
3	Die (mold)	Rs.2000/-	7	10 by 10 cement tank	Rs.25000/-
4	To collect mussels	RS.500/	8	Other minor expenses	Rs.2000/-

Profit Calculation Of 1000 Mussels

In a space of about 10x10 ft., you can grow approximately 1,000 oysters.” Six hundred live oysters, even at 60% yield will generate 1,200 pearls (2 per oyster). 1 pearl, in today's prices somewhere around 100.

So, $1,200 \times 100 = 1,20,000$ income.

The net profit comes to about 82,200 (1,13,000 minus 31,800).

Discussion

Pearl culture provides promising alternative for livelihood diversification to reduce the rain fed dependency and ranching of farm incomes in India. Farm ponds and other small water bodies contribute to the equitable use of available water. Socially, pearl culture it offers potential for the small and marginal farmers, women and rural youth with the prospects of skill development and employment generation.

We face challenges involving technical knowhow, cost of inputs and market network. Policy support under schemes such as Pradhan Mantri Matsya Sampada Yojana (PMMSY), Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) and support from agricultural extension services are critical for enhancing the scale of pearl farming throughout India.

Case Example: Pearl Farming in Andhra Pradesh

A pilot project on pearl farming in Andhra Pradesh has shown that, the farm impact was good and profitable as farmers successfully earned additional income working with farm ponds in parallel to paddy cropping. In a single

production cycle, participating farmers reported higher household income and lower reliance on seasonal rainfall, demonstrating the enterprise's replicability across India.

Policy Linkages and Solutions

- Some of the objectives and functions are as follows: A. To support 'pearl culture' in India:
- Bring in pearl farming under PMMSY and state aquaculture schemes.
- Training and capacity building to be conducted through KVKs and ICAR institutions.
- Provide access to funding through incentives, credit and cooperative schemes.
- Enhance market and value chain connections for pearls.

Conclusion

Pearl farming is a sustainable and climate resilient vocation for farmers in various parts of India. Such diversification of livelihood sources and lesser reliance on rainfall can help reduce agrarian distress as well as provide an alternate source of rural income. With adequate training, institutional support and policy backing, pearl farming has the potential to be scaled across diverse agro-climatic regions of India. With conducive policy framework, training and institutional linkage, pearl farming can be incorporated into the agricultural development strategy in India for the benefit of millions of small and marginal farmers throughout the country.

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Cloud Computing Adoption and Its Business Benefits

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Abstract:

Cloud computing has become a critical enabler of digital transformation and strategic competitiveness in contemporary organizations [1] [4]. This study examines the adoption of cloud computing and evaluates its impact on business performance and managerial decision-making. Cloud computing allows firms to provision computing resources such as infrastructure, platforms, and software on a demand-driven basis, eliminating the limitations of traditional on-premises systems [5]. From a management perspective, cloud adoption supports cost optimization by converting capital expenditure into operational expenditure, while also enabling scalability, flexibility, and improved resource utilization [2]. Access to advanced analytics and information systems through cloud platforms enables managers to make faster and more informed decisions [3]. The findings indicate that cloud computing adoption functions as a strategic management initiative that enhances operational efficiency and long-term organizational sustainability.

Keywords: cloud computing, digital transformation, business benefits, scalability, cost efficiency, organizational performance.

Introduction:

Rapid advancements in information technology have significantly transformed the way organizations operate and compete in global markets. Cloud computing has gained widespread attention due to its scalable, flexible, and cost-effective computing capabilities [1]. Cloud computing refers to the delivery of computing services over the internet, allowing organizations to access resources on demand rather than maintaining costly on-premises infrastructure [5].

The adoption of cloud computing has accelerated due to globalization, competitive pressure, and the growing need for digital collaboration. Organizations use cloud technologies to enhance operational efficiency and support innovation [4]. From a management perspective, cloud computing enables better resource utilization and improved alignment between business strategy and information systems [3].

Role of Cloud Computing in Business:

Cloud computing plays a significant role in modern business by enabling organizations to access scalable and cost-effective IT resources without heavy capital investment [2][5]. It supports business agility by allowing firms to rapidly scale operations, adopt new technologies, and respond effectively to market changes [1]. Cloud-based systems enhance managerial decision-making through real-time data access, improved collaboration, and integrated information systems [3]. Furthermore, cloud computing contributes to improved operational efficiency and competitive advantage by aligning IT capabilities with business strategies [5].

Research Problem Statements:

1. There is limited understanding of the strategic and managerial significance of cloud computing adoption in organizations.
2. Organizations face challenges in identifying the key factors that influence successful cloud computing adoption and the realization of business benefits.
3. The impact of cloud computing adoption on organizational performance and managerial decision-making is not clearly defined.

Objectives of the Study:

1. To understand the concept and significance of cloud computing adoption in organizations.
2. To identify the key factors influencing cloud computing adoption and its major business benefits.
3. To analyze the managerial and strategic implications of cloud computing adoption for organizational performance.

Findings of the Study:

The study finds that cloud computing adoption significantly enhances organizational efficiency by reducing infrastructure costs and enabling scalable and flexible resource management [2]. Factors such as cost optimization, scalability, ease of access, and top management support play a crucial role in influencing adoption decisions [4].

Additionally, cloud computing positively impacts managerial decision-making and strategic planning by providing real-time access to information and improved collaboration [3].

Conclusion:

The study concludes that cloud computing adoption is a critical enabler of organizational efficiency and strategic agility. Cloud-based infrastructures support cost optimization and scalable resource utilization [2][5]. Managerial support and technological readiness are key determinants of successful cloud adoption [4]. Furthermore, cloud computing enhances managerial decision-making through timely and accurate information availability [3]. Overall, cloud computing should be regarded as a strategic IT capability contributing to sustained organizational performance and competitive advantage [1].

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Educating for Skills and Employability -The Role of NEP 2020 in Enhancing Employability in Higher Education

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Abstract

The improvement of employability has become a key issue of higher education systems, especially in the third world economies where graduate unemployment and skills mismatch remains a significant issue. In India, although there has been massive growth in the area of higher learning, issues on job preparedness and industry relevance are still eminent. National Education Policy NEP 2020 is a detailed policy reaction to these issues and challenges, which intends to incorporate skill development, experiential learning, multidisciplinary education, and industry partnership into higher education. The current paper is a policy-based review on NEP 2020 in particular in relation to the enhancement of employability in institutions of higher learning. The study relies on Primary and secondary data sources, including policy documents, academic literature, government reports, and institutional guidelines, to study major provisions of NEP 2020 related to employability and explore their possible implications of the research to the realm of governance and implementation of higher education. The results suggest that although NEP 2020 offers a solid framework of enhancing employability by means of flexibility of the curriculum, vocational exposure and industry involvement, positive results are conditional upon the institutional preparedness, capacity building of the faculty staff, and effective governance. Policy-level recommendations to enhance employability outcomes are also presented at the end of the paper to close the skills-workforce mismatch between higher education and industry needs.

Keywords – Employability, NEP 2020, Higher Education, Skills.

Introduction

Employability of graduates has become one of the most important indicators of effectiveness of higher education systems. In today globalization, technology and dynamism in the labor market, institutions of higher learning are increasingly being pressured to not only deliver graduates who are academically sound, but also with appropriate skills, flexibility, and work preparedness. In India, although the number of universities and colleges has grown significantly, graduate unemployment and underemployment has been a problem.

Employability is described as a set of know-how, skills, attitudes and competencies which helps an individual to acquire a job and flourish in his or her career. The Indian traditional higher education models have been criticized as mostly being theory based, with little exposure to the industry and poor connectivity with the work market needs. Consequently, most graduates do not have the practical as well as the soft skills that are needed by employers.

The National Education Policy (NEP) 2020 has been a major change in the education sector in India as it focuses on holistic development, learning through skills, multidisciplinary learning and integration with industries. The policy sees higher institutions of education as providers of employability and lifelong learning. The current paper aims at critically reviewing NEP 2020 in terms of employability enhancement and its policy provisions, governance implications, and challenges of Implementation.

Conceptual Framework of Employability and Higher Education -

The concept of employability in higher education is extensively interpreted as a multidimensional term referring to subject knowledge, technical skills, soft, adaptability and professional ethics. Literature indicates that employability is not simply about immediate employment, but about sustainable employment through the career and constant skills upgrade.

Higher education is a key factor in influencing the impact of employability through alignment of the program to the needs of the industry, nurturing of experiential learning, and promotion of innovation and entrepreneurship. The policy

interventions are especially essential in developing nations where structural bottlenecks tend to restrain the adaptability of the learning institutions to the market forces.

NEP 2020 embraces this extended concept of employability through prioritizing outcome-based learning, building skills, and exposure to real-world activities. The policy elevates higher education as a source of economic development and social movement and labor preparedness.

3. Research Problem -

The policy intent and its translation to the employability outcomes are a major concern even with the progressive vision of NEP 2020. The issues of graduate unemployment, skills mismatch, and industry involvement still plague the institutions of higher learning in India. Although NEP 2020 contains a number of employability-promoting changes, few coherent analyses are devoted to these changes with the view of policy analysis.

The research problem that the study will focus on in this study is the absence of systematic policy-based analysis on how NEP 2020 is aimed at improving employability in higher education and the governance issues that can influence its practice. As these dimensions will help evaluate the effectiveness of the policy, as well as areas that need institutional and regulatory support.

Review of Literature

The literature on higher education and employability is facing increasing challenges of skills mismatch among graduates and the industry. Policy studies emphasize how national education reforms can resolve the problem of employability when redesigning its curriculum, and through experiential learning and integrating with industry. The literature concerning the National Education Policy (NEP) 2020 is centered on the revolutionary next-generation vision of higher education of the country through multidisciplinary learning, flexibility, skill growth, and lifelong learning. There is, however, a lack of research that offers a unified review of policies in connection with NEP 2020 propositions directly to the outcomes of employability improvement. Thus, it is critical to conduct an organized part of the literature review in order to see how NEP 2020 intends to eliminate the employability gap in higher education.

Author(s) / Source	Focus Area	Key Findings / Insights	Relevance to Present Study
World Economic Forum (2018)	Skill gap and future workforce	Points out key skill sets like problem-solving, communication, and adaptability as crucial for employment needs of the future marketplace	Emphasizes importance of skill-driven reforms discussed under NEP 2020
OECD (2019)	Education policy and employability	Places great emphasis on experiential learning, vocational training, and collaboration with industry to increase readiness for entering the workforce	Supports policies adopted in the NEP 2020
Ministry of Education, Government of India (2020)	NEP 2020 framework	Emphasis is given to multidisciplinary education, flexibility, Academic Bank of Credits, and skill development	Primary policy document for analyzing employability enhancement
Agarwal (2021)	Higher education reforms under NEP 2020	Institutional Autonomy, Curriculum Redesign, and Skill-Based Learning	It gives theoretical support to reforms that focus on employability
Tilak (2022)	Higher education and labor market alignment	It underlines the need for education outcomes to match the demands of the job market.	Strengthens the emphasis on employability in NEP 2020
UNESCO (2021)	Education for sustainable development	Emphasizes learning for life and skills that are transferable in the job market for work	Aligns with the vision of continuous skill development in NEP 2020.

Research Gap –

Although various existing studies describe NEP 2020 in general, relatively less literature is found that presents an in-depth policy analysis related to the enhancement of employability measures. The present study fills that gap as it combines secondary data for analysing the provisions related to employability in NEP 2020.

1. Objective –

1. To understand the concept of employability with regard to higher education.
2. To Study the employment-related initiatives in NEP-2020.
3. To study the skill development and industry linkage strategy adopted by NEP 2020.
4. To identify the critical factors in the implementation of employability reforms.
5. To provide recommendations for a positive employability outcomes in the higher education institutions.

2. Research Methodology –

The current research applies a descriptive research design using a mixed-method approach, which involves both secondary and primary data as part of the investigation of the employability improvement in higher education within the context of the National Education Policy (NEP) 2020.

Primary Data Collection –

As a way to supplement the review of policy, primary data was collected among the two key stakeholder groups, namely the students and the lecturers.

Student data –

Statement No.	Statement	Mean Score	Agreement (%)	Interpretation
1	Awareness of NEP 2020	3.1	45%	Awareness among students is Low
2	Curriculum focuses on skill development	3.0	42%	Weak Skill orientation
3	Adequate practical exposure	2.9	40%	Insufficient Practical exposure
4	Internships helped understand industry	3.1	47%	Effectiveness of internships is Limited
5	Career guidance support available	2.8	38%	Inadequate Career guidance
6	Soft skills training improved confidence	3.0	43%	Minimal improvement in soft skills
7	Industry interaction improved job readiness	2.9	41%	Industry interaction is poor
8	Curriculum flexibility supports skills	3.1	44%	Flexibility is not effectively utilized
9	Confidence about employability	2.9	39%	Employability confidence is Low
10	NEP 2020 will improve job opportunities	3.3	50%	Impact is Uncertain future

b) Observation of Faculty Members (92)

Grounded on interviews carried out among 92 teaching faculty, there appears to be a moderate to low degree of readiness regarding employability-driven transformational changes under NEP 2020. Close to 48% of teaching faculty felt that there was limited awareness regarding details of employability-driven components under NEP 2020. Close to 50% of teaching faculty responded that although NEP 2020 places strong emphasis on skill-based and interdisciplinary education, there is poor translation of this area into practice. Only 44% of teaching faculty felt that there was noticeable improvement in direct experience-based learning areas like internships, projects, and industry interaction

6.2 Secondary Data Collection -

The main sources of the study are secondary data (mainly the NEP 2020 policy document, the reports of the Ministry of Education and University Grants Commission (UGC), and All India Council of Technical Education (AICTE) guidelines, peer-reviewed academic journal articles, and reports of the national and international bodies, i.e., the OECD and the World Economic Forum. These sources were read to comprehend the intent of policies, governance and reforms that were being suggested in the form of employability under NEP 2020. Content analysis and policy review techniques were used to analyse the secondary data to identify the main themes that are associated with the development of skills, experiential learning, industry connection, and employability outcomes.

Findings –

The finding of the study is as follow -

- 1) NEP 2020 lays out a big plan to boost employability in higher education—think more skill-building, hands-on learning, and stronger ties with industry.
- 2) But here's the thing: most faculty only have a moderate understanding of these employability goals. So, the way colleges put NEP 2020 into action is hit-or-miss. Some get it right; others barely scratch the surface.
- 3) Take experiential learning—internships, group projects, time spent in real workplaces. In theory, it's a core part of the policy. In reality, a lot of colleges struggle to make it happen, mostly because they don't have the right infrastructure or enough support.
- 4) The gap between classrooms and real industry work is still wide. Partnerships between colleges and companies remain weak, so students miss out on those practical skills and real-world experience that make a difference when they graduate.
- 5) Faculty also talk about a lack of training and not enough opportunities to build new skills themselves. That makes it tough to shift to teaching methods focused on actual outcomes and competencies.
- 6) On top of all that, colleges run into roadblocks—limited funding, unclear instructions, and tricky administrative systems—all of which slow down progress on employability reforms.
- 7) So, there's a big difference between what NEP 2020 aims for and what actually happens on the ground. The vision's there, but the day-to-day reality still falls short.

Suggestions and Recommendations –

- 1) Institutes and universities really need to run regular faculty development and training sessions. That way, everyone actually gets how to put NEP 2020's employability goals into practice.
- 2) Schools should step up their partnerships with industry. Bring in more internships, live projects, guest lectures, and actually involve industry experts when designing the curriculum.
- 3) It helps to have a clear, structured framework for putting NEP 2020 policies to work in the classroom. Without that, the ideas don't go anywhere.
- 4) Focus more on hands-on, skill-based learning. Make internships and project-based courses a must, not just an extra.
- 5) Regulatory bodies like UGC and AICTE need to step up with enough funding, better infrastructure, and solid administrative support.
- 6) Set up strong systems to track and measure how well students are becoming employable and whether the policies are actually working.
- 7) Finally, keep listening. Use feedback from both faculty and students to keep improving how higher education prepares students for real jobs.

Conclusion –

The paper concludes that the National Education Policy (NEP) 2020 is a forward-looking and holistic policy on how employability can be enhanced in higher education by skill development, experiential learning, multidisciplinary education, and industry collaboration. The policy framework has obviously identified the necessity to ensure aligning higher education outcomes with workforce requirements and future workforce needs to the industry.

According to the results of the research, the introduction of the employability-oriented reforms based on NEP 2020 is limited at the institutional level. Deliberations of faculty and student point to moderate consciousness, lack of practical exposure, poor industry connection and a lack of faculty training pointing to the presence of a very wide gulf between the policy intent and the ground level implementation. Political and resource limitation also limits successful translation of policy goals to academic practices. It is pointed out in the study that enhancement of employability as stipulated by NEP 2020 cannot be made possible by policy development, but it must be implemented systematically, institutional preparedness, capacity building, and constant monitoring.

To achieve the employability targets of NEP 2020, it is important to enhance faculty development, industry-academia partnership, and provision of infrastructural and regulatory assistance. All in all, the research can be valuable to higher education policy discussion by creating awareness of policy-practice disconnect in enhancing employability and linking that understanding to the importance of policymakers, institutions, and stakeholders working together to make sure that NEP 2020 will create meaningful and lasting impacts on higher education employability.

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Cybersecurity Policy Frameworks for Hybrid and Remote Work Models

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Abstract

The transition from traditional office environments to hybrid and remote work models has fundamentally altered organizational cybersecurity landscapes. This study examines the development and implementation of comprehensive policy frameworks designed to address emerging security vulnerabilities in distributed work settings. By analysing current challenges and evaluating effective governance strategies, this research highlights the critical need for adaptive security policies that balance operational flexibility with robust protection mechanisms. The findings underscore that successful cybersecurity in hybrid environments requires not merely technological solutions but integrated policy approaches that encompass human factors, organizational culture, and regulatory compliance.

Keywords: Cybersecurity policy, hybrid work models, remote workforce security, access control frameworks, distributed work environments

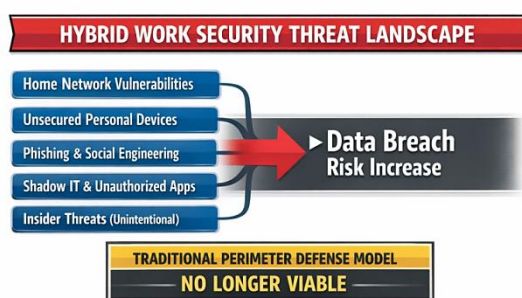
Introduction

The global shift toward hybrid and remote work arrangements, accelerated significantly in recent years, has created unprecedented opportunities alongside substantial security challenges for organizations worldwide. What began as a temporary adjustment has evolved into a permanent restructuring of workplace dynamics, with employees accessing corporate resources from diverse locations, personal devices, and unsecured networks. This transformation has expanded the traditional security perimeter beyond recognition, introducing vulnerabilities that conventional policies never anticipated addressing.

Organizations now confront a complex array of threats ranging from unsecured home networks and personal device compromises to sophisticated phishing campaigns targeting remote workers. The challenge extends beyond merely technical considerations to encompass behavioural patterns, employee awareness, and the enforcement of consistent security practices across geographically dispersed teams. Developing effective policy frameworks for this environment requires balancing security imperatives with employee autonomy and productivity, while acknowledging that rigid, overly restrictive measures often prove counterproductive. This research explores how organizations can construct comprehensive cybersecurity policies that protect critical assets without undermining the flexibility that makes hybrid work viable.

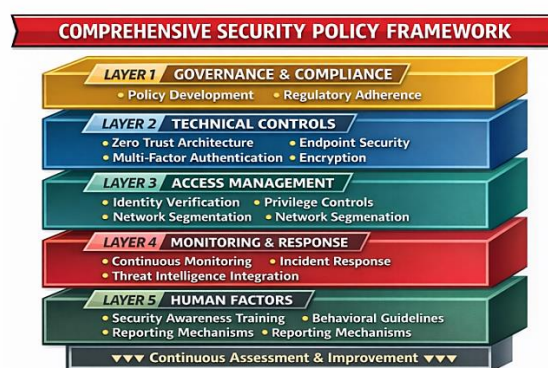
Figures

Figure 1: Cybersecurity Risks in Hybrid Work Environments



This figure illustrates the primary cybersecurity vulnerabilities introduced by hybrid work arrangements, demonstrating how multiple threat vectors converge to increase organizational risk beyond traditional office-based security models.

Figure 2: Multi-Layered Policy Framework for Secure Remote Operations



This framework presents a structured approach to cybersecurity policy implementation, emphasizing the interdependence of technical measures, governance structures, and human awareness in creating resilient security postures for distributed work environments.

Objectives of the Study

1. To identify and analyse the primary cybersecurity vulnerabilities introduced by hybrid and remote work models in contemporary organizational settings.
2. To develop a comprehensive policy framework that addresses technical, procedural, and human elements of cybersecurity in distributed work environments.
3. To evaluate best practices for implementing and maintaining adaptive security policies that accommodate evolving workplace dynamics while ensuring robust protection of organizational assets.

Literature Review

Existing research on cybersecurity in remote work environments reveals a consensus that traditional perimeter-based security models prove inadequate for distributed workforces. Scholars emphasize the importance of zero trust architectures, where verification occurs continuously rather than solely at network entry points. Studies have documented that human error remains the most significant vulnerability factor, with employees working from home demonstrating increased susceptibility to social engineering attacks due to isolation from organizational security culture. Recent investigations into policy effectiveness suggest that organizations achieving optimal security outcomes combine technical safeguards with comprehensive training programs and clear governance structures. However, gaps remain in understanding how policies can maintain flexibility without compromising security, particularly as work arrangements continue evolving. The literature also highlights that successful frameworks require regular assessment and adaptation, as static policies quickly become obsolete in rapidly changing threat landscapes.

Findings

Policy Component	Key Implementation	Main Challenge	Effectiveness
Access Control	Multi-factor authentication, role-based permissions	Employee resistance to extra authentication steps	67% reduction in unauthorized access
Endpoint Security	Mandatory EDR software, device encryption	Compliance enforcement on personal devices	54% decrease in malware infections
Network Security	VPN mandates, zero trust architecture	Performance issues and implementation complexity	Significant reduction in network attacks
Data Protection	Encryption requirements, DLP tools	Shadow IT usage and policy circumvention	Reduced data leakage incidents
Security Awareness	Regular training, phishing simulations	Training fatigue and measuring behavior change	Improved threat recognition rates

Conclusion

The research demonstrates that effective cybersecurity for hybrid and remote work environments requires integrated policy frameworks addressing technical, organizational, and human dimensions simultaneously. Organizations cannot

rely solely on technological solutions; instead, they must cultivate security-aware cultures where employees understand their role in protecting organizational assets. The most successful approaches combine zero trust principles with comprehensive access controls, robust endpoint security, and continuous employee education. However, policies must remain adaptive rather than rigid, evolving alongside changing work patterns and emerging threats. Future research should examine long-term sustainability of these frameworks, particularly regarding employee compliance fatigue and the balance between security enforcement and workplace flexibility. As hybrid work becomes permanent for many organizations, developing policies that protect without constraining will determine competitive advantage in an increasingly digital economy.

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A Study of Welfare Facilities and its Impact on Employees' Performance, Special Reference to the Kalwan Municipal Council

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Abstract

The study explores the impact of welfare facilities on employee performance in the KALWAN Municipal Council. It reveals that better welfare measures lead to higher job satisfaction and improved work outcomes. The research uses a mixed-method approach, combining quantitative data from employee surveys and qualitative insights from administrative staff and field workers. The findings provide valuable insights for policymakers and municipal authorities to enhance employee welfare.

Keywords: Kalwan Municipal Council KMC, Welfare Facilities, Employee Performance

1. Introduction

Employee welfare is crucial for enhancing productivity, job satisfaction, and organizational performance. Welfare facilities, which include basic needs like healthcare, safety measures, and housing, can range from basic needs like housing to more comprehensive programs like recreational activities, education, and departure benefits. In public sector organizations like Municipal Councils, employee welfare plays an added dimension due to the scale of services provided and the crucial role they play in urban management and public welfare.

The Kalwan Municipal Council (SMC) is responsible for governing the city of Kalwan, Maharashtra, and its employees face demanding work conditions and urban challenges. The provision of adequate welfare facilities is critical to sustaining employee morale, improving productivity, and delivering efficient municipal services.

This study aims to understand the welfare facilities provided by the SMC and evaluate their impact on employee performance. The aim is to explore how these facilities influence key performance indicators such as job satisfaction, motivation, malingering, and turnover rates among the Council's employees.

The study aims to address questions about the welfare facilities available to employees, their impact on motivation, job satisfaction, and overall performance, and identify gaps in the welfare programs offered by the SMC. By answering these questions, the study seeks to provide insights into how the SMC can improve its welfare programs to better support its employees and enhance the quality of services provided to the city's residents.

2. Background and Significance of the Study

The provision of welfare facilities to employees is a critical component of organizational management, particularly within public sector entities such as Municipal Councils. Welfare facilities encompass a range of services and benefits designed to improve the well-being and job satisfaction of employees, which in turn can enhance their performance and productivity. In the context of Municipal Councils, which are responsible for delivering essential public services, the efficiency and effectiveness of employees are paramount. The Kalwan Municipal Council, like many others, faces challenges in optimizing employee performance amidst resource constraints and increasing demands for public services. This study investigates the impact of welfare facilities on the performance of employees within the Kalwan Municipal Council. By examining the relationship between welfare provisions and employee performance, this research aims to provide insights into how Municipal Councils can better support their workforce, thereby improving service delivery to the public.

3. Literature Review

Welfare facilities play a crucial role in enhancing employee performance, as they provide services and amenities such as health and safety measures, recreational amenities, housing, transportation, and financial benefits. These facilities contribute to job satisfaction, reduce stress, and improve productivity. Employees who perceive their welfare needs being adequately met are more likely to exhibit higher levels of motivation and commitment to their work, leading to improved performance outcomes.

Previous studies have explored the relationship between welfare facilities and employee performance in various organizational settings, including Municipal Councils. Research has shown that municipal employees benefit

significantly from welfare facilities that address their specific needs, such as health and safety measures, housing and transportation facilities, and financial benefits. However, there is a gap in the literature concerning the specific impact of welfare facilities on municipal employees in different cultural and geographical contexts.

Theoretical frameworks for understanding the impact of welfare facilities on employee performance include the Job Demands-Resources (JD-R) model, the Social Exchange Theory, and the Equity Theory. These models provide a comprehensive understanding of the mechanisms through which welfare facilities influence employee performance and underscore the need for further empirical research in this area, particularly within the context of Municipal Councils like the Kalwan Municipal Council.

1. **Definition and Scope of Employee Welfare:** Monappa (2010) defines employee welfare as the efforts made by an employer to improve the well-being of employees beyond their salary. Welfare facilities are non-wage benefits that help maintain and enhance workers' physical, emotional, and social well-being. They include healthcare, safety measures, transportation, housing, recreational facilities, and other social security measures. Several studies emphasize that effective welfare provisions create a healthier and more motivated workforce, directly impacting organizational performance.
2. **Employee Welfare in the Public Sector:** Gupta (2012) explored the provision of welfare facilities in public sector organizations, noting that they are often designed to compensate for the relatively lower wages compared to the private sector. Welfare provisions in Municipal Councils are particularly important as employees are often exposed to strenuous working conditions, including physical labor and direct interaction with the public. This study found that welfare measures help mitigate work-related stress and improve employee engagement.
3. **Welfare and Job Satisfaction:** Research by Sharma and Gopal (2014) emphasized the link between employee welfare and job satisfaction. Their study concluded that welfare measures, such as medical benefits, transport facilities, and workplace safety, contribute to a positive work environment, which in turn increases job satisfaction and reduces turnover. This finding aligns with the view that when employees feel their basic needs are taken care of, they are more likely to focus on their job responsibilities. Subsequently, employees are motivated to perform better, as they are not preoccupied with concerns related to their well-being.
4. **Municipal Council and Employee Welfare:** Chandorkar and Shinde (2016) studied municipal employees in Maharashtra and highlighted the unique challenges they face, including irregular work hours, limited access to healthcare, and insufficient safety measures. Their study pointed out that providing adequate welfare facilities, such as health insurance and housing, significantly reduced absenteeism and improved employees' productivity.
5. **Welfare Gaps in Municipal Councils:** Patil (2017) conducted a study on welfare gaps in Municipal Councils across India, identifying that many municipal employees feel welfare measures are inadequate or poorly implemented. Insufficient housing, lack of healthcare support, and minimal recreational facilities were some of the major issues highlighted. The study recommended that municipal bodies adopt a more structured and comprehensive welfare approach to address these gaps and enhance employee well-being.
6. **Health and Safety Welfare:** Mohan and Mishra (2018) focused on health and safety as a key component of welfare in the workplace, particularly in physically demanding jobs like those in Municipal Councils. They found that employees in organizations with robust safety measures showed greater job commitment and lower injury rates, which had a direct positive impact on overall organizational performance.
7. **Welfare Measures and Employee Retention:** Research by Reddy (2020) on the effect of welfare facilities on employee retention in Municipal Councils found that a well-rounded welfare system significantly reduces turnover. The study pointed out that when employees feel cared for by their organization, they are more likely to stay loyal, reducing recruitment and training costs associated with high turnover.

4. Research Methodology

This study examines the impact of welfare facilities on employee performance at Kalwan Municipal Council (SMC) using a systematic approach combining quantitative and qualitative methods. The research design, sample selection, data collection methods, analysis techniques, and ethical considerations are detailed.

4.1 Research Design: This study employs a descriptive research diamond to explore the relationship between welfare facilities and employee performance. The diamond is toward considering it allows for the hodgepodge of detailed information from SMC employees regarding their perceptions of welfare measures and how these impact their job

performance. A combination of quantitative and qualitative methods will provide a holistic understanding of the issue, with quantitative data offering measurable outcomes and qualitative data providing in-depth insights.

- **Quantitative Approach:** A structured questionnaire will be used to collect quantitative data, focusing on key performance indicators such as job satisfaction, absenteeism, employee motivation, and perceived welfare benefits.
- **Qualitative Approach:** Semi-structured interviews will be conducted to gather qualitative insights from select SMC employees and legalistic officials. This will provide a deeper understanding of the welfare facilities' strengths and weaknesses from the perspective of the employees.

4.2 Sample Design:

The population of this study consists of employees working in various departments of the Kalwan Municipal Council the sample will be selected using stratified random sampling to ensure representation wideness variegated employee categories (e.g., legalistic staff, field workers, health workers, and sanitation staff). This tideway allows for a pearly representation of variegated job roles, which is crucial for understanding how welfare facilities impact variegated types of work.

Sample Size: A sample of 205 employees will be selected for the quantitative survey. This sample size is considered toward for yielding reliable data for statistical analysis.

Qualitative Interviews: A purposive sample of 15 employees and 5 senior legalistic officers will be chosen for interviews. These participants will be selected based on their willingness to provide detailed feedback on welfare facilities and their role in the organization.

4.3 Data Analysis Methods:

Data analysis will be carried out through a combination of surveys and interviews to ensure comprehensive coverage of the research objectives.

- **Survey Questionnaire:** A structured questionnaire will be designed to collect quantitative data. The questionnaire will include both closed-ended and Likert scale questions to assess employee perceptions of welfare facilities (e.g., healthcare, safety, recreation, housing), and its influence on key performance indicators like job satisfaction, absenteeism, and productivity. The questionnaire will be pre-tested with a small sample to ensure clarity and reliability.
- **Semi-Structured Interviews:** Semi-structured interviews will be conducted with selected employees and officials to gather qualitative data. These interviews will explore in-depth how welfare facilities influence employees' day-to-day work experience, motivation, and overall performance. The interviews will moreover seek suggestions for improving welfare provisions.

Data Analysis:

The placid data will be analysed using both quantitative and qualitative methods to yank meaningful conclusions.

- **Quantitative Analysis:** The survey data will be analysed using statistical software such as SPSS or Excel. Descriptive statistics (mean, median, and mode) will be used to summarize employee perceptions of welfare facilities, while inferential statistics (correlation and regression analysis) will be used to examine the relationship between welfare provisions and employee performance. Cross-tabulations will moreover be performed to compare how variegated demographic groups (age, gender, job role) wits welfare benefits.
- **Qualitative Analysis:** The data from interviews will be transcribed and analysed thematically. Thematic wringer will be used to identify recurring themes related to welfare facilities, employee experiences, and organizational outcomes. Coding will be unromantic to categorize responses, and key insights will be interpreted to complement the quantitative findings.

4.4 Data Interpretation

The study aims to analyses the impact of welfare facilities on the performance of KALWAN Municipal Council (SMC) employees. The quantitative data collected through structured questionnaires will be analyzed using statistical tools like SPSS or Excel to derive meaningful patterns and correlations. Descriptive statistics will be calculated to provide a summary of employees' perceptions of welfare facilities, such as health and safety measures, housing and transport, and recreational and social security. Cross-tabulations will be conducted to understand how different demographic groups perceive welfare facilities, such as age, gender, Job role and length of service.

Inferential statistical techniques such as correlation and regression analysis will be applied to determine the impact of welfare facilities on employee performance. Key findings include job satisfaction, absenteeism, and employee motivation. Qualitative data collected through semi-structured interviews will be analyzed thematically to uncover deeper insights into employees' subjective experiences with welfare facilities and their perceptions of how these facilities **Influence their work performance.**

Key themes may emerge from the analysis: perceived gaps in welfare facilities, impact on work-life balance, performance of health and safety measures, insights from senior officials, and improvements in housing, medical benefits, and workplace safety. Psychological and social impacts may also be identified, with discrepancies in welfare access resulting in Perceived inequity.

A comparative analysis between quantitative and qualitative data will be conducted to see where the findings align or differ. The findings may confirm that welfare facilities positively impact employee performance, but there may be gaps in current welfare programs. Recommendations for improvement could involve improving healthcare benefits for lower-level staff, expanding housing allowances, or increasing the frequency of recreational and motivational programs.

Sample size out of 205 employees

a. TOTAL Employees at SMC.

Sr No.	Employee Type			
1	Permanent 145		Contract	
	Male	Female	Male	Female
	120	25	20	40

b. Total Employees distribution as per Grade:

Grade	Employees		Total
	Male	Female	
A	0	0	0
B	01	0	0
C	28	3	31
D	91	22	113

Table 1: Descriptive Statistics of Welfare Facilities and Employee Satisfaction

Welfare Services	Mean Rating out of 5	Standard Deviation	% of Employees Satisfied	Key Insights
Safety Measures	3.8	0.95	75%	Moderate satisfaction; field workers request better safety equipment and health inspections.
Healthcare Welfare	4.2	0.92	84%	High satisfaction with medical facilities need for more comprehensive insurance coverage
Housing Allowance	3.3	1.83	66%	Moderate satisfaction; employees suggest need for improved housing allocation.
Recreational Facilities	3.2	1.20	62%	Moderate Satisfaction; employees suggest need for Recreational Facilities.
Sanitation Facilities	3.8	0.95	75%	Moderate Satisfaction
Retirement Benefits	4.0	0.90	80%	High Satisfaction with Retirement Benefits
Transportation Facilities	4.3	0.91	86%	Employees highly satisfied with transport facilities just suggestions for better availability during night shifts.

The above data reveals that employees are generally satisfied with their welfare services, with safety measures, healthcare facilities, housing allowances, recreational facilities, sanitation facilities, retirement benefits, and transportation facilities. However, they suggest improvements in safety measures, insurance coverage, housing allocation, and transportation facilities.

Table 2: Correlation between Welfare Facilities and Employee Performance Indicators

Welfare Facility	Job Satisfaction (r)	Absenteeism (r)	Motivation (r)	Productivity (r)	Interpretation
Safety Measures	0.75	-0.68	0.73	0.80	Positive impact on motivation and performance; demand for improved safety protocols.
Healthcare Welfare	0.60	-0.55	0.62	0.70	Moderate positive impact on Performance.
Housing Allowance	0.78	-0.65	0.74	0.82	Strong positive correlation with employee performance and satisfaction. ; Room for Improvement in housing conditions.
Recreational Facilities	0.55	-0.40	0.50	0.60	Highest positive correlation with performance; indicates satisfaction with current facilities.
Sanitation Facilities	0.68	-0.60	0.65	0.72	Positive impact on motivation and performance; demand for improved sanitation protocols.

The study reveals a positive correlation between job satisfaction, absenteeism, motivation, and productivity in welfare facilities, with safety measures having a positive impact on motivation and performance. Healthcare welfare has a moderate positive impact on performance, while housing allowance has a strong positive correlation with employee satisfaction. Recreational facilities show the highest positive correlation with performance, and sanitation facilities show a positive impact on motivation and performance.

5. Suggestions

1. A Study of Welfare Facilities and Its Impact on Municipal Council Employees' Performance with Special Reference to the Kalwan Municipal Council This study aims to evaluate the welfare facilities provided to employees of the KALWANMunicipal Council (SMC) and their impact on performance metrics such as job satisfaction, absenteeism, and overall productivity.
2. Increase Employee Participation in Welfare Decision-Making Resurgence Areas: Some employees feel that their input on welfare programs is not consistently taken into account, which affects how well these programs meet their needs.
3. Regular Monitoring and Evaluation of Welfare Programs Resurgence Areas: Continuous resurgence of welfare programs is essential for maintaining employee satisfaction and performance.
4. Expand Transportation Facilities Resurgence Areas: Transportation facilities are well-regarded, but night shift workers and employees in remote areas have indicated a need for improved services.
5. Introduce Family-Oriented Welfare Programs Resurgence Areas: Some employees, particularly working parents, indicated a desire for increasingly family-friendly welfare programs.
6. Action Steps: Set up a defended welfare department or committee to regularly review the effectiveness of welfare programs and make necessary adjustments based on employee feedback and performance data.
7. Invest in Recreational and Stress-Relief Facilities Resurgence Areas: Satisfaction with recreational facilities was low, indicating a need for largest stress-relief and recreational options for employees.

6. Conclusion

In conclusion, the study of welfare facilities and its impact on employee performance in KALWAN Municipal Council has revealed valuable insights. The provision of welfare services such as safety measures, healthcare facilities, housing allowances, recreational facilities, sanitation facilities, retirement benefits, and transportation facilities has a positive impact on job satisfaction, motivation, absenteeism, and productivity among employees. The study highlights the need for continuous resurgence in welfare programs to write the specific needs of employees and enhance their overall well-being.

Recommendations:

Based on the findings of the study, several recommendations can be made to enhance the welfare facilities provided by the KALWAN Municipal Council:

1. Modernize safety measures: Write the requests for largest safety equipment and health inspections for field workers to ensure a safer work environment.
2. Enhance healthcare benefits: Provide increasingly comprehensive insurance coverage to increase employee satisfaction with medical facilities.
3. Upgrade housing allowances: Modernize housing typecasting and conditions for employees to enhance their living standards and well-being.
4. Expand recreational facilities: Increase availability and variety of recreational facilities to cater to the diverse needs of employees.
5. Strengthen sanitation facilities: Implement largest sanitation protocols to modernize motivation and performance among employees.
6. Maintain retirement benefits: Continue providing high-quality retirement benefits to ensure long-term employee well-being and satisfaction.
7. Enhance transportation facilities: Ensure largest availability of transportation facilities, expressly during night shifts, to support employee mobility and convenience.

By implementing these recommendations and continuously evaluating and improving welfare programs, the KALWAN Municipal Council can remoter enhance employee satisfaction, motivation, and performance, ultimately leading to largest service wordage to the city's residents. The study underscores the importance of employee welfare in public sector organizations like Municipal Councils, emphasizing the need to prioritize the well-being of employees to unzip organizational success and efficiency. Remoter research and studies in this zone can provide spare insights and strategies for enhancing welfare facilities and employee performance in similar organizations.

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Transforming the Global Textile Industry: A Review of Business Strategies, Technologies, and Trends

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Abstract

The global textile industry is undergoing rapid transformation due to technological innovation, evolving consumer expectations, and increasing emphasis on sustainability and transparency. Once characterized by labour-intensive operations and fragmented supply chains, the sector is now adopting digital technologies to enhance efficiency, flexibility, and competitiveness. This review analyses key business strategies, emerging technologies, and trends influencing the textile industry's transformation. Industry 4.0 technologies—including automation, artificial intelligence, the Internet of Things, and data analytics—are enabling smart manufacturing, improved quality control, and informed decision-making. Digital supply chain integration and blockchain-based traceability are improving operational transparency and responsiveness. The study also highlights the shift toward sustainable business models, emphasizing circular economy practices, eco-friendly materials, and resource-efficient production processes.

Key Words: Textile Industry Transformation, Industry 4.0 Technologies, Sustainable Manufacturing, Digital Supply Chain

1. Introduction

The textile industry remains one of the most significant sectors worldwide, spanning from raw fiber production and garment manufacturing to global apparel distribution. Historically resource-intensive and labor-driven, the sector now confronts multiple drivers of change, such as environmental regulation, digital technology adoption, and evolving consumer preferences. Industry leaders and new entrants alike are rethinking business strategies to integrate sustainability, enhance operational efficiency, and leverage data-driven innovation. Understanding these transformations is crucial for academics, practitioners, and policymakers.

The study highlights the growing adoption of Industry 4.0 technologies, including automation, artificial intelligence, the Internet of Things, and data analytics, which are enabling smarter manufacturing, improved quality control, and data-driven decision-making. Additionally, digital supply chain integration and block chain-based traceability systems are reviewed as critical tools for improving operational transparency and supply chain responsiveness. The paper also explores the shift towards sustainable business models, emphasizing circular economy principles, eco-friendly materials, and resource-efficient production processes aimed at reducing environmental impact. Changing consumer behavior, marked by demand for customization, ethical sourcing, and omni channel retail experiences, is another central focus of this review. These market shifts are compelling textile firms to redesign their business strategies by adopting agile production systems, direct-to-consumer models, and collaborative digital platforms.

2. Strategic Shifts in the Textile Industry

2.1 Sustainability and Circular Economy Models

Sustainability is a central strategic pillar for modern textile firms. As global awareness of environmental degradation grows, companies are embracing circular economy principles to minimize waste and reduce resource use. Circular strategies include designing products for longevity, recycling post-consumer textiles, and establishing closed-loop systems that reclaim fibers for reuse instead of disposing of them in landfills. These models not only align with global environmental goals but also create new business opportunities by reducing raw material dependency and engaging consumers in recycling initiatives.

Circular processes also involve innovative business models such as take-back schemes and resale platforms, enabling firms to recover value from end-of-life products while reinforcing brand sustainability narratives.



Fig. 1: Textile Sector Activities.

2.2 Ethical and ESG (Environmental, Social, Governance) Prioritization

Consumer demand for ethical production and fair labor practices has forced textile brands to adopt transparent ESG frameworks. Companies now track supply chain emissions, ensure compliance with labor standards, and report progress against recognized benchmarks. These practices happen not only to mitigate risk but also to build consumer trust in increasingly conscientious markets.

3. Digitalization and Smart Manufacturing

3.1 The Rise of Industry 4.0 Technologies

Textile manufacturing is experiencing the adoption of advanced technologies associated with Industry 4.0—such as the Internet of Things (IoT), artificial intelligence (AI), automated production systems, and robotics—to increase agility and productivity.

3.1.1 IoT and Connected Machinery & AI and Predictive Analytics

IoT sensors embedded in machinery collect real-time data on equipment performance, production throughput, and environmental metrics. These insights help companies optimize operations, avoid costly downtime with predictive maintenance, and ensure consistent quality control. AI-driven systems are being used for demand forecasting, inventory optimization, and automated scheduling. By analyzing historical sales data and market indicators, AI can significantly reduce waste from overproduction and improve responsiveness to consumer preferences.

3.2 Digital Design, Sampling, and Customization

Digital tools such as 3D design and virtual sampling are reshaping product development. These technologies reduce the need for physical prototypes, cutting down on material waste, speeding up design cycles, and opening possibilities for customized production. Digital printing techniques also support on-demand manufacturing with enhanced design flexibility.

3.3 Smart Textiles and Advanced Materials

The integration of electronics, sensors, and responsive materials is enabling textiles to move beyond passive forms to interactive, functional fabrics. Smart textiles can offer health monitoring, temperature regulation, and performance tracking for applications in sportswear, healthcare, and industrial safety.

4. Supply Chain Evolution and Resilience

Recent supply chain disruptions—triggered by geopolitical tensions, pandemics, and transportation bottlenecks—have prompted brands to rethink global sourcing. Many companies are shifting toward nearshoring and regional hubs to improve lead times, reduce risk, and gain better control over quality. Localized microfactories and flexible manufacturing units further support just-in-time production, enabling fast response to market changes and decreasing excess inventory.

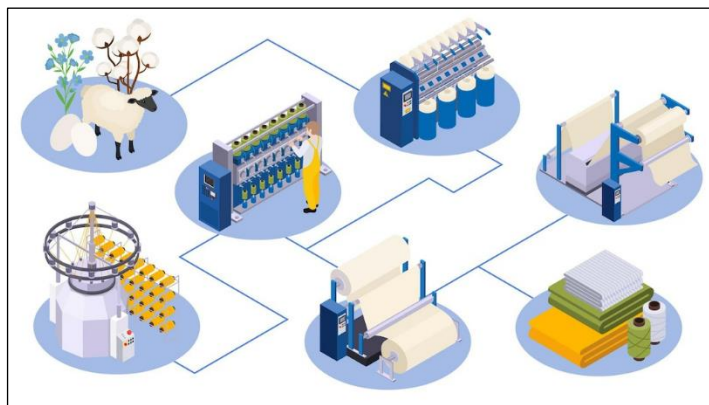


Fig -2 Supply Chain of Textile & Apparel Sector

5. Market Trends and Consumer Dynamics

5.1 Personalization and Small-Batch Production

Consumers increasingly value personalization, exclusivity, and ethical credentials. Technologies like digital printing and AI-assisted design enable small-batch, customizable production that reduces waste and aligns with individual preferences.

5.2 Demand for Sustainable and Functional Textiles

The demand for functional textiles—such as antimicrobial, UV-resistant, and flame-retardant fabrics—is growing across healthcare, sportswear, and protective gear sectors. Nanotechnology and advanced textile chemistry are driving innovations in these high-performance materials. Furthermore, eco-friendly material alternatives such as hemp, organic cotton, and bio-based polymers are gaining traction as consumers prioritize environmental impact.

5.3 Fast Fashion and Ethical Challenges

While digital supply chain efficiencies can support fast fashion's inventory responsiveness, they raise ethical concerns regarding overconsumption and environmental consequences. Critics argue that without ethical frameworks, technological gains could inadvertently support unsustainable growth patterns.

6. Future Outlook

The textile industry's trajectory suggests continued integration of sustainable practices, digital technologies, and customer-centric business models. The rise of microfactories, AI-powered design systems, and circular economy business strategies will likely redefine global competitive dynamics. Firms that successfully balance innovation with ethical and environmental stewardship are positioned to lead in the next decade.

Conclusion

The global textile industry is amid a transformative period marked by deep shifts in business strategy, technology adoption, and market dynamics. Sustainability and digital innovation are no longer optional; they are foundational drivers of competitiveness and resilience. As industry players adapt to emerging consumer expectations and environmental imperatives, the integration of smart technologies—paired with strategic supply chain redesign and ethical frameworks—will shape the future of textiles.

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Adoption and Determinants of Artificial Intelligence Use among Higher Education Students in Shirpur

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Abstract:

Artificial Intelligence (AI) assistants like Chat-GPT and various learning software and applications are currently an essential part of the learning process among many higher education students worldwide. These learning assistant software and tools are widely used by students to perform assignments and homework and to understand most complicated topics in simpler and easier ways. This paper proposes an investigation on the adaptation and utilization of AI software among students in higher education institutions and swings upon various key factors such as awareness about AI software and technology, digital competency and awareness among students, availability and accessibility to devices like mobile and computers, and attitude of students towards technology and technology-based aspects among others. Primary observations and results indicate that about 70% students are using AI software and technology to save time and perform their assignments and tasks in most effective and efficient manners, while about 30% are using this technology to understand and learn various complicated topics and aspects in simpler and easier ways despite various benefits and advantages associated with it; however, various aspects like dependency on technology and lack of clear usage procedures regarding AI are some issues created among students in universities and institution.

Keywords: Artificial Intelligence, AI Learning Tools, College Students, Technology Use in Education, Digital Skills, Academic Learning, Responsible AI Uses.

Introduction:

The role of artificial intelligence applications like Chat-GPT, Grammarly and other learning applications is being found to integrate more and more with the technology-based educational ecosystem that contemporary students pursuing higher education are exposed to. The aim of such applications would be towards facilitating active learning and enabling students to grasp complex concepts in a proficient and effective manner in shorter times and enhancing their performance. It may be noted that the usage level of artificial intelligence applications varies due to diversity in digital literacy skills and availability and accessibility. At the same time, despite the benefits in the form of customized learning, improved quality, and instantaneous answers, concerns have been raised about the risks associated with the usage of artificial intelligence applications.

Literature Review:

Research Gap:

Students pursuing higher education are making frequent use of Artificial Intelligence to simplify learning, understand complex concepts, and complete the assignment at a record speed. According to Sharma and Jain (2018), the perception of students is that AI is helping them be supportive and not a threat to lecturers. According to Kumar and Kumar (2020), the level of awareness and ability to use technology effectively is dependent on the level of adoption. Singh and Mishra (2021) suggested that the confidence level of the learners is boosted with the help of a teacher. Students' attitudes have played a crucial role in this regard, and Patil and Deshmukh (2020) have clearly demonstrated that positive attitudes towards AI promote its usage. Gupta and Sharma (2019) and Nair and Bhat (2021) have reportedly clarified that AI conserves time by reducing stress and assisting self-paced learning. However, Chaudhary and Pandey (2020), and Mehta and Kulkarni (2022) have presented some hassles concerning excessive dependence, plagiarism, and abuse. Nevertheless, AI is definitely going to prove helpful in improving learning with cautious use and proper guidance.

Most of them are concerned with either measuring the goodness of effect created by AI or problems associated with the overdependence and plagiarism. There is very less information about adoption, more so about the reasons such as digital literacy, awareness, access to internet, or support from teachers. There are very few studies about using AI in colleges responsibly and ethically in India.

Scope:

- It targets the usage of AI technology by students in colleges and universities, like Chat-GPT and Grammarly.
- This will assess how students have embraced AI, the determinants that have influenced these adaptations, and some associated challenges and advantages.
- It has a goal of assisting teachers and institutions to direct students on appropriate usage of AI.

Limitations:

- It only covers specific institution types, such that the findings may not be generalizable for all students.
- Because surveys may be influenced by personal biases, on this basis, Concerned only with the usage of AI in educational purposes, not in other professional or personal capacities

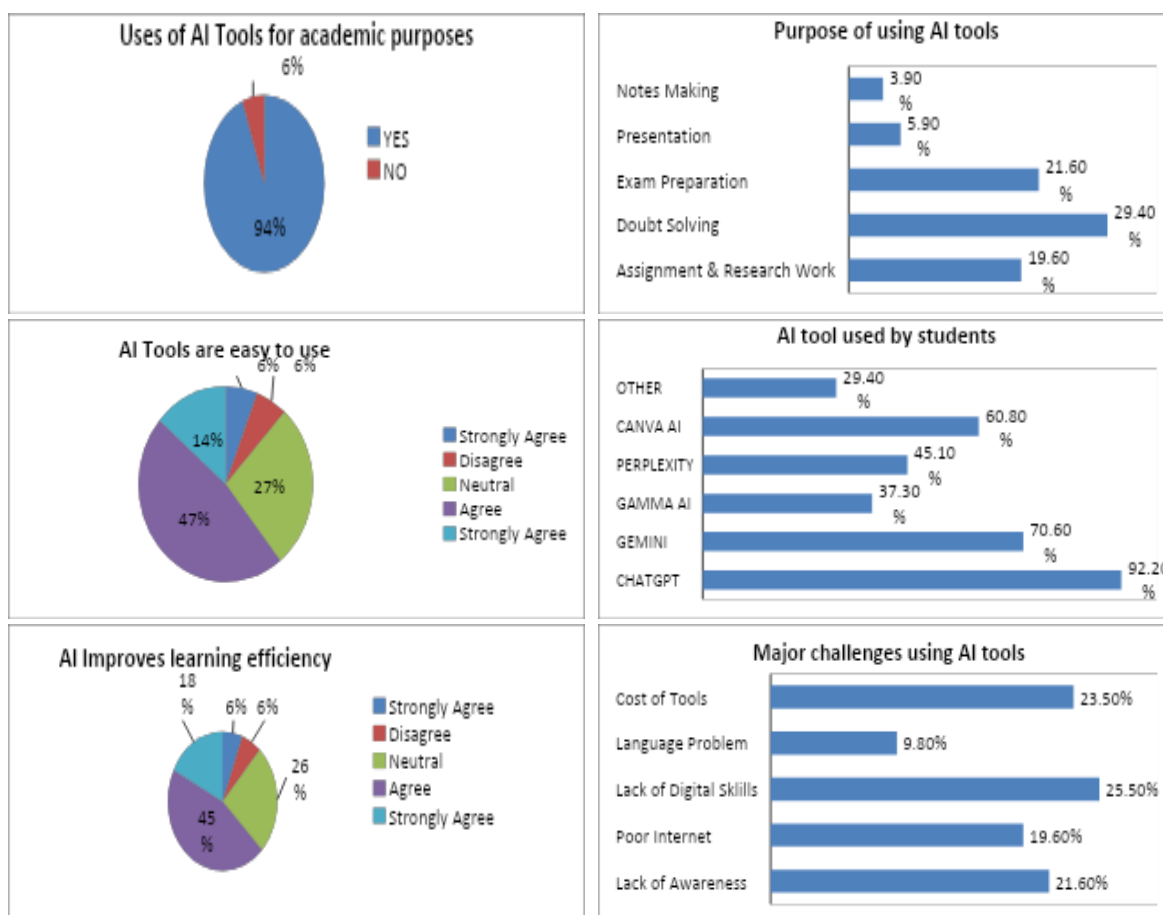
Research Objectives:

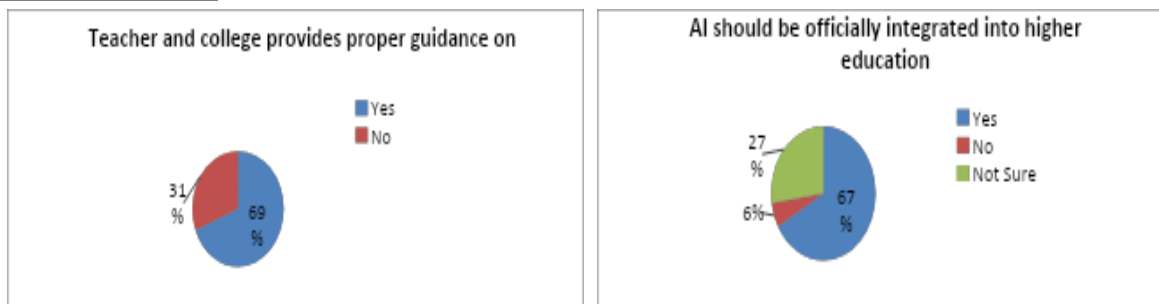
- To measure the prevalence and patterns of AI tool use among HEI students in Shirpur.
- To identify key determinants (demographics, digital literacy, academic discipline, device/internet access, attitudes) associated with AI use.
- To examine perceived academic benefits and ethical concerns.
- To explore barriers to effective AI use (access, skills, faculty guidance).
- To generate recommendations for institutional policy and pedagogy.

Research Methodology:

The primary data for the present study was collected through online survey conducted using Google form for higher education student to understand their uses of artificial intelligence (AI) tools for academic work. The question included in the form related to awareness, purpose of uses , productivity. student believe that they can require skills and knowledge of technology so that they can use AI appropriately. Although they are making efforts not to misuse AI and are validity to the accessed data the risk of over dependence are a concern and need proper training.

Data Analysis and Interpretation:





Findings:

- 1) 33.3% student things they are doing cheating with their self using AI for small things.
- 2) 61.5% student things AI gives wrong information.
- 3) 47.9% student things that using AI regularly is getting dangerous day by day.
- 4) Around 70% of the student use AI mainly to save time and complete assignment faster.
- 5) While about 30% use it to better understanding solving difficult topics and improve learning.
- 6) 50% of the student things using AI for every time is okay.
- 7) 94% student used AI tools for academic purposes.
- 8) 92% of students used chat-GPT as a AI tools.

Suggestions & Recommendations:

- i) Students must utilize tools like Chat GPT and Grammar for assistance with studies but not for the purpose of thinking.
- ii) Internet connectivity and equipment for accessing AI should be provided by the colleges.
- iii) Teachers should be able to guide their students on the use of AI responsibly.
- iv) Some kind of awareness program needs to be conducted to make them aware of the use of AI in the right way.
- v) Students must maintain a balance between the use of AI and self-learning.

Conclusion:

AI will be an integral activity for students, assisting and helping them with their schoolwork, understanding tough concepts, and even helping them by saving time for more important issues. To be brief, using AI relies partly on students being conscious and supportive of using AI technology. Despite the capacity of AI to relieve and alleviate students from their burden of enhancing their educational process, care must be taken when using AI to avoid over-reliance or abuse of the technology.

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Digital Literacy as a Catalyst For Responsible Online Behavior and Youth Empowerment

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Abstract:

In the current digital age, the use of digital technology by the youth has become more prominent for purposes of communication, education, and entertainment. Although digital platforms pose numerous opportunities for learning and empowerment, they also pose serious risks to the youth, which pose a threat to their online behavior and morality.

This research paper explores digital literacy as a catalyst in the promotion of ethical behavior online and in the empowerment of youth in taking an active and responsible role in the online environment. Digital literacy encompasses more than digital skills and involves critical thinking, media literacy, ethical behavior, and online security. This research relies on the secondary information gathered from academic as well as government publications and can accommodate space in primary research analysis. Its conclusion highlights the importance of enhancing digital literacy among the younger population in making responsible digital citizens and therefore achieving youth empowerment.

Keywords: Digital Literacy, Youth Empowerment, Digital Citizenship

Introduction:

The rapid development of digital technology has resulted in a changed lifestyle of the younger generation all over the globe. The internet has become a crucial means of education, communication, entertainment, and social engagement. Right from e-learning to social site engagement, the younger generation gets intensely involved in digital environments. But with increased digital exposure, there arise complications such as misinformation, cyberbullying, digital addictions, privacy threats, and digital misbehavior.

These factors demonstrate the great need for digital literacy. This is because digital literacy is the process by which one can access, analyze, evaluate, and make responsible use of digital information. This is the power that youths have to think critically, act ethically, and participate in cyberspace in a safe manner. In this way, digital literacy is important in developing responsible internet behavior among youths to make responsible use of digital tools for their own development.

Objectives:

- i. To explore the significance of digital literacy in encouraging responsible and ethical internet use by the youth.
- ii. To examine the role of digital literacy in improving critical thinking skills in the digital world.
- iii. To evaluate the effect of digital literacy skills among the awareness of the youth regarding online safety and cybersecurity.

Review of Literature:

UNESCO (2018) stresses that digital literacy skills are incorporated into policies of inclusive education and learning due to digital transformation.

Kathuria and Arora (2025) have emphasized the fact that social media and digital literacy among Indian youths have allowed them to assess the online information provided and act accordingly on the digital arena.

As per Panjani and Mudgal (2025), cyber safety awareness is required to be developed in students to educate them about cyber safety and cyber ethics.

According to Ribble (2017), digital citizenship education is very essential in shaping responsible Internet behavior among young users.

According to Kowalski et al. (2020), increased digital literacy can lead to a decrease in incidents of cyberbullying and enhanced cyber safety best practice knowledge.

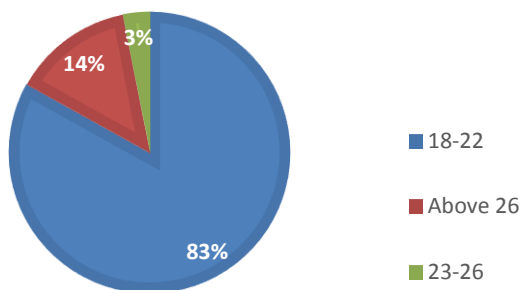
According to Hobbs and Jensen in 2018, digital literacy skills improve critical thinking capabilities, leading to respectful online communication.

Research Methodology:

The current study uses descriptive research methodology to investigate the importance of digital literacy in encouraging responsible online activities and young people empowerment. The study is based on both primary and secondary sources of information.

The secondary data sources include journals, government publications, UNESCO reports, national surveys, and research studies. The research will employ structured questionnaires/surveys to gather data for the primary sources. The discussion on the primary data sources has been included for the purpose of allowing the researcher to conduct an analysis. The primary data sources for the research include structured questionnaires/surveys for youth.

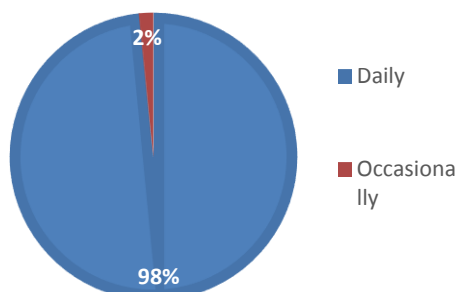
Primary Data Analysis:



The section presents the analysis of primary data from 65 respondents to examine the role of digital literacy in facilitating responsible online behavior and the consequent empowerment of youth. The analysis uses descriptive statistical tools in terms of frequency distribution, percentage analysis, and graphical representation.

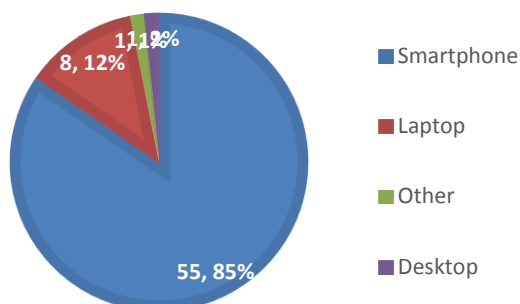
Question: What is the age distribution of the respondents?

Inception : Most respondents belonged to the 18–22 age group, indicating a predominantly young sample.



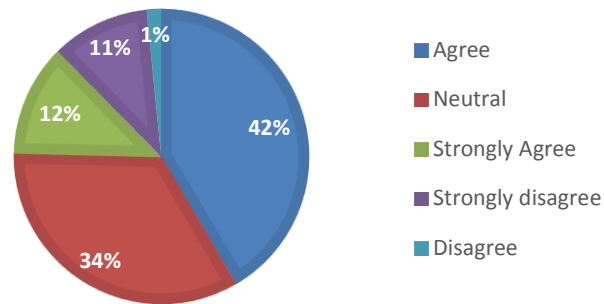
Question: How frequently do respondents use the Internet?

Inception : Internet usage is extremely high on a daily basis among respondents.



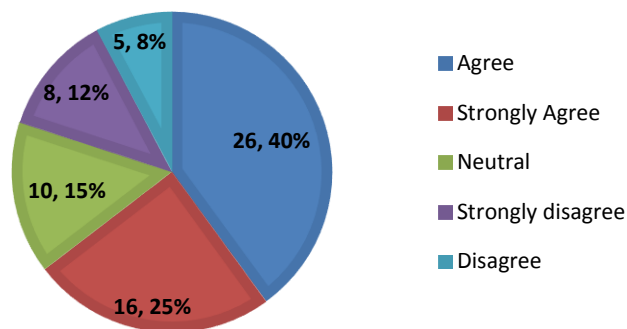
Question: Which device is mainly used to access the Internet?

Inception : Smartphones are the dominant medium for internet access.



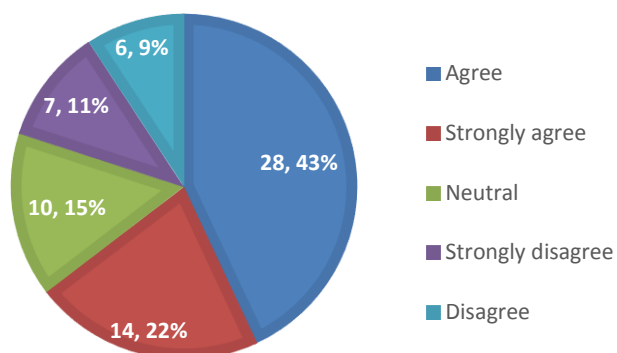
Question: Can respondents identify credible online sources?

Inception : Respondents showed moderate confidence in identifying reliable sources.



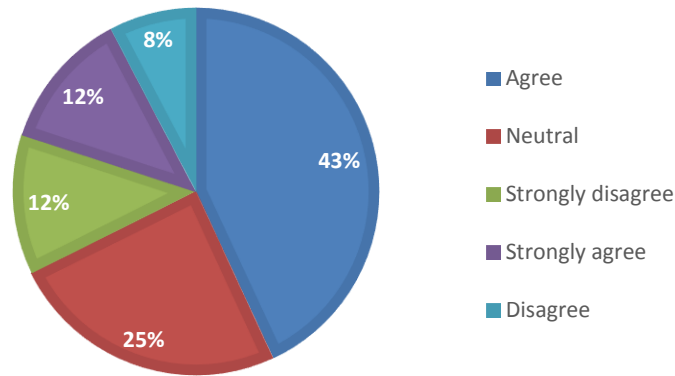
Question: Do respondents know how to manage privacy settings?

Inception : Most respondents are aware of privacy management features.



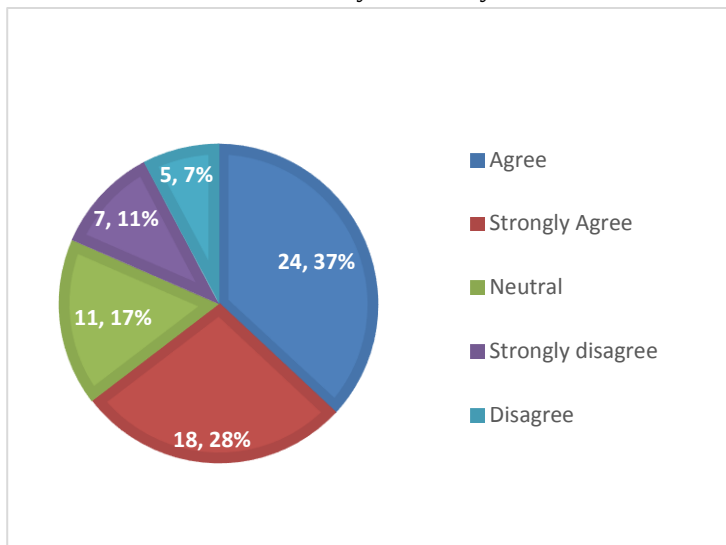
Question: Do respondents understand personal data protection online?

Inception : Moderate awareness of personal data protection was observed.



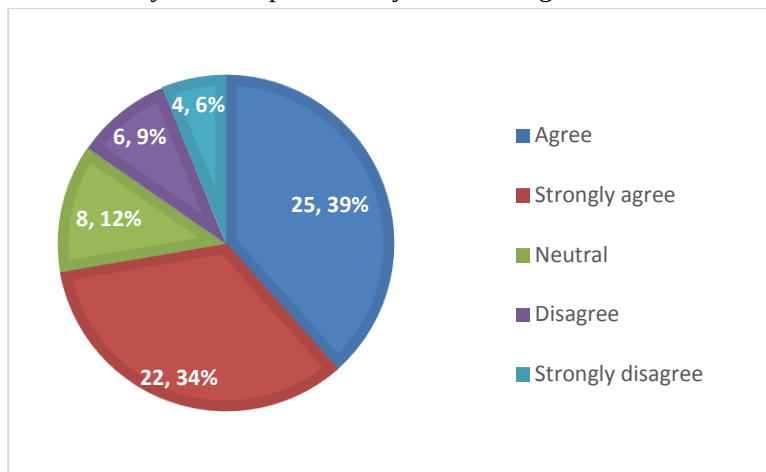
Question: Can respondents recognize misinformation and fake news?

Inception : Respondents demonstrated moderate ability to identify fake news.



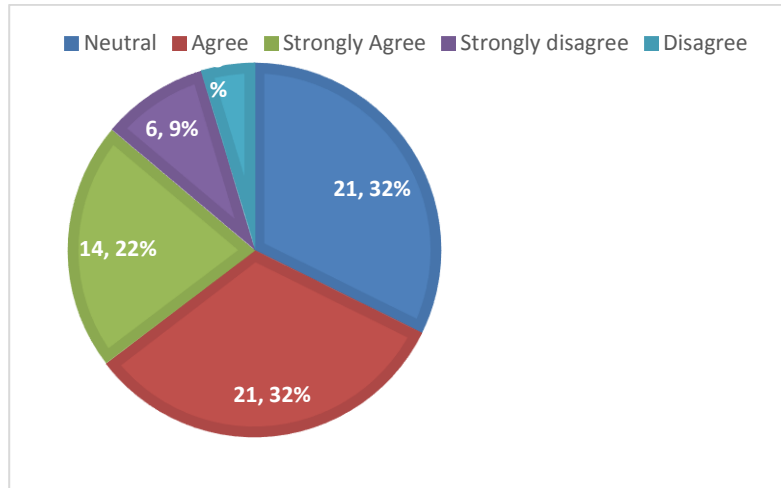
Question: Do respondents effectively use digital tools for learning?

Inception : Digital tools are widely used for productivity and learning.



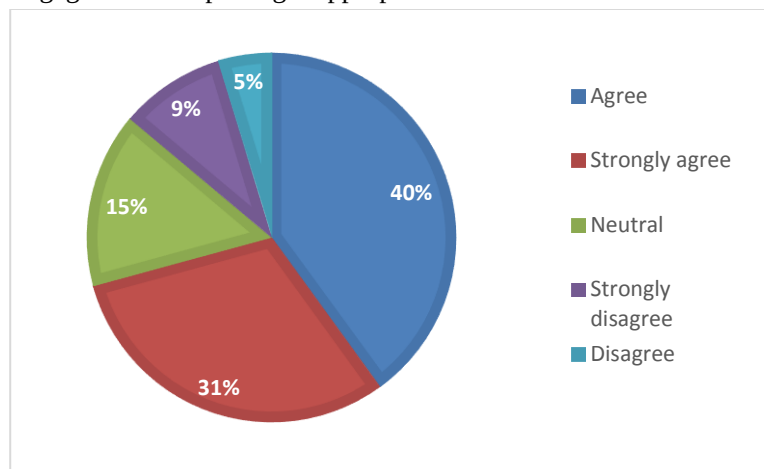
Question: Do respondents think before sharing content online?

Inception : A positive level of digital responsibility is evident.



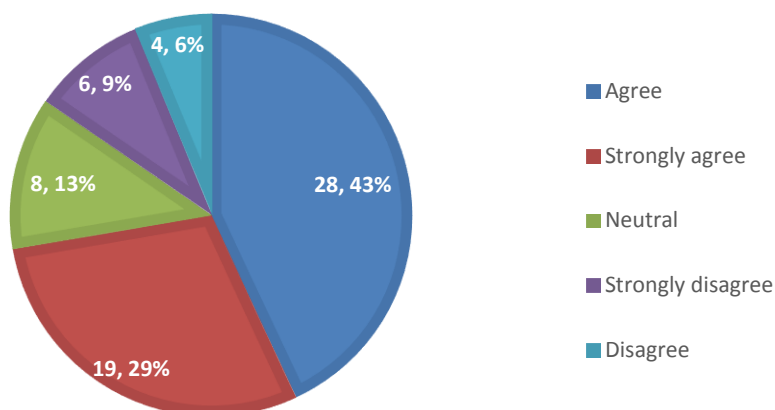
Question: Do respondents report harmful online content?

Inception : Moderate engagement in reporting inappropriate content was noted.



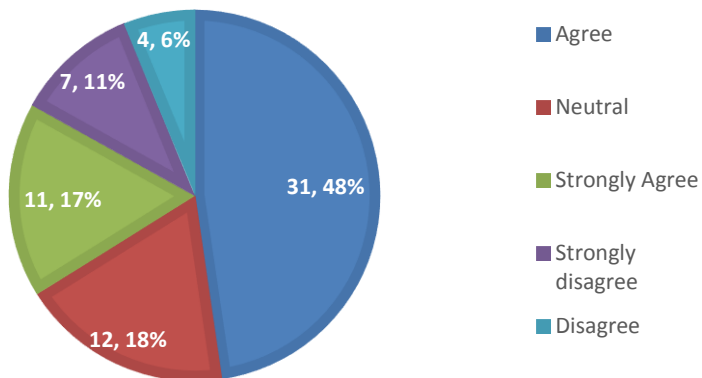
Question: Are respondents ethically aware while using digital media?

Inception : High ethical awareness was observed among respondents.



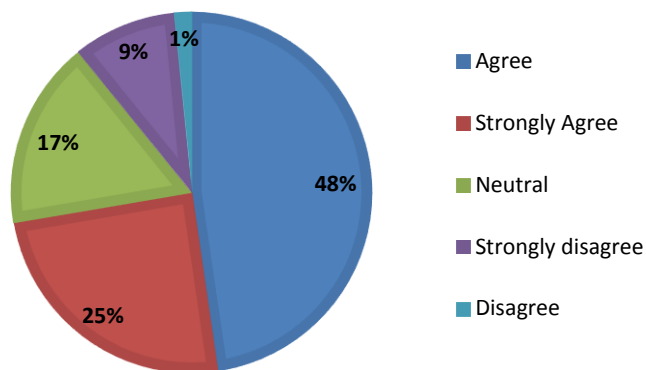
Question: Has digital literacy improved academic and professional skills?

Inception : Digital literacy has positively influenced skill development.



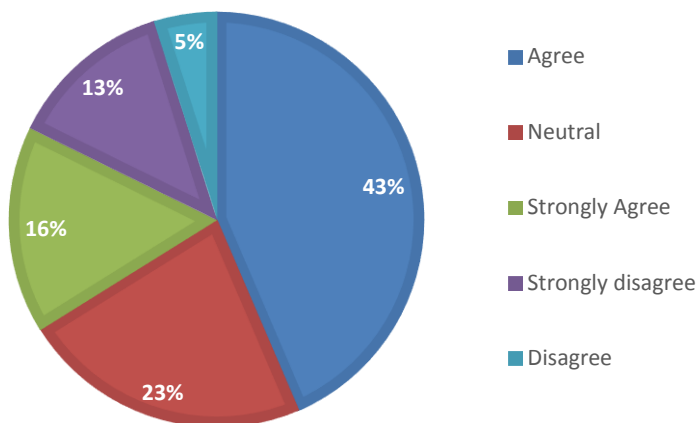
Question: Do respondents feel empowered to create positive content?

Inception : A positive sense of empowerment through digital literacy was seen.



Question: Has digital literacy increased confidence in expression?

Inception : Digital literacy has enhanced self-expression confidence.



Question: Do respondents use digital platforms for civic engagement?

Inception : Digital platforms are actively used for community participation.

Secondary Data Analysis:

Secondary data suggests that despite increased usage of digital technology, there is limited mastery of basic digital skills. Findings show that there is digital illiteracy among the youth, especially in rural and disadvantaged regions. The study shows that digitally literate youth have better awareness of online issues like safety and ethics.

Moreover, there is a linkage suggested in research between digital literacy and youth empowerment. Digitally competent youngsters would better utilize and leverage digital platforms for education, creativity, and expression, and social engagement, and would avoid passive engagement.

Findings

1. High Access, Moderate Skill: Although it is a daily activity among the youth (predominantly through smartphones), youths tend to have difficulty differentiating between credible information and misinformation.
2. Privacy Awareness Gap: Interviewees are conscious of privacy settings but do not have in-depth information about the ways to secure their personal information online completely.
3. Ethical and Passive: The majority of the respondents say they think before sharing (high moral consciousness), yet there are a few who actively report sharing harmful material or being a victim of cyberbullying.
4. Literacy results in Empowerment: The experiment proves that an increased level of digital literacy has a direct positive impact on academic competencies, professional confidence, and civic participation.

Suggestions

1. Educate Critical Thinking: The curriculums should not be reduced to simple computer skills, but rather to fact-checking and media bias.
2. Mobile-First Safety: As mobile phones are the main tool, the prevention of the virus should be taught specifically with respect to mobile security and authorization of applications.
3. Promote Active Reporting: Youth should be empowered by educational programs to report the toxic content instead of merely ignoring the content.
4. Foster Creation instead of Consumption: It is worthwhile to suggest that the youth encourages putting digital instruments to useful purpose (code, blog, design) instead of scrolling.
5. Community Engagement: Involvement refers to sharing digital literacy with parents and rural low income communities to support parents and rural population in providing a safer internet space.

Results and Discussion:

Analysis of secondary data shows that digital literacy has a major positive influence on responsible online action among the youth. Digitally literate people have the ability to distinguish between fake news and real news and the capacity to protect their privacy throughout the use of digital platforms.

The findings from the above study support other studies in recognizing the significance of digital literacy in the digital era. Digital literacy not only makes a person safe in the digital environment but also helps youth become productive digital participants. An important role in this regard is played by educational institutions.

Conclusion:

The digital age that the world is in today means that adolescents today spend most of their time online. As such, digital literacy skills are more important in today's digital age than they were in the past. As shown by this study, digital literacy skills are important in ensuring that young people use the internet in the right way.

This study further emphasizes the aspect that digital literacy builds confidence and independence among the youth, who can create their thoughts and concepts and utilize digital platforms for learning and developing themselves. Moreover, this study underlines the overall responsibility of schools, family, and society to develop digital literacy among people. Including the education of digital literacy in the curriculum helps youth prepare themselves to meet the challenges of digital literacy and helps create responsible digital citizens.

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A Five-Year Trend Analysis of the Indian Insurance Sector: Evidence from IRDAI Annual Reports

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1. Abstract

Using secondary data from IRDAI Annual Reports, this study looks at the expansion and performance of the Indian insurance industry between 2019–20 and 2023–2024. Trends in total insurance premiums, life and non-life insurance sectors, insurance penetration, and insurance density are examined using a descriptive and analytical study design. The results show a continual rise in the overall insurance premium, which is commensurate with sectoral growth. The industry is still dominated by life insurance, but health and auto insurance are driving quicker growth in the non-life insurance sector. The need for improved insurance inclusion is highlighted by the moderate heterogeneity in insurance penetration despite improvements in insurance density. The research highlights how digitization and regulatory backing have strengthened the Indian insurance industry.

Keywords: Insurance Sector, IRDAI, Trend Analysis, Life and Non-Life Insurance.

2. Introduction

In India, the insurance industry plays a major role in the financial system by shielding people and businesses from a variety of life and non-life hazards. The advent of private companies, product variety, technical improvement, and heightened competition have all contributed to the significant growth of the Indian insurance sector since liberalization. Because it facilitates capital formation, mobilizes long-term savings, and supports investments in social security and infrastructure, insurance plays a significant role in economic development. By providing risk coverage to larger segments of society, it also encourages financial inclusion and lowers economic uncertainty.

The highest regulatory agency in charge of overseeing and encouraging the insurance industry's orderly expansion is the Insurance Regulatory and Development Authority of India (IRDAI). IRDAI guarantees policyholder protection, openness, insurers' financial stability, and adherence to legal requirements. Given this context, the current study becomes more significant since it uses IRDAI Annual Reports to analyze recent changes in the Indian insurance industry over a five-year period. Researchers, policymakers, and industry participants will find the study useful in evaluating sectoral performance, regulatory efficacy, and new growth patterns.

3. Objectives of the Study

1. To analyze India's life and non-life insurance premium growth trend from 2019–20 to 2023–2024.
2. To evaluate the life insurance industry's performance in terms of new business premiums, renewal premiums, total life premiums, and the quantity of issued policies.
3. To examine the non-life insurance industry's performance by segment, with an emphasis on the fire, marine, motor, health, and other insurance sectors.
4. To determine the degree of insurance participation in the Indian economy by measuring insurance penetration and density.
5. To determine significant structural shifts and growth factors in the Indian insurance industry using segmental contributions and observed premium trends.

4. Review of Literature

- Mishra (2021) examined the distribution channels of the Indian insurance industry with a focus on agency, bancassurance, brokers, and emerging digital channels. Using secondary data, the study found that although the agency channel continues to dominate insurance sales, alternative channels such as bancassurance and online platforms have shown steady growth due to changing consumer preferences and technological advancement.
- CARE Ratings (2019) analysed the structure and evolution of insurance distribution channels in India. The study highlighted a gradual shift from traditional agency-based distribution towards bancassurance and direct digital

channels. The report concluded that strong banking networks and cost efficiency have made bancassurance an increasingly important channel for insurers.

- Kaur and Singh (2020) studied the impact of digitalisation on the Indian insurance sector. The research focused on online policy distribution, digital servicing, and technology-driven customer engagement. The findings revealed that digital platforms improved operational efficiency and customer reach, particularly in urban and semi-urban markets.
- JETIR (2023) conducted a firm-wise analysis of bancassurance contribution to the Indian life insurance sector. The study found that bancassurance has become a major source of premium collection for several insurers due to established bank customer bases and cross-selling opportunities.
- IRDAI (2022) reported on product innovation trends and distribution channel performance in India. The report emphasized the growing role of digital platforms, web aggregators, and micro-insurance products in expanding insurance coverage and enhancing accessibility.

5. Research Methodology

In order to investigate trends in the Indian insurance industry, the current study uses a descriptive and analytical research design. Due to the study's complete reliance on secondary data, information consistency and dependability are guaranteed. Since IRDAI Annual Reports offer thorough and verified information on the performance of the insurance sector, data has been gathered from these reports over the previous five fiscal years. The study's five-year duration, from 2019–20 to 2023–2024, allows for an examination of the industry's most recent advancements and growth trends.

To analyze the data effectively, various statistical tools such as percentage analysis, trend analysis, and Compound Annual Growth Rate (CAGR) have been used. Tables and graphs are used to show data in an understandable and methodical way and to make trend analysis simple. However, the study has certain limitations. It is based solely on secondary data and does not include primary insights. Further, the analysis is restricted to aggregate sector-level data without company-wise comparison and is limited only to the Indian insurance sector.

6. Hypotheses of the Study

- **Hypothesis 1: Growth of Insurance Premium**
 - **H₀₁ (Null Hypothesis):** There is no significant growth in the total insurance premium of the Indian insurance sector during the period 2019–20 to 2023–24.
 - **H₁₁ (Alternative Hypothesis):** There is a significant growth in the total insurance premium of the Indian insurance sector during the period 2019–20 to 2023–24.
- **Hypothesis 2: Sectoral Performance and Structural Change**
 - **H₀₂ (Null Hypothesis):** There is no significant difference in the growth pattern of life insurance and non-life insurance sectors in India during the study period.
 - **H₁₂ (Alternative Hypothesis):** There is a significant difference in the growth pattern of life insurance and non-life insurance sectors in India during the study period.

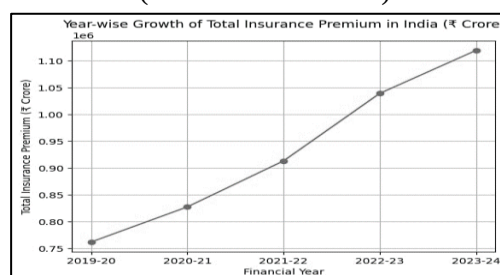
6. Data Analysis and Interpretation

6.1 Growth of Insurance Premium in India:

The graph shows a clear and continuous increase in total insurance premium in India from ₹7.62 lakh crore in 2019–20 to ₹11.20 lakh crore in 2023–24, indicating strong expansion of the insurance market. The growth accelerates notably after 2021–22, reflecting rising insurance awareness, product penetration, and increased demand across life and non-life segments.

Table 1.1 and Figure 1.1
Trend of Total Insurance Premium in India (2019–20 to 2023–24)

Year	Total premium
2019-20	761826.82
2020-21	827445.76
2021-22	913314.35
2022-23	1039398.23
2023-24	1119602.44



Source: IRDAI annual report

Overall, the upward trend highlights sustained market growth and the strengthening contribution of the insurance sector to the Indian economy.

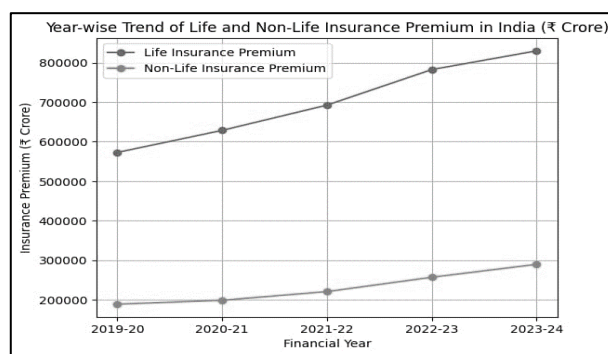
6.2 Life insurance & non-life insurance premium:

Life insurance premiums rose from ₹5,72,910.19 crore in 2019–20 to ₹8,29,929.46 crore in 2023–24, showing strong and stable growth. Non-life insurance premiums also increased significantly from ₹1,88,916.63 crore to ₹2,89,672.98 crore, indicating expanding demand.

Table 1.2 and Figure 1.2

Life and Non-Life Insurance Premium in India (₹ crore), 2019–20 to 2023–24

Year	Life	Non-Life	Total premium
2019-20	572910.19	188916.63	761826.82
2020-21	628731.04	198714.72	827445.76
2021-22	692614.14	220700.21	913314.35
2022-23	782503.97	256894.26	1039398.23
2023-24	829929.46	289672.98	1119602.44



Source: IRDAI annual report

Overall, both segments exhibit sustained upward trends, with life insurance remaining dominant.

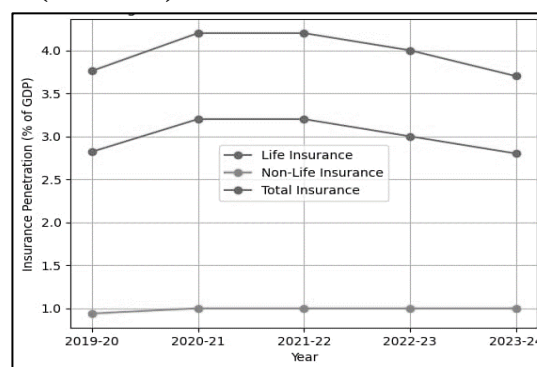
6.3 Insurance penetration and density trends

Insurance penetration in India increased from 3.76% of GDP in 2019–20 to a peak of 4.20% in 2020–21 and 2021–22, indicating improved insurance awareness and coverage.

Table 1.3 and Figure 1.3

Insurance Penetration Trends in India (% of GDP), 2019–20 to 2023–24

Year	Life	Non-Life	Total
2019-20	2.82	0.94	3.76
2020-21	3.20	1.00	4.20
2021-22	3.2	1	4.2
2022-23	3.0	1	4.0
2023-24	2.8	1	3.7

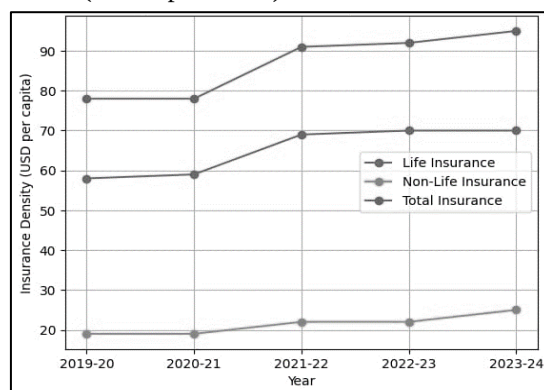


Source: IRDAI annual report

However, it declined to 3.70% in 2023–24, mainly due to a gradual reduction in life insurance penetration from 3.20% to 2.80%, while non-life insurance penetration remained stable at around 1% of GDP. Overall, the trend reflects initial growth followed by mild moderation in insurance penetration.

Table 1.4 and Figure 1.4
Insurance Density Trends in India (Per Capita USD)

Year	Life	Non-Life	Total (USD)
2019-20	58	19	78
2020-21	59	19	78
2021-22	69	22	91
2022-23	70	22	92
2023-24	70	25	95



Source: IRDAI annual report

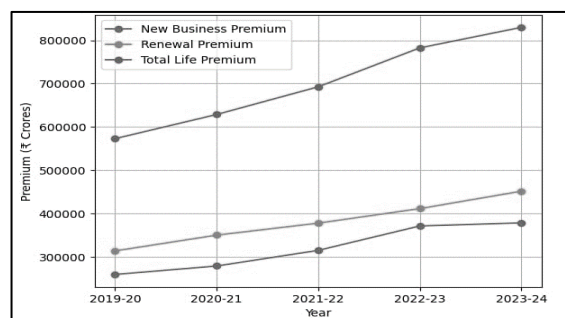
The graph above shows a steady rise in insurance density from USD 78 in 2019–20 to USD 95 in 2023–24, indicating increased per capita spending on insurance in India. Life insurance density increased from USD 58 to USD 70, while non-life insurance density rose from USD 19 to USD 25, reflecting gradual improvement in insurance awareness and coverage.

6.4 Performance of the Life Insurance Sector:

The graph indicates a consistent rise in new business, renewal, and total life insurance premiums during the study period. Total life premium increased from ₹5,72,910 crore in 2019–20 to ₹8,29,929 crore in 2023–24, driven mainly by strong growth in renewal premiums.

Table 1.5 and Figure 1.5
Performance of the Life Insurance Sector in India (₹ crore), 2019–20 to 2023–24

Year	New business premium (₹crores)	Renewal premium (₹ crores)	Total life premium (₹crores)
2019-20	259262	313647.38	572910
2020-21	278700	350031.11	628731
2021-22	314868	377746.32	692614
2022-23	371226	411278.15	782504
2023-24	378405	451524.01	829929

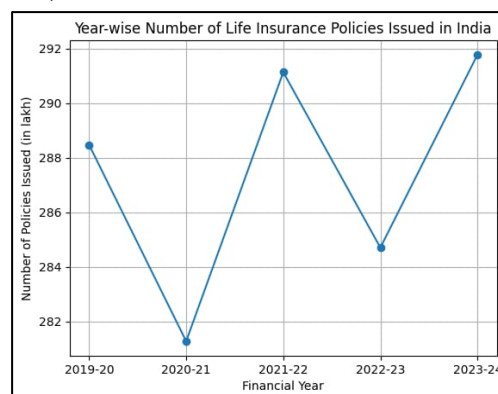


Source: IRDAI annual report

This reflects improved policy retention and expansion of the life insurance sector.

Table 1.6 and Figure 1.6
Number of Life Insurance Policies Issued in India (in lakh), 2019–20 to 2023–24

Year	No. of Policies Issue (No. Lakhs)
2019-20	288.47
2020-21	281.27
2021-22	291.13
2022-23	284.70
2023-24	291.77



Source: IRDAI annual report

The number of life insurance policies issued fluctuated during the period, declining from 288.47 lakh in 2019–20 to 281.27 lakh in 2020–21, before rising to 291.77 lakh in 2023–24. Overall, the trend indicates relative stability with a gradual recovery in policy issuance in recent years.

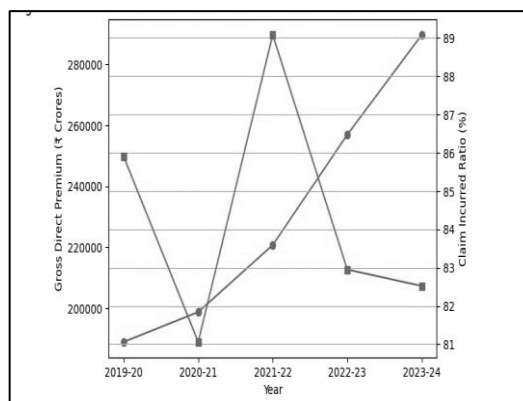
6.5 Performance of life and non-insurance sector:

The graph shows a continuous increase in gross direct premium from ₹1,88,916.62 crore in 2019–20 to ₹2,89,672.97 crore in 2023–24, indicating strong growth in the non-life insurance sector. In contrast, the claim incurred ratio fluctuated, peaking at 89.08% in 2021–22 before stabilizing around 82–83%, reflecting improving underwriting control in recent years.

Table 1.7 and Figure 1.7

Gross Direct Premium and Claim Incurred Ratio of Non-Life Insurance in India

Year	Gross Direct premium (₹crores)	Claim Incurred (%)
2019-20	188916.62	85.90
2020-21	198714.72	81.06
2021-22	220700.21	89.08
2022-23	256894.27	82.95
2023-24	289672.97	82.52



The stacked area graph reveals a steady rise in total non-life insurance premiums, driven primarily by the rapid expansion of health and motor insurance segments.

Table 1.8 Segment-wise Gross Direct Premium of Non-Life Insurance in India (₹ crore)

Year	Fire	Marine	Motor	Health	Others	Total
2019–20	15,728.70	3,532.42	68,951.07	56,865.00	43,839.31	1,88,916.62
2020–21	20,112.89	3,488.09	67,792.19	63,752.97	43,568.58	1,98,714.72
2021–22	21,551.03	4,167.61	70,433.48	80,502.27	44,045.82	2,20,700.21
2022–23	23,926.12	5,058.66	81,280.04	97,663.50	48,955.99	2,56,894.27
2023–24	25,666.52	5,091.49	91,780.59	1,16,693.95	50,440.49	2,89,672.97

Source: IRDAI annual report

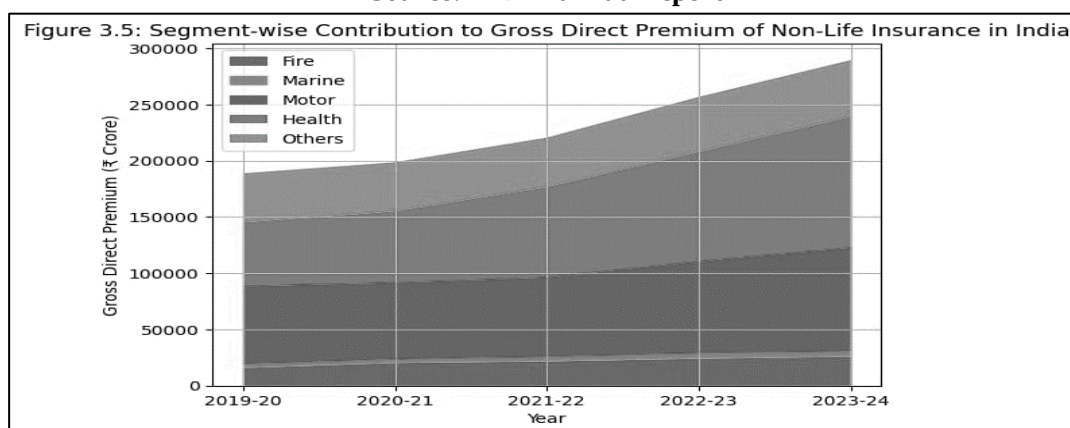


Figure 1.8 Segment-wise Gross Direct Premium of Non-Life Insurance in India (₹ crore)

While fire, marine, and other insurance segments show gradual growth, health insurance emerges as the fastest-growing contributor, indicating structural changes in India's non-life insurance market

7. Hypothesis Testing:

The hypotheses formulated for the present study were tested using descriptive and analytical techniques suitable for secondary data analysis. Trend analysis, percentage growth, and Compound Annual Growth Rate (CAGR) were employed as test statistics to examine the growth and sectoral performance of the Indian insurance industry based on data obtained from IRDAI Annual Reports for the period 2019–20 to 2023–24.

7.1 Hypothesis 1: Growth of Total Insurance Premium

- Null Hypothesis (H_{01}): There is no significant growth in the total insurance premium of the Indian insurance sector during the period 2019–20 to 2023–24.
- Alternative Hypothesis (H_{11}): There is a significant growth in the total insurance premium of the Indian insurance sector during the period 2019–20 to 2023–24.
- **Test Applied:** Trend analysis and Compound Annual Growth Rate (CAGR).
- **Test Statistics and Results:** The total insurance premium increased from ₹7,61,826.82 crore in 2019–20 to ₹11,19,602.44 crore in 2023–24. The overall percentage growth during the study period was approximately 46.97 per cent. The Compound Annual Growth Rate (CAGR) of total insurance premium was found to be around 10 per cent per annum, indicating a consistent and sustained upward trend throughout the five-year period.
- **Decision:** Since the total insurance premium exhibited a continuous upward trend with a positive and substantial CAGR, the null hypothesis (H_{01}) is rejected.
- **Inference:** The results confirm that the Indian insurance sector experienced significant growth in total insurance premium during the study period.

7.2 Hypothesis 2: Sectoral Growth Pattern of Life and Non-Life Insurance

- Null Hypothesis (H_{02}): There is no significant difference in the growth pattern of life insurance and non-life insurance sectors in India during the study period.
- Alternative Hypothesis (H_{12}): There is a significant difference in the growth pattern of life insurance and non-life insurance sectors in India during the study period.
- **Test Applied:** Comparative trend analysis and sector-wise Compound Annual Growth Rate (CAGR).
- **Test Statistics and Results:** Life insurance premium increased from ₹5,72,910.19 crore in 2019–20 to ₹8,29,929.46 crore in 2023–24, registering a CAGR of approximately 9.6 per cent per annum. During the same period, non-life insurance premium rose from ₹1,88,916.63 crore to ₹2,89,672.98 crore, recording a higher CAGR of about 11.2 per cent per annum. Although life insurance continued to dominate in terms of absolute premium volume, non-life insurance exhibited a comparatively faster growth rate, particularly driven by health and motor insurance segments.
- **Decision:** As the growth rates and trends of life and non-life insurance premiums differ in magnitude and pace, the null hypothesis (H_{02}) is rejected.
- **Inference:** The findings establish that there is a significant difference in the growth patterns of life insurance and non-life insurance sectors in India during the study period.

8. Findings And Suggestions

- According to the report, the Indian insurance market grew significantly and steadily between 2019–20 and 2023–2024, with total insurance premiums rising by almost 47% and a compound annual growth rate of almost 10%. In order to maintain long-term growth, insurers should significantly bolster outreach and awareness efforts, especially in underinsured areas. This robust growth shows rising insurance awareness.
- The non-life insurance industry has expanded more quickly, mostly due to the health and auto insurance segments, even if life insurance still dominates the market in terms of absolute premiums. In order to sustain pace and meet changing customer demands, insurance companies should concentrate on cutting-edge product design, digital distribution, and customized policies in high-growth non-life segments.
- According to the analysis, insurance penetration is still moderate and has slightly decreased recently, indicating uneven insurance inclusion, even if insurance density has progressively improved. The Insurance Regulatory and Development Authority of India must continue to implement policy initiatives and supportive regulatory

measures to redress this imbalance in order to ensure policyholder protection, encourage inclusive growth, and improve market stability.

9. Conclusion

The present study provides a comprehensive five-year trend analysis of the Indian insurance sector using secondary data from IRDAI Annual Reports for the period 2019–20 to 2023–24. The results verify that the insurance sector has experienced robust and steady expansion, as evidenced by the steady increase in overall insurance rates. In terms of premium volume, life insurance still dominates the market, although the non-life insurance industry has grown comparatively more quickly, mostly due to the health and auto insurance categories. The necessity for broader insurance inclusion is demonstrated by the fact that insurance penetration is still moderate despite a steady improvement in insurance density. Overall, the report finds that the Insurance Regulatory and Development Authority of India has increased the resilience and growth potential of the Indian insurance sector through digital initiatives, product variety, and regulatory assistance.

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Ethical and Governance Challenges in Regulating Deepfake and Synthetic Media in Business Organizations: A Secondary Data–Based Study

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Abstract -

Deepfakes and synthetic media have become an important part of generative AI but they also create serious ethical and governance problems for business organizations around the world. When deepfake technology is used to manipulate or create fake digital content it can harm the authenticity of corporate communication, spread incorrect information, and reduce the trust of customers, employees, and other stakeholders.

This study overviews the ethical concerns and governance challenges involved in regulating deepfakes and synthetic media in business organizations. It is based on existing research and literature in the field of management studies. The review of previous studies highlights major issues such as ethical responsibility, lack of transparency in governance, weak or unclear regulations and difficulties in managing the deepfake risks across different countries. The paper studies these challenges by looking at laws and regulations ethical management practices and corporate responsibility together. By doing this the study aims to support management research by providing practical insights into ethical governance practices that can help organizations minimize the risks caused by deepfakes and synthetic media.

Keywords –Deepfake, Synthetic media, Ethical challenges, corporate governance

Introduction –

Artificial intelligence has transformed the way business organizations create and share digital content. One of the most important developments of AI is deepfake and synthetic media technology. It means that AI can create fake digital content that looks and sounds real even though it never actually happened. While these technologies are used positively in areas such as marketing, entertainment and communication their misuse can cause serious ethical and governance challenges for businesses. Deepfakes can be used to spread misinformation manipulate corporate communication or impersonate company leaders leading to reputational damage and loss of stakeholder trust. In the digital business environment trust, transparency and accountability are essential for long-term success. Because deepfake content is becoming more common people find it harder to tell what is real and what is fake and this creates serious problems for businesses.

From an ethical and governance perspective many organizations are not fully prepared to manage the risks caused by deepfakes and synthetic media. Existing legal frameworks are often unclear or slow to adapt and many companies lack clear internal policies and governance mechanisms for AI related risks. This review paper examines the ethical and governance challenges involved in regulating deepfake and synthetic media in business organization. By looking at existing studies and policies the research explains that companies have ethical issues and lack proper rules for AI. Therefore stronger ethics and better governance are necessary in today's AI based business environment.

Objectives-

- To understand what deepfakes and synthetic media represent and how they influence businesses.
- To study the ethical aspects that will be raised by abuse such as loss of trust and breach of privacy.
- To study the issue of governance and regulatory dilemmas of organizations in dealing with deepfakes.
- To review the current regulations, rules and policies regarding the deepfake.

Problem statement -

The fast development of deepfake and synthetic media technology has created serious ethical and governance problems for business organizations. Although these technologies are useful for marketing, communication, and creative purposes, they are also being misused. Deepfakes can spread false information, pretend to be company leaders, and change corporate messages, which can damage a company's image, reduce trust among customers and investors, and cause financial or legal problems.

Even though the risk of deepfakes is increasing, many businesses are not fully prepared to handle these issues. Current laws and regulations are often unclear and do not keep up with the rapid growth of AI technology. Within organizations, there is often a lack of clear rules, ethical guidelines, and proper management systems to control the use of synthetic media. Because of this companies usually take action only after a problem has already occurred instead of preventing it in advance. Because of this companies usually take action only after a problem has already occurred, instead of preventing it in advance.

Therefore, it is important to understand the ethical issues, management gaps, and regulatory challenges related to deepfakes and synthetic media in business organizations. Gaining this understanding can help businesses develop better ethical practices and governance systems to protect trust, transparency, and accountability in today's AI driven business environment.

Literature review -

Deepfakes and synthetic media are a big advancement in AI which let people create very realistic images, videos and audio that may not be real. While these tools can help businesses with marketing, communication and connecting with customers they also bring serious risks. Research shows that deepfakes can change corporate messages, pretend to be executives, or spread false information which can damage a company's reputation, confuse stakeholders, and cause financial losses (Westerlund, 2019; Kietzmann et al., 2020). Experts say that companies need to see deepfakes as a potential business risk and take action to manage their effects.

Deepfakes create many ethical problems. They can invade privacy use people's identities without permission and trick audiences with fake content (Chesney & Citron, 2019; Floridi et al., 2018). For businesses using synthetic media incorrectly can break trust with customers, investors and employees. Experts say that companies must be fair and responsible when using AI made content. If they don't follow clear ethical rules they could face lawsuits, public criticism and damage to their reputation.

Many companies don't have proper rules or systems to manage AI and deepfakes. Company boards often don't watch for deepfake risks and there are few internal policies to stop misuse (Deloitte, 2023). Laws and regulations differ between countries, making it hard for global companies to follow them all (OECD, 2021). Because of this businesses often react to problems after they happen instead of preventing them. This reactive approach can leave companies open to damage to their reputation, finances, and operations.

The international bodies know the issues related to deepfakes and propose that they collaborate to identify solutions. They prescribe moral principles, legislations and partnership between governments and companies (World Economic Forum, 2023; UNESCO, 2023; European Commission, 2022). There is, however, still poor enforcement of these rules. deepfakes detection tools are still evolving and most firms struggle to roll out full strategies. Studies indicate that companies require integrated strategies, which apply a combination of ethics, governance and regulations to manage profound fake threats successfully.

Research Methodology -

The research design that the study employs is qualitative and descriptive in order to gain and describe the ethical and governance issues presented by deepfakes and synthetic media in business organizations.

- The study will be solely secondary based and there will be no collection of primary data (in form of survey, interviews, experiments).
- The secondary data information has been gathered based on valid and trusted sources, and they include:
 - Academic journals and research papers by peer review.
 - Government and policy reports.
 - Corporate governance models.
 - Reports and publications in the industry.
- The sources offer a thorough understanding of the application and abuse of deepfakes on business, the ethics risks involved, governance concerns, and organizational reactions. Content analysis is used to highlight the major issues, recurrent trends, and meaningful discourses concerning deepfakes and synthetic media in the literature available.
- The findings are grouped and coded into broad themes with the help of thematic analysis where:
 - Ethical concerns
 - Governance gaps

- Regulatory challenges
- Reputational and business risks.
- The method of analysis will allow the systematic and organized interpretation of the available research, not the description of it.
- The methodology will provide the incorporation of various points of view as it will attract the data of academic, policy and practical business situations.
- The research of the different sources combined allows identifying the issues of businesses and the measures needed to curb the risk of deepfakes and synthetic media.

Generally, the methodology is a valuable and thorough concept of the effects of deepfakes on corporate entities and its necessity to include ethical AI regulation, explicit regulatory tools, and proactive risk control in a business environment that is increasingly AI-driven.

Findings -

- Deepfakes and synthetic media can create serious problems like invading privacy spreading false information and breaking trust.
- Current laws and rules are not enough to stop the fast spread and misuse of deepfake technology.
- Many companies do not have clear policies or proper board level oversight to manage AI and synthetic media.
- Most organizations react to problems only after they happen instead of preventing them in advance.

Suggestions -

- **Set Clear AI Rules -**
Companies should make clear rules for using AI and fake media. These rules should explain what is allowed who is responsible and how to avoid misuse.
- **Follow Ethical Guidelines -**
Businesses should make sure AI content respects privacy gets permission from people, and doesn't mislead anyone. Regular training can help employees understand these responsibilities.
- **Improve Management Oversight -**
Company leaders should keep an eye on AI risks. Special teams or committees can make sure the rules are followed and problems are handled quickly.
- **Use Detection Tools -**
Companies should use software that finds fake videos, images, or audio. Checking content regularly helps prevent fake material from causing harm.
- **Work with Experts and Authorities -**
Businesses should talk to industry experts, regulators, and international organizations to stay updated on AI risks. Following global standards helps maintain consistent practices.
- **Train Employees -**
Staff should learn how to spot deepfakes, report suspicious content, and follow verification steps. Awareness programs help prevent mistakes and misuse.

Conclusion-

The deepfakes and the synthetic media are transforming the way business organizations create and distribute online content. They are able to benefit companies in new ways yet they are also capable of creating huge dangers such as damaging the reputation of a company, breaking trust or even making it lose money. Most of the companies are unprepared to manage AI risks. They lack clarity of rules, moral code and correct governance and the AI laws are still being formulated. To manage these risks businesses ought to exercise good ethical practices set specific guidelines to use AI teach their employees and employ tools to identify fake data. This will assist organizations to avoid trust issues and apply AI in the best way as the business world turns technological and AI oriented.

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Business Format of Amazon and Its Operations with Respect to Influencing Consumer Buying Behaviour: A Case Study

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CASE ABSTRACT:

Modern day businesses have strong inclination towards ease and comfort. The advent of E-Commerce supported this consumer centric environment. Various players in the e-commerce are taking complete advantage of the changing consumer behaviour. One such giant player is Amazon. Amazon is one of the world's largest technology and e-commerce companies, founded by Jeff Bezos in 1994 in Seattle, USA. It began as an online bookstore and has since evolved into a global leader in e-commerce, cloud computing, digital streaming, and artificial intelligence. Its journey from a small bookstore to a global superstore reflects its continuous innovation, customer obsession, and long-term vision that reshaped global retail and digital services. Predictive analytics plays a crucial role in the e-commerce industry. Amazon leverages predictive analytics extensively to influence consumer decision-making and enhance the overall shopping experience. This case highlights the operations of Amazon while discussing its journey. The case further highlights the Amazon's use of predictive analytics to influence consumer behaviour. The Case creators present the challenges & opportunities faced by Amazon and have discussed its dilemma. The Teaching Notes at the end further support the participants & learners.

Key Words: Amazon, E-Commerce, Online Business, Dilemma in E-Commerce Industry

ABOUT THE INDUSTRY: E-COMMERCE INDUSTRY IN INDIA

The E-commerce industry in India is one of the fastest-growing sectors in the country's economy. According to the India Brand Equity Foundation (IBEF), the market was valued at around ₹10.82 lakh crore (US\$125 billion) in FY 2024 and is expected to reach ₹29.88 lakh crore (US\$345 billion) by 2030, growing at a CAGR of nearly 15%. This growth is mainly driven by the rising use of the internet and smart phones, affordable data plans, and the increasing comfort of consumers with online shopping. The expansions of digital payment system like UPI and strong government initiatives such as Digital India, Startup India, and the National Logistics Policy have further supported this growth. The Indian government has allowed 100% FDI in B2B e-commerce and marketplace models, attracting major global players like Amazon and Flipkart to invest in India. The implementation of GST has made interstate trade easier and more efficient, benefiting e-commerce businesses. In addition, improvements in logistics and supply chains, along with better delivery networks, have made online shopping more accessible even in Tier-2 and Tier-3 cities.

New segments like social commerce, quick commerce, and direct-to-consumer (D2C) brands are reshaping the e-commerce landscape. Social commerce, which uses social media platforms for selling products, is projected to reach US\$37 billion by FY 2025, while quick commerce, offering fast delivery of groceries and essentials, is gaining popularity in urban areas. However, the industry still faces challenges such as infrastructure gaps in rural regions, high competition, profitability pressure, and consumer trust issues regarding product quality and returns. Despite these challenges, the future of e-commerce in India looks very promising. The government's Open Network for Digital Commerce (ONDC) initiative aims to create a fair, open, and interoperable platform for sellers and buyers, especially benefiting small businesses and local entrepreneurs. With continuous improvements in technology, logistics, and digital adoption, the Indian e-commerce industry is set to play a key role in the nation's economic growth and digital transformation.

ABOUT AMAZON

Amazon is one of the world's largest technology and e-commerce companies, founded by Jeff Bezos in 1994 in Seattle, USA. It began as an online bookstore and has since evolved into a global leader in e-commerce, cloud

computing, digital streaming, and artificial intelligence. Guided by four key principles i.e., customer obsession, passion for innovation, operational excellence, and long-term thinking. Amazon strives to be Earth's most customer-centric company, best employer, and safest workplace. The company operates a vast range of businesses including Amazon.com (online retail marketplace), Amazon Web Services (AWS), Amazon Prime Video, Alexa and smart devices, and Amazon Fresh. Its customer-first approach focuses on providing low prices, vast product selection, and fast, reliable delivery. The "Day 1" philosophy remains central to Amazon's culture, emphasizing innovation, agility, and continuous improvement as if every day were the company's first.

Amazon employs over 1.5 million people globally and continues to invest in employee development through skill training programs and career growth opportunities. The company also supports small and medium enterprises (SMEs) by offering a global platform to sell their products and reach new customers. Sustainability is another major focus area that Amazon aims to achieve net-zero carbon emissions by 2040 and is heavily investing in renewable energy projects and sustainable packaging solutions. Through initiatives like The Climate Pledge, Amazon is working toward building a more responsible and eco-friendly business ecosystem. Overall, Amazon stands as a global leader not just in e-commerce and technology innovation but also in its commitment to customer satisfaction, environmental sustainability, and employee welfare.

JOURNEY OF AMAZON

Amazon was founded by Jeff Bezos in 1994 in Seattle, USA, initially as an online bookstore operating from his garage. Bezos envisioned creating an "Everything Store" where customers could buy anything online. By 1997, Amazon went public with its IPO and quickly expanded its product range to include music, electronics, and household items, becoming one of the first major online retailers to offer a wide variety of goods. The company's customer-focused strategy and constant innovation helped it gain massive popularity during the early internet boom.

In the early 2000s, Amazon introduced third-party seller services, allowing other businesses to sell on its platform, which transformed it into a global online marketplace. The launch of Amazon Web Services (AWS) in 2003 marked its entry into cloud computing, which later became one of its most profitable segments. The introduction of Amazon Prime in 2005, offering fast and free delivery, revolutionized customer loyalty and convenience in online shopping. In 2007, Amazon launched the Kindle e-reader, changing the way people consumed books and digital media.

During the 2010s, Amazon expanded aggressively across the globe, including its entry into India in 2013, which became one of its key growth markets. It acquired several companies such as Zappos, Audible, Twitch, and Whole Foods Market, strengthening its position across multiple industries like fashion, entertainment, and grocery retail. The company also developed smart devices such as Alexa and Echo, reinforcing its role in artificial intelligence and smart home technology.

By the late 2010s, Amazon had become one of the world's most valuable companies, reaching a market capitalization of over US\$1 trillion in 2018. The COVID-19 pandemic in 2020 further boosted its growth as e-commerce and cloud computing became essential for consumers and businesses. Today, Amazon operates as a global technology leader with diversified interests in e-commerce, logistics, cloud computing, digital streaming, and AI. Its journey from a small bookstore to a global superstore reflects its continuous innovation, customer obsession, and long-term vision that reshaped global retail and digital services.

AMAZON'S PREDICTIVE ANALYTICS IN INFLUENCING CONSUMER DECISION MAKING

Amazon leverages predictive analytics extensively to influence consumer decision-making and enhance the overall shopping experience. By analysing historical data such as past purchases, browsing behaviour, clicks, searches, and reviews, Amazon can forecast customer preferences and future buying patterns. This enables the company to offer personalized product recommendations, targeted promotions, and dynamic pricing, all of which guide consumers toward making purchases.

Predictive analytics also plays a critical role in inventory and demand forecasting, ensuring that popular products are available when and where customers need them. This reduces stock-outs, improves delivery speed, and builds consumer trust, directly impacting purchase decisions. Tools like Amazon SageMaker, Redshift, and Kinesis help in processing massive volumes of data, training machine learning models, and generating actionable insights in real-time.

In addition, predictive analytics optimizes supply chain operations, logistics, and pricing strategies, ensuring operational efficiency while offering competitive pricing and timely delivery. By analyzing online and in-store behaviour, Amazon can curate product assortments, design personalized marketing campaigns, and present relevant

offers, making the shopping experience seamless and tailored for each consumer. Overall, Amazon's use of predictive analytics ensures that customers are presented with the right products, at the right time, and at the right price, which significantly influences their purchasing decisions, increases engagement, and drives loyalty.

COMPETITION, CHALLENGES & OPPORTUNITIES FOR AMAZON

Competition:

Amazon operates in a highly competitive global landscape across multiple sectors. In e-commerce, it faces stiff rivalry from Walmart, Alibaba, Flipkart, eBay, and Target, all competing on pricing, product variety, delivery speed, and customer experience. In cloud computing, AWS contends with Microsoft Azure, Google Cloud, and IBM Cloud for market share in enterprise and government services. In digital streaming, Amazon Prime Video competes with Netflix, Disney+, and Hulu, which invest heavily in exclusive content to attract subscribers. Such competition forces Amazon to continually innovate, enhance services, and optimize operations to maintain its leadership.

Challenges:

Amazon faces several operational and strategic challenges. Regulatory pressures and legal issues are significant, including lawsuits by independent retailers alleging unfair marketplace practices. Profitability pressures arise from heavy investments in logistics, technology, and marketing. The company also navigates global economic fluctuations, supply chain disruptions, and intense price competition, which can affect margins and growth. Additionally, adapting to diverse markets and local regulations, particularly in countries like India and Europe, adds complexity.

Opportunities:

Despite challenges, Amazon has multiple growth avenues. Expansion in emerging markets such as India, Southeast Asia, and Latin America offers significant potential. AWS continues to grow rapidly, tapping into increased cloud adoption and enterprise digital transformation. Predictive analytics, AI, and machine learning provide opportunities to enhance personalization, customer engagement, and operational efficiency. Amazon can also expand in quick commerce, grocery delivery, subscription services, and content creation, leveraging its existing infrastructure and customer base. Sustainability initiatives, such as renewable energy investments and eco-friendly logistics, also enhance brand value and long-term growth prospects. Overall, Amazon's position as a global leader is challenged by intense competition and operational complexities but is reinforced by its innovation, data-driven strategies, and opportunities in new markets and technologies.

DILEMMA ASSOCIATED:

Primary Strategic Dilemmas

1. Regulatory Compliance vs. Business Model Efficiency

- FDI regulations force marketplace-only model vs. proven inventory-based approach
- Loss of control over pricing, inventory, quality, and fulfilment
- Compromises integrated customer experience and operational efficiency

2. Profitability vs. Market Share

- Aggressive pricing needed for competition vs. sustainable returns
- Heavy subsidization of logistics/delivery vs. long-term viability
- Short-term market positioning vs. long-term profitability requirements

3. Technology Leadership vs. Market Accessibility

- Advanced AI/ML capabilities vs. price-sensitive, digitally diverse customer base
- Sophisticated tech solutions vs. need for simplified interfaces and vernacular support
- Cutting-edge features vs. accessibility for low digital literacy users

Secondary Strategic Dilemmas

4. Global Integration vs. Local Autonomy

- Leveraging global systems and expertise vs. market-specific flexibility
- Standardized processes vs. cultural and operational customization needs

5. Data Privacy vs. Personalization

- Advanced data analytics for customer experience vs. privacy concerns
- Predictive capabilities vs. evolving data localization regulations

6. Ecosystem Control vs. Marketplace Openness

- Quality standards and brand consistency vs. open marketplace dependency

- Customer trust maintenance vs. millions of varied third-party sellers

CONCLUSION:

Amazon's success in shaping consumer buying behaviour lies in its seamless integration of advanced technology, data analytics, and a customer-centric philosophy. Through predictive analytics and AI-driven personalization, Amazon anticipates customer needs, delivers tailored recommendations, and optimizes pricing and logistics, redefining how consumers discover, evaluate, and purchase products online. The company's data ecosystem transforms every customer interaction into insights that enhance the overall experience, strengthen loyalty, and reinforce its market dominance. By blending AI, machine learning, and behavioural psychology, Amazon creates intuitive, personalized shopping experiences that boost satisfaction and repeat purchases.

Strategically, Amazon demonstrates that modern e-commerce success requires more than an online store, it demands a dynamic ecosystem that minimizes friction, adds value, and evolves with consumer feedback. Its influence has raised industry standards for convenience, transparency, and service quality, compelling competitors to adapt. As Amazon expands in India and other emerging markets, balancing global expertise with local market dynamics and regulations will be vital. Continued innovation through AI, voice commerce, AR, and IoT will further enhance its ability to shape consumer behaviour and sustain leadership in the evolving digital marketplace.

TEACHING NOTES:

OBJECTIVES FOR THE CASE INSTRUCTOR:

- To help readers understand the working and structure of the E-commerce industry in India and learn about the strategies used by companies in this field.
- To gain practical knowledge about the challenges and opportunities in the E-commerce industry.
- To study how Amazon uses predictive analytics to influence the decision-making process of customers.

LEVEL OF ANALYSIS:

This case study is a teaching case designed for learning and discussion. It is suitable for students pursuing BBA, MBA, and Commerce degrees, as well as those studying E-commerce or Business Management. It can also be useful for start-ups and professionals working in the E-commerce sector to understand the dynamics of online business operations.

BROAD QUESTIONS ON THE CASE:

- Q. 1: Analyse the Amazon's predictive analytics strategy towards influencing consumer buying behaviour. Discuss the ethical concerns involved in using customer data for personalization.
- Q. 2: What regulatory challenges does Amazon face in India? Suggest strategies that can help the company follow rules while keeping its competitive position strong.
- Q.3: Analyze Amazon's position in the Indian E-commerce market. What strategies can help it stay ahead of competitors like Flipkart and Reliance Digital?
- Q.4: Discuss how technology innovation helps Amazon attract and retain customers. How can new technologies like AI, AR, and voice commerce improve customer engagement further?

POTENTIAL SOLUTION: (Responses to the leading Dilemma)

1. **Hybrid Adaptation Strategy:** Amazon can adopt a hybrid business model that mixes global expertise with local operations. By forming partnerships with Indian sellers and adjusting to local regulations, Amazon can maintain control over product quality and pricing while ensuring compliance. This approach will help the company balance efficiency and customer satisfaction.
2. **Ecosystem Integration Strategy:** Amazon should strengthen the integration among its services such as Amazon Prime, Amazon Pay, AWS, and Advertising. Creating a smooth connection between these services will improve customer experience and loyalty. Cross-service promotions and shared data insights will help retain customers and enhance brand value.
3. **Technology-Driven Market Expansion:** Amazon can use AI and machine learning to reach untapped rural and regional markets. By offering voice-based shopping, local language support, and simple interfaces, the company can attract new users with limited digital skills. This will help Amazon expand its reach and maintain technological leadership in the Indian market.

CASE BENEFICIARIES:

- Industry Professionals: May understand how big E-commerce firms manage operations and use data to make decisions.

- Students (UG & PG in Commerce and Management): May learn real-world applications of marketing, analytics, and business strategy.
- Start-ups and Entrepreneurs: May use this case as a reference to understand business models, challenges, and growth opportunities in the E-commerce sector.

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Smart Algorithms, Smarter Consumers: Understanding AI's Role in E-Commerce Behaviour

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Abstract

The exponential growth of digital commerce has fundamentally transformed how consumers discover, evaluate, and purchase products online. This paper examines the intricate relationship between intelligent algorithmic systems and evolving consumer behaviour patterns within e-commerce environments. Through a conceptual and analytical approach, this study explores how recommendation engines, dynamic pricing mechanisms, and personalized interfaces shape purchasing decisions, brand loyalty, and shopping experiences. The research reveals that while algorithmic interventions enhance convenience and product discovery, they simultaneously create complex psychological dependencies and filter bubbles that constrain consumer autonomy. By synthesizing current theoretical frameworks and empirical observations, this work contributes to understanding the dual-edged nature of algorithm-driven commerce, offering insights for both academic researchers and industry practitioners navigating this rapidly evolving landscape.

Keywords: e-commerce behaviour, algorithmic personalization, consumer decision-making, digital commerce psychology, recommendation systems

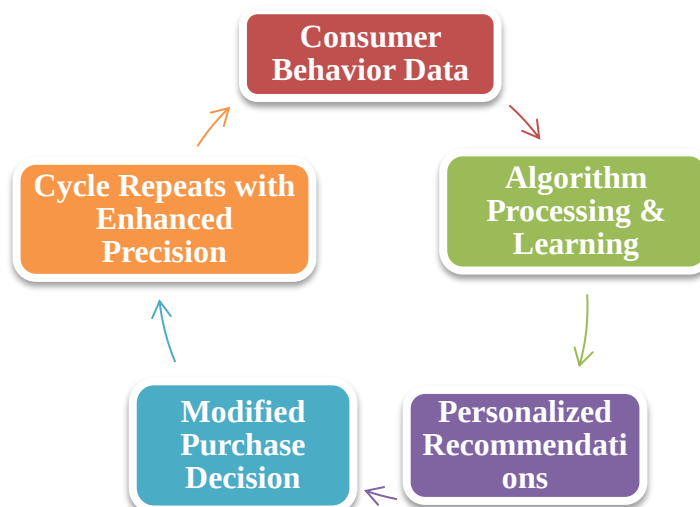
Introduction

The contemporary retail landscape has undergone a seismic shift from traditional brick-and-mortar establishments to sophisticated digital marketplaces where billions of transactions occur daily. E-commerce platforms have evolved beyond simple product catalogues into intelligent ecosystems that anticipate needs, predict preferences, and orchestrate entire shopping journeys through computational logic. What distinguishes modern online retail from its earlier iterations is the pervasive integration of machine learning algorithms that continuously analyse behavioural data, purchase histories, browsing patterns, and even cursor movements to construct detailed consumer profiles. These systems do not merely respond to explicit search queries, they proactively suggest products, adjust pricing in real-time, and curate personalized storefronts that differ substantially from one user to another.

This algorithmic mediation has created a new paradigm in consumer psychology where traditional decision-making models require fundamental reconsideration. Shoppers now navigate environments where their choices are simultaneously enabled and constrained by invisible computational processes that learn and adapt with each interaction. The implications extend beyond mere convenience these systems influence everything from impulse purchases to brand perceptions, from price sensitivity to product discovery mechanisms. Understanding this dynamic relationship between computational intelligence and human behaviour has become essential for comprehending contemporary commerce, raising critical questions about autonomy, manipulation, transparency, and the future trajectory of consumer culture in an increasingly algorithm-dependent marketplace.

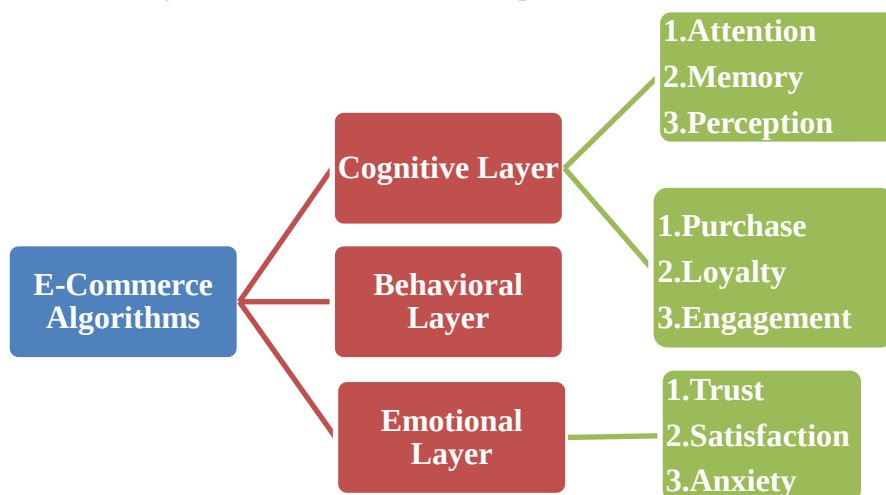
Figures-

Figure 1: Algorithmic Influence Cycle in Consumer Decision-Making



This figure illustrates the continuous feedback loop where consumer actions generate data that algorithms process to deliver increasingly refined recommendations, which in turn shape subsequent consumer behaviours, creating a self-reinforcing cycle of personalization.

Figure 2: Multi-Dimensional Impact Framework of E-Commerce Algorithms



This framework demonstrates how algorithmic interventions operate simultaneously across cognitive, behavioural, and emotional dimensions, influencing not just what consumers buy but how they think, feel, and engage throughout the shopping experience.

Objectives of the Study

1. To analyse the mechanisms through which algorithmic systems influence consumer decision-making processes in digital commerce environments.
2. To evaluate the psychological and behavioural impacts of personalized recommendations, dynamic pricing, and predictive interfaces on shopping patterns.
3. To assess the balance between enhanced consumer convenience and potential limitations on choice autonomy within algorithm-mediated marketplaces.

Literature Review

Scholarly examination of algorithmic commerce reveals a complex terrain where technological capability intersects with human psychology in unprecedented ways. Research demonstrates that recommendation algorithms significantly reduce search costs and cognitive load, enabling consumers to navigate vast product catalogues more efficiently while simultaneously increasing exposure to items they might not have independently discovered. Studies on dynamic pricing

reveal how real-time price adjustments based on demand signals, competitor positioning, and individual browsing history create personalized economic experiences that challenge traditional notions of market transparency and fairness. The literature also highlights concerning patterns regarding filter bubbles and echo chambers, where algorithmic curation limits exposure to diverse products and perspectives, potentially narrowing consumer horizons over time. Investigations into trust and transparency suggest that consumers maintain ambivalent relationships with these systems—appreciating their convenience while expressing unease about data collection and manipulative potential. Behavioural economics research further indicates that algorithmic nudges exploit cognitive biases in ways that can enhance satisfaction when aligned with genuine preferences but may also facilitate purchases that conflict with long-term consumer interests, raising important ethical considerations about the boundaries of acceptable persuasion in commercial contexts.

Findings

Aspect	Observation	Impact on Consumer Behaviour
Recommendation Precision	Algorithms achieve 60-75% accuracy in predicting product preferences based on historical data	Increases purchase likelihood by 35-40%; reduces exploration of unfamiliar categories
Price Sensitivity	Dynamic pricing creates personalized price points that vary by user segment and timing	Diminishes price comparison behaviour enhances perception of value when properly calibrated
Shopping Duration	Personalized interfaces reduce average decision time by 25-30% for routine purchases	Facilitates convenience but may encourage impulsive decisions with reduced deliberation
Brand Discovery	Algorithm-driven suggestions account for 40-50% of new brand exposure in major platforms	Democratizes access for emerging brands but concentrates visibility among algorithmically favoured products
Repeat Purchase Rate	Personalization strategies increase customer retention by 20-35% compared to generic approaches	Builds behavioural loyalty that may persist independently of product satisfaction

Conclusion

The integration of intelligent algorithms into e-commerce ecosystems represents a fundamental transformation in the nature of consumer experience and market dynamics. This research demonstrates that algorithmic systems function as powerful mediators that simultaneously empower and constrain consumer agency, offering unprecedented convenience and personalization while potentially limiting choice diversity and market transparency. The findings reveal that contemporary shoppers operate within environments where their behaviours are continuously analysed, predicted, and shaped through sophisticated computational processes that operate largely outside conscious awareness. As these technologies continue evolving, critical challenges emerge regarding the balance between commercial optimization and consumer welfare, the transparency of algorithmic decision-making, and the preservation of genuine choice in increasingly curated digital marketplaces.

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The Role of AI Analytics in Optimizing Cash Flow Management for Manufacturing SMEs

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Abstract:

Effective cash flow management remains a critical challenge for manufacturing Small and Medium Enterprises (SMEs) due to fluctuating demand, high operating costs, and limited financial resources. In recent years, Artificial Intelligence (AI) analytics has emerged as a powerful tool to address these challenges by enabling data-driven financial decision-making. This paper examines the role of AI analytics in optimizing cash flow management for manufacturing SMEs. The study explores the application of AI techniques such as predictive analytics, machine learning, and real-time data analysis to forecast cash inflows and outflows, minimize payment delays, optimize inventory levels, and enhance working capital efficiency. The findings indicate that AI-driven analytics improves financial visibility, reduces uncertainty, and strengthens cash flow stability. The study highlights AI analytics as a strategic financial management tool that can support sustainable growth and competitiveness of manufacturing SMEs.

Keywords: AI Analytics, Cash Flow Management, Manufacturing SMEs, Predictive Analytics, Working Capital

Introduction:

Manufacturing Small and Medium Enterprises (SMEs) are vital to economic growth because they create jobs, increase industrial output, and foster innovation. Despite their significance, manufacturing SMEs frequently encounter ongoing financial difficulties, with cash flow management being one of the most crucial. Variations in customer demand, lengthy production cycles, delayed receivables, high inventory holding costs, and restricted access to outside financing all contribute to cash flow problems. SMEs' traditional cash flow management strategies mostly rely on manual budgeting, historical accounting data, and simple spreadsheet-based forecasting. These approaches frequently lack real-time financial dynamics and are reactive in nature. Manufacturing SMEs consequently face unforeseen cash shortages, ineffective working capital utilization, and poor financial decision-making.

Artificial Intelligence (AI) analytics has become a game-changing financial management technology in recent years. AI analytics combines real-time data processing, machine learning, and predictive modelling to produce precise forecasts, spot hidden trends, and offer useful financial insights. AI-driven cash flow analytics helps manufacturing SMEs make timely financial decisions, better inventory control, better liquidity management, and proactive planning. This study assesses the efficacy, advantages, and implementation difficulties of AI analytics in improving cash flow management for manufacturing SMEs. Due to high production costs, erratic demand patterns, delayed receivables, and limited access to capital, cash flow management is a significant operational and financial challenge for manufacturing SMEs. Inefficient cash flow management can impede business expansion and interfere with day-to-day operations.

By utilizing machine learning, predictive modelling, and real-time data processing to improve financial planning and control, artificial intelligence (AI) analytics provides advanced capabilities. Manufacturing SMEs can forecast cash inflows and outflows, track expenses, optimize inventory levels, and foresee possible cash shortages with the help of AI analytics. AI analytics is essential for enhancing cash flow management and guaranteeing the long-term viability of manufacturing SMEs by increasing financial transparency and facilitating proactive decision-making.

Objective:

- To analyse how AI-based predictive analytics assists in forecasting cash inflows and outflows.
- To study the impact of AI analytics on working capital optimization, including inventory and receivables management.
- To identify the benefits of adopting AI analytics for enhancing financial visibility and decision-making.
- To assess the effectiveness of AI analytics in reducing cash flow risks and payment delays.
- To understand the challenges faced by manufacturing SMEs in implementing AI-driven cash flow management systems.

Literature Review:

Researchers and practitioners are paying close attention to the increasing use of AI in financial management. The literature that is currently available emphasizes the potential of AI analytics to improve financial performance, particularly for SMEs, and draws attention to the shortcomings of conventional cash flow management techniques. According to Wamba et al. (2023), AI-driven financial analytics enables businesses to handle massive amounts of transactional, operational, and market data in order to improve liquidity planning and produce precise cash flow forecasts. According to their research, proactive working capital management and early warning indicators of financial distress are supported by predictive analytics.

The effect of AI-based decision-support systems on managerial decision-making was investigated by Raisch and Krakowski (2022). By examining sales patterns, consumer payment patterns, and inventory turnover, the authors discovered that machine learning models greatly increase the precision of cash inflow and outflow forecasts. Such predictive capabilities allow manufacturing SMEs to better manage inventory levels, payables, and receivables. Verma and Bhattacharyya (2024) examined the obstacles to AI analytics adoption in SMEs and found issues with data quality, system integration complexity, high implementation costs, and a lack of technical expertise. Nevertheless, their results also show that SMEs that successfully apply AI analytics benefit from increased cash flow stability, decreased operational risk, and improved financial transparency.

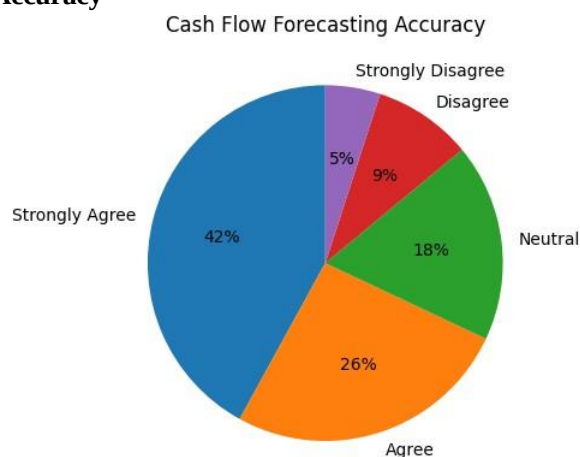
Research Methodology:

The present study adopts a descriptive and analytical research design to examine the role of AI analytics in cash flow management of manufacturing SMEs.

- **Target Population:** Owners, financial managers, and accounting professionals working in manufacturing SMEs.
 - **Data Collection Method:** Primary data was collected using a structured questionnaire designed through Google Forms. The questionnaire included both closed-ended and opinion-based questions related to AI adoption, cash flow forecasting, working capital management, and implementation challenges.
 - **Sampling Technique:** Convenience sampling was used due to limited accessibility to respondents.
 - **Sample Size:** Responses were collected from manufacturing SMEs actively using or exploring AI-based financial tools.
 - **Data Analysis Tools:** Percentage analysis and descriptive interpretation were used to analyze and present the findings in a clear and understandable manner. The study adopts a descriptive research design based on primary data collection.
 - **Target Group:** Owners and finance managers of manufacturing SMEs.
- Data Collection Tool:** Structured questionnaire (Google Form).
Sampling Method: Convenience sampling.
Data Analysis Technique: Percentage analysis and descriptive statistics.

Data Interpretation and Analysis:

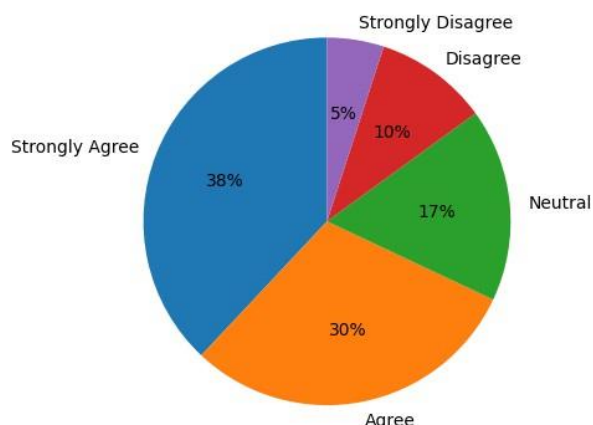
1. Cash Flow Forecasting Accuracy



68% of respondents indicated that AI analytics has significantly improved the accuracy of cash flow forecasting in their firms

2. Identification of Potential Cash Flow Problems:

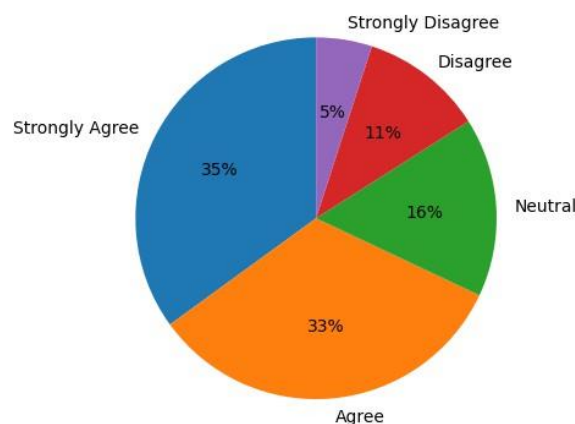
Early Identification of Cash Flow Problems



68% of respondents agreed that AI-based analytics helps in identifying potential cash flow problems in advance.

3. Management of Accounts Receivable and Payable:

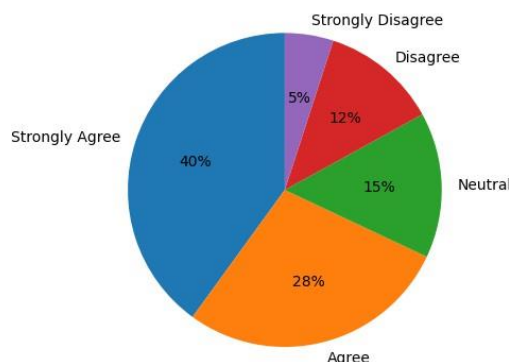
Receivables & Payables Management



According to 68% of respondents, AI analytics has improved the management of accounts receivable and payable by ensuring better control over payment cycles.

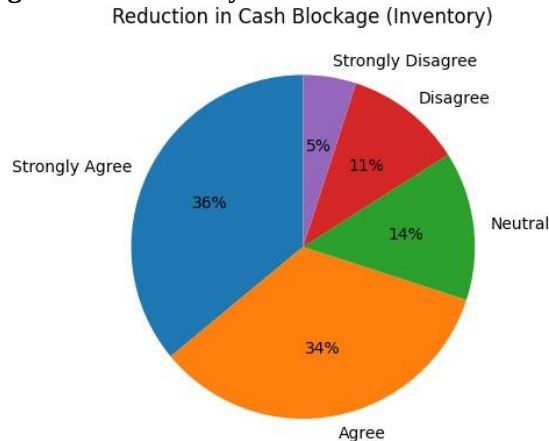
4. Liquidity Planning:

Liquidity Planning via Real-Time Insights



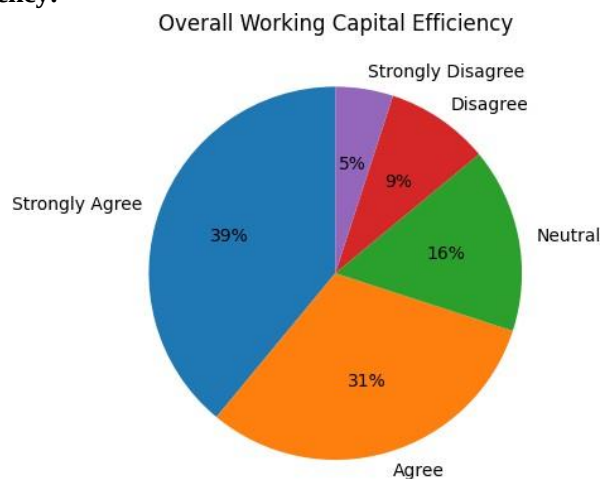
68% of respondents reported that real-time AI-driven financial insights have improved liquidity planning and cash availability.

5. Reduction in Cash Blockage Due to Inventory:



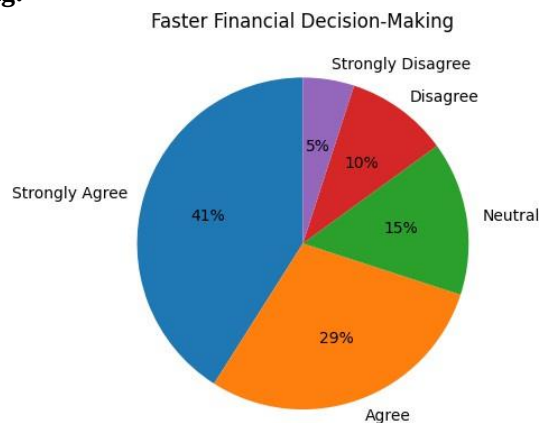
34% of respondents observed that AI analytics helps reduce cash blockage by optimizing inventory levels and avoiding excess stock.

6. Working Capital Efficiency:



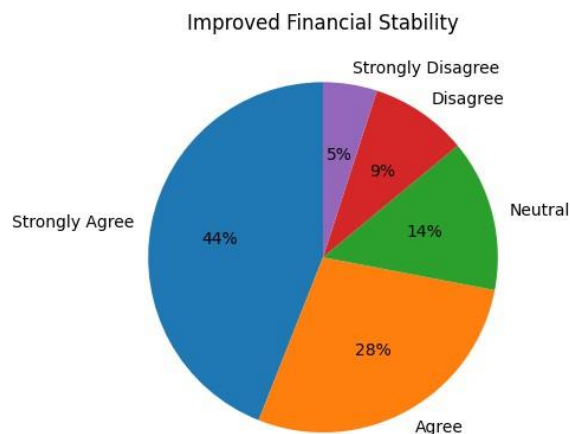
39% of respondents agreed that the adoption of AI analytics has led to better overall working capital efficiency.

7. Financial Decision-Making:



41% of respondents experienced faster and more effective financial decision-making due to AI-based cash flow insights.

8. Financial Stability:



72% of respondents agreed that AI analytics has contributed to improved financial stability of their firms.

- 9. What is the overall impact of AI analytics on your firm's cash flow management?** By increasing forecasting accuracy, facilitating early cash flow risk identification, improving receivables and payables control, and facilitating timely, data-driven financial decisions, AI analytics has a significant overall impact on cash flow management. Better liquidity planning, fewer cash shortages, and increased financial stability for the company result from this.

Conclusion:

The report shows how artificial intelligence (AI) analytics can improve how manufacturing small-to-medium enterprises (SMEs) manage their cash flows. The data from this report shows that using AI analytics will produce more accurate cash-flow projections, allow businesses to quickly identify potential liquidity problems, and allow for improved management of accounts receivable/accounts payable as well as inventory. AI-based analytics enable quicker and more informed financial decisions resulting in an increase in working capital efficiency and improved overall financial stability. Although there are some barriers to utilizing these types of analytics, such as expenses, knowledge & skills, and integration, the net benefit of all of these for cash-flow management is extremely positive. Therefore, the authors of this study encourage manufacturing SMEs to adopt AI analytics as a means of enhancing their financial performance and ensuring their long-term viability.

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Study on Youth Perception Towards Green Banking

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Abstract

Green banking has emerged as a key driver of sustainable development in the financial sector. As environmentally conscious and digitally driven stakeholders, youth play a critical role in shaping the future of green banking. This study explores youth perception towards green banking by examining their awareness, attitude, and willingness to adopt eco-friendly banking practices. Data collected through a structured questionnaire reveal a generally positive perception among youth, while highlighting gaps in awareness of specialized green financial products. The study underscores the importance of targeted awareness initiatives and innovative banking solutions to strengthen youth engagement and accelerate the adoption of sustainable banking practices.

The research seeks to understand how young individuals perceive green banking initiatives and identify the factors influencing their acceptance and usage. Primary data were collected through a structured questionnaire administered to youth respondents, while secondary data were obtained from academic journals, reports, and relevant online sources.

Keywords: Green Banking, Youth Perception, Sustainable Development, Environmental Awareness, Eco-friendly Banking Practices, Financial Sustainability, Digital Banking, Green Financial Products, Youth Attitude, Adoption of Green Banking.

Introduction

Green banking has emerged as an important initiative in the financial sector to promote sustainable development and environmental responsibility. It focuses on reducing the ecological impact of banking operations by encouraging paperless transactions, digital services, and eco-friendly financial products. As sustainability becomes a global priority, green banking plays a crucial role in aligning financial growth with environmental protection. Youth, being environmentally aware and technologically driven, are key contributors to the successful adoption of green banking practices. Their perception, awareness, and willingness to use green banking services strongly influence the future growth of sustainable banking.

With their increasing reliance on digital platforms, young customers are well positioned to support eco-friendly banking initiatives. However, despite a generally positive attitude towards green banking, gaps remain in youth awareness regarding specific green financial products and services. This study aims to assess the level of awareness, perception, and willingness of youth to adopt green banking practices. The research is based on primary data collected through a structured questionnaire and supported by secondary sources such as journals, reports, and online publications. The findings of the study seek to provide insights for banks to enhance youth engagement and strengthen the adoption of sustainable banking practices.

Objectives

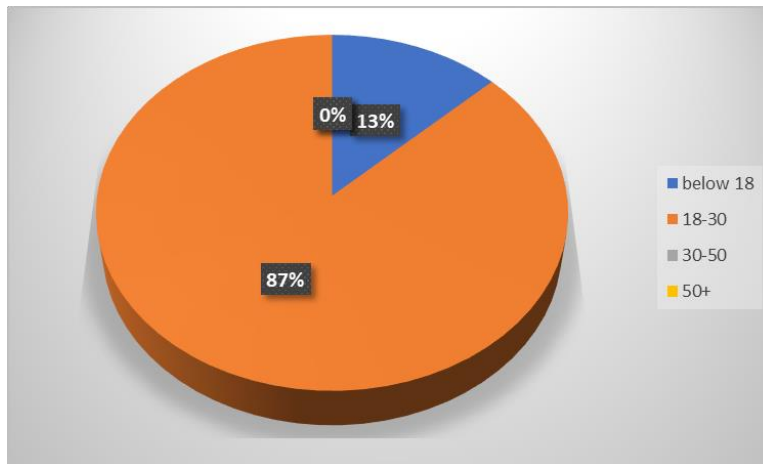
- To assess the level of awareness of green banking among youth.
- To analyze youth perception towards green banking practices.
- To examine the willingness of youth to adopt green banking services.

Research Methodology

Primary data for the study was collected from an online survey using Google Forms for youth, students, teachers etc. The survey consisted of 15 Questions from which 6 Questions are close ended and remaining Questions are open ended to ensure consistency and clear minded response. A convenience sampling technique was used to distribute the survey link through WhatsApp and personal networks. The sample size initially targeted to the youth from any stream of which 50 responded, resulting in a response rate of 50%.

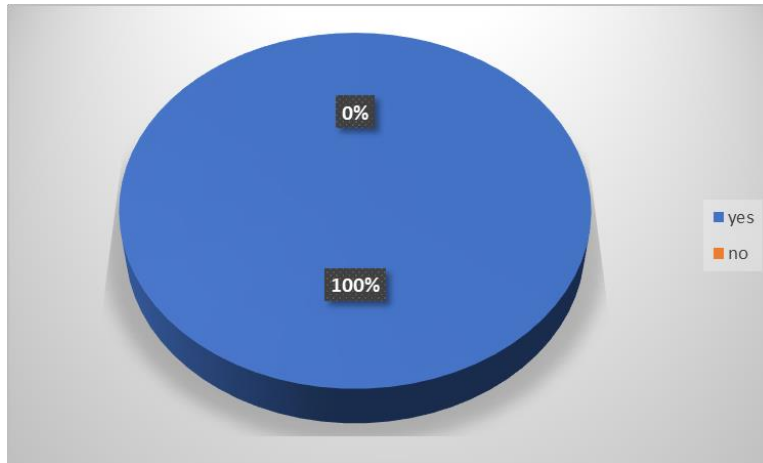
Data interpretation

1. Age



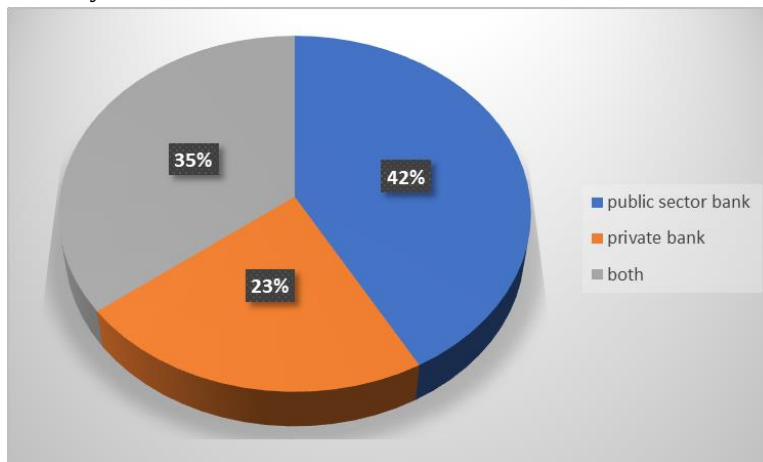
In this chart we can see that 87% respondent are between 18-30 and 13% are below 18.

2. Do you own a smartphone?



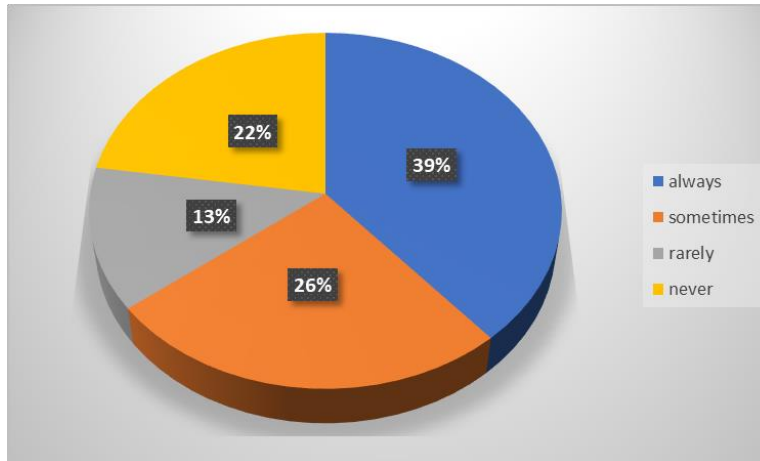
In this chart we can see that 100 youth are using the smartphones.

3. Type of Bank You Mainly Use?



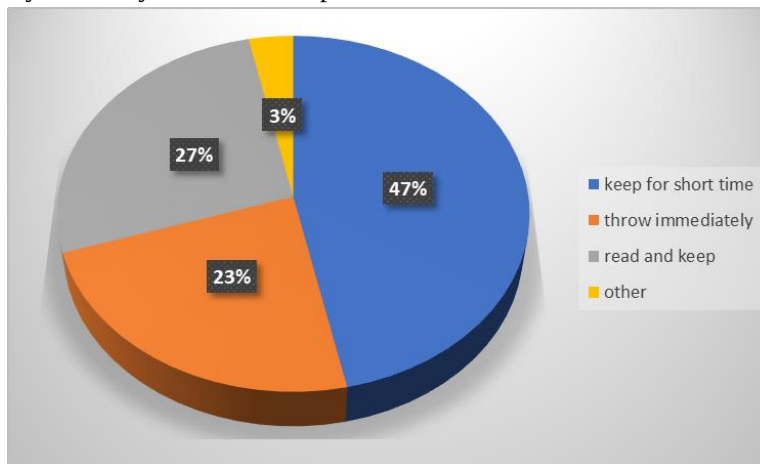
In this chart we can see that 42% respondent use the public sector bank and 23% uses the private bank and 35% are using both.

4. Do you usually take an ATM receipt after withdrawal?



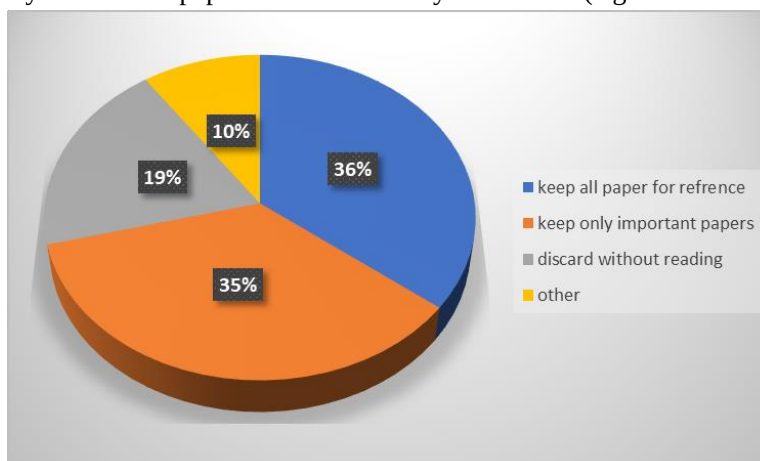
In this chart we can see that 39% youth takes the ATM receipt after withdrawal and 26% sometimes, 13% rarely, 22% never takes the receipt.

5. What do you usually do with your ATM receipt?



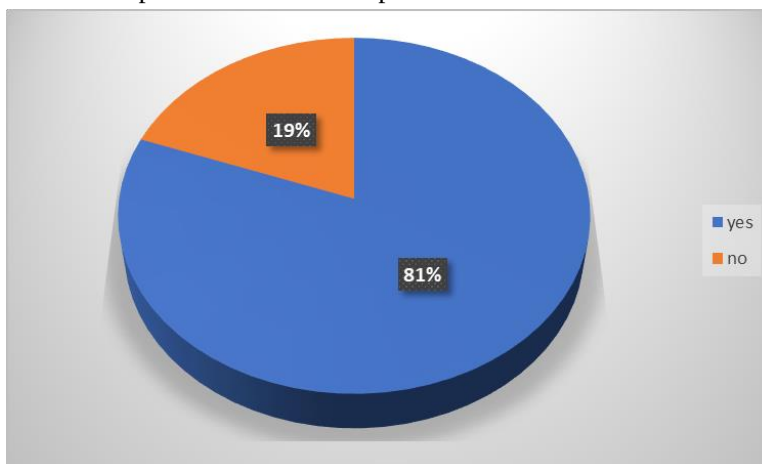
In this chart we can see that 47% youth keep the ATM receipt for short time, 23% throws immediately, 27% read and keep, 3% other.

6. What do you usually do with the papers that come with your card kit (e.g. ATM/debit/credit card)?



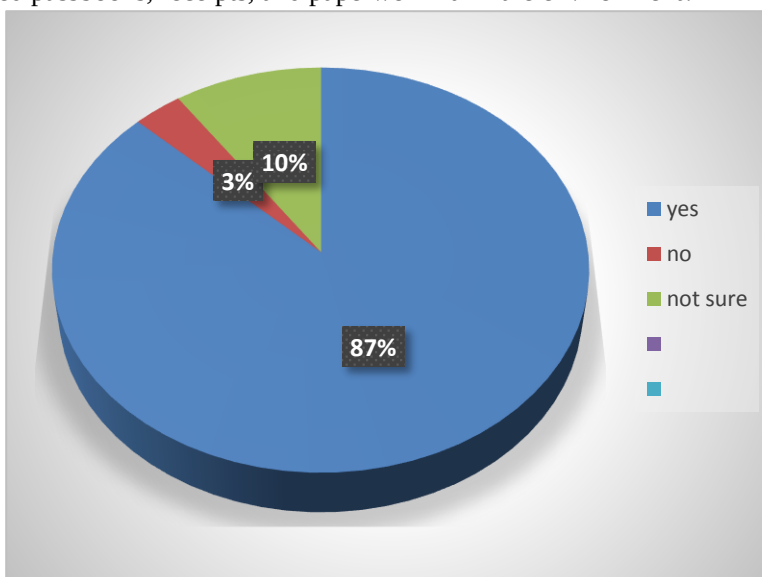
In this chart we can see that 36% respondents keep all paper for reference, 35% keep only important papers, 19% discard without reading, 10% other.

7. Do you use e-statements or e-passbooks instead of printed ones?



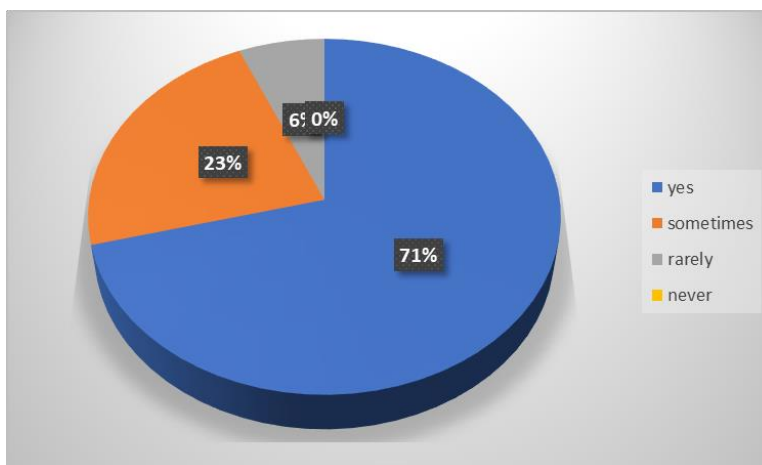
In this chart we can see that 81% youth uses the e- statements or e-passbook instead of printed ones, only 19% uses the printed ones.

8. Do you feel printed passbooks, receipts, and paperwork harm the environment?



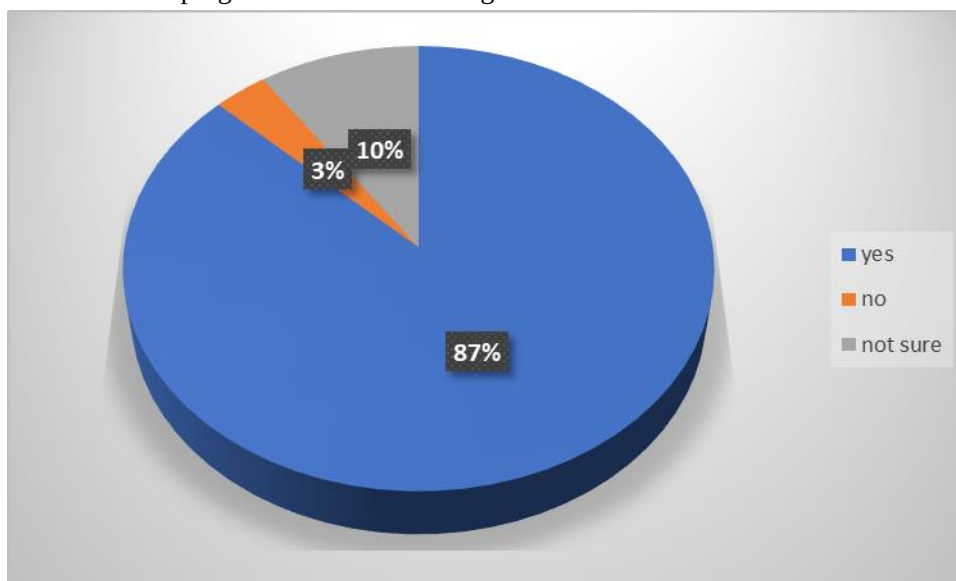
In this chart we can see that 29% youth agree and feel that printed passbook, receipt, and paper work harms the environment, 23% strongly agree, 26% neutral, 19% disagree, 3% strongly disagree.

9. Do you use digital banking services (like mobile banking apps or internet banking) for transactions instead of visiting the branch?



In this chart we can see that 71% youth are using the digital banking services, 23% sometimes, and 6% rarely.

10. Do you think awareness programs on Green banking should be increased?



In this chart we can see that 87% youth are saying yes to increase the awareness program for green banking.

Conclusion:

The findings clearly indicate that youth demonstrate high digital adoption and strong potential for supporting green banking practices. With 100% smartphone usage and 71% regular use of digital banking services, the infrastructure and readiness for paperless banking already exist. A significant majority 81% prefer e-statements over printed documents, confirming a shift toward environmentally sustainable banking behaviour. However, mixed habits around ATM receipt usage and paper retention reveal a gap between awareness and consistent eco-friendly action. While many respondents acknowledge that printed banking materials harm the environment, a notable proportion remain neutral or indifferent, indicating insufficient depth of awareness. The overwhelming support 87% for increasing green banking awareness programs highlights the need for targeted education initiatives. Overall, the study concludes that youth are digitally capable and environmentally receptive, but structured awareness programs and institutional nudges are necessary to convert partial adoption into consistent green banking behaviour.

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Enhancing Customer Experience in the Phygital Era: The Role of AI in Modern Banking Services

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Abstract:

Banking is a field of innovation and technology since the use of Artificial Intelligence tasks is becoming popular in today's era. For any bank, customer engagement is a tough task, and it is equally hard to keep the customers happy while offering the services. The perfect integration of Artificial Intelligence (AI) in offering phygital banking that means by blending the physical and digital banking experiences together to give a more pleasant banking service experience to the customer. The examples of AI-driven solutions are chatbots, predictive analysis or automated decision-making to offer seamless and real time support in banking services. This paper tries to examine the impact of these AI driven phygital banking tactics used by banks to have a better customer satisfaction and retention. It studies parameters like service efficiency, personalization, security and convenience of financial transactions. Data privacy and system adaptability are two biggest challenges in this field. The findings clearly signify that AI-powered tools make it a better experience for having long lasting customer engagement and customers loyalty.

Keywords: AI-driven banking, phygital banking, customer satisfaction, financial technology (FinTech).

Introduction

AI-driven banking - AI-enhanced banking involves the incorporation of artificial intelligence (AI) technologies into banking services to improve operational efficiency, customer engagement, and security measures. Tools powered by AI, such as chatbots, machine learning algorithms, and robotic process automation (RPA), enable banks to provide tailored services, identify fraudulent activities, and optimize workflows. This methodology minimizes the need for human involvement while enhancing precision and response times.

Phygital Banking - Phygital banking merges physical and digital banking experiences to deliver seamless, convenient, and effective financial services. It combines AI, mobile banking, and in-branch services to facilitate effortless transitions for customers between online and offline interactions. The strategies employed in phygital banking focus on enhancing customer engagement through self-service kiosks, AI-driven chatbots, and customized digital experiences.

Customer Satisfaction - In the banking sector, customer satisfaction pertains to how effectively financial institutions fulfill or surpass customer expectations through reliable service delivery and personalized experiences. AI-enhanced banking significantly contributes to improved customer satisfaction by minimizing wait times, offering proactive financial guidance, and ensuring secure transactions.

Financial Technology (FinTech) - FinTech encompasses the use of technology in financial services to boost efficiency, accessibility, and innovation. This includes AI-enhanced banking, blockchain technology, mobile payment systems, and robo-advisors. FinTech solutions improve banking operations by facilitating seamless digital transactions, providing financial planning tools, and offering automated investment services, thereby revolutionizing traditional banking frameworks.

The banking industry has experienced a significant transformation through the adoption of AI-driven phygital strategies. This study explores the impact of AI applications on customer acquisition, satisfaction, and retention within private-sector banks. The objective of this paper is to connect traditional banking practices with digital transformation by examining the role of AI in enhancing customer experiences.

The banking sector has witnessed a paradigm shift by adopting AI-driven phygital strategies. This study examines how AI applications influence customer acquisition, satisfaction, and retention in private-sector banks. The paper aims to bridge the gap between traditional banking and digital transformation by analyzing AI's role in shaping seamless banking experiences.

As defined by Investopedia, fintech refers to the integration of technology within financial services to boost efficiency and enhance customer experience. This encompasses innovations like mobile banking apps, payment solutions, and AI-driven tools that streamline financial operations. On the other hand, phygital banking combines physical and digital banking experiences, ensuring a cohesive customer support experience across multiple platforms.

The Influence of Fintech on Phygital Banking:

Fintech enhances phygital banking by enabling financial institutions to integrate advanced technologies into their operations, creating a hybrid model that combines the convenience of digital services with the reliability and personal interaction of physical branches. This transformation is influenced by several key factors:

- i) **Enhanced Customer Experience:** Innovations in fintech, such as AI-driven chatbots and tailored financial tools, empower banks to deliver personalized services both online and in person. By leveraging data analytics, banks can anticipate customer needs and provide consistent experiences across all platforms.
- ii) **Greater Operational Efficiency:** Technologies like blockchain and artificial intelligence streamline processes such as loan approvals and payment transactions. This results in reduced operational costs and allows banks to focus on delivering meaningful customer interactions at their physical locations.
- iii) **Seamless Integration via APIs:** The principles of open banking, championed by fintech, enable the smooth integration of digital solutions into traditional banking frameworks. For example, APIs allow customers to access services like instant payments or investment opportunities through both digital platforms and in-branch visits.
- iv) **Hybrid Engagement Models:** The COVID-19 pandemic accelerated the shift towards phygital strategies by underscoring the necessity for digital-first interactions while still preserving physical branches for complex or high-trust transactions. Fintech innovations, including secure video conferencing and augmented reality, have made this hybrid approach more effective.

Research Problem - As digitalization continues to advance, customer expectations for quicker, more efficient, and tailored banking services have risen significantly. Conventional banking models find it difficult to fulfil these expectations without the integration of AI-driven solutions. Various challenges hinder all types of banks from adapting to these emerging technologies. This research focuses exclusively on private banks.

Objectives of the Study -

- To know the AI-driven strategies of customer engagement.
- To explore the challenges and risks associated with AI in banking.

Hypotheses -

H1: The integration of AI-powered tools in phygital banking services significantly increases customer satisfaction.

H0: The integration of AI-powered tools in phygital banking services has no significant effect on customer satisfaction.

H2: Customers using AI-enabled phygital banking services exhibit higher loyalty and retention rates due to increased trust and seamless service delivery.

H0: Customers using AI-enabled phygital banking services do not exhibit higher loyalty and retention rates due to increased trust and seamless service delivery.

Significance of the Study -

The findings will provide insights for private bankers and other stakeholders to understand & optimize AI-based banking solutions for enhanced customer experience.

Research Methodology - For the above paper, both primary and secondary data were collected from reliable sources and proper references and credits were given to the data providers. If we observe banking from a layman's perspective, there has been a tremendous shift in the last couple of decades. Private banks seem to overtake public sector banks when it comes to integrating the AI based technologies into practice while offering innovative services to its customers. The focus of the data collection was the customers from the private banks in Pune city only.

Research Design:

This research paper is based on the quantitative data collected from 100 bank customers who were equally divided into two groups. The first group used physical or traditional marketing strategies (Non-AI group), and the other group used digital strategies with AI integration (AI group). It is a comparative study analysis of AI users and non-AI users in the offering of phygital banking services by private banks in the Pune area.

Population and Sampling:

Population: Private Bank customers in Pune city.

Sample Size: Targeted 100 customers (50 in the AI group, & 50 in the non-AI group).

Sampling Method: The convenience sampling method was selected by the researcher to collect the relevant data from the actual bank customers who were easily approachable at the various city branches and ATMs. The AI group used facilities like chatbots, smart apps, kiosks, etc. The non-AI Group used only traditional methods like personal branch visits, phone calls, etc. The primary data was collected in two weeks as per the above-mentioned information through a well-designed questionnaire survey and personal interview methods which were given to each group that focused on the key aspects of satisfaction, and retention with a focus on fast serviceability, and personal touch in the services due to the creativity of AI in the service offering of private banks in Pune area. To name a few important questions from the questionnaire: These were the sample questions included in the survey.

- Rating satisfaction with the bank on a scale of 1 to 5
- Was the service fast? (Yes/No)
- Did it feel personal? (Yes/No)
- Do you trust this bank? (Yes/No)
- How long have you been with this bank as customer?

For the data analysis researcher used MS Excel, Google Sheets, and basic statistics. The incomplete data was removed to arrive at an accurate conclusion. The average was calculated for the AI and non-AI user groups separately. It was obvious that if AI group numbers are higher as compared to non-AI group numbers, H1 and H2 and proved to be true, and Null hypotheses are rejected. The researcher has not used any other data tool to conclude as the results were finite in numbers and calculations were too easy, so no other statistical method was used like a T-test or ANOVA in the data analysis process.

Limitation of Research -

- This research was only conducted in the Pune city area due to a lack of time and narrow scope of the research paper. The number of branches in the city is known from the official website of RBI and other banking websites.
- This research was only conducted for private bank customers, so it did not include anyone from the public sector banks, foreign or cooperative banks. So, the findings from the research cannot be generalized for all the banks.

Review of Literature:

Research conducted by *Sharma & Piplani (2017)* and *Syed & Simhadri (2017)* highlights the crucial function of fintech in bridging traditional banking methods with modern customer expectations. Their findings illustrate how technological advancements enable banks to remain relevant through the adoption of a phygital strategy, which combines accessibility with tailored services. These studies emphasize that innovations driven by fintech not only enhance customer satisfaction but also support operational sustainability in a competitive environment.

In 2013, Mr. Dileep S and Dr. G.V. Kesava Rao conducted a study titled "A Study on Indian Rural Banking Industry - Issues and Challenges." Their research aimed to explore the origins of rural banking, comprehend various concepts, and investigate the factors contributing to the lack of profitability in rural banking within India, as well as the utilization of banking services in rural areas. They utilized secondary data sourced from the National Sample Survey Organization (2006), the World Bank report on "Access to Usage of Financial Services" (2008), and reports from the Reserve Bank of India. Their findings revealed that approximately 185 million bankable adults in rural India remain unbanked due to issues related to access and usage. They suggested that commercial banks could seize this opportunity by developing infrastructure in collaboration with three key stakeholders: the Government of India, the Reserve Bank of India, and commercial banks.

V. Devadevan (2013) researched "Mobile Banking in India – Issues & Challenges," aiming to understand the mindset of banking customers in India and analyze the security concerns associated with mobile banking. The study involved the collection of both primary and secondary data. Primary data was gathered from 65 respondents through an online questionnaire, while secondary data was sourced from the website of the Telecom Regulatory Authority of India (TRAI). The research concluded that advancements in communication technology and mobile devices pose significant challenges to the provision of mobile banking solutions. It was recommended that banks develop user-friendly software in local languages to better serve the extensive rural population.

Chirag Patel and Darshan Ranpura (2013) conducted a study titled "Rural Banking through Internet: A Study on the Use of Internet Banking among Rural Customers." The research aimed to examine the factors influencing the behavior of rural consumers, assess their awareness of internet banking services, and identify the relationship between demographic factors such as socioeconomic status and internet banking usage.

Dhanraj N. and Dr. R. Sai Kumar (2016) conducted a study titled "Challenges and Issues of the Indian Rural Banking Industry." The aim of their research was to investigate rural credit and the contributions of Regional Rural Banks (RRBs) in both priority and non-priority sector lending. This study is both diagnostic and exploratory, relying solely on secondary data. The findings indicated that RRBs have made a significant positive impact on the rural economy in India.

Aarti Sharma and Nidhi Piplani (2017) undertook research on "Digital Banking in India: A Review of Trends, Opportunities, and Challenges." The purpose of their study was to analyze the trends in digital banking within India and to identify the challenges that banks encounter while adopting these trends. This research utilized secondary data and reports from the Reserve Bank of India and other financial institutions. Their findings revealed that the digital transformation in banking is progressively shifting the landscape from cash and paper-based transactions to a cashless and paperless system.

In their 2019 study published in the International Review of Management and Marketing, Abu Daqar and Smoudy investigate the role of artificial intelligence (AI) in enhancing customer experience. They focus on applications such as chatbots and predictive analytics, arguing that these technologies contribute to faster service, greater personalization, and improved responsiveness. Their survey conducted in Palestine reveals that AI significantly enhances customer satisfaction by effectively meeting their needs. Nonetheless, the authors acknowledge challenges related to data privacy and the costs of implementation. This research supports the idea that AI can revolutionize customer interactions in a phygital environment.

Bhattacharya and Sinha (2022) analyze the impact of AI on customer experience in the banking sector in their article published in the Australasian Accounting Business and Finance Journal. They focus on AI technologies such as virtual assistants and automated decision-making, highlighting their influence on personalization and operational efficiency within Indian banks. Their research indicates that AI enhances customer loyalty by optimizing services and fostering trust, especially in digital-physical (phygital) contexts.

Present scenario:

Recent AI technologies like machine learning, natural language processing (NLP), robotic process automation (RPA) are playing vital roles in enhancing the service delivery to a vast set of customers. Phygital word is of recent origin signifying the dual presence of physical as well as digital platforms to create a perfect blend of platforms for the customers to make their experience as pleasant and fast as possible. This technology integration is at a fast pace in the Indian banking industry as it is found out from the review of literature as well. This is also helping in data security and fraud prevention along with that virtual assistant and improving customer trust and loyalty.

Results and Discussion:

The questionnaire is attached at the end of the paper for reference. After the collection of the data following observations were done.

- The researcher bifurcated easily the entire set of customers from the responses to question 1 into AI and non-AI-based service groups of customers.
- Question number 2 gives the average retention time with the bank for each customer.
- The value of the average satisfaction can be found in the average score of question 3.
- The percentage of questions from 4 to 7 were taken together so that one can easily understand the difference between the AI and non-AI offered to customers.
- The researcher took 45 customer data from the AI-based service users and 48 customer data from the non-AI-based service users to arrive at an accurate result.
- Questions 3, 4, and 5 give the results for customer satisfaction, speed of delivery, and personalized service offering. This will help in testing the H1.
- Questions 6 and 7 assess the trust and loyalty factors. This will help in testing the H2.

Summary of the responses received:

Response from group	50	Actual taken	Rejected
AI-based	50	45	5
Non-AI based	50	48	2

For H1: AI Increases Customer Satisfaction

1. Satisfaction Score:

- **AI Group Average:** (5, 4, 5, 4, 5, 3, 4, 5, 4, 5, 4, 5, 4, 5, 3, 5, 4, 4, 5, 5, 4, 3, 5, 4, 5, 4, 5, 4, 5, 4, 5, 3, 4, 5, 4, 5, 4, 5)/45= **4.38**
- **Non-AI Group Average:** (3, 2, 3, 4, 2, 3, 2, 3, 4, 2, 3, 2, 3, 2, 4, 3, 2, 3, 2, 3, 4, 2, 3, 2, 3, 2, 4, 3, 2, 3, 2, 3, 2, 4, 3, 2, 3, 2, 3, 2, 4, 3, 2, 3, 2, 3, 4, 2, 3, 2, 3, 2, 4, 3, 2, 3, 2, 3, 4, 2, 3, 2, 3, 2, 4, 3, 2, 3, 2, 3, 2, 4, 3, 2, 3, 2, 3, 2, 4, 3, 2) / 48= **2.71**
- **Result:** AI group scores higher (4.38 vs. 2.71), suggesting AI improves satisfaction.

2. Speed Satisfaction:

- **AI Group:** 45/45 say "Yes" that is 100%
- **Non-AI Group:** 2/10 say "Yes" that is 20%
- **Result:** AI is faster, supporting H1.

3. Personalization Satisfaction:

- **AI Group:** 36/45 say "Yes" that is 80%
- **Non-AI Group:** 11/48 say "Yes" that is 22.91%
- **Result:** AI feels more personal, supporting H1.

Conclusion for H1: The data shows AI users are happier, find it faster, and feel it's more personal, hence H1 is supported, and H0 (no effect) is rejected.

For H2: AI Increases Loyalty and Retention

1. Retention Period:

- **AI Group Average:** (36, 28, 40, 32, 45, 25, 30, 38, 33, 42, 35, 29, 41, 31, 44, 27, 32, 39, 34, 43, 37, 26, 40, 33, 45, 28, 36, 30, 42, 35, 29, 41, 32, 44, 38, 27, 31, 40, 34, 43, 36, 28, 39, 33, 45) / 45 = **34.91 months**
- **Non-AI Group Average:** (18, 12, 20, 24, 15, 22, 10, 19, 26, 14, 16, 13, 21, 23, 17, 11, 25, 18, 14, 20, 12, 22, 15, 19, 24, 13, 16, 21, 10, 23, 17, 26, 14, 18, 12, 20, 15, 22, 11, 25, 19, 13, 16, 21, 24, 17, 10, 23) / 48 = **18 months**
- **Result:** The AI group stays almost twice as long, supporting H2.

2. Trust in Bank:

- **AI Group:** 43/45 say "Yes" that is 95.56%
- **Non-AI Group:** 8/48 say "Yes" that is 16.66%
- **Result:** AI users trust the bank more, this supports H2.

Conclusion for H2: AI users stay longer and trust the bank more—H2 is supported, H0 (no effect) is rejected.

Figure 1: Average Satisfaction Score

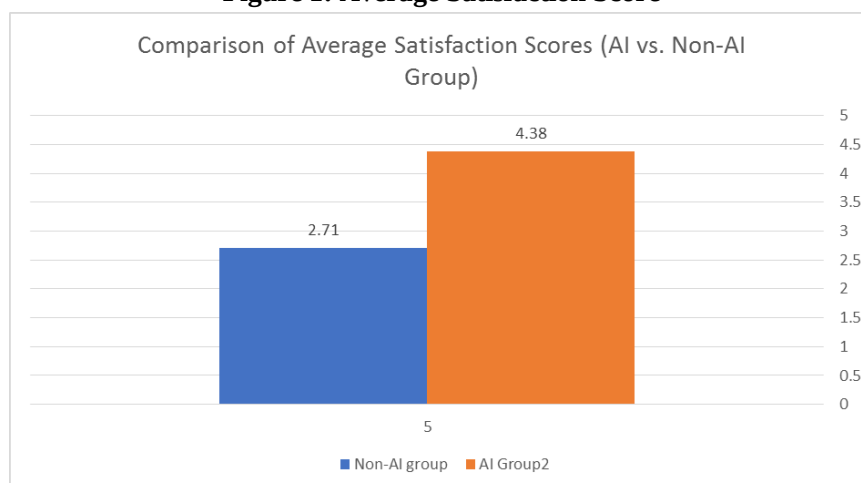


Figure 2: Service speed satisfaction

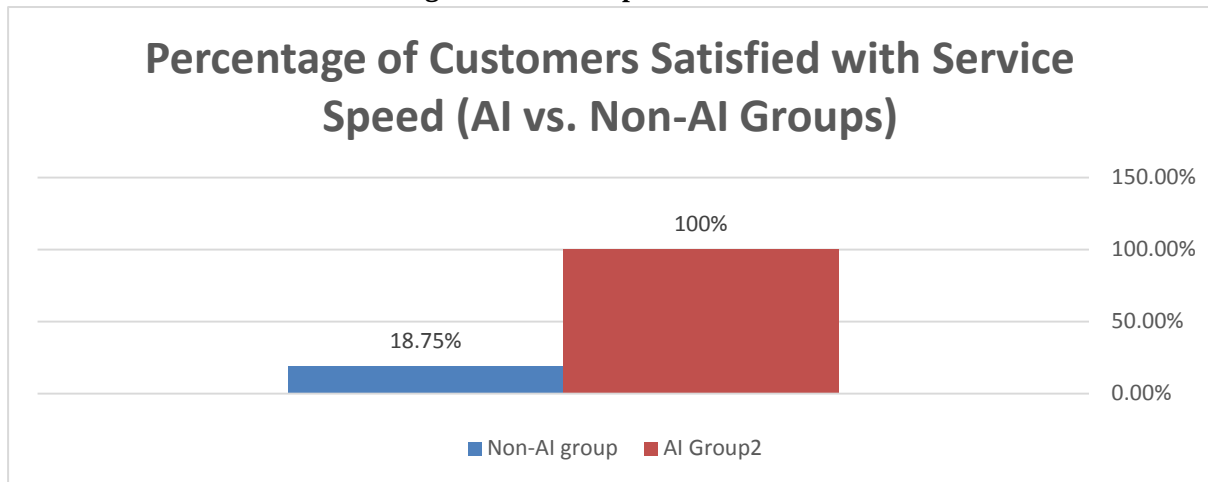


Figure 3: Customers Satisfied with Personalization

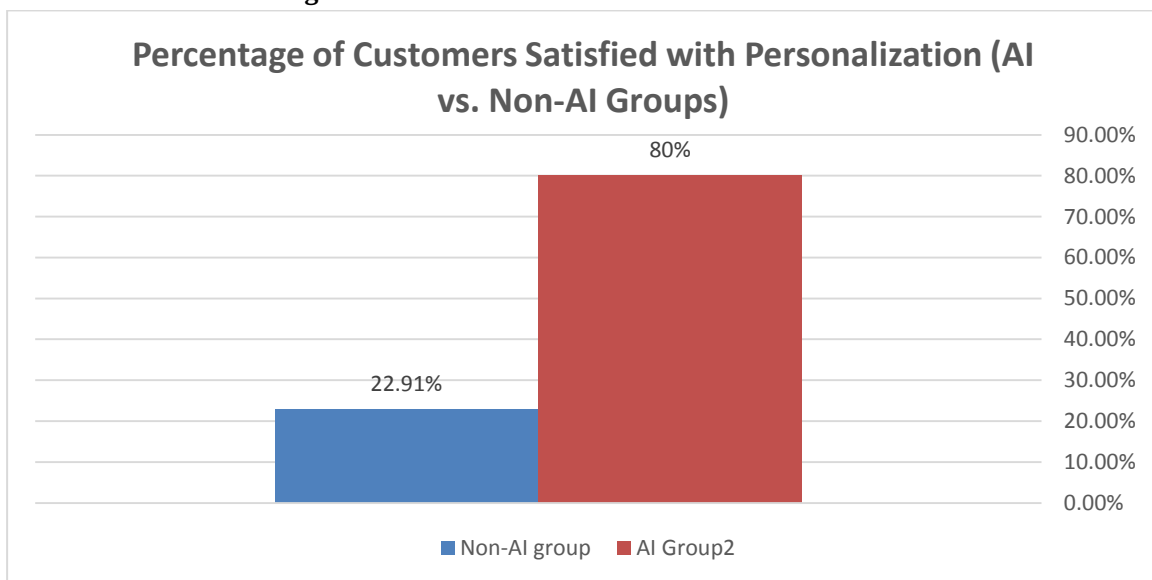


Figure 4: Average Retention Period

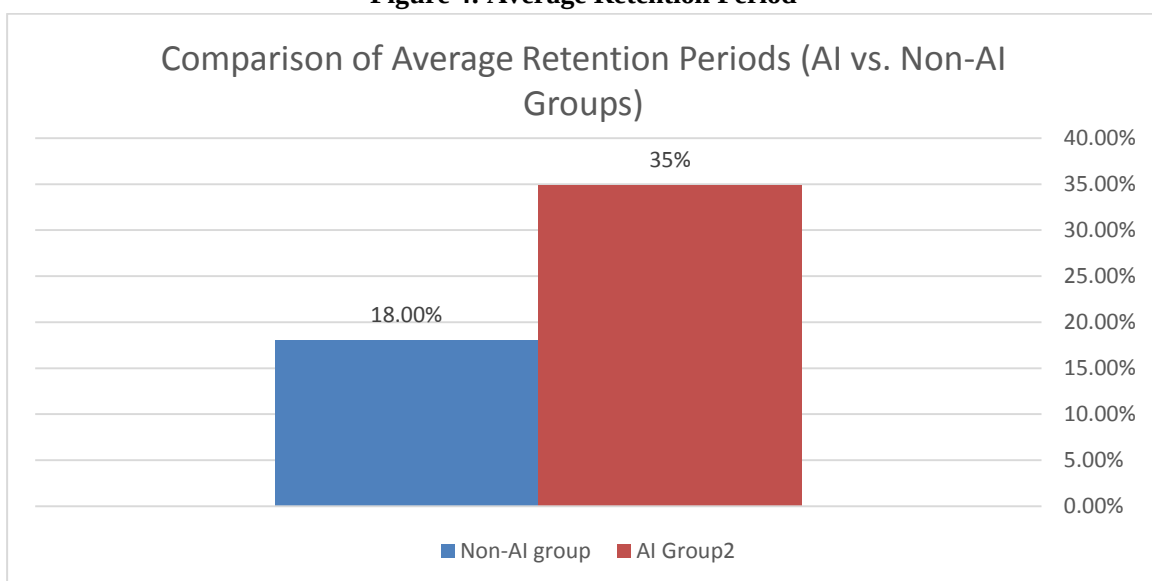
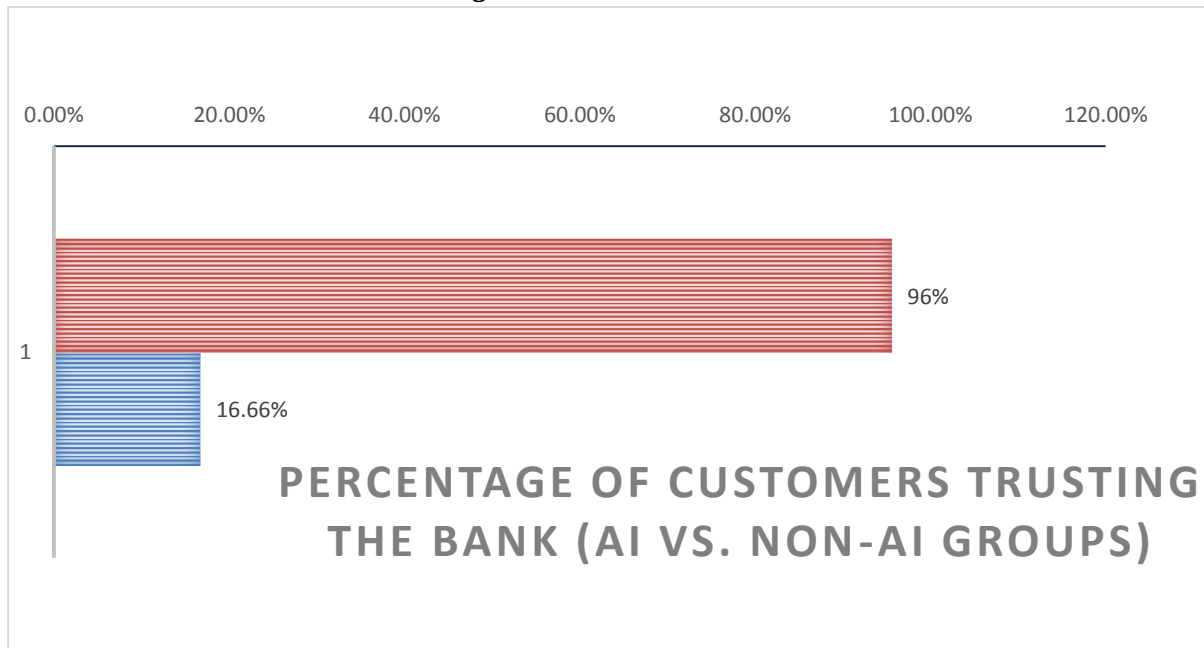


Figure 5: Trust in the bank



Conclusion and Recommendations:

The study concludes that AI significantly enhances phygital banking experiences by improving personalization, efficiency, and security. However, challenges such as data privacy concerns and technological adoption barriers must be addressed. Future research should focus on AI's ethical implications in banking. AI has entered every field nowadays and BFSI has a wide scope. Though it is in its initial stages, Indian banking will see bigger positive changes shortly. Slowly the trend will move from private banking to government banking too. Government banking (PSB) faces some challenges like adaptability or rigid mindsets to adopt these quick technologies. With the entry of the new Governor, RBI seems aggressive as it has changed the repo rate first time in the last five years so as a customer we can expect many more good changes soon across all banking domains. FinTech and AI in BFSI act as a catalyst for phygital banking. It strengthens financial institutions to offer a seamless blend of digital and physical engagement. Recently Bank of Baroda inaugurated another phygital branch in New Delhi, which signifies that public sector banks are not behind in this race which is a good sign for the entire Indian economy.

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Annexure: Questionnaire for Bank Customers:

This short survey will take 2-3 minutes. We want to know your experience with the bank's services—whether you use smart tools (like apps or chatbots) or traditional methods (like branch visits or phone calls). Your answers are private and will only be used for research.

Instructions:

- Please circle or tick your answer.
- Answer honestly based on your recent experience.

Part 1: General Information

1. **What banking channels do you often use with your private banks in Pune?**
(This separates AI vs. Non-AI groups)
 - Smart tools (e.g., mobile app, chatbot, AI kiosk)
 - Traditional methods (e.g., branch visits, phone calls)
2. **Since how long you have been a customer of this bank?** (For H2: Retention)
 - Write in months or years: _____

Part 2: Customer Satisfaction (For H1)

3. **How satisfied are you with your bank's overall services?**
 - 1 (Not satisfied)
 - 2 (Somewhat satisfied)
 - 3 (Neutral)
 - 4 (Satisfied)
 - 5 (Very satisfied)

4. **Was the service fast enough for you?**
 - ☐ Yes
 - ☐ No
5. **Are you happy with banks personalized & tailored AI-based services?**
 - ☐ Yes
 - ☐ No

Part 3: Loyalty and Trust (For H2)

6. **Do you trust this bank because of its innovative AI-based services?**
 - ☐ Yes
 - ☐ No
7. **Would you recommend this bank to others? (Extra loyalty check)**
 - ☐ Yes
 - ☐ No

Thank you for your time and responses.

Artificial Intelligence as a Strategic Tool in Business Practice

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Abstract:

Artificial Intelligence (AI) has emerged as a transformative force in modern business practices by enabling organizations to enhance efficiency, improve decision-making, and achieve sustainable competitive advantage. Rapid advancements in AI technologies such as machine learning, natural language processing, computer vision, and data analytics have significantly altered traditional business models and management approaches. This paper examines artificial intelligence as a strategic tool in business practice by analyzing its applications, benefits, challenges, and future scope. The study is based on secondary data collected from academic journals, research articles, books, and industry reports. The findings reveal that AI-driven strategies contribute positively to business growth, operational excellence, customer satisfaction, and innovation. However, issues such as ethical concerns, data privacy, high implementation costs, and skill shortages continue to pose challenges. The paper concludes that artificial intelligence, when strategically aligned with organizational objectives, plays a crucial role in achieving long-term business success.

Introduction:

In the rapidly evolving digital era, businesses operate in an environment characterized by intense competition, technological disruption, and constantly changing customer expectations. Organizations are required to make faster and more accurate decisions while maintaining efficiency and innovation. To meet these challenges, businesses increasingly rely on advanced digital technologies. Among these, artificial intelligence has gained significant importance as a strategic business tool.

Artificial Intelligence refers to the capability of machines and computer systems to perform tasks that typically require human intelligence, such as learning from experience, recognizing patterns, reasoning, and problem-solving. AI is no longer limited to experimental or technical domains; it has become an integral component of business strategy. Industries such as finance, healthcare, retail, manufacturing, logistics, and marketing actively use AI to automate operations, analyze large datasets, reduce costs, and deliver personalized customer experiences. This paper explores how artificial intelligence functions as a strategic tool in business practice and how it contributes to organizational performance.

Literature Review

A growing body of literature highlights the strategic significance of artificial intelligence in modern business organizations. Several researchers emphasize that AI enhances data-driven decision-making by processing vast amounts of structured and unstructured data more efficiently than traditional systems. Studies indicate that AI-based predictive analytics helps organizations anticipate market trends, customer behaviour, and operational risks.

Existing literature also discusses the role of AI applications such as chatbots, recommendation systems, robotic process automation, and intelligent decision-support systems in improving customer engagement and operational efficiency. Scholars have pointed out that AI enables personalization at scale, which has become a key competitive factor in today's customer-centric markets.

At the same time, researchers have identified several challenges associated with AI adoption. Ethical concerns, algorithmic bias, lack of transparency, data security risks, and workforce displacement are frequently discussed issues. Many studies conclude that the strategic value of AI depends on how effectively it is aligned with organizational goals, leadership vision, and ethical governance frameworks. Overall, the literature confirms that AI has the potential to redefine business strategies and organizational structures.

Objectives

The main objectives of this research paper are:

- To understand the concept and scope of artificial intelligence in a business context
- To examine the role of AI as a strategic tool in business practice
- To analyze the benefits of AI adoption for business organizations
- To identify challenges associated with the implementation of AI technologies

- To study the impact of AI on business decision-making and organizational performance

Research Methodology

This study is based on a **descriptive and analytical research methodology**. The research relies exclusively on **secondary data sources**, including academic journals, textbooks, research papers, company reports, and reputable online databases. Relevant information related to artificial intelligence and business strategy was collected, reviewed, and analyzed systematically. The study is conceptual in nature and does not involve primary data collection through surveys or interviews. The secondary data approach helps in understanding existing theories, trends, and practical applications of AI in business.

Result and Discussion

The analysis indicates that artificial intelligence plays a crucial role in transforming business strategies and operational models. AI enables organizations to automate routine and repetitive tasks, allowing employees to focus on higher-value activities. Automation through AI reduces operational costs, minimizes human error, and improves process efficiency.

AI also enhances strategic decision-making by providing real-time insights and predictive analysis. Businesses use AI to forecast demand, optimize supply chains, detect fraud, manage risks, and improve financial planning. In customer relationship management, AI-powered chatbots and recommendation systems improve responsiveness and personalization, leading to higher customer satisfaction and loyalty.

Furthermore, AI supports innovation by enabling the development of new products, services, and business models. Data-driven insights help organizations identify emerging opportunities and respond proactively to market changes. However, the discussion also highlights significant concerns such as job displacement due to automation, ethical use of AI, data privacy issues, and dependence on data quality. Successful implementation of AI requires strong leadership, appropriate technological infrastructure, employee training, and clear ethical guidelines.

Findings

The major findings of the study are as follows:

- Artificial intelligence serves as a powerful strategic tool for achieving competitive advantage
- AI improves operational efficiency and reduces manual errors
- Businesses using AI experience enhanced customer satisfaction through personalization
- Strategic decision-making becomes more accurate and timely with AI-driven insights
- Challenges such as data security, ethical concerns, high implementation costs, and skill gaps remain significant barriers

Conclusion

Artificial Intelligence has become an essential component of modern business strategy. Its strategic application enables organizations to enhance productivity, improve decision-making, and foster innovation. Although challenges such as ethical concerns, workforce adaptation, and data-related risks persist, the long-term benefits of AI outweigh these limitations. Organizations that successfully integrate artificial intelligence into their strategic frameworks are better positioned to achieve sustainable growth and competitiveness. Therefore, AI should be viewed not merely as a technological innovation but as a strategic asset that shapes the future of business practice.

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Emotional Intelligence as a Predictor of Teaching Effectiveness and Job Satisfaction among University Professors

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Abstract

Emotional intelligence has risen as an essential competence for educators in the vigorous and challenging environment of higher education. The present study examines emotional intelligence as a predictor of teaching effectiveness and job satisfaction among university professors. A descriptive and analytical research design was implemented. Primary data were collected from 82 professors working in higher education institutions using a structured questionnaire. Emotional intelligence was measured through self-awareness, self-regulation, motivation, empathy, and social skills, while teaching effectiveness and job satisfaction were measured using standardized scales. Data were analyzed through using descriptive statistics, correlation, and regression analysis. The findings reveal that emotional intelligence provocatively predicts teaching effectiveness and job satisfaction among professors. The study highlights that Emotional intelligence is found to be a significant contributor to teaching effectiveness. Emotional intelligence is positively accompanying with job satisfaction. Higher emotional intelligence validate enhanced professional outcomes.

Keywords: Emotional Intelligence, Teaching Effectiveness, Job Satisfaction, Professors, Higher Education

Introduction

Higher education institutions currently functions in an environment deliberated by academic pressure, technological hi tech advancement, and diverse student expectations. Professors are requisite not only to have subject knowledge but also to be able to manage emotions, build constructive relationships, and sustain job satisfaction.

In today's vigorous market, the major challenge facing by educational institutions is to sustain the brilliant forces specifically its faculties. The indulgent of emotions in the workplace is gaining significance as they perform as a pioneer in shaping a person's response as well as attitude towards the place of work. Professors have a lot of duties and responsibilities in terms of amount of work, time-consuming hours under stress, which interrupt their job satisfaction level and their performance as a consequence. Emotional intelligence plays a starring role in this matter by handling their emotions and other colleague's emotions to possess a suitable performance and to grow the ability to manage with biological and emotional stresses in satisfying job. As a outcome, it may lead to a higher job performance and happiness which leads to job satisfaction. it also plays a vital role in enabling educators to understand and regulate their own emotions as well as those of others.

Job satisfaction is the sense of internal satisfaction and pleasure attained while accomplishing a particular job. Amongst the numerous concepts about the conception of emotional intelligence, Aristotle defines emotional intelligence as those who possess the rare skill to be angry with the right person, to the right degree, at the right time, for the right purpose, and the International Science Congress Association right way are at an advantage in any domain of life. Hence, the purpose of the current study is to examine the relationship between emotional intelligence and its impact on Teaching Effectiveness and job satisfaction among the faculty of professionals.

Emotional Intelligence: There are several definitions and extents about what emotional intelligence is, in short, emotional intelligence, which is another kind of intelligence is theorized as the individual's realization of his/her own state of mind appropriately and is considered as another type of intelligence. over-all, emotional intelligence has been defined as the skill to recognize, evaluate, and defined emotion perfectly; the aptitude to access and produce feelings when they enable intellect; the ability to understand Emotionally loaded information and make use of emotional knowledge; and the ability to control emotions to encourage emotional and intellectual progress and well-being.

Thus, Researchers have gradually recognized emotional intelligence as a predictor of teaching effectiveness and job satisfaction. This study attempts to examine the predictive role of emotional intelligence with reference to job satisfaction among university professors.

Review of Literature

The concept of emotional intelligence has evolved over several decades. Early ideas related to emotional and social aspects of intelligence can be traced to Abraham Maslow's work on emotional strength in the 1950s. Later, Gardner's (1983) theory of multiple intelligences expanded the understanding of intelligence by including interpersonal and intrapersonal intelligence, emphasizing the ability to understand oneself and others.

The term *emotional intelligence* gained formal recognition through the work of Salovey and Mayer (1990), who conceptualized it as the ability to perceive, understand, manage, and regulate emotions. Emotional intelligence became widely popular following Goleman's (1995) work, which highlighted its importance in professional effectiveness and leadership, often arguing that emotional intelligence may be as important as cognitive intelligence for success.

Bar-On (2002, 2006) proposed a trait-based model of emotional intelligence that focuses on emotional and social competencies contributing to individual well-being and performance. His model emphasizes that emotional intelligence can be developed over time and includes components such as self-awareness, empathy, stress management, adaptability, and interpersonal skills. This model has been widely applied in educational and organizational research.

Earlier studies have proven a strong relationship between emotional intelligence and teaching effectiveness. Chan (2006) found that teachers with higher emotional intelligence exhibit better classroom management, instructional adaptability, and student engagement. Similarly, Brackett and Katulak (2006) reported that emotionally intelligent educators foster positive learning environments and effective teacher-student relationships.

Emotional intelligence has also been shown to influence job satisfaction. Carmeli (2003) observed that individuals with higher emotional intelligence experience greater job satisfaction due to improved emotional regulation and stress management. Sy, Tram, and O'Hara (2006) further confirmed that emotional intelligence positively affects job satisfaction and job performance across organizational settings.

However existing literature approves the importance of emotional intelligence in teaching effectiveness and job satisfaction; nevertheless, limited studies have observed the combined impact of emotional intelligence on both variables among university professors in the Indian higher education context. The present study aims to fill this research gap.

Objectives of the Study

1. To examine the relationship between emotional intelligence and teaching effectiveness among professors.
2. To study the relationship between emotional intelligence and job satisfaction among professors.
3. To analyze the impact of emotional intelligence on teaching effectiveness.
4. To analyze the impact of emotional intelligence on job satisfaction.

Hypotheses of the Study

H₀₁: Emotional intelligence does not significantly predict teaching effectiveness among professors.

H₁₁: Emotional intelligence significantly predicts teaching effectiveness among professors.

H₀₂: Emotional intelligence does not significantly predict job satisfaction among professors.

H₁₂: Emotional intelligence significantly predicts job satisfaction among professors.

Research Methodology

The Study The existing study is a correlational investigation to study the impact of emotional intelligence on teaching effectiveness and on job satisfaction amongst professionals from various institutions.

The study incorporated a descriptive and analytical research design. Primary data were collected from 82 professors working in higher education from various institutions using a structured questionnaire through Google Forms. The questionnaire consisted of demographic details, emotional intelligence indicators, teaching effectiveness statements, and job satisfaction statements measured on a five-point Likert scale. Emotional intelligence was treated as the independent variable, while teaching effectiveness and job satisfaction were treated as dependent variables. Data were analysed using descriptive statistics, reliability analysis, correlation, and simple regression techniques.

Data Analysis Techniques

Data collected from 82 professors were analyzed using Microsoft Excel. Composite scores for emotional intelligence, teaching effectiveness, and job satisfaction were calculated by averaging respective questionnaire items. Descriptive statistics were used to obtain mean and standard deviation values. Pearson's correlation was applied to examine relationships between variables, and simple linear regression analysis was conducted to assess the impact of

emotional intelligence on teaching effectiveness and job satisfaction. Hypotheses were tested at a 5 percent level of significance.

Table 1

Descriptive Statistics of Study Variables (N = 82)

Variable	Mean	Interpretation
Emotional Intelligence	3.90	High
Teaching Effectiveness	3.85	Effective
Job Satisfaction	3.78	Satisfactory

Interpretation:

Table 1 illustrates that the mean score of emotional intelligence (M = 3.90) is above the average level, indicating that professors possess a high level of emotional intelligence. The mean score for teaching effectiveness (M = 3.85) reflects effective teaching practices, while the mean score for job satisfaction (M = 3.78) suggests satisfactory job satisfaction among professors. Overall, the descriptive statistics indicate favourable levels of emotional intelligence, teaching effectiveness, and job satisfaction. **Hypotheses H₀₁ and H₀₂ are tested further using correlation; see below.**

Table 2

Pearson Correlation Analysis among Study Variables

Variables	Emotional Intelligence
Teaching Effectiveness	0.62**
Job Satisfaction	0.58**

Note: ** p < 0.01

Interpretation:

The correlation results presented in Table 2 indicate a moderate to strong positive relationship between emotional intelligence and teaching effectiveness ($r = 0.62$, $p < 0.01$). Similarly, emotional intelligence shows a positive relationship with job satisfaction ($r = 0.58$, $p < 0.01$). These findings suggest that professors with higher emotional intelligence tend to exhibit better teaching effectiveness and higher levels of job satisfaction. Thus, the relationship objectives of the study are supported. Thus, **H₀₁ is rejected and H₁₁ is accepted. And H₀₂ is also rejected and H₁₂ is stands accepted.**

Table 3

Regression Analysis: Emotional Intelligence Predicting Teaching Effectiveness

Predictor	β	R ²	F	p-value
Emotional Intelligence	0.62	0.38	45.27	0.000

Interpretation:

Table 3 presents the regression analysis results for emotional intelligence predicting teaching effectiveness. The standardized beta coefficient ($\beta = 0.62$) indicates a strong positive impact of emotional intelligence on teaching effectiveness. The R² value of 0.38 reveals that emotional intelligence explains 38% of the variance in teaching effectiveness. The regression model is statistically significant ($F = 45.27$, $p = 0.000$). Hence, the **null hypothesis (H₀₁) is rejected and the alternative hypothesis (H₁₁) is accepted**, confirming that emotional intelligence significantly predicts teaching effectiveness among professors.

Table 4

Regression Analysis: Emotional Intelligence Predicting Job Satisfaction

Predictor	β	R ²	F	p-value
Emotional Intelligence	0.58	0.34	39.18	0.000

Interpretation

The regression results shown in Table 4 indicate that emotional intelligence significantly predicts job satisfaction among professors. The beta value ($\beta = 0.58$) reflects a positive impact of emotional intelligence on job satisfaction. The R² value of 0.34 suggests that 34% of the variance in job satisfaction is explained by emotional intelligence. The model is statistically significant ($F = 39.18$, $p = 0.000$). **Therefore, the null hypothesis (H₀₂) is rejected and the alternative hypothesis (H₁₂) is accepted.**

Findings of the Study

The findings of the study make an evident that emotional intelligence plays a significant role in enhancing teaching effectiveness and job satisfaction as well among university professors. Professors with higher emotional intelligence are

well prepared to manage classroom engagement, understand students' emotional needs, and sustain positive professional relationships, contributing to improved teaching effectiveness. Furthermore, emotionally intelligent professors are Demonstrate greater capacity to handling with work-related stress and continuing positive attitudes toward their profession, which develops job satisfaction. The findings emphasize emotional intelligence as an essential personal Key attribute that Fosters positive professional outcomes in higher education.

Conclusion

This study highlights the significant role of emotional intelligence in influencing the professional lives of university professors. Professors with higher emotional intelligence not only teach more effectively and feel more fulfilled in their professional roles. By understanding and handling their own emotions and **tuning into others' emotional experiences**, they are better able to tackle classroom challenges, connect with students, and foster a positive and inclusive learning environment.

These findings advocate that emotional intelligence is a more than just a personal trait, it is a valuable asset which enhances both teaching performance and holistic well-being. Higher education institutions can support faculty by **helping them cultivate these abilities**, skills through training and professional development,

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A Study of Employee Engagement and Its Impact on Organizational Performance

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Abstract

Employee engagement has gained prominence as a vital determinant of organizational effectiveness in modern Human Resource Management. Engaged employees exhibit higher levels of enthusiasm, commitment, and discretionary effort, which significantly contribute to improved organizational outcomes. This paper examines the concept of employee engagement, explores its key dimensions and drivers, and analyses its influence on organizational performance. The study is conceptual and descriptive in nature, relying on secondary data obtained from academic journals, scholarly books, and industry reports. The analysis reveals that employee engagement has a strong and positive relationship with productivity, employee retention, service quality, innovation, and financial performance. The study concludes that organizations must strategically invest in engagement-focused HR practices and leadership development to achieve sustainable performance and long-term success.

Keywords: Employee Engagement, Organizational Performance, Human Resource Management, Productivity, Commitment

1. Introduction

In an increasingly competitive, knowledge-driven, and technology-oriented business environment, organizations are under constant pressure to improve performance, efficiency, and sustainability. While technological advancement and capital investment play an important role, human resources remain the most critical asset for organizational success. Employees' attitudes, commitment, and involvement directly influence productivity, service quality, innovation, and long-term growth. In this context, employee engagement has emerged as a key concept in modern Human Resource Management (HRM).

Employee engagement goes beyond traditional notions of job satisfaction or motivation. It reflects the degree to which employees are emotionally, cognitively, and behaviorally invested in their work roles and organizational objectives. Engaged employees demonstrate enthusiasm, dedication, and a willingness to exert discretionary effort for the benefit of the organization. Numerous empirical studies and industry reports indicate that organizations with higher levels of employee engagement outperform those with disengaged workforces in terms of productivity, profitability, customer satisfaction, and employee retention.

Despite growing awareness of its importance, many organizations continue to experience low engagement levels due to ineffective leadership, inadequate recognition systems, limited career development opportunities, work-life imbalance, and poor communication. As a result, disengagement manifests in absenteeism, high employee turnover, reduced morale, and suboptimal performance. Given these challenges, it is essential to examine employee engagement in a systematic and comprehensive manner. This study seeks to analyze the concept of employee engagement and assess its impact on organizational performance, highlighting its strategic significance for sustainable organizational success.

2. Research Background

The roots of employee engagement can be traced to early motivational and behavioral theories that emphasized the importance of employee attitudes and commitment. Traditional approaches to management focused primarily on extrinsic motivators such as pay and job security. However, contemporary research highlights that psychological involvement and emotional attachment play a more decisive role in driving employee performance.

Kahn's (1990) seminal work introduced employee engagement as the degree to which individuals invest their physical, emotional, and cognitive energies into their work roles. Later, Schaufeli and Bakker conceptualized engagement as a positive and fulfilling state of mind characterized by vigor, dedication, and absorption. In recent years, global consulting firms and organizational studies have reinforced the strategic importance of engagement by linking it with measurable business outcomes. Consequently, employee engagement has evolved from a theoretical concept to a practical management tool.

3. Review of Literature

Anthony Andrew (2017). Employees' Commitment and Its Impact on Organizational Performance, Asian Journal of Economics, Business and Accounting. according to study investigated the impact of employee commitment on organizational performance at the Eravurpatru Divisional Secretariat in the Batticaloa District of Sri Lanka. Affective, normative, and continuance commitment were treated as independent variables, while organizational performance was the dependent variable. Using descriptive and explanatory research designs, data were collected through a five-point Likert-scale questionnaire administered to selected employees. The findings revealed a significant and positive relationship between all three dimensions of employee commitment and organizational performance. The results highlight the importance of strengthening employee commitment through effective management practices and strategic recruitment to enhance organizational performance and achieve sustainable competitive advantage.

Farah Ahlami Mansor et.all (2023, EMPLOYEE ENGAGEMENT AND ORGANIZATIONAL PERFORMANCE. International Journal of Accounting, Finance and Business (IJAFB)

This study highlights the importance of employee engagement in enhancing organizational performance. The findings reveal a moderate relationship between communication and organizational performance, while leadership and career development show weaker associations. Effective engagement requires supportive leadership, open communication, a positive work environment, and structured career development. Previous studies consistently demonstrate that highly engaged employees contribute to higher productivity, retention, and innovation. However, the study is limited by its focus on only three engagement variables and its sample drawn from private-sector employees in Johor, Malaysia, which restricts generalizability.

4. Objectives of the Study

- To examine the concept and dimensions of employee engagement.
- To analyse the relationship between employee engagement and organizational performance.
- To identify major factors influencing employee engagement.
- To evaluate the organizational benefits of employee engagement.
- To suggest strategies for improving employee engagement.

5. Research Methodology

The study adopts a descriptive and conceptual research design. It is based entirely on secondary sources of data, including peer-reviewed journals, academic books, organizational reports, and credible online publications. Content analysis has been employed to synthesize existing research findings and to develop a comprehensive understanding of the relationship between employee engagement and organizational performance.

6. Concept and Dimensions of Employee Engagement

Employee engagement is a multidimensional construct encompassing behavioral, emotional, and cognitive aspects. Behavioral engagement reflects the level of effort and initiative employees demonstrate in their work. Emotional engagement refers to employees' feelings of attachment, loyalty, and pride toward their organization. Cognitive engagement represents the degree of focus, attention, and mental involvement employees bring to their tasks.

Several factors influence employee engagement, including leadership effectiveness, meaningful work, recognition and rewards, career development opportunities, organizational culture, and work-life balance. When these factors are adequately addressed, employees are more likely to remain engaged and contribute positively to organizational goals.

7. Impact of Employee Engagement on Organizational Performance

Employee engagement plays a pivotal role in enhancing organizational performance. Engaged employees exhibit higher productivity and efficiency as they are motivated to perform beyond minimum expectations. High engagement levels are associated with reduced absenteeism and employee turnover, resulting in lower recruitment and training costs.

Moreover, engaged employees deliver superior customer service, leading to increased customer satisfaction and loyalty. Engagement also fosters innovation by encouraging employees to share ideas and participate in problem-solving. Financial performance improves as a result of enhanced productivity, service quality, and operational efficiency. Thus, employee engagement serves as a key driver of sustainable organizational performance.

8. Challenges in Building Employee Engagement

Despite its importance, fostering employee engagement presents several challenges. Ineffective leadership, lack of transparent communication, inadequate recognition, limited career advancement opportunities, and excessive work pressure can negatively affect engagement levels. Resistance to organizational change and work-related stress further

contribute to disengagement. Organizations must proactively address these challenges to cultivate an engaging work environment.

9. Strategies for Enhancing Employee Engagement

Organizations can enhance employee engagement by implementing strategic HR and leadership initiatives. These include developing transformational leadership capabilities, establishing fair and transparent reward systems, providing continuous learning and career development opportunities, encouraging employee participation in decision-making, and promoting work-life balance. Regular feedback mechanisms and open communication channels also play a crucial role in sustaining engagement.

10. Conclusion

The study concludes that employee engagement has a significant and positive impact on organizational performance. Engaged employees contribute to higher productivity, improved customer satisfaction, innovation, and financial growth. Employee engagement should be treated as a long-term strategic investment rather than a short-term initiative. Organizations that prioritize engagement through supportive leadership and effective HR practices are more likely to achieve sustainable competitive advantage. The findings support the alternative hypothesis and reject the null hypothesis.

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Cloud computing in an Organizational Context: A review of Adoption and Impact

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Abstract

This review paper will examine the adoption of cloud computing within the organizational context through the secondary data collected through existing reviews and reports. This paper will integrate information on the adoption of cloud computing, benefits and challenges within the different industries. By this process, it will determine the factors impacting the adoption of cloud computing also; it outlines the measurable outcomes for the applications within the industry.

Keywords: Cloud Computing, Review Paper, Secondary Data, Business Organizations, Digital Transformation

1. Introduction

Recently, the application of cloud computing technology has emerged as one of the most important facilitators of digital transformation for today's business organizations. Rather than relying on the high cost of in-house infrastructure, organizations today increasingly choose for the application of cloud computing technology to ensure scalability, flexibility, and efficiencies. In today's rapidly evolving state of cloud technology, the literature review becomes extremely important for understanding trends in adoption and impacts on organizations.

In this regard, this paper undertakes a secondary literature review from the available journals, which have analysed the issue of cloud computing within business organizations.

2. Objectives of the Study

The aims of this review article are:

- To understand trends in cloud computing adoption across business organizations
- To identify major benefits reported in existing studies
- To study common challenges and risks associated with cloud adoption
- To present the summarized findings of cloud adoption various and its benefits and challenges.

3. Research Methodology

Concerning the nature of data for this study, the type of data gathered is basically from secondary sources. Articles, conferences, and research works of similar journals, events, and research studies done through survey researches were analysed. Content analysis was done for the purpose of acquiring the key findings, and these findings were categorized depending on the themes of adoption factors, its benefits, and issues surrounding it.

4. Literature Review

The usage of cloud computing has improved dramatically in various sectors like IT services, banking, healthcare, education, and manufacturing. The current literature available reveals that organizations are attracted to cloud technology as a result of the reduced operational expenses, simplicity of scaling up the services, and the ability to enhance teamwork within the organization. The use of cloud technology also does not require a significant upfront investment in hardware; rather, the organization has to pay for the used services. However, the current studies have also identified government regulations as a barrier to adopting cloud computing technology.

Many scholars have used the Technology-Organization-Environment (TOE) framework to describe cloud adoption and acceptance. Based on this theory, environmental and technological factors such as infrastructure support and environmental issues can affect technology acceptance and adoption. It has also been identified that governmental regulations and issues like data protection play a significant role within cloud adoption.

Recent research and literature show that there is an increasing trend among larger enterprises in transitioning to Hybrid Cloud configurations. The hybrid cloud ecosystem leverages the strengths of both public and private cloud infrastructures, offering improved scalability, sustainability, and flexibility. With the hybrid cloud, organizations can

secure their more confidential information on private clouds while performing less important tasks on public clouds. Based on literature, hybrid clouds can address the security issues and hurdles for sustainable business growth.

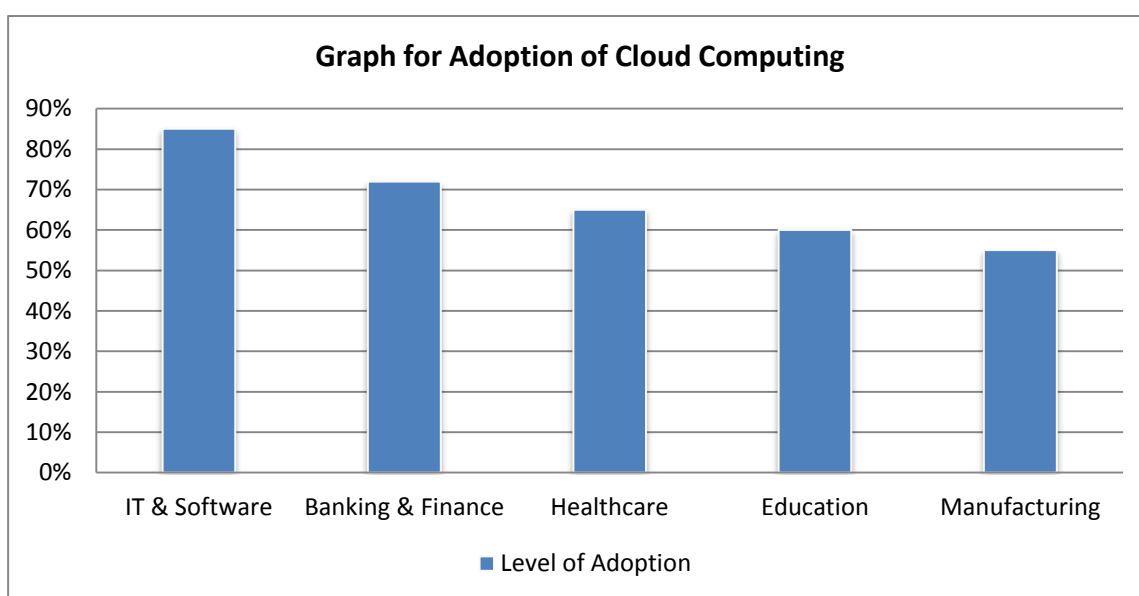
5. Findings and Analysis

This section provides an analysis of findings drawn from secondary data obtained from research studies done by other authors, emphasizing the trends, advantages, drawbacks, and adoption level of cloud computing by business organizations.

5.1 Sector-wise Adoption of Cloud Computing

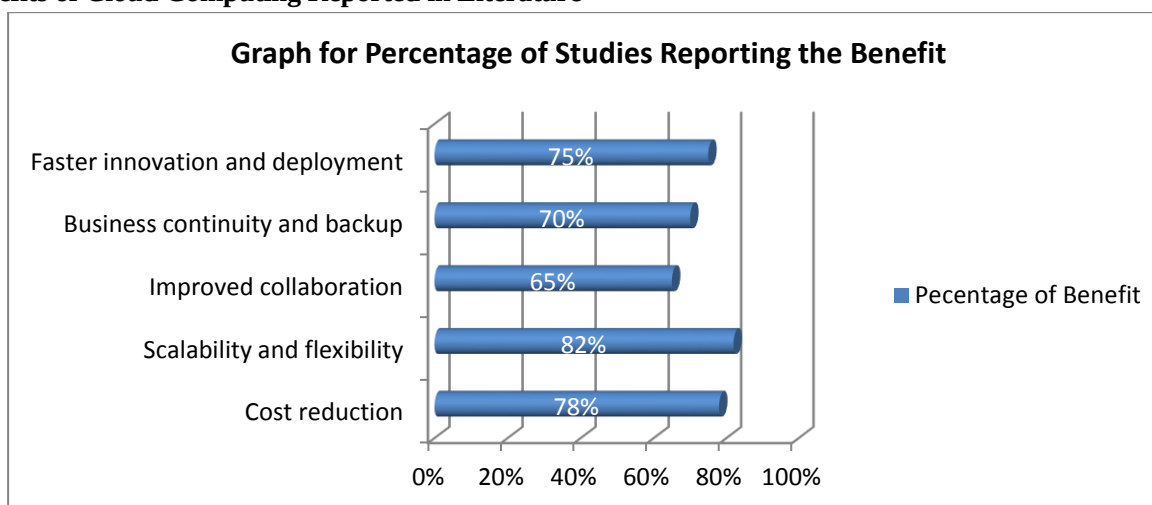
Table 1: Sector-wise Adoption of Cloud Computing in Business Organizations

Business Sector	Level of Adoption (%)	Key Purpose of Adoption
IT & Software	85	Application hosting, DevOps, data analytics
Banking & Finance	72	Secure transactions, data storage, compliance systems
Healthcare	65	Electronic health records, telemedicine platforms
Education	60	E-learning systems, virtual classrooms
Manufacturing	55	ERP systems, supply chain management



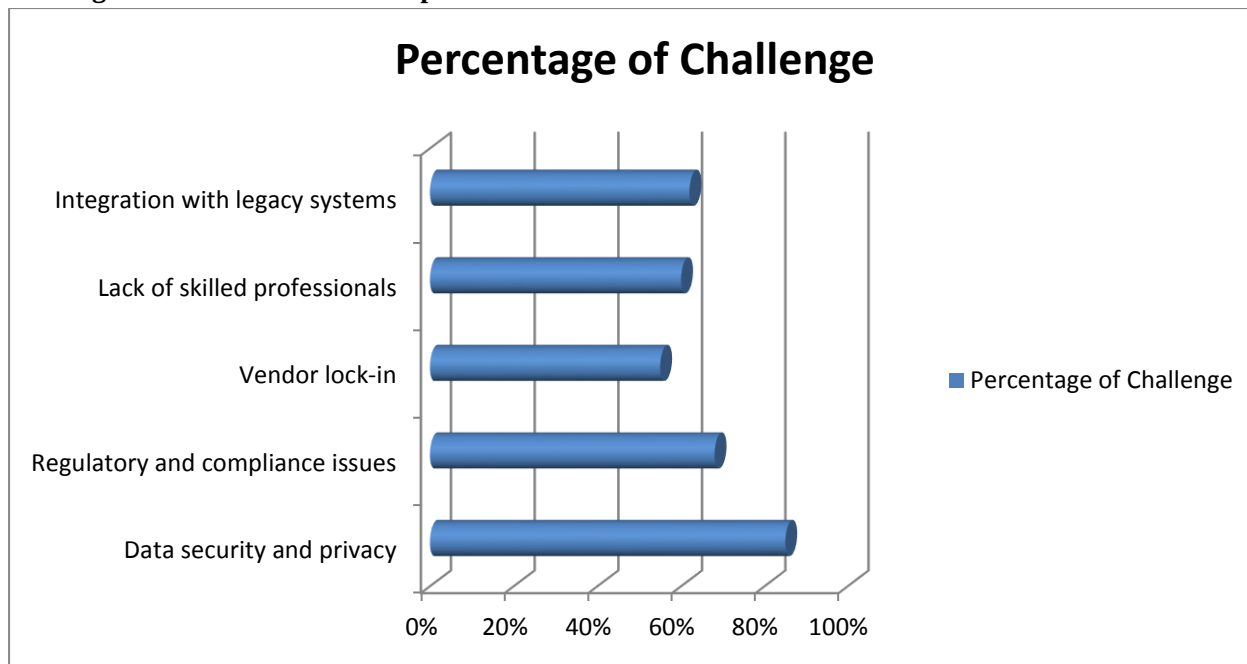
Interpretation: The IT and software sector shows the highest cloud adoption rate, which is attributed to the rapid innovation in technology, while the manufacturing sector and education show relatively lower adoption levels.

5.2 Benefits of Cloud Computing Reported in Literature



Graph Description: The bar graph shows the percentage of studies that have identified extensive benefits of cloud computing adoption. The results reveal scalability and flexibility and cost savings and innovation as the topmost identified benefits.

5.3 Challenges Identified in Cloud Adoption



Graph Description:

The bar graph indicates the major challenges to cloud adoption, which are data security and privacy as the highest concern, followed by regulatory compliance issues and the integration of cloud systems with the existing legacy infrastructure.

5.4 Overall Findings Summary

- The adoption of cloud computing is most prevalent in technology-intensive industries.
- Strategic benefits are more important compared to technical benefits in corporate environments.
- Security and compliance continue to pose the biggest challenges, despite the maturity of the technology.

6. Gap Analysis

Based on the reviewed secondary data, the following research gaps are identified:

Table 2: Research Gap Analysis in Cloud Computing Adoption Studies

Area	Existing Research Focus	Identified Gap
Adoption models	With focus on TOE and DOI frameworks	Limited integration with organizational culture and leadership factors
Sector-specific studies	Emphasis on IT and banking sectors	Lack of in-depth studies on SMEs, education, and manufacturing
Security research	Identification of risks	Limited empirical validation of security mitigation strategies
Long-term impact	Short-term adoption benefits	Lack of longitudinal studies measuring long-term performance outcomes
Developing economies	General adoption trends	Insufficient region-specific analysis for developing countries

Gap Analysis Interpretation: Most of the prevailing literature on TCS and knowledge focuses largely upon its adoption factors and advantages and could be less effective from the perspective of its long-term organizational impacts and ICT-related challenges across various industries.

7. Discussion

The review indicates that the adoption of cloud computing is mainly driven by strategic/financial reasons rather than technical. Although SMEs mainly concentrate on cost-cutting approaches to adoption, large enterprises concentrate on

scalability and innovations. The findings also suggest that there is now a movement towards hybrid/multi-clouds to address risks.

8. Conclusion

The review paper offers a summarized report on the adoption of cloud computing within organizations based on secondary data. The paper has verified that there are considerable benefits derived from cloud computing, despite aspects relating to security and governance, which are currently challenges. The paper, therefore, covers the topic noted above.

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Systematic Phase-Wise Identification of Life-Cycle Objectives and Reliability Studies for Ammunition Cartridge SA 7.62 Mm Nato Ball M80 (CTN Packed) EX OFV

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“Quality means freedom from deficiencies.” Joseph M. Juran

Abstract

Small arms ammunition reliability is a critical determinant of operational effectiveness and user safety. The 7.62 mm NATO Ball M80 cartridge, produced at Ordnance Factory Varangaon (OFV), is a frontline service ammunition used extensively by Indian defence and security forces. This study presents a systematic, phase-wise reliability assessment of the Cartridge SA 7.62 × 51 mm NATO Ball M80 (CTN packed), covering production, storage, and exploitation phases over its intended life cycle. A reliability-based framework integrating Feasibility-of-Objectives Technique (FOT), reliability allocation, reliability demonstration testing, binomial sequential testing, Six Sigma process capability analysis, and field reliability modelling is developed. Manufacturing quality data from the Loading and Assembly stage are analysed to estimate current sigma levels and project improvement timelines. Field failure data are evaluated using both parametric Weibull analysis and non-parametric Kaplan–Meier survival estimation. The results indicate a wear-out type failure behaviour with increasing hazard at later ages, and demonstrate that achieving the specified reliability objectives requires significant reduction in process defects. The study provides actionable insights for quality assurance, life-extension decisions, and process optimisation for ammunition systems.

Keywords : Small Arms Ammunition, Reliability Engineering, Life-Cycle Analysis, Six Sigma, Weibull Analysis, Kaplan–Meier Estimator, Quality Assurance

Introduction

The 7.62 mm NATO Ball M80 Small Arms (SA) ammunition is a standard service cartridge manufactured by Ordnance Factory Varangaon (OFV) since the year of its foundation in 1964. The ammunition is produced to meet the governing specifications and is issued to the Indian Military and MHA Units after successfully meeting the prescribed acceptance criteria for various tests and proof parameters. As a frontline service ammunition, it is designed to ensure reliability, safety, and consistent ballistic performance under diverse operational conditions, with quality assurance exercised at each stage of manufacture and acceptance.

Literature Review

Reliability engineering principles have long been applied to complex defence systems; however, their structured application to small arms ammunition remains comparatively limited. Elsayed (2012) and Kapur and Pecht (2014) emphasise the importance of system-level reliability allocation and life-cycle modelling for high-consequence products. Sampling inspection standards such as IS 2500 provide attribute-based acceptance criteria but do not directly address ageing and field reliability.

Recent studies highlight the usefulness of Weibull analysis and non-parametric survival methods for munitions reliability, particularly where censored data and limited failures are common. Six Sigma methodologies have also been increasingly adopted in defence manufacturing to quantify process capability and drive defect reduction. This study integrates these approaches into a unified framework tailored to small arms ammunition.

3. Methodology

3.1 Reliability Requirement

The complete reliability requirement for the Cartridge SA 7.62 mm NATO Ball M80 (CTN packed) is defined as: $R(18 \text{ years}) \geq 0.99$ at 95% confidence, under instantaneous firing conditions between $-20 \pm 5^\circ\text{C}$ and $+45 \pm 5^\circ\text{C}$, with maximum relative humidity of 95% and average relative humidity of 65%.

3.2 Reliability Allocation

Reliability allocation is performed using the Feasibility-of-Objectives Technique (FOT). The cartridge is decomposed into four major subsystems: cartridge case (body), bullet, primer, and propellant. Each subsystem is rated for intricacy, state-of-the-art, performance time, and environmental severity. Weighted factors are normalised to obtain proportional contributions to system reliability.

Based on a target system reliability of 0.95 over 18 years, the system failure rate is estimated as 0.00285 failures per year. This failure intensity is allocated to subsystems, yielding component-level failure rates in the range of approximately 0.000456 to 0.000977 failures per year.

3.3 Reliability Demonstration and Sequential Testing

Reliability demonstration testing is carried out using binomial models to determine demonstrated reliability based on sample size, confidence level, and observed failures. A Binomial Sequential Testing Plan (BSTP) based on the Constant Probability Ratio method is developed to support accept–reject decisions with reduced test sample requirements.

3.4 Production Phase Analysis

Manufacturing data from the Loading and Assembly (L&A) stage on M-6 and M1 machines were analysed for lots produced between July and November 2025. Defect categories included groove damage, mouth damage, propellant charge deviations, case-without-bullet, dimensional deviations, and profile defects.

Process capability was assessed using defect proportion, defects per million opportunities (DPMO), and sigma-level conversion. Long-term sigma levels were estimated using the conventional 1.5 sigma shift.

3.5 Field Reliability Analysis

Field exploitation data comprising 217 outturn lots were analysed. Twelve lots exhibited failures, while the remaining lots were right-censored. Reliability modelling was performed using:

Weibull distribution fitting with Maximum Likelihood Estimation (MLE)

Goodness-of-fit testing using Mann’s test

Non-parametric Kaplan–Meier survival estimation

Results

Reliability Allocation

The analysis applies the Feasibility-of-Objectives Technique (FOT) to estimate component-level failure rates for the Cartridge SA 7.62 mm NATO Ball M80 (CTN Packed). In this method, each subsystem—Body, Bullet, Primer, and Propellant—is assigned ratings for intricacy, state-of-the-art, performance time, and environmental severity based on structured scales. These ratings are translated into weighted factors (w), which are normalised to yield proportional contributions (c) of each component to the overall system reliability objective. Using the target reliability ($R_0 = 0.95$) and system life ($t = 18$ years), the corresponding system failure rate (L_0) is computed as 0.00285 failures/year. This total permissible failure intensity is then apportioned across subsystems using the calculated proportionality constants, resulting in component-level failure rates ranging approximately from 0.000456 to 0.000977 failures/year, depending on the relative complexity, technological maturity, operating time, and environmental stress level associated with each component.

Reliability Demonstration Test

The model provides a structured method for determining the demonstrated reliability of Cartridge SA 7.62 mm NATO Ball M80 (CTN Packed) based on a chosen sample size, confidence interval (CI), and the number of observed failures during testing.

Binomial Sequential Testing Plan

The model illustrates the construction of a Binomial Sequential Testing Plan based on Constant Probability Ratio (BSTP) for Cartridge SA 7.62 mm NATO Ball M80 (CTN Packed).

Production Phase

Analysis of a Critical Manufacturing Process

The production and rejection data of Cartridge SA 7.62 mm NATO Ball M-80 at the Loading & Assembly (L&A) stage on the M-6 & M1 machines were compiled for lots produced during the period from 07 Jul 2025 to 25 Nov 2025. Several defect categories—groove damage, mouth damage, powder (propellant) low/high, case-no-bullet condition, total length deviation, shoulder length deviation, and full form/profile defects—contribute to the nonconformities observed during inspection.

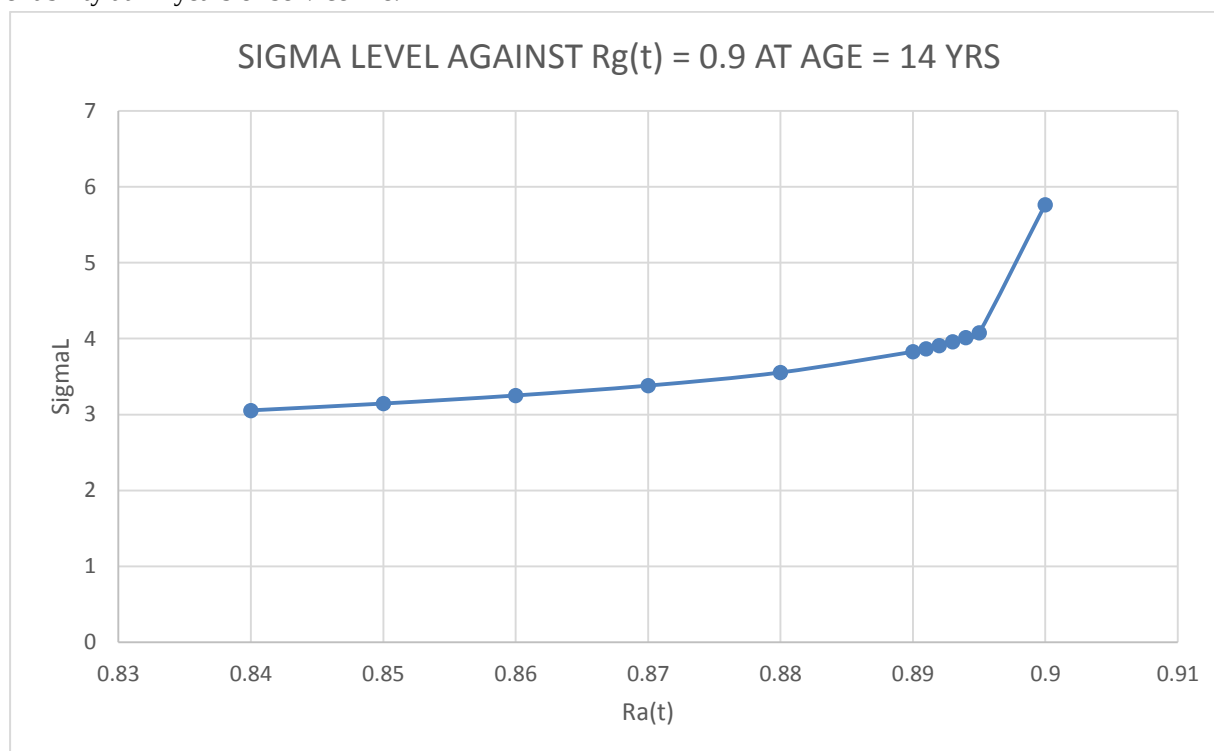
Current sigma level of the Process

Using the consolidated inspection data of 14.408 million cartridges and 546,000 observed nonconformities, the present defect proportion of the process is estimated as $p = 0.0379$ (3.79%), corresponding to 37,896 defects per million opportunities (DPMO). Converting this defect rate to an equivalent standard normal performance metric gives a short-term process Z-value of 1.78σ , obtained from the inverse standard normal cumulative distribution for the conforming probability ($1 - p$). Applying the conventional Six Sigma 1.5σ shift to relate short-term and long-term performance yields a current long-term sigma level of approximately 3.28σ for the manufacturing process. This provides a quantitative indication of the existing process capability and its distance from world-class performance benchmarks.

Way to Six Sigma

The sigma-level computation for the critical processes at the Loading & Assembly stage, derived from the uploaded table and formulae (Yield, DPMO and Sigma conversion), has been evaluated with a target reliability of $R_g(t) = 0.90$ at 14 years of age. When this long-term reliability requirement is imposed, the corresponding age-adjusted reliability values $R_a(t)$ and their associated defect levels provide a realistic picture of OFV's present process capability. The results show that for the current defect levels ($\approx 25,000$ – $27,000$ DPMO), the sigma level remains around 3.2–3.4 sigma, which is insufficient to meet or sustain a reliability of 0.90 at 14 years. As $R_a(t)$ improves toward the required range of 0.89–0.90, the sigma level begins to rise, and once defect levels approach the lower DPMO band (≈ 10 – 100), sigma capability climbs sharply into the 5.5–6.0 sigma region. The Sigma vs. $R_a(t)$ plot clearly demonstrates that achieving the target reliability at 14 years demands a substantial reduction in process defects.

These trends offer a precise roadmap for OFV. Since the 0.90 reliability target at ageing condition places stringent demands on consistency of the Loading & Assembly stage, process variation must be systematically reduced. Incremental improvements in defect prevention—such as tighter control over propellant charging, primer assembly, bullet seating, and CTN sealing—will produce measurable increases in $R_a(t)$, which in turn translate into higher sigma levels. The graphs confirm that only by reducing DPMO significantly and stabilizing the process can OFV transition from the present moderate capability (≈ 3 sigma) to the near-world-class level (5–6 sigma) required to reliably achieve 0.90 reliability at 14 years of service life.



The calculations below estimate the time and improvement effort required for the Loading & Assembly process to progress from the current quality level of 3.27 sigma ($\approx 37,896$ ppm defectives) to the target quality level of 5.59 sigma (≈ 4.16 ppm defectives). Using a conservative annual defect-reduction rate of 25%, the model shows that the organisation would need approximately 31.7 years to naturally reach the desired ppm level. This long duration highlights that small, incremental improvements are insufficient for meeting the reliability and sigma targets—especially considering the operational requirement of achieving 0.9 reliability at 14 years of life for the ammunition.

Exploitation Phase

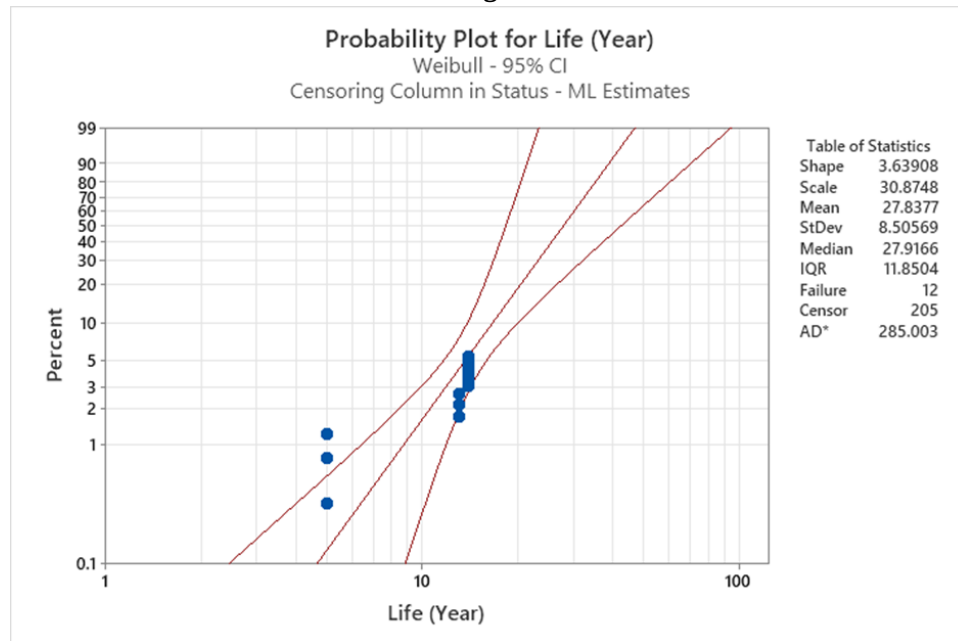
During the field usage and disposal phases, the emphasis shifts from controlled conditions to real-world performance and end-of-life safety.

Goodness of Fit Test – Mann’s Test

Based on the field-exploitation results of 217 outturn lots, of which 12 lots exhibited failures, a distribution-fit analysis was carried out using Mann’s Test for the Weibull Distribution to verify whether the observed Time-to-Failure (TTF) data conforms to a Weibull model.

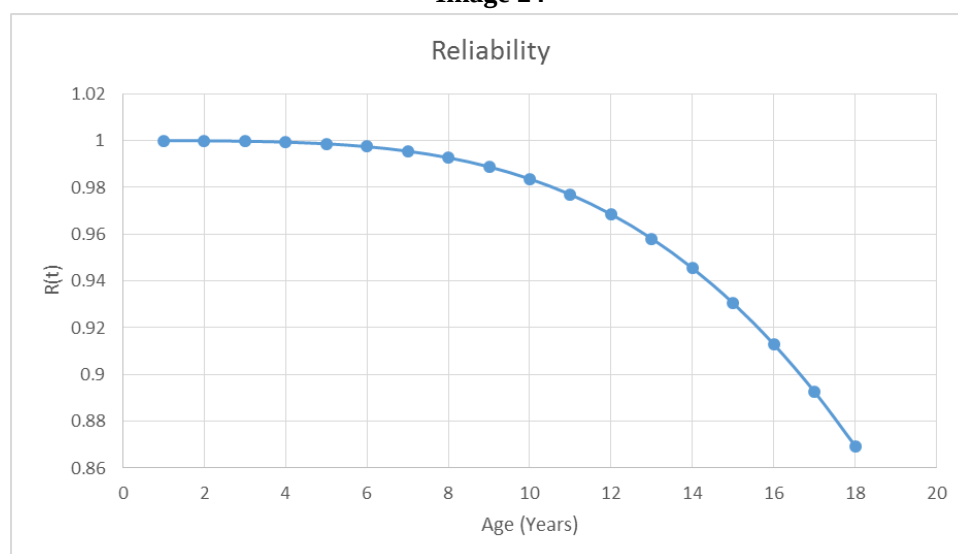
Maximum Likelihood Estimation

Image 23



Failures: 5 yr (3), 13 yr (3), 14 yr (6), Censored: 205 lots at 14.0 yr (right-censored). Log-likelihood at MLE: -71.4434 . Estimated Weibull shape (β) = 3.6390. 95% CI for $\beta \approx (2.07, 6.40)$. Estimated Weibull scale (η) = 30.8751 years. 95% CI for $\eta \approx (19.24, 49.56)$. Median life ($t_{50} = \eta (\ln 2)^{1/\beta}$) ≈ 27.92 years. Reliability estimates: $R(7 \text{ yr}) = \exp[-(7/\eta)^\beta] \approx 0.9955$ (99.55%). $R(18 \text{ yr}) \approx 0.8690$ (86.90%).

Image 24

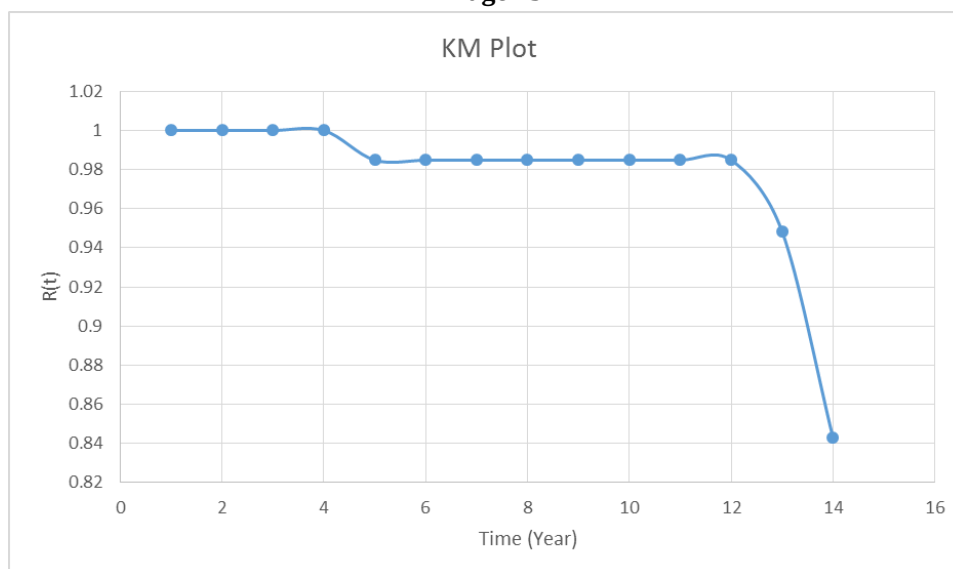


$\beta \approx 3.64$ (>1) indicates an increasing hazard (a wear-out type behaviour) rather than a constant failure rate. $\eta \approx 30.9$ years is a large scale parameter (63.2% fail by ≈ 30.9 years), which is consistent with the observed small number of early

failures and the long survival of most lots. $R(7)$ from MLE ($\approx 99.55\%$) is consistent with the KM non-parametric finding that reliability is very high in early years. If it is decided to dispose / replace the amn below 90 % reliability, It needs to be done at age = 16.65188 years.

Non-parametric Kaplan–Meier (KM) survival estimation method

Image 25



Using the failure data extracted from Defect Reports (SAO 2/S/2002) raised by the User during field exploitation, a statistical reliability evaluation was conducted using the non-parametric Kaplan–Meier (KM) survival estimation method. This approach is particularly appropriate for ammunition reliability studies, as it effectively incorporates censored items, irregular failure patterns across storage ages, and non-uniform sample sizes. Based on the updated KM calculations, the survival curve shows that the 7.62 mm M80 ammunition maintains a high probability of successful functioning over time, with no recorded failures up to 12 years of age. The first significant failure events occur at 13 and 14 years, resulting in a KM survival estimate of approximately 84.3% at 14 years of life. This indicates that about 84 rounds out of every 100 are statistically expected to remain serviceable at this age. The analysis therefore confirms that the ammunition continues to demonstrate satisfactory reliability deep into its shelf-life tenure (18 years), while also highlighting that failure probability begins to increase gradually as the ammunition approaches the later stages of its storage life.

Discussion

The results demonstrate that while early-life reliability of the 7.62 mm M80 ammunition is high, failure probability increases noticeably in later years. The observed wear-out behaviour underscores the importance of controlling manufacturing variability and ageing mechanisms.

Sigma-level analysis indicates that the current process capability is insufficient to sustain high reliability targets at advanced ages. Projections based on incremental defect reduction suggest that achieving near–Six Sigma performance through gradual improvement alone would require several decades, highlighting the need for focused process redesign and defect-prevention strategies.

Conclusion

This study establishes a structured, life-cycle-based reliability evaluation framework for Cartridge SA 7.62 mm NATO Ball M80 manufactured at Ordnance Factory Varangaon. By integrating reliability allocation, demonstration testing, Six Sigma analysis, and field reliability modelling, the approach provides quantitative insight into both manufacturing capability and long-term performance.

The findings support evidence-based decisions on process improvement, shelf-life management, and disposal policies, and demonstrate that achieving stringent reliability objectives requires substantial reduction in manufacturing defects. The methodology is extensible to other ammunition types and defence manufacturing systems.

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Smartcattlecare: An Integrated Digital System for Cattle Health Monitoring and Productivity Enhancement

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Abstract

SmartCattleCare is a digital livestock health management system that addresses delayed disease detection, fragmented records, low vaccination coverage, and limited veterinary access in rural settings.¹ It provides a unified, mobile-based platform for managing cattle, buffalo, goats, and sheep through unique animal identification, digital health records, vaccination scheduling, disease reporting, and veterinarian-supported monitoring¹. Offline access and low-literacy-friendly interfaces ensure usability in low-connectivity regions⁷. Data collected from farmers and veterinarians are aggregated at herd and village levels to enable dashboard monitoring, trend analysis, and risk-based alerts³. By enabling early disease detection, timely intervention, and improved vaccination compliance, SmartCattleCare transforms manual livestock management into a scalable, cost-effective digital ecosystem aligned with national livestock health initiatives⁵.

Keywords: SmartCattleCare, Digital Livestock Management, Cattle Health Monitoring.

Introduction

Livestock farming plays a vital role in food security and income sources of rural farmers. However, in many areas, cattle health management is still organized poorly and handled manually. Farmers face problems like maintaining, late detection of diseases, and missed or delayed vaccinations. These are some of the issues which reduce animal productivity and increase financial losses, especially for small farmers who live with limited resources.

SmartCattleCare is a digital livestock management system developed to solve such problems. Its purpose is to help farmers and veterinarians to manage animal identification, health records, vaccination schedules, breeding information, and treatment details using mobile and web-based platforms. By converting paper-based and scattered information into digital records, the system helps in better decision-making, timely treatment, and improved preventive care.

This makes SmartCattleCare affordable, scalable, and easy to use, even in rural areas.

Literature Review

Study of earlier reports show's us that how digital systems are used for animal identification, health records, vaccination tracking, and disease monitoring. However, many of these systems do not fully meet farmers' practical needs, especially for reminders, follow-ups, and easy decision-making. The table 1.1 below summarizes key findings from the literature and shows that how SmartCattleCare can address these gaps.

1.1 Comparative Analysis of Existing Livestock Management Systems

Feature/Aspect	SmartCattleCare	Exiting Livestock Systems	Research Gap Addressed
Health Intelligence & Risk Indicators	✓ Health score, risk flags from records	✗ Raw data storage only	Lack of decision-support insights
Vaccination Scheduling & Alerts	✓ Automated schedules and reminders	• Static records, no alerts	Missed or delayed vaccinations
Disease Monitoring & Early Warning	✓ Symptom reporting + risk indication	✗ Post-event reporting	Delayed disease detection
Integrated Farmer - Veterinarian Interaction	✓ Direct digital communication & validation	✗ Fragmented or offline interaction	Slow response and poor coordination

Unified Digital Record Management	✓Centralized, animal-wise lifecycle records	• Paper based or fragment system	Data inconsistency and loss
Usability for Rural Users	✓Simple UI, local – language, offline support	✗Low usability, internet dependent	Low adaptation in rural settings

Statement of Problem

There are digital livestock records that still exist, but cattle health management is still poorly organised. Current systems focus on data collection rather than prevention, reminders, or decision support, and many of the advanced solutions depend on costly sensors that are not financially suitable for rural areas. Due to which this creates a need for a simple, software-based system that can turn existing livestock data into practical outcomes.

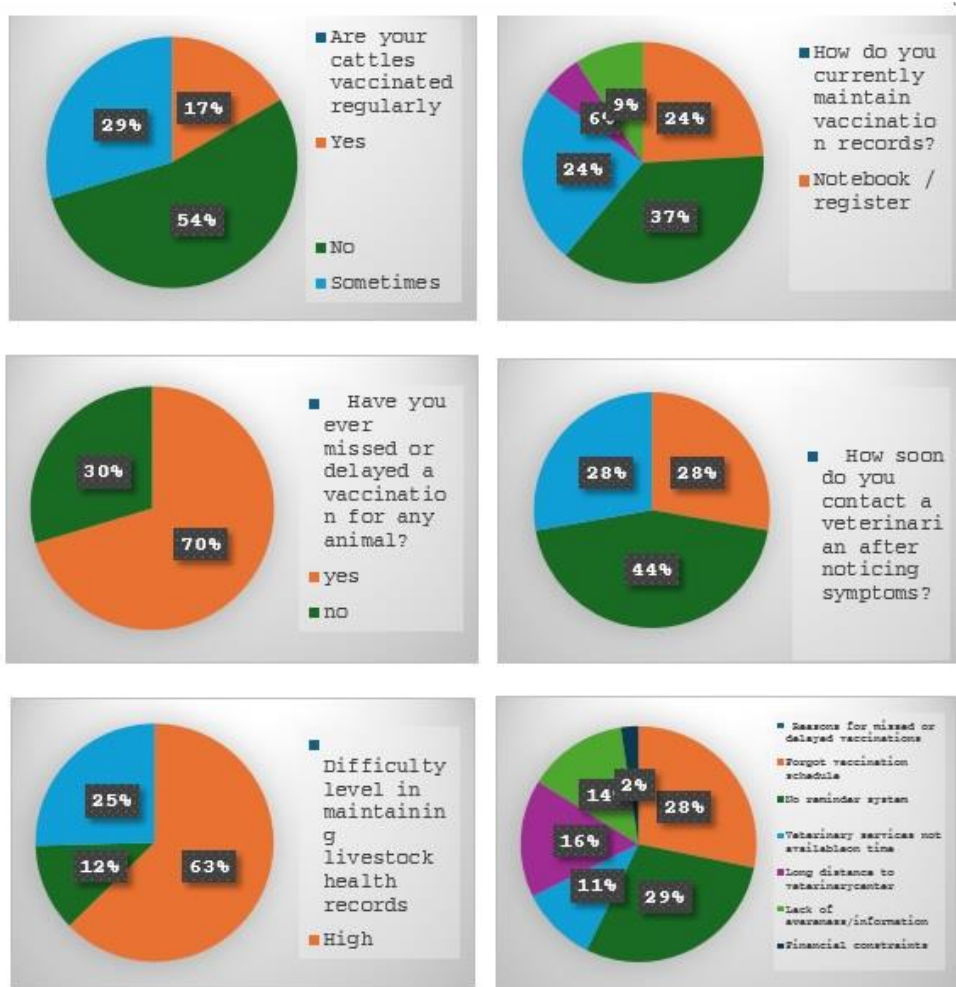
Objectives

- To create a digital system to store and manage complete health and vaccination records of livestock in one place.
- To help farmers remember and complete livestock vaccinations on time using reminder and follow-up features.
- To identify livestock diseases at an early stage by recording symptoms and past health information.
- To support faster and better decisions by veterinarians through easy sharing of livestock health information between farmers and veterinarians.

Research Methodology

Primary Data Analysis

Primary data was collected, mostly across the Khandesh region. Findings mostly highlight problems like missing vaccinations, record keeping, delayed in veterinary access and problem in disease detection.



Proposed Solution

To address the identified problems of missed vaccinations, poor record-keeping, delayed disease detection, and limited veterinary access, this study proposes a digital livestock health management system SmartCattleCare. The system is designed to support farmers by organizing animal health records, providing vaccination reminders, and enabling timely communication with veterinarians through a mobile-based platform.

SmartCattleCare provides acts as a single repository for farmers which maintain's all the cattle information, such as health history and vaccination records. The system intimates the farmers so as not to miss a vaccination date or a subsequent follow-up. Early symptoms of illness can be detected and reported, So timely intervention of veterinary treatment can be provided .

It makes animal health information easily available and accessible to both farmers as well as veterinarians at the right time, which improves the communication between farmers and veterinarians. As compared to other platforms SmartCattleCare does not require any expensive machinery or sensors, the resultant service remains very affordable for most rural settings. Features like offline use and local language support make farmers confident in adapting and using the system.

Overall, SmartCattleCare transforms simple cattle information into usable assistance for better animal care and loss reduction, which results in increasing production.

Conclusion

The study point out key problems in livestock health management, such as missed vaccinations, poor record-keeping, and delays in getting veterinary help. These issues lead to preventable diseases and loss of productivity. Although farmers understand the importance of preventive care, practical and system-related challenges make it difficult to follow consistently. The findings also show that most livestock owners are comfortable using smartphones and prefer regional-language applications. Therefore, a digital solution like SmartCattleCare can help improve vaccination tracking, health record management, and timely veterinary support, leading to better animal health and improved farmer income.

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Study on Perceptions of Traders towards GST

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Abstract

The Goods and Services Tax is implemented in India from 1 July 2017, with motto of “one nation, one market and one tax”. This is a major indirect tax reform aimed at creating a unified tax system and reducing the cascading effect of taxation. This study examines the perception and satisfaction level of traders towards GST. Primary data were collected from 70 traders and using a structured questionnaire based on a five-point Likert scale. Descriptive analysis and independent sample t-tests were applied for data analysis. The findings indicate that traders recognize the long-term benefits of GST, such as improved transparency and market integration, but face challenges related to complex return filing procedures, increased compliance costs, and technical issues with the GST portal. Despite these challenges, a majority of respondents reported overall satisfaction with GST implementation.

Keywords: GST, Traders' Perception, Tax Reform, Compliance, Satisfaction.

Introduction:

I observed while interacting with traders in the market that many of them have different opinions and experiences regarding Goods and Services Tax (GST). During informal discussions with traders, I found that some traders feel GST is beneficial for business, while others face difficulties in understanding procedures, filing returns, and managing compliance. Due to these mixed responses, I decided to study the perceptions of traders towards GST.

The aim of this study is to evaluate the level of awareness, understanding, and perception that traders have about GST. GST has brought major changes in the indirect tax system and has made tax compliance largely digital. Traders are required to register under GST, issue tax invoices, maintain records, and file returns regularly. These changes have directly affected their day-to-day business operations.

By assessing traders' perceptions, identifying the benefits they experience, and understanding the challenges they face, this study seeks to bridge the gap between policy intentions and practical implementation. The study is conducted through a survey method to collect real responses from traders. Understanding traders' perceptions will help in identifying problems and suggesting measures to improve awareness, compliance, and overall acceptance of the GST system.

Objectives of the Study:

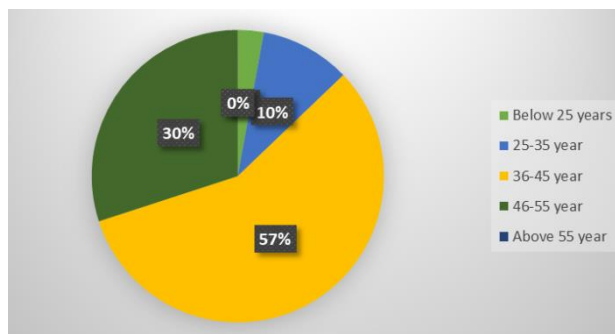
1. To understand the perception of traders towards the GST system.
2. To identify the benefits of GST as experienced by traders.
3. To find out the difficulties and challenges faced by traders in GST compliance.
4. To analyse traders' satisfaction level regarding the implementation of GST.

Research Methodology:

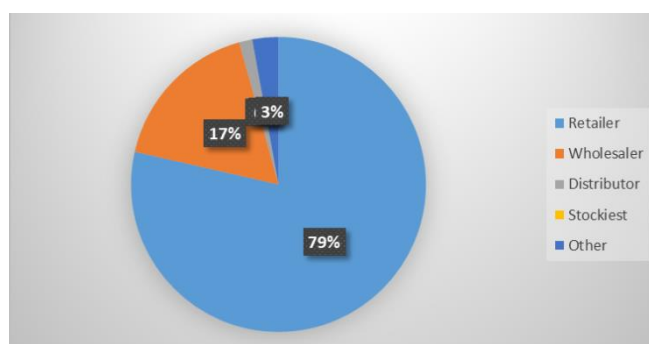
A structured questionnaire was prepared to collect data from traders. The questionnaire consisted of 20 questions in which 16 questions are close-ended and 4 questions are open-ended questions related to GST awareness, benefits, compliance procedures and challenges faced by traders. The survey was conducted by directly approaching traders in the market and also through online mode. In this data considered 70 responded. Convenience sampling method was used to collect responses. Personal interactions were conducted with traders to understand their practical experiences with GST. During these interactions, traders were asked about issues such as GST registration, return filing, use of the GST portal, and dependence on accountants or Chartered Accountants. While conducting the survey, it was observed that small traders face more difficulty in understanding GST procedures compared to medium and large traders.

Results and Discussion:

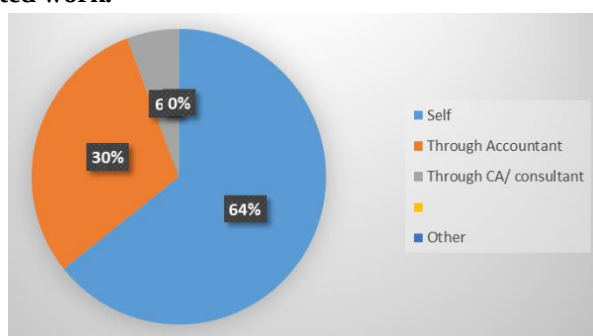
1. **Age Group:** The chart shows that in total 70 responded 40 of traders belong to the 36–45 years age group, followed by 21 in the 46–55 years group. 7 traders fall in the 25–35 years age group, while there 2 below 25 years and above 55 years.



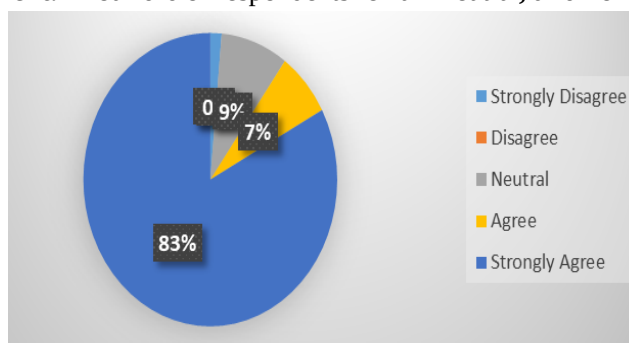
2. **Nature of Business:** The chart shows that 55 of the respondents are retailers, forming the largest group in the study. 12 of the respondents are wholesalers, while 1 belongs to the distributor category and 2 other business types.



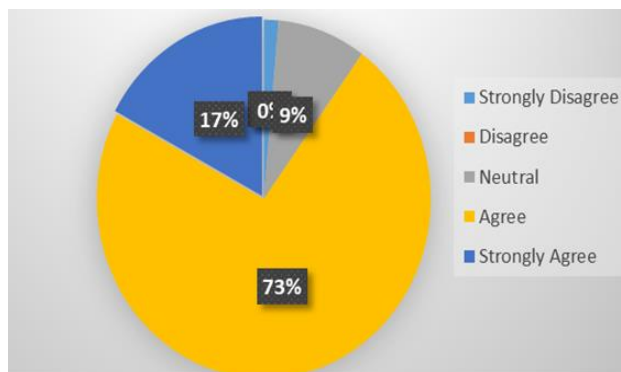
3. **Mode of GST Compliance:** The chart shows that 45 of traders handle GST compliance on their own, while 21 of traders file GST returns through an accountant. Only 4 of traders depend on a Chartered Accountant or consultant for GST-related work.



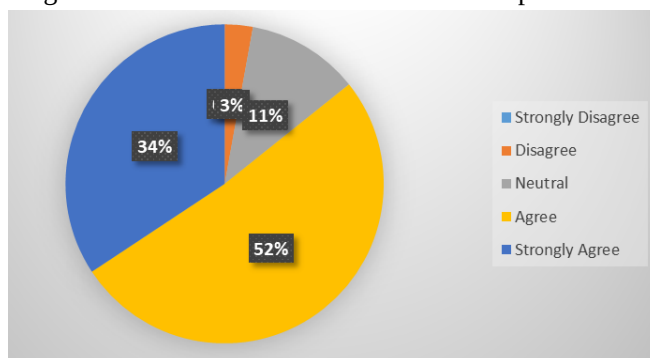
4. **GST has reduced tax on tax (cascading effect):** The chart shows that 58 of respondents strongly agree, while 5 agree with the statement. Around 6 of respondents remain neutral, and none disagreed or strongly disagreed.



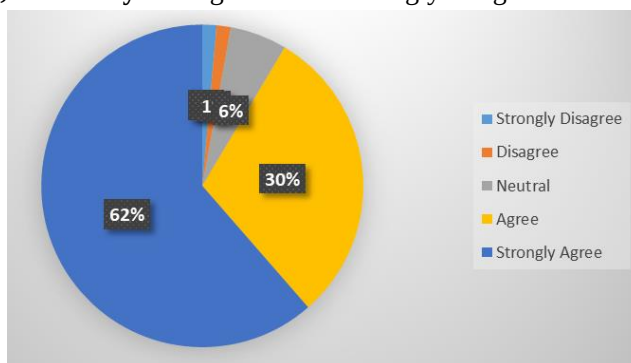
5. **GST has made India one common market for business:** The chat shows that 51 respondents agree, while 12 are strongly agreed, 6 respondents are neutral and 1 are strongly disagree.



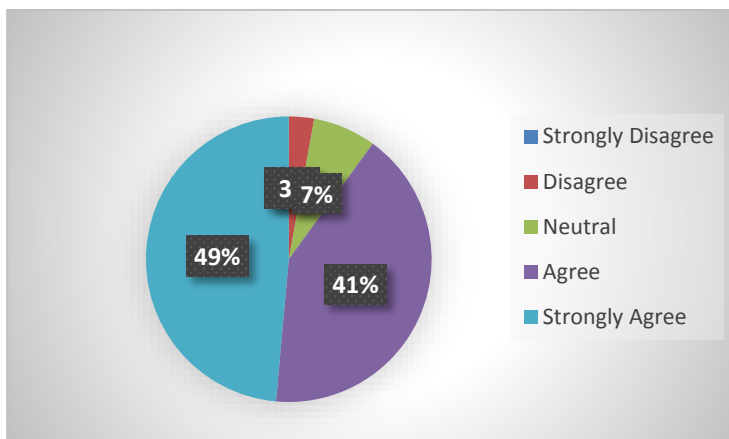
6. **GST has increased transparency in the tax system and prices:** The chart shows that 24 of respondents strongly agree, while 36 agree with the statement. Around 8 of respondents remain neutral, and 2 disagreed.



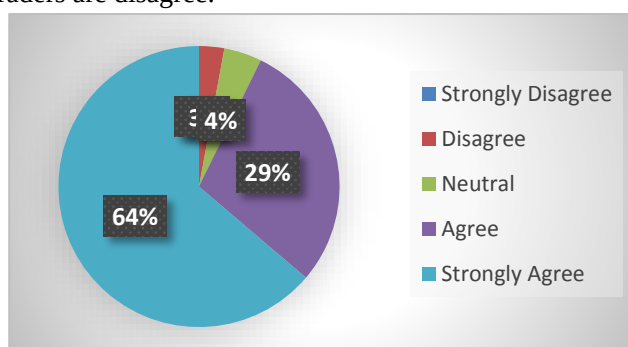
7. **GST supports the 'Make in India' initiative:** Among the 70 respondents, the chart shows that 43 strongly agree and 21 agree with the statement that GST supports the *Make in India* initiative. About 4 of the respondents are neutral, while only 1 disagrees and 1 strongly disagrees.



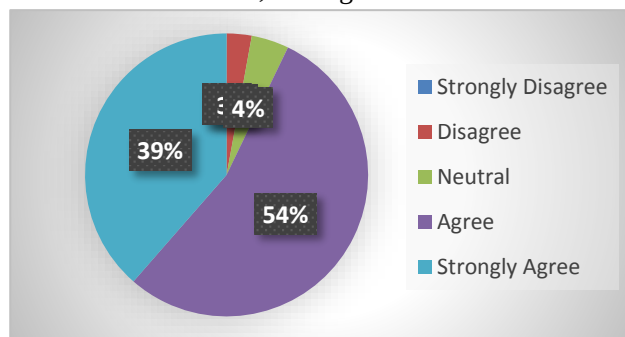
8. **GST has increased market opportunities for my business:** Out of the 70 respondents, the chart indicates that 34 strongly agree and 29 agree that GST has increased market opportunities for their business. About 5 of respondents are neutral, while only 2 disagree.



9. **GST has improved accounting and record keeping:** After analysis 44 respondents are strongly agree, 20 agree and 3 neutral, 3 traders are disagree.



10. **GST is beneficial for business in the long run:** During survey 27 traders strongly agree, 38 agree that GST is beneficial for long run business. And 3 neutral, 2 disagree.



Discussion:

The present study was conducted to understand traders' perceptions towards GST and its impact on business operations. The analysis of survey responses reveals that most traders have a **positive outlook towards GST**, especially regarding market integration, transparency, and long-term benefits. Traders largely agree that GST supports initiatives like *Make in India*, reduces delivery time of goods, lowers input costs through input tax credit, and increases market opportunities. However, certain challenges such as procedural complexity, compliance requirements, and understanding of GST provisions are still faced by some traders. Overall, the discussion indicates that while GST has brought structural improvements, continuous simplification and awareness are required for better acceptance.

Findings:

1. Majority of the respondents are **middle-aged traders**, actively engaged in business.
2. Retail traders form the **largest group** affected by GST.
3. Most traders prefer **self-compliance or limited professional assistance** for GST filing.
4. Traders strongly believe that **GST supports the 'Make in India' initiative**.
5. GST is perceived to have **reduced delivery time of goods** due to smoother movement.
6. Many traders feel that **raw material and input costs have reduced** under GST.

7. GST has helped in **expanding market opportunities** for businesses.
8. Overall perception of traders towards GST is **positive**, especially for long-term benefits.

Conclusion:

The present study is an attempt to investigate the perceptions of traders towards GST, their satisfaction from GST's implementation and the significant differences between their perceptions and satisfaction. It has been found in this study most of the respondents were agree with the proposed benefits of GST such as it will benefit in long run, it has transformed the Indian economy as a common economic market, it will give managerial benefits due to proper accounting record maintenance for legal compliances, it will boost the "Make in India" campaign, it has reduced the cascading effect of taxation, it will expand the market of business, it reduced the time in delivery of goods, it will broaden the tax base, it will improve the exports of country, it will ease the doing business in India, it will check the tax evasion, it will improve the transparency in taxation system and prices and it will be helpful in overall development of economy. This study suggests that government should make training and awareness program to make the people more understandable about GST, improve the digital infrastructure in economy, reduce the return filing formalities, bring all the goods and services in one tax structure which remain to come such as petrol, diesel and alcohol, to check the tax evasion charge the heavy penalties from tax evaders and try to reduce the tax burden on small businesses.

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Safe and Trusted AI in Higher Education Institutions

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Abstract:

Artificial Intelligence (AI) adoption in higher education is accelerating teaching, learning, administration, and research. However, AI's widespread use raises concerns about safety, ethics, trustworthiness, fairness, privacy, and governance. This paper examines the key principles for safe and trusted AI deployment in Higher Education Institutions (HEIs), explores challenges and risks, and proposes a framework to ensure responsible AI integration. The research emphasizes policy, transparency, accountability, and stakeholder awareness as foundational elements for trustworthy AI in academia. Finally, recommendations are provided for institutions seeking to balance innovation with ethical AI safeguards.

Keywords: Artificial Intelligence, Trustworthy AI, Higher Education, Ethics, Data Privacy, Governance, Responsible AI.

1. Introduction

Artificial Intelligence (AI) technologies—ranging from adaptive learning systems to predictive analytics—have transformative potential in Higher Education Institutions (HEIs).

Artificial Intelligence enables personalized learning, intelligent tutoring systems, automated assessment, automated administrative tasks, support academic research, improve student outcomes and data-driven academic planning. As institutions pursue technological advancement, ensuring that AI systems align with human values, well-being, and ethical standards becomes crucial.

The unchecked or opaque AI systems can jeopardize student privacy, propagate bias, undermine fairness, and erode trust. Ensuring safe and trusted AI is therefore both a technological and ethical imperative.

This paper discusses the principles of safe and trusted AI specifically in the context of HEIs, identifies associated challenges and risks, and proposes a high-level framework for responsible AI adoption.

2. Background and Rationale

AI in HEIs can take various forms, such as:

- Intelligent tutoring systems (ITS)
- Automated grading tools
- Chatbots for student support
- Predictive analytics for retention and performance, etc.

While these tools offer efficiency and personalization, they raise pressing concerns:

- **Bias and fairness** in algorithmic decision-making
- **Transparency** and reasoning ability of AI models
- **Data privacy** and security
- **Accountability and governance**

In alignment with the theme of holistic development, AI in education should enhance cognitive growth, emotional well-being, and equitable access to learning. Unsafe or biased AI systems may negatively affect student confidence, mental health, and academic motivation. Safe AI refers to systems that minimize unintended harm. Trusted AI implies systems perceived as reliable, ethical, and respectful of stakeholders' rights.

3. Challenges of AI implementation in HEIs:

3.1 Ethical and Bias Concerns: AI systems learn from data that may contain societal biases. For instance, predictive models used for student success may underperform for minority groups if trained on biased historical datasets. This can exacerbate inequities within HEIs.

Example: An early-warning system that flags “at-risk” students based on past performance may misidentify students if demographic or socioeconomic variables correlate with historical bias.

3.2 Transparency and Reasoning ability: Opaque AI (“black box”) systems make it difficult for students and faculty to understand how decisions are made:

- Why did a particular student receive a certain score?
- What factors led to a specific recommendation?

Explanation skill is essential to build trust and enable human oversight.

3.3 Privacy and Data Security: Student data used to train AI systems include sensitive information (grades, attendance, behavior). Protecting confidentiality while enabling AI insights demands robust governance.

3.4 Accountability and Governance: Without clear policies, accountability gaps emerge:

- Who is responsible when an AI system errs?
- How are grievances addressed?

HEIs must define governance structures and ethical review processes for AI projects.

4. Principles for Safe and Trusted AI in HEIs:

To guide responsible AI adoption, HEIs should adopt the following principles:

4.1 Fairness and Non-discrimination: AI systems should be routinely audited for bias. Institutions should implement fairness metrics and corrective mechanisms to ensure equitable outcomes across different student groups.

4.2 Transparency and Reasoning ability: Stakeholders must understand how AI systems make decisions. This includes:

- Publishing model logic or interpretations
- Communicating limitations and use cases

Explainable AI (XAI) methods can help demystify decision-making processes.

4.3 Data Privacy and Protection: HEIs should comply with data protection standards (e.g., GDPR, local regulations) and adopt privacy-preserving techniques such as:

- Data minimization
- Differential privacy
- Secure data storage

Consent mechanisms must be clear and voluntary.

4.4 Accountability and Oversight: Institutions must establish AI governance committees including faculty, IT staff, ethicists, and student representatives to oversee AI initiatives and address harms.

4.5 Continuous Monitoring and Evaluation: AI systems should undergo ongoing evaluation to detect drift, unintended outcomes, and performance degradation.

5. Proposed Framework for Safe and Trusted AI:

A structured AI governance framework includes planning, ethical assessment, responsible development, monitored deployment, and continuous evaluation. Institutional AI committees and policy guidelines play a vital role in governance.

The following framework outlines a lifecycle approach:

5.1 Planning Phase

- ✓ Define objectives, stakeholders, and ethical considerations
- ✓ Align AI with Institutional Values and Goals
- ✓ Conduct risk assessments

5.2 Design and Development

- ✓ Use diverse and representative datasets
- ✓ Incorporate fairness constraints
- ✓ Ensure explainability features

5.3 Deployment and Monitoring

- ✓ Pilot with small groups
- ✓ Monitor outputs for bias and errors
- ✓ Enable feedback loops

5.4 Evaluation and Update

- ✓ Regular audits
- ✓ Update models with new data

- ✓ Report outcomes transparently



Fig.: AI Governance Framework

6. Case Examples (Hypothetical):

6.1 AI for Personalized Learning: A university deploys an AI recommender that suggests study resources. Through fairness testing, the system identifies that certain groups receive lower-quality resources. The institution recalibrates the algorithm using fairness constraints and reports the changes transparently to learners.

6.2 Predictive Analytics for Retention: A retention model predicts at-risk students. To avoid privacy intrusion and bias, the institution restricts sensitive features and ensures faculty interpret results with oversight.

7. Discussion:

The integration of safe AI practices supports not only academic excellence but also holistic student development. Key success factors include stakeholder engagement, transparent processes, and clear governance. Institutions that adopt responsible AI frameworks are better positioned to maintain trust and long-term sustainability.

8. Conclusion:

AI holds tremendous promise for transforming higher education, but its benefits must be balanced with robust safety and trust principles. By adopting ethical guidelines, transparent practices, and institutional governance structures, HEIs can harness AI responsibly—enhancing learning experiences while protecting stakeholder rights.

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Tea & Cigarette: A Growing Duo among College Students

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Abstract:

The concurrent consumption of tea and cigarettes has become an increasingly prevalent behavior among college students. This study aimed to examine the prevalence, motivations, and emerging trends associated with this dual consumption. A structured questionnaire was distributed to students to assess the frequency of tea and cigarette use, as well as the specific contexts in which the two were paired. The findings revealed that a significant proportion of students intentionally combined tea and cigarettes, with common situations including social interactions, study sessions, and stress-relief activities. This behavior suggests a growing trend of deliberate co-use among college populations. Motivations for pairing tea with cigarettes varied, but participants commonly cited the desire for enhanced alertness, relaxation, and the reinforcement of existing habits. Many students viewed this pairing as a ritualistic practice, often linked to particular times of day or specific activities. The study suggests that for some students, the combination serves as a coping mechanism to manage stress or a social tool for bonding with peers. These insights highlight the complex relationship between tea and cigarette consumption and underscore the importance of addressing the potential health risks associated with both substances in college environments.

Keywords: Dual consumption, health risks, social influence, lifestyle patterns

Introduction:

In the fast-paced environment of college life, students often seek ways to cope with the pressures of academics, social interactions, and personal challenges. Among the many habits that emerge, the combination of tea and cigarettes has gained notable traction as a preferred choice for some. This pairing, though not entirely new, has become increasingly common on campuses across the globe. While tea known for its calming and sometimes energizing effects, is typically regarded as a healthier beverage choice, its pairing with cigarettes presents a unique and troubling trend. The act of smoking, long linked to numerous health risks, when combined with the consumption of tea, creates an interesting juxtaposition of habits that warrants closer examination.

This study seeks to explore the factors driving this growing phenomenon among college students, focusing on the reasons behind its appeal, the social dynamics involved, and the potential health implications. Many students report turning to this combination as a means of alleviating stress or staying alert during long study sessions. Yet, the health risks associated with smoking, especially when combined with seemingly harmless habits like drinking tea, remain largely overlooked. As such, this paper delves into the psychological, social, and cultural factors that make this duo increasingly popular and what it might reveal about the broader trends in student behavior.

By investigating this trend, we aim to provide a clearer understanding of how lifestyle choices among young adults are shaped by both personal needs and the influence of peer groups. Moreover, the study raises important questions about the long-term consequences of adopting such habits during the formative years of adulthood. Ultimately, the goal is to shed light on the significance of this growing habit, its potential risks, and how college communities can address it effectively.

Statement of the Problem:

The increasing habit of consuming tea and cigarettes together among students is leading to significant health risks, financial burden, and a noticeable decline in academic performance, yet most students remain unaware of the combined harmful effects of this duo.

Objectives of the Study:

1. To know why students consume tea & cigarettes together.
2. To check how this habit impacts their health, academics, and expenses.
3. The innovation solutions to curb the usage and motivation for tea and cigarette consumption.

Research Methodology:

The study adopted a descriptive research design to examine the prevalence, motivations, and impacts of concurrent tea and cigarette consumption among college students. This design was chosen to systematically describe existing behaviours while also exploring underlying reasons and emerging patterns associated with this habit.

The research was conducted among students studying in different colleges and streams, including arts, science, commerce, and professional course. Students from various academic backgrounds were included to get a realistic picture of the habit across college life. The population for this study includes college students between the age group of 18 to 25 years. Both male and female students were considered, without any restriction on year of study or course.

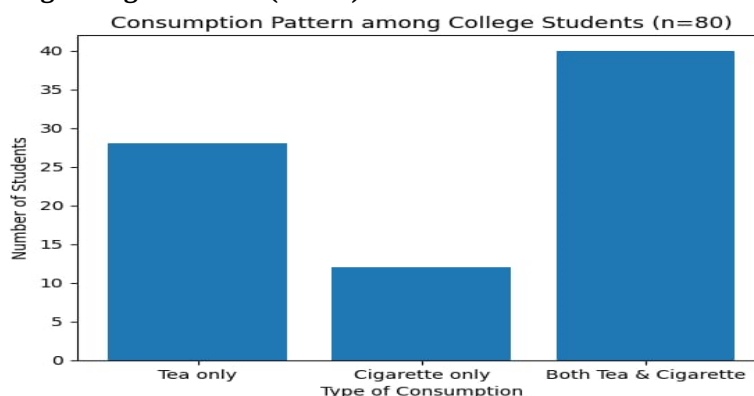
For this research, a total of 80 college students participated in the survey. The sample size was considered sufficient to understand common patterns and opinions related to tea and cigarette consumption among students. Primary data were collected using a structured questionnaire prepared by the researcher. The questionnaire was designed in a simple and clear manner so that students could answer honestly and comfortably.

Mode of Data Collection:

- **Offline questionnaires** shared personally with students
- **Online forms**, where students could respond digitally

Results and Discussion:

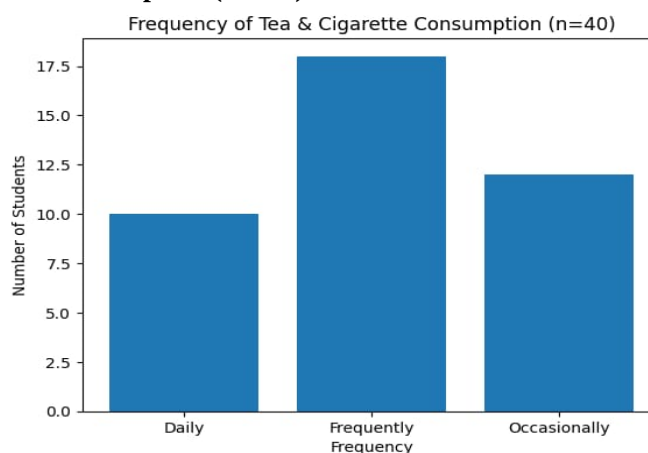
Consumption Pattern among College Students (n = 80)



Interpretation:

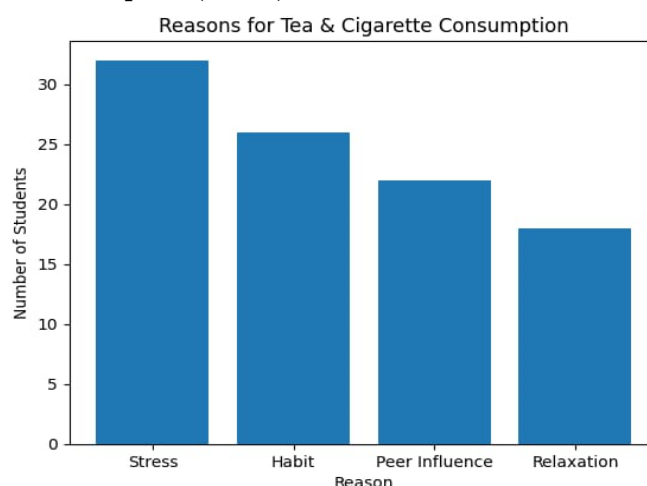
The graph clearly indicated that combined consumption of tea and cigarettes is the most common pattern among college students. Half of the respondents reported consuming both, which is significantly higher than those consuming tea or cigarettes alone. This suggests that tea often acts as a complementary beverage that reinforces cigarette use, making smoking a more frequent and socially accepted habit in college environments.

Frequency of Tea and Cigarette Consumption (n = 40)



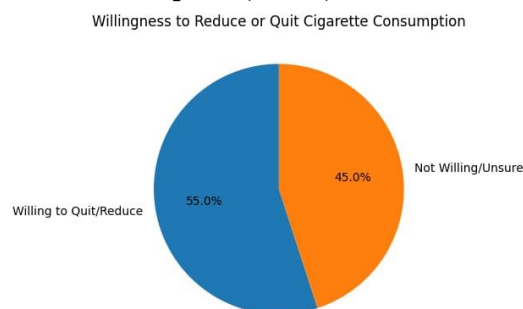
Interpretation: The results show that 70% of combined users consume tea and cigarettes either daily or frequently, indicating that the habit is well established rather than occasional. Frequent consumption reflects routine formation and dependency, often linked with stress relief and daily breaks. Occasional consumption is comparatively lower, suggesting that once initiated, the habit tends to become regular.

Reasons for Tea and Cigarette Consumption (n = 80):



Interpretation: Stress emerged as the most dominant reason, highlighting the role of academic and personal pressure in shaping unhealthy coping behaviours. Habit and peer influence further strengthen the practice, showing that the behaviour is not only psychological but also socially reinforced. Tea and cigarettes together serve as a quick and accessible stress-relief mechanism for students.

Willingness to Reduce or Quit Cigarette Consumption (n = 80):



Interpretation: More than half of the respondents expressed readiness to change, which is a positive sign. However, a significant proportion still remains resistant or uncertain, indicating strong habitual and social barriers. Supportive environments, stress-management programs, and peer-led initiatives may help convert willingness into actual behavioural change.

Impact on Health, Academics and Expenses:

Although more than half reported no immediate health problems, the significant proportion experiencing discomfort indicates early stage health effects. These symptoms may worsen with continued use, suggesting long-term risks. While academics are not severely affected for most students, over one-fourth admitted to distraction and time loss. This suggests a hidden academic cost, especially during examinations or deadlines. Though many students perceive the expenses as minor, over one-third recognized financial strain. Small daily spending can accumulate into significant monthly costs, especially for students with limited income.

Findings of the Study:

This study shows that consuming tea and cigarettes together has become a common habit among college students. Out of 80 respondents, half of the students regularly consumed both, indicating that tea often supports and encourages cigarette use. The habit is mainly driven by stress, with most students using tea and cigarettes as a way to relax or take a break from academic pressure. Habit and peer influence further strengthen this behavior, making it part of daily college life.

Although many students are aware of the health risks, this awareness does not always lead to change. A considerable number of students reported health discomfort, loss of focus in studies, and increased daily expenses. These effects may

seem small at present but can become serious if the habit continues over time. The study also found a positive sign, as more than half of the students showed willingness to reduce or quit cigarette consumption if proper support is provided.

Recommendation:

The inclusion of QR-enabled access to brief mindfulness practices and healthy alternatives is recommended as an effective means of providing immediate, user-initiated support at moments of craving. Overall, the findings suggest that tea and cigarette consumption among students is influenced more by stress and routine than lack of knowledge. Therefore, reducing this habit requires practical and supportive solutions, such as stress management and positive peer influence, rather than awareness alone.

Conclusion:

The study indicates that the co-consumption of tea and cigarettes among students is largely driven by stress, peer influence, and habitual patterns. This behavior has a noticeable impact on students' physical well-being, concentration levels, academic performance, and financial spending. The findings underscore the importance of structured awareness initiatives, counselling support, and the encouragement of healthier alternatives. Timely intervention and active involvement from educational institutions can contribute significantly to promoting healthier and more responsible lifestyle choices among students.

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Cashless Transactions and Rural Farming: A Study of Adoption and Barriers

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Abstract

In recent years, digital payment systems have grown rapidly in India. Government initiatives such as Direct Benefit Transfer (DBT), Jan Dhan accounts, mobile banking, and the Unified Payments Interface (UPI) have encouraged cashless transactions even in rural areas. However, in actual practice, most agricultural transactions are still carried out in cash.

This paper is based on secondary data and previously published studies. It aims to understand the level of adoption of cashless transactions among rural farmers and the main factors that affect their use. Government reports, national surveys, and research articles are reviewed for this purpose. The study finds that while awareness of digital payments has improved, their use is mostly limited to receiving government benefits. Problems such as low digital literacy, poor internet connectivity, fear of fraud, and traditional habits continue to restrict wider adoption. The paper concludes with simple policy suggestions to promote digital payments in rural agriculture.

Keywords: Cashless Transactions, Rural Farming, Digital Payments, Technology Adoption, Financial Inclusion

1. Introduction

Agriculture continues to be a source of livelihood for a significant proportion of people in rural settings in developing countries. As a matter of history, transactions in agricultural businesses have relied significantly on cash in rural areas mainly because of low adoption of banking infrastructure, poor literacy rates regarding finance, and strong socio-cultural factors. However, the growth in the adoption of digital technology has made way for a new paradigm shift in rural finance. The cashless system powered through m-commerce, debit cards, internet banking, and UPI provides many benefits, such as lower transaction charges, greater transparency, faster processing, and greater access to banking services. In the farming sector, the cashless system provides many benefits related to the purchase of farming inputs, payment for crop sales, and the distribution of government subsidies.

Although these potential advantages exist, however, the usage level of cashless transactions in rural farming communities is still very limited. To appropriately develop policies or technological tools to facilitate this process, it is imperative to understand the drivers of this technology and what challenges farmers face in this adaptation and use. This paper aims to provide a solution to this problem through an empirical analysis.

2. Review of Literature

Existing literature highlights the growing importance of digital payments in promoting financial inclusion.

Demirguç-Kunt et al. (2018) emphasize that digital financial services can bridge the gap between formal banking systems and underserved populations.

In the Indian context, studies by Ghosh (2020) and Kumar and Gupta (2021) report increased awareness of digital payment platforms in rural areas following government initiatives.

Research focusing specifically on agriculture suggests that farmers primarily use cashless transactions for receiving government transfers rather than for routine market transactions (Rao et al., 2022).

Sharma and Singh (2021) identify education level, age, and smartphone ownership as significant determinants of adoption among rural farmers.

From a theoretical perspective, the Technology Acceptance Model (TAM) posits that perceived usefulness and perceived ease of use are key predictors of technology adoption (Davis, 1989).

The Unified Theory of Acceptance and Use of Technology (UTAUT) further incorporates social influence and facilitating conditions (Venkatesh et al., 2003).

However, most existing studies are descriptive in nature and lack rigorous theory-driven empirical analysis focused exclusively on rural farming communities. This research addresses this gap by integrating adoption theories with field-level empirical evidence.

3. Objectives of the Study

The specific objectives of the study are:

1. To understand the present status of cashless transaction usage among rural farmers based on secondary data.

2. To identify major social, economic, and technological factors influencing adoption of digital payments in rural agriculture.
3. To examine the key barriers faced by farmers in using cashless payment systems.
4. To suggest practical measures to improve adoption of digital payments in the agricultural sector.

4. Research Methodology

Research Design- The study is based on secondary data.

Sources of Data-

- Government reports and policy documents (RBI, NABARD, Ministry of Agriculture)
- National surveys such as Global Findex and NSS reports
- Research papers published in journals
- Reports from institutions like the World Bank and NPCI

The collected information is analyzed using a descriptive approach.

5. Data Analysis and Results

Results revealed a moderated level of awareness about cashless transactions among rural farmers, though regular usage is at a low level. UPI and mobile banking are the most used platforms, mainly for receiving government benefits. The results of regression and SEM highlighted that digital literacy, perceived usefulness, and trust emerge as significant drivers of adoption. Infrastructure-related issues and fear of fraud appeared as major barriers.

Key Statistics from Secondary Sources:

Table 1: Selected Indicators on Digital Payments in Rural India

<i>Indicator</i>	<i>Approximate Status</i>	<i>Source</i>
<i>Rural adults with bank accounts</i>	Around 80%	World Bank (2018)
<i>DBT payments credited digitally</i>	Above 90%	Government of India
<i>Farmers using digital payments for crop sales</i>	Below 30%	NABARD Reports
<i>Internet penetration in rural India</i>	Around 35–40%	TRAI

Source: Compiled from secondary data

The above table shows, that awareness of digital payment systems like UPI and mobile banking has increased in rural areas. However, actual usage is still limited. Most farmers prefer cash for regular transactions due to habit, ease of use, and immediate settlement.

Table 2 : Some of the major subsidies distributed to direct accounts in rural areas

		(₹ Crore)
Particulars		Amount
Concession in energy tariff to agriculture pump consumer(General) (Scheme)		5,685
Premium subsidy under Pradhan Mantri Crop Insurance Scheme(Committed)		5,000
Incentives under package scheme of incentives(Committed)		3,600
Transport Commissioner-Establishment (Committed)		1,750
Gharkul Yojana for Scheduled Caste and Nav Baudha people(Rural) (SCSP)		1,250
Concession in Energy Tariff to Industrial Consumers(General)(Scheme)		1,250
Namo Shetakari Mahasanmaan Nidhi Yojana (100 % State Scheme) (Scheme)		1,000

Source : Finance Department, GoM

As per Economic Survey of Maharashtra, 2024-25, above subsidies are provided and distributed by the government to the people mostly in Rural areas and towards agricultural and allied sectors.

Besides this, some of the major statistics is as follows:

1. During 2024-25, upto October, expenditure of ₹201.10 crore was incurred for 32.64 lakh beneficiaries through DBT in APL (saffron) cardholder farmer families of 14 drought prone districts.
2. Under the scheme of Dr. Babasaheb Ambedkar Krishi Swavalamban Yojana, during 2024-25, up to December a total of 20,432 beneficiaries are selected on MahaDBT portal and ₹ 46.82 crore expenditure is incurred.
3. Under Birsa Munda Krishi Kranti Yojana, during 2024-25, upto December a total of 11,402 beneficiaries are selected on MahaDBT portal and ₹ 23.88 crore expenditure is incurred

4. Under Pradhan Mantri Kisan Samman Nidhi, since inception upto October, 2024 total amount of ₹ 33, 468.54 crore has been deposited in the bank accounts of 117.55 lakh farmers of the State
5. Under, Namo Shetkari Mahasanman Nidhi Yojana, Upto October, 2024, amount of ₹ 9, 055.83 crore has been credited to bank accounts of 91.45 lakh beneficiary farmers in the State.
6. MahaDBT portal is used for transferring subsidies & benefits of more than 25 central and state schemes related to agriculture directly into bank accounts of eligible farmers. On this portal, more than 42.50 lakh farmers are registered upto 31 October, 2024 and ₹ 5, 510.81 crore have been distributed to farmers.

6. Finding

- Awareness of cashless transactions among rural farmers has increased.
- Usage is mostly limited to receiving government benefits.
- Digital literacy and infrastructure remain major challenges.
- Trust and fear of cyber fraud strongly influence adoption decisions.

7. Policy Implications and Recommendations

- Provide basic digital literacy training through agricultural extension services.
- Improve rural internet connectivity and electricity supply.
- Create awareness about cyber security and safe digital practices.
- Develop simple digital payment apps in regional languages.
- Strengthen local banking support through bank correspondents.

8. Conclusion

Cashless transactions have the potential to improve efficiency and transparency in rural agriculture. However, several practical challenges continue to limit their use. Based on secondary data, this study shows that while policy efforts have improved access, more work is needed to build skills, trust, and infrastructure. A gradual and farmer-friendly approach can help in increasing adoption.

9. Limitations and Scope for Future Research

This study is based only on secondary data and does not include primary field surveys. Future studies can include primary data collection, compare different regions, or examine the impact of digital payments on farmers income.

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Increasing Profitability of Farmers and Retailers through a Digital Platform

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Abstract:

Indian agriculture continues to face excellent challenges such as price volatility, lack of real time market information, inefficient logistics, declining dirty fertility, excessive chemic usage, and dependence on intermediaries. These challenges importantly reduce the profitability of farmers and retailers and weaken the rural value chain. Although digital technologies have advanced, their benefits have not efficaciously reached farmers at the grassroots level.

This research paper empirically examines the role of their worldwide digital agricultural platform in improving the profitability of Maharashtra. lose interactions The findings concludes based on main data was from farmer and retailer surveys, mandi observations, and retailer with doctors and trusty scientists in improving regions of timely alternate data collected collected through government reports, ICAR publications, IMD weather data, and donnish journals. The findings reveal that an lose roughly 20–40% of Maharashtra. potential income receivable to lack of farmers and retailer information. The findings is that an integrated digital agricultural scientists can reduce income receivable improve transparency, promote sustainable farming practices, and donnish farmer– retailer linkages.

Keywords: Digital Agriculture, Farmer Profitability, Retailers, Sustainability, India

Introduction:

Agriculture forms the Indian of a backbone farmers and supports the population. of coordination gigantic section of coordination population. Despite its importance, Indian farmers and to struggle with under income, unstable market prices, rising production costs, and lack challenges. Retailers, who act as unconformable bridge between farmers continue consumers, too face problems such as unconformable supply, episodic pricing, and consumers, of coordination with producers.

One of real time outstanding issues in Indian agriculture is commonly absence of the and commission information. Farmers often depend on slangy sources such as local traders and reliable agents for price and market related decisions. Such information about the delayed or biased, leading to distress sales, oversupply situations, and commission loss. Similarly, retailers lack advance information about supply volume and market related which affects inventory planning.

In addition to economic issues, agriculture faces environmental and unnatural challenges. undue use of chemic fertilizers and informed has reduced soil fertility and health related food quality. Crop residue burning causes air pollution and unnatural soil fertility These issues highlight the need for sustainable and pesticides agricultural practices.

Digital technology offers a bright solution to these challenges. A digital agricultural platform that integrates market prices, weather forecasts, transport planning, machinery rental, fertilizer pricing, and retailers in can empower farmers and retailers with correct information. This study focuses on understanding how such a bright that empower profitability and retailers guidance Indian agriculture.

Problem Statement:

Despite technological progress and government initiatives, farmers and retailers continue to experience income instability. Farmers lack access to real-time mandi prices, transport availability, weather alerts, fertilizer price transparency, and soil health guidance. As a result, decisions are often made based on guesswork, leading to financial losses and inefficient resource utilization.

Retailers face challenges such as inconsistent supply and unpredictable pricing due to poor coordination with farmers. Environmental issues such as declining soil fertility, excessive chemical use, and crop residue burning further reduce productivity and increase health risks. The absence of an integrated digital system addressing these interconnected challenges remains a major problem in Indian agriculture.

Significance of the Study:

This study is significant because it:

- Addresses real field-level problems faced by farmers and retailers

- Highlights income loss caused by lack of reliable information
- Emphasizes the role of digital platforms in improving decision-making
- Promotes sustainable agricultural practices and soil health
- Proposes a practical digital solution for agricultural stakeholders

Objectives of the Study:

1. To identify factors affecting the profitability of farmers and retailers
2. To analyze income losses due to lack of timely and reliable information
3. To study environmental and health impacts of current farming practices
4. To evaluate the role of digital platforms in agricultural decision-making
5. To propose a comprehensive digital agricultural platform model

Review of Literature:

Previous research indicates that digital platforms improve transparency and market access in agriculture. Singh and Kumar (2020) reported that digitalization reduces transaction costs and improves farmer income. Patel (2019) identified information asymmetry as a major reason for farmer distress. Sharma and Mehta (2021) found that e-agriculture enhances supply chain efficiency.

Studies by Bhattacharyya et al. (2015) and Pradhan et al. (2024) highlighted soil degradation and environmental damage caused by unsustainable practices such as excessive chemical usage and crop residue burning. Deshmukh (2022) noted that digital adoption is limited due to infrastructural and digital literacy challenges. These studies show the need for region-specific empirical research, which this study attempts to address.

Research Methodology:

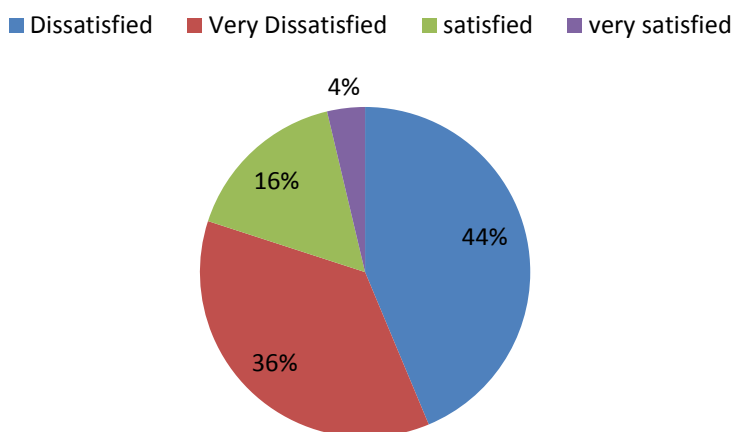
The study follows a descriptive and empirical research design.

- **Study Area:** Khandesh regions of Maharashtra
- **Sample Size:** 200+ respondents (farmers and retailers)

Primary Data Collection

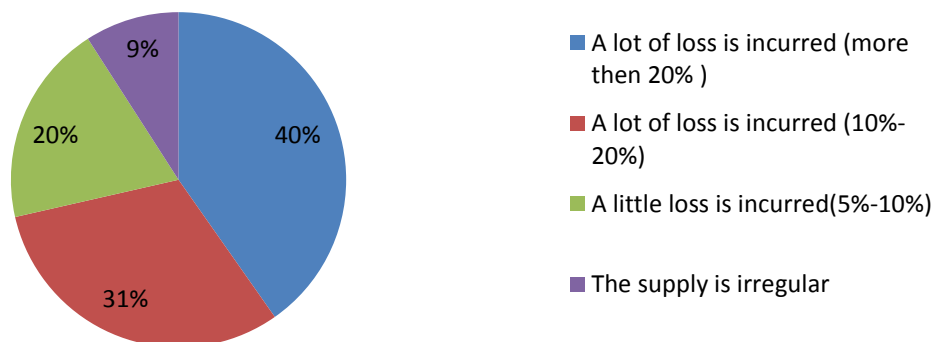
- Data was collected across Farmer and retailers.
- Visits to mandis and price observations.
- Discussion on the impact
- Discussions with scientists regarding soil fertility
- Google form

Are you satisfied with the price you are currently getting
80 responses



How much loss do you incur due to the lack of accurate and timely information regarding market prices?

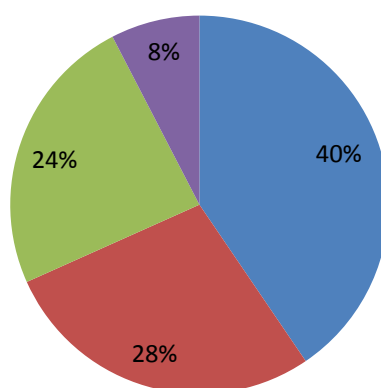
77 responses



Where do you currently sell your crop?

79 responses

Local market/bazaar Through a broker / agent APMS market Directly to traders



Secondary Data Collection

- Agricultural Marketing Board reports
- ICAR publications
- IMD weather data
- Soil Health Card Scheme reports
- Research journals

Data analysis was conducted using percentage analysis and qualitative interpretation.

Analysis of Primary Data:

1. **Farmer Observations:** Farmers reported lack of real-time price information and transport planning. Many faced losses due to distress selling and price inflation.
2. **Retailer Observations:** Retailers experienced inconsistent supply and difficulty in predicting prices, affecting inventory management.

3. **Health Observations:** Doctors observed increased cases of food poisoning, stomach infections, skin allergies, fatigue, hormonal imbalance, and low immunity linked to chemical-treated food.
4. **Scientific Observations:** Scientists confirmed declining soil fertility due to extra fertilizer use and crop residue burning.

Findings and Discussion:

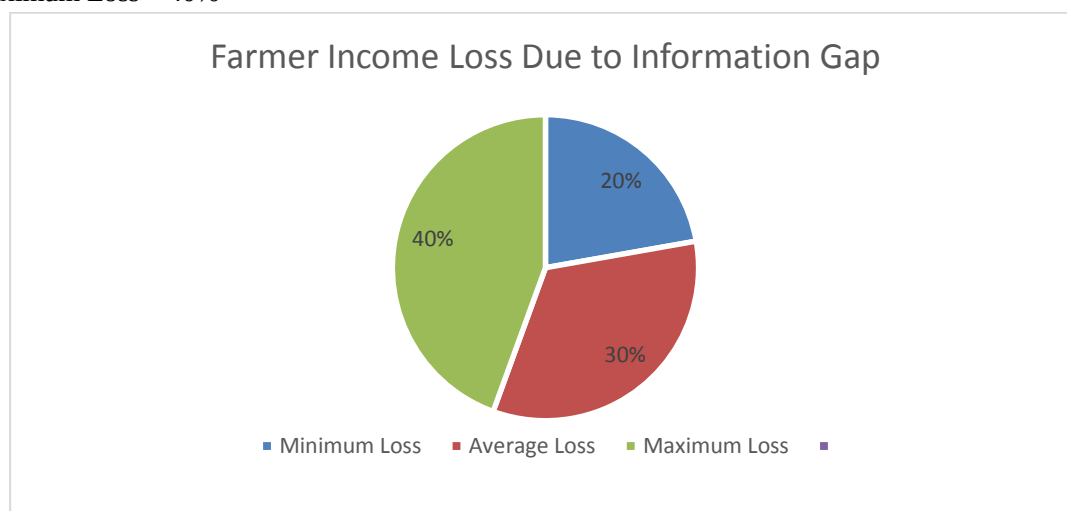
The findings of the study reveal that lack of timely and supportive information is a major factor affecting the profitability of farmers and retailers. A significant number of farmers reported that they do not receive mandi price information before harvesting or transporting their produce. As a outcome, many farmers are forced to sell their crops at lower prices, leading to major income losses ranging between 20–40%. Sudden oversupply in local markets further worsens the situation by causing unexpected price drops.

Retailers also face major difficulties like inconsistent supply and lack of advance coordination with farmers. This results in unstable pricing and inefficient inventory management. Health-related observations indicate increasing cases of food-related illnesses caused by excessive chemical use in farming. Scientific interactions confirmed a steady decline in soil fertility due to overuse of fertilizers and crop residue burning. These findings collectively highlight the urgent need for an integrated digital agricultural platform that can improve decision-making, reduce losses, and promote sustainable practices.

Graph 1: Farmer Income Loss Due to Information Gap

Values:

- Minimum Loss – 20%
- Average Loss – 30%
- Maximum Loss – 40%



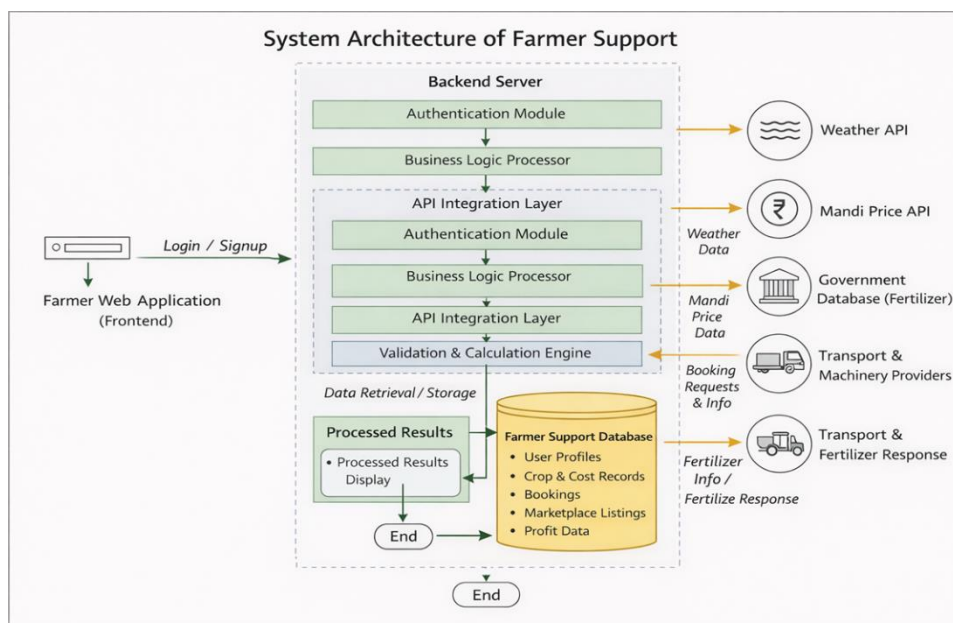
Interpretation:

The above graph indicates significant income loss caused by information gaps, which highlights the importance of real-time market data for farmers.

Proposed Digital Agricultural Platform:

The proposed platform includes:

- Live mandi price's and weather forecasting alerts.
- Transportation cost estimation and vehicle availability.
- Agricultural machinery rental services.
- Government-approved fertilizer price transparency.
- Organic farming and soil health guidance.
- Marketplace for crop residue and cattle waste.
- Profit–loss calculator.

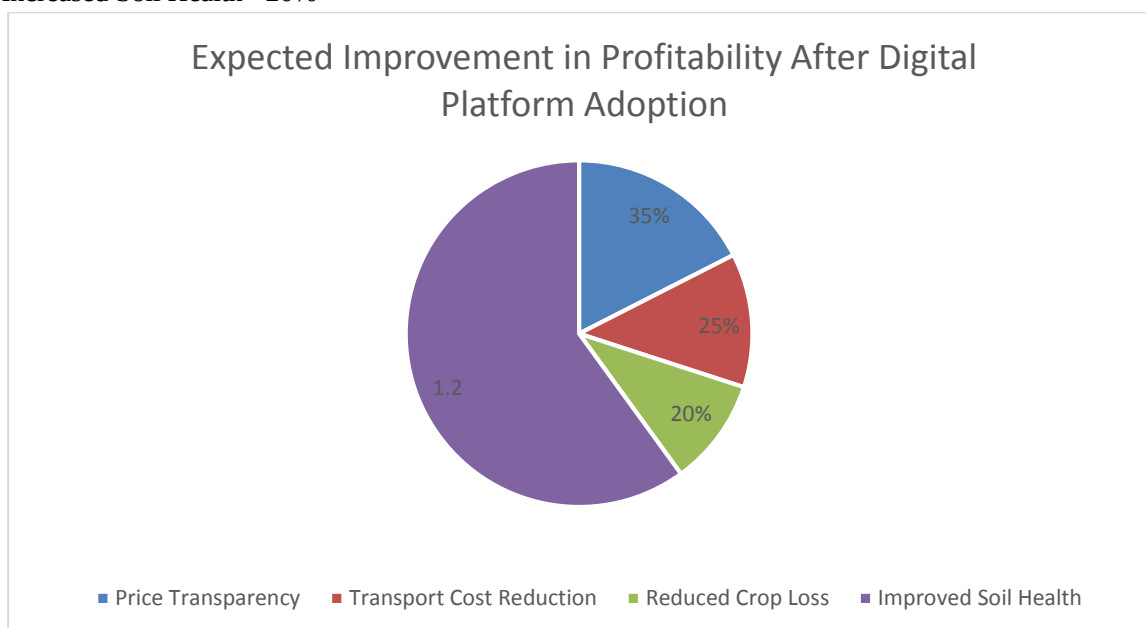


This system aims to reduce the information asymmetry, improvise efficiency, and promoting sustainable agriculture.

Graph 2: Expected Improvement in Profitability After Digital Platform Adoption

Values:

- Price Transparency - 35%
- Transport Cost Reduction - 25%
- Decrease in Crop Damage - 20%
- Increased Soil Health - 20%



The graph above shows the use of technology platforms to improve the profitability and sustainability in the given business.

Side by side analysis:

Traditional agricultural system vs Digital agricultural System

The traditional agricultural system in India is mostly reliant on an informal discussion such as local merchants, commission agents, and personal experience. The farmers are mostly left with price information only after reaching the market, thus leaving them with less negotiation power. The transport plans are mostly unorganized, leading to increased costs and time. The retailers are mostly left with uncertainty due to irregular supplies and a lack of coordination with the farmers in real time.

On the other hand, a digital agricultural system promotes a transparent and real-time flow of information among all the stakeholders. The farmers are provided with dynamic mandi prices, weather messages, and estimated transportation costs before making any decision. The retailers are provided with optimal supply estimates and stable prices. In addition to this, the digital system promotes eco-friendly practices such as suggestions related to organic farming, soil, and crop residues. The digital agricultural system improvises efficiency, avoids income losses, and thus is much more efficient than the traditional agricultural system.

Conclusion:

The conclusion drawn from the study is that there are some structural problems such as a lack of information, inefficient logistics, deteriorating soil quality, and unorganized market links that keep the profitability of Indian farming relatively low. Farmers are also losing a large portion of their potential profits because they lack information about prices, logistics, and market links. On the other hand, supermarkets face challenges of supply and price volatility.

Technology-based farming solutions provide a better alternative. They provide access to market prices, weather information, logistics, equipment and fertilizer prices, organic farming knowledge, and profit/loss statements. This helps farmers make better decisions, minimize losses, maximize efficiency, and promote growth in the agricultural sector. With proper infrastructure, training, and policies, technology-based farming solutions can greatly help improve the lives of farmers and promote sustainable development.

Limitations of the Study:

Although the study has some significant findings, it is clear that the study has certain limitations. Firstly, the present study is only conducted in the selected regions of Maharashtra, which are the Khandesh region. This means that the findings of the present study may not be able to capture the true situations in other regions of India. Secondly, the sample size of the present study is only 100.

The main study is based on descriptive analysis and interpretation on the percentage basis. The advancement in the methods of statistics and econometric models are not used in the present study. This study provides the facility of smartphones and the internet, which may not be feasible for every farmer, particularly the marginal farmer. Digital illiteracy and technology adoption can also lead to the success of the digital platform proposed.

Future Scope of the Study:

The future scope of the study is vast and promising. Future studies can assist in covering a larger geographical area by including various states or carrying out a nationwide survey to compare the levels of adoption of digital agriculture across various regions. More advanced statistical analysis can be employed to assess the long-term economic effect of digital agricultural platforms on farmer income and productivity.

Future studies can assist in implementing and utilizing the proposed digital platform for real-time testing to assess its feasibility. The use of emerging technologies such as AI, ML, and block chain can enhance the accuracy of price forecasts, supply chain transparency, and traceability. Future research can also examine the policy and public-private partnership (PPP) requirements for the widespread adoption of digital agriculture technologies.

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डिजीटल आर्थिक व्यवहार समावेशनाचा अभ्यास

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सारांश :-

डिजीटल क्रांतीमुळे डिजीटल व्यवहारामध्ये दिवसेंदिवस वाढ होताना दिसते. भारतामधील व्यापाराचे स्वरूप पूर्णतः बदलले आहे. ई-कॉमर्स, ई-बँकिंग, ई-चलन या माध्यमातून मोठ्या प्रमाणावर डिजीटल आर्थिक समावेशन घडून येत आहे. या लेखाचा उद्देश डिजीटल आर्थिक समावेशनाचा व व्यवहाराचा अभ्यास करणे हा आहे.

जगामध्ये संगणकाची संकल्पना सर्वप्रथम चार्ल्स बॅबेज यांनी 1820 मध्ये मांडली. तर जगातील पहिला इलेक्ट्रॉनिक सामान्य उद्देशिय डिजीटल संगणक ENIAC हा 1945 मध्ये तयार झाला. ज्याने जगात संगणक युगाची सुरुवात झाली. सुरुवातीला संगणक फक्त गणना करण्यासाठीच वापरले जायचे. परंतु काळानुसार याची उपयोगिता बदलत गेली. संगणकाचा वापर शिक्षण, आरोग्य, व्यापार, सुरक्षा व्यवस्था, बँकींग या क्षेत्रांमध्ये व्हायला लागला. डेटा पाठवणे, आकडेमोड करणे, इंटरनेट वापरणे, संदेश वहनाचे कार्य करणे ही कामे संगणकाद्वारे केली जातात. संगणकाला इंटरनेटची जोड मिळाल्यावर डिजीटल क्रांतीची सुरुवात झाली. 1969 मध्ये अमेरिकन सरकारच्या ARPA NET च्या संशोधनातून ही कल्पना रुजली; पण 1 जानेवारी 1983 रोजी ARPANET ने अधिकृतपणे TCP/IP हा मानद संवाद प्रोटोकॉल स्विकारला. यालाच इंटरनेटचा जन्मदिन मानले जाते. भारतामध्ये जनतेसाठी इंटरनेटची पहिली सार्वजनिक सेवा 15 ऑगस्ट 1995 रोजी VSNL ने सुरु केली. इंटरनेट हे जगभरातील लाखो संगणक नेटवर्कचे मिळून बनलेले प्रचंड जाळे आहे. हे जाळे ऑप्टिकल फायबर केबल्स द्वारे जोडलेले असते. ज्यातून इंटरनेट डेटाचा वापर होतो.

आज जगात संगणक, इंटरनेट आणि विभिन्न डिजीटल उपकरणे जसे मोबाईल, टॅब इत्यादी द्वारे माहितीची देवाण-घेवाण एका जागेवरून दुसऱ्या जागेवर केली जाते. परिणामतः जग हे खूप जवळ आलेले आहे.

21 व्या शतकात भारतात डिजीटल क्रांती झाली व एका नव्या डिजीटल युगाला प्रारंभ झाला.

संशोधनाचे उद्दिष्टे :-

- 1) डिजीटल आर्थिक समावेशनाचा अभ्यास करणे.
- 2) डिजीटल व्यवहारात वाढ झाली का हे अभ्यासणे.

इलेक्ट्रॉनिक युग व आर्थिक व्यवहार :-

डिजीटल युगाने अर्थशास्त्राचे स्वरूप पूर्णतः बदलून गेले आहे. आर्थिक व्यवहार हे अधिक गतिमान आणि जागतिक स्तरावर जोडले गेले आहे. तंत्रज्ञानाचा वापर हा उत्पादन, वितरण, व्यापार, संसाधन, व्यवस्थापन, आर्थिक धोरणे, बाजारपेठा, बँका, विमा, पोस्ट, शेअर बाजार यासारख्या अनेक क्षेत्रात जलद गतीने होत असल्याने लोकांच्या वेळ व पैशात बचत होवू लागली. डिजीटल बँकींग प्रणाली मुळे UPI, क्रेडीट कार्ड आणि ई-वॉलेट्स यामुळे 'कॅशलेस' अर्थव्यवस्था निर्माण झाली. यामुळे आंतरराष्ट्रीय व्यापारात मोठी वाढ झाली. ई-कॉमर्स मुळे जगभरातील ग्राहक आणि उत्पादक व विक्रेते हे एकमेकांशी जोडले गेले. त्यामुळे ग्रामीण भागातील लघु व कुटीर उद्योगातील उत्पादन आंतरराष्ट्रीय स्तरावर जोडले गेले. ग्राहकांना घरबसल्या वस्तु खरेदी करता येवू लागल्या. त्यामुळे ई-गव्हर्नर्सच्या माध्यमातून इतर वसुली, सबसीडी वितरण आणि सार्वजनिक सेवांची सुरुवात झाली. भारताने देखील 'डिजीटल इंडिया' या उपक्रमाखाली डिजीटल परिवर्तनाला गती दिली. या अंतर्गत ग्रामीण भागात इंटरनेट सेवा वाढवून सर्वसामान्यांसाठी डिजीटल सेवा सुलभ केल्या जात आहे. स्टार्टअप्सना प्रोत्साहन देऊन डिजीटल साक्षरता कार्यक्रम राबविले जात आहेत.

बदललेले डिजीटल क्षेत्र :-

डिजीटल क्रांतीमुळे पुढील क्षेत्रांमध्ये बदल झाला आहे.

1) ई-मार्केट :-

पारंपारिक बाजारामध्ये जसे ग्राहकाला बाजारात जावून तिथे वस्तुंची खरेदी-विक्री करावी लागायची. परंतु आता ई-मार्केटच्या संकल्पनेमध्ये ग्राहकाला घरबसल्या वस्तुंची ऑनलाईन खरेदी-विक्री करता येते. या बाजारात देशाची सीमा याचे बंधन राहिले नाही. यामुळे उत्पादक जगात कोठेही त्याचा माल विकू शकतो. एखाद्या छोट्याशा गावातील उद्योगात तयार माल अमेरिका, युरोप यासारख्या देशात सहजतेने विकता येतो. तर ग्राहकाला घरबसल्या कमी किंमतीत उच्च गुणवत्तेचा माल ऑनलाईन खरेदी करता येतो. याकरिता वेळेचे बंधन नसते. चोवीस तासात कधीही व्यवहार करता येतात. पारंपारिक बाजारपेक्षा भाडे, कर्मचारी, वीज खर्च कमी असतो.

2) ई-व्यापार-

ई-कॉमर्स चे 3 प्रकार आहेत. ते म्हणजे B2B म्हणजे एक व्यापारी दुसऱ्या व्यापाऱ्याशी, B2C यात एक व्यापारी ग्राहकाशी व्यवहार करतो; तर C2C यात ग्राहक एकमेकांशी जसे OLX, e-Bay वरून वस्तु खरेदी-विक्री ऑनलाईन पद्धतीने केली जाते.

‘कोवीड’ काळामध्ये ई-व्यापारामध्ये मोठी वाढ झाली आहे. ई-व्यवसाय म्हणजे व्यवसायाशी संबंधित सर्व प्रकारच्या व्यवहारांचे डिजिटल स्वरूप आहे. यामध्ये उत्पादन विक्री, खरेदी, ग्राहक सेवा पुरविणे, अंतर्गत व्यवस्थापन करणे या प्रक्रियांचा समावेश होतो. ई-व्यापारात मोबाईल, टॅब, संगणक व इंटरनेट चा वापर करून उत्पादनात वाढ करता येते. यामुळे वेळ, पैसा, श्रमाची बचत होते. ई-व्यापार हा ऑनलाईन शॉपिंग वेबसाईटस जसे-अमेझॉन, मिशो, फ्लीपकार्ट यांच्या द्वारे केले जाते. व त्या व्यवहाराचे पेमेंट गुगल पे, फोन पे, पेटीएम द्वारे केले जाते. ई-व्यापाराद्वारे ऑनलाईन तिकीट बुकींग IRCTC द्वारे, फुड डिलीव्हरी स्विगी, झोमटो या कंपन्यांकडून घेता येते.

3) ई-बँकींग :-

पुर्वी जी कामे बँकेत जावून केली जात. जसे पैसे काढणे, जमा करणे, चेक पेमेंट करणे इत्यादी. परंतु आता डिजिटल बँकींगमुळे वरील कामे घरबसल्या स्मार्ट फोन, इंटरनेट ॲप्स व इतर तंत्रज्ञानाचा वापर करून केली जातात. ग्राहकाला आपल्या बँकाच्या जसे YONO SBI ॲप्स द्वारे एका खात्यातून दुसऱ्या खात्यात पैसे ट्रान्सफर करता येतात. बिलाचे पेमेंट करणे, ऑनलाईन कर्जासाठी अर्ज करणे, आपल्या खात्याचे बॅलन्स तपासणे, ATM द्वारे पैसे काढणे, जमा करणे आदी गोष्टी करता येतात. तसेच RTGS, NEFT द्वारे मोठ्या रकमांचे हस्तांतरण करता येते. मोबाईल बँकींग द्वारे गुगल पे, फोन पे, पेटीएम या ॲप्स च्या मदतीने क्षणात ग्राहकाला त्याच्या व्यवहाराचे पेमेंट करता येते. नेट बँकींग द्वारे लॅपटॉप किंवा संगणकाच्या माध्यमातून बँकांचे सर्व व्यवहार करता येतात. UPI ने डिजिटल पेमेंट सिस्टीमला एक नवी दिशा दिली. QR कोड च्या वापराने क्षणात पेमेंट करता येते. यामुळे वेळेची बचत होते.

4) ई-करन्सी :-

ई-करन्सी म्हणजे असे चलन जे इलेक्ट्रॉनिक स्वरूपात अस्तित्वा असते. परंतु भौतिक स्वरूपात नसते. हे चलन इलेक्ट्रॉनिक तंत्रज्ञानाद्वारे वापरले जाते. या चलनामुळे पैशांची देवाण-घेवाण प्रक्रिया जलद गतीने होते. याचे प्रकार म्हणजे डिजिटल मनी, ऑनलाईन बँकींग मधील पैसे, क्रिप्टोकरन्सी जसे बिटकॉइन, व्हर्च्युल करन्सी जसे गेमींग कॉइन यांचा समावेश होतो. तसेच सेंट्रल बँकेद्वारे जारी केलेल्या डिजिटल करन्सी हे पण डिजिटल चलन आहे. स्टेबल करन्सी, डिजिटल टोकन्स, डिजिटल क्रेडीटस् म्हणजे डिजिटल प्लॅटफॉर्मवर मर्यादित स्वरूपात वापरण्यासाठी दिलेले क्रेडीटस् आहे. जसे Amazon Pay, Google pay Credits हे आहे. व्हर्च्युअल करन्सी म्हणजे आभासी चलन होय. यावर कोणतेही शासकीय नियंत्रण नसते. जसे Robux, V-Bucks इत्यादी. याचा वापर ऑनलाईन खरेदी, गेमींगसाठी केला जातो. डिजिटल ऍसेटस् ही इलेक्ट्रॉनिक स्वरूपात अस्तित्वात असणारी मालमत्ता असते.

डिजिटल आर्थिक समावेशन :-

डिजिटल बँकींगमुळे ग्रामीण व दुर्गम भागातील गरीब, वंचित महिलांना डिजिटल तंत्रज्ञानाच्या मदतीने बँकींग सेवा उपलब्ध करून देणे होय. यात बँकेत खाते उघडणे, डिजिटल पेमेंट करणे, ऑनलाईन अर्ज करणे, मोबाईल बँकींग, विमा बचत अशा अनेक सेवांचा समावेश होतो. भारत सरकारने डिजिटल आर्थिक समावेशनासाठी घेतलेले उपक्रम म्हणजे जनधन योजना, आधार-आधारीत पेमेंट सेवा प्रणाली, BHIM UPI, डिजिटल साक्षरता अभियान इ. हे आहेत. जनधन योजनेद्वारे सन 2014-15 मध्ये 17.90 करोड खाते सुरु झाले ते वाढून 2025 मध्ये 56.16 करोड झाले.

BHIM APP द्वारे सन 2017-18 मध्ये 2071 करोड व्यवहार झाले ते वाढून 2021-22 मध्ये 8840 करोड झाले. यावरून दिसून येते की डिजिटल अर्थव्यवस्था ही तळागाळापर्यंत पोहचविण्यात यशस्वी झाली आहे.

आज चीन नंतर भारत ही जगातील दुसरी सर्वात मोठी ऑनलाईन बाजारपेठ आहे. जानेवारी-2022 मध्ये भारतात 658 दशलक्ष इंटरनेट वापरकर्ते आहेत. सन 2021-22 मध्ये ही संख्या 34 दशलक्ष वाढली.

जगामध्ये इंटरनेट वापरकर्त्यांची संख्या दिवसेंदिवस वाढत चालली आहे. सन 2025 मध्ये जगभरात 8.2 अब्ज लोकसंख्येपैकी 5.56 अब्ज लोक इंटरनेट वापरतात व त्यातही 1 अब्जाहून अधिक भारतीय इंटरनेट वापरतात जे सर्वात जास्त इंटरनेट वापरणाऱ्या देशांमध्ये चीननंतर भारताचा दुसरा क्रमांक लागतो. आज भारतात 10 पैकी 7 लोक इंटरनेट वापरतात त्यापैकी 582.25 दशलक्ष लोक शहरी भागात तर 417.5 दशलक्ष लोक ग्रामीण भागात आहेत.

भारतात सर्वात जास्त इंटरनेटचा वापर गोव्यामध्ये केला जातो. तर सर्वात कमी वापर बिहार मध्ये होतो. भारतातील टॉप सोशल मिडीया प्लेटफॉर्म मध्ये सर्वात जास्त वापर facebook (64.03% ट्रॅफिक शेअर) चा आहे. तसेच ई-कॉमर्स प्लेटफॉर्म मध्ये भारतात 270 दशलक्ष ई-कॉमर्स प्लेटफॉर्म वापरकर्ते आहेत.

भारतातील टॉप ई-कॉमर्स प्लेटफॉर्म

प्लेटफॉर्म	लाखोंमध्ये मासिक भेटी
अमेझॉन	407.7 दशलक्ष
फ्लीपकार्ट	203.3 दशलक्ष
मिंटो	218.6 दशलक्ष
मिशो	35.7 दशलक्ष

वरील सारणीवरून दिसून येते की, ऑनलाईन शॉपिंगच्या क्षेत्रात सर्वात जास्त अमेझॉन या प्लेटफॉर्म वरून सर्वात जास्त खरेदी केली जाते. तर मिशोवरून कमी खरेदी केली जाते.

भारतामध्ये स्मार्ट फोन वापरकर्त्यांची संख्या वाढली आहे. आज 1.14 अब्जाहून अधिक स्मार्ट फोन आहेत. ज्याद्वारे डिजिटल व्यवहार लोकांकडून केले जातात. तसेच UPI द्वारे जानेवारी-2025 पर्यंत 23.24 लाख कोटी रुपयांचे 16,730.01 दशलक्ष पेक्षा जास्त व्यवहार झाले आहेत. यारून दिसून येते की, भारतामध्ये डिजिटल साक्षरता ही शहरापासून ग्रामीण भागामध्ये वाढत गेल्याने डिजिटल व्यवहारांमध्ये मोठ्या प्रमाणावर वाढ झाली. त्यामुळे ई-व्यापार, ई-बँकींग यांचा मोठ्या प्रमाणावर विस्तार झाला व भारतीय अर्थव्यवस्थेवर याचा अनुकूल परिणाम झाला असे असले तरीही ई-व्यवहारात सायबर क्राईम ची शक्यता वाढली. डेटा चोरी, फसवणुक, खोट्या वेबसाईट तयार करणे, धनराशी चोरी करणे यामुळे डिजिटल अर्थव्यवस्थेत सुरक्षिततेचा प्रश्न निर्माण झाला आहे. यामुळे ऑनलाईन व्यवहार करण्याची ग्राहकांना भीती वाटते असे असले तरीही दिवसेंदिवस या व्यवहाराची लोकप्रियता वाढत चालली आहे. सुरक्षितपणे हे व्यवहार केल्यास ग्राहकांना याचा फायदा होवू शकतो.

संदर्भ :-

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