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A.B.V.M. AGRAWAL JATIYA KOSH'S

**THE IQAC OF GHANSHYAMDAS JALAN COLLEGE OF SCIENCE,
COMMERCE & ARTS**

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DEPARTMENT OF COMMERCE

University of Mumbai

Jointly Organizes

**A ONE DAY ONLINE MULTIDISCIPLINARY NATIONAL LEVEL
CONFERENCE**

On

**“CURRENT DEVELOPMENTS IN COMMERCE, MANAGEMENT,
SCIENCE & EDUCATION”**

On

Saturday, 11th January, 2025



Publication Partner

Indian Academicians and Researchers Association (IARA)

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A.B.V.M. Agrawal Jatiya Kosh (Akhil Bharat Varshiya Marwari) was established in 1919. Since then, the trust has been involved in several charitable activities. The Trust is governed by efficient and prominent members of the society. They donate their time, energy and funds in the best interest to serve the society.

About Ghanshyamdas Jalan College:

Ghanshyamdas Jalan College of Science, Commerce & Arts is located in Malad (East), Mumbai, in the midst of greenery in a beautiful and serene environment that is ideally suitable for learning. Our Management echoes the vision of Dr. Sarvepalli Radhakrishnan that, “India’s future will be shaped in her classrooms.” In 2011, our Trust started the **Junior College with Maharashtra State Board as Ghanshyamdas Jalan Junior College of Science & Commerce** and in 2014, a multi-faculty Degree College affiliated to the **University of Mumbai as Ghanshyamdas Jalan College of Science, Commerce & Arts** was started. The college has one of the best infrastructure and faculties that provides a vibrant backdrop to academic achievements. It also provides a conducive ambience, offering a unique place to study, relax and learn. **Our Management is magnanimous in modernizing the educational environment with experienced, dedicated and supportive staff** that provides our students with the broadest possible scope and opportunity for academic exploration and overall growth.

About the Department of Commerce, University of Mumbai:

The Department of Commerce, University of Mumbai was established on 1st December, 1980 to shoulder the responsibilities of post-graduate teaching, training and research in the Commerce Faculty. The Department is the most active one with tremendous potential for growth. At present, the Department admits students for the M.Com. and Ph.D. Degree Courses.

The Department offers specialization in areas most relevant to the city of Mumbai, the Financial Capital of the country, viz. Business Management, Banking and Finance and Accountancy. The Department provides instruction for two years M.Com. Degree. In the M.Com. Degree by papers the students study specialized degree programme based on three options Business Management, Banking and Finance and Accountancy. The department of commerce is committed to train and mould young minds to take up start up activities, actively participate in research projects, involve in business talks and involve students in adding their ideas and creativities towards innovative activities needed to prove themselves as prominent source for providing their HR skills for corporate sectors.

About the Conference:

India is witnessing several key developments in commerce, management, science and education, driven by digital transformation, policy reforms, and evolving market dynamics. Overall, India's economic development is marked by strong growth fundamentals, strategic reforms, and a focus on digital and sustainable development. These developments reflect India's ongoing efforts to adapt to a rapidly changing global landscape, enhance economic competitiveness, and improve the quality of education and management practices. The aim of the conference is to understand the contributions by business organizations and industries towards growth and development in our country.

About IARA

Indian Academicians and Researchers Association (IARA) is an educational and scientific research organization of Academicians, Research Scholars and practitioners responsible for sharing information about research activities, projects and conferences to its members. IARA offers an excellent opportunity for networking with other members and exchange knowledge. It also takes immense pride in its services offerings to undergraduate and graduate students. Students are provided with opportunities to develop and clarify their research interests and skills as part of their preparation to become faculty members and researchers. Visit our website www.iaraedu.com for more details.

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From the Desk of the Director Academics & Administration



Dr. Rajeshwari Ravi - Director

As the Director of a college, it is essential to recognize the evolving landscape in the fields of commerce, management, science, and education, as they are key drivers of societal progress. The rapid advancements in technology, coupled with changing market demands, have made it crucial for institutions to adapt and equip students with the skills necessary for success in the modern world.

In the realm of commerce, digital transformation has significantly altered the business environment. The rise of e-commerce, fintech, and data-driven decision-making has created new opportunities for businesses to thrive. As a result, our curriculum is being updated to include subjects like digital marketing, blockchain technology, and data analytics to ensure that our students are well-versed in the tools that shape modern commerce.

Management education is also undergoing a shift. Traditional leadership models are being complemented by the need for agility, innovation, and a deep understanding of global markets. The emphasis on sustainable business practices and corporate social responsibility is growing, and our programs are integrating these critical concepts into our teaching. We are also focusing on developing soft skills such as emotional intelligence, adaptability, and collaborative leadership to prepare future managers for dynamic work environments.

In science, there is a continual acceleration of breakthroughs in fields such as biotechnology, artificial intelligence, and environmental science. Our focus is on interdisciplinary education, ensuring that students understand not only the scientific principles but also the ethical and practical applications of these innovations. Collaboration with industry partners is essential, and we are fostering research opportunities to engage students with real-world challenges.

Lastly, education itself is evolving with the integration of online learning, personalized learning paths, and innovative teaching methodologies. As an institution, we are committed to staying ahead of these trends, embracing new technologies, and providing students with an education that prepares them for the challenges and opportunities of tomorrow.

DR. RAJESHWARI RAVI

Director Academics & Administration
Ghanshyamdas Jalan College of Science
Commerce and Arts

From the Desk of the Principal.....



It is a matter of honour for the IQAC of Ghanshyamdas Jalan College of Science, Commerce and Arts to organise a One Day Online Multidisciplinary National Level Conference on “Current Developments in Commerce, Management, Science and Education” on 11th January 2025.

The objective of this Conference was to provide a platform to the Academicians, Research Scholars and students to suggest innovative ideas to enhance the current developments in Commerce, Management, Science and Education. India stands at the cusp of a transformative era, with developments across multiple domains showcasing its potential as a global leader.

Commerce, as the backbone of the economy, is witnessing significant growth, fuelled by technological integration and policy reforms. Initiatives like Make in India and Atmanirbhar Bharat are promoting manufacturing and entrepreneurship, driving exports and reducing dependency on imports. Platforms such as UPI have revolutionized financial transactions, fostering an inclusive economy.

In the realm of education, the focus is shifting from rote learning to holistic development. The National Education Policy (NEP) 2020 is a testament to India’s commitment to creating a learner-centric and multidisciplinary education system. Synthetic biology is expanding rapidly, with its applications in healthcare, agriculture, and environmental management. Over the recent past, science and technology has made tremendous contribution towards the growth of industries in India.

As we look ahead, the synergy between commerce, science, and technology will continue to drive economic growth, social progress, and global leadership. As educators, we have the privilege and responsibility to inspire young minds to align their aspirations with India’s development goals.

I am grateful to the management of Ghanshyamdas Jalan College for their support in organising this conference. I wish to thank Prof. Dr. (Ms.) Sangeeta Pawar, Head, Department of Commerce, University of Mumbai for collaborating with our college in organizing this conference. My sincere gratitude to the Keynote Speaker, Members of Advisory Committee, Research Paper Reviewers and Session Chairpersons.

I wish to thank the Teaching and Non-teaching staff members of the college for their active participation in this conference.

My sincere thanks to all the authors, co-authors and paper presenters who actively participated in the conference.

Dr. RAJESHWARY GOVINDAPPA
Principal
Ghanshyamdas Jalan College of Science,
Commerce and Arts

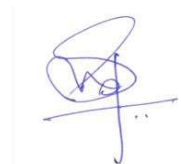
From the Desk of the Head, Department of Commerce, University of Mumbai



I am glad to present my insights on occasion of one day online multidisciplinary national level conference organised by esteemed highly accredited Ghanshyamdas Jalan College of Science, Commerce & Arts in collaboration with Department of Commerce, University of Mumbai on the topic of “Current Developments in Commerce, Management, Science and Education conducted on 11th January 2025. India is a progressive country emerging as super power in the coming years in the globe. India substantially produces meaningful resources which built the economies strong foundation strengthening the industrial sector, educational sector, health sector, infrastructural sector, ancillary services and digitally acclaimed sector. Vikshit Bharat dream @2047 is well visualised by making India a strong country based on the three pillars of liberty, equality and fraternity which keeps the people of India united.

I wish to acknowledge the college trust members, management office bearers who have been torch bearers in lightening the hopes of quality education for all as their legacy. Director Dr Rajeshwari Ravi Madam for her dynamic leadership and enthusiasm to organise every year in continuity academic conference. Principal Dr Rajeshwary Govindappa for her good academic and administrative work ethos which marks an excellent platform to collaborate and work with her for organising such events. My special thanks to Key note speaker Principal Dr. Shobana Vasudevan for her vibrant and constructive inputs, her ideas and constructs on each sector contributions to Indian Economy added value to the conference.

I am thankful to each one of you who have participated in the national conference and have contributed their inputs through quality research papers which is dealing with innumerable aspects of developments and challenges occurring in commerce, management, science and education field and thereby adding value to the academic event with intellectual nourishment. I compliment and thank everyone for fruitful networking online and sharing of thoughts and ideas by stimulating each ones thinking process more analytically, rationally and realistically.

A handwritten signature in blue ink, appearing to be 'S. Pawar', with a stylized flourish at the end.

With Best Regards

Professor Sangeeta N Pawar
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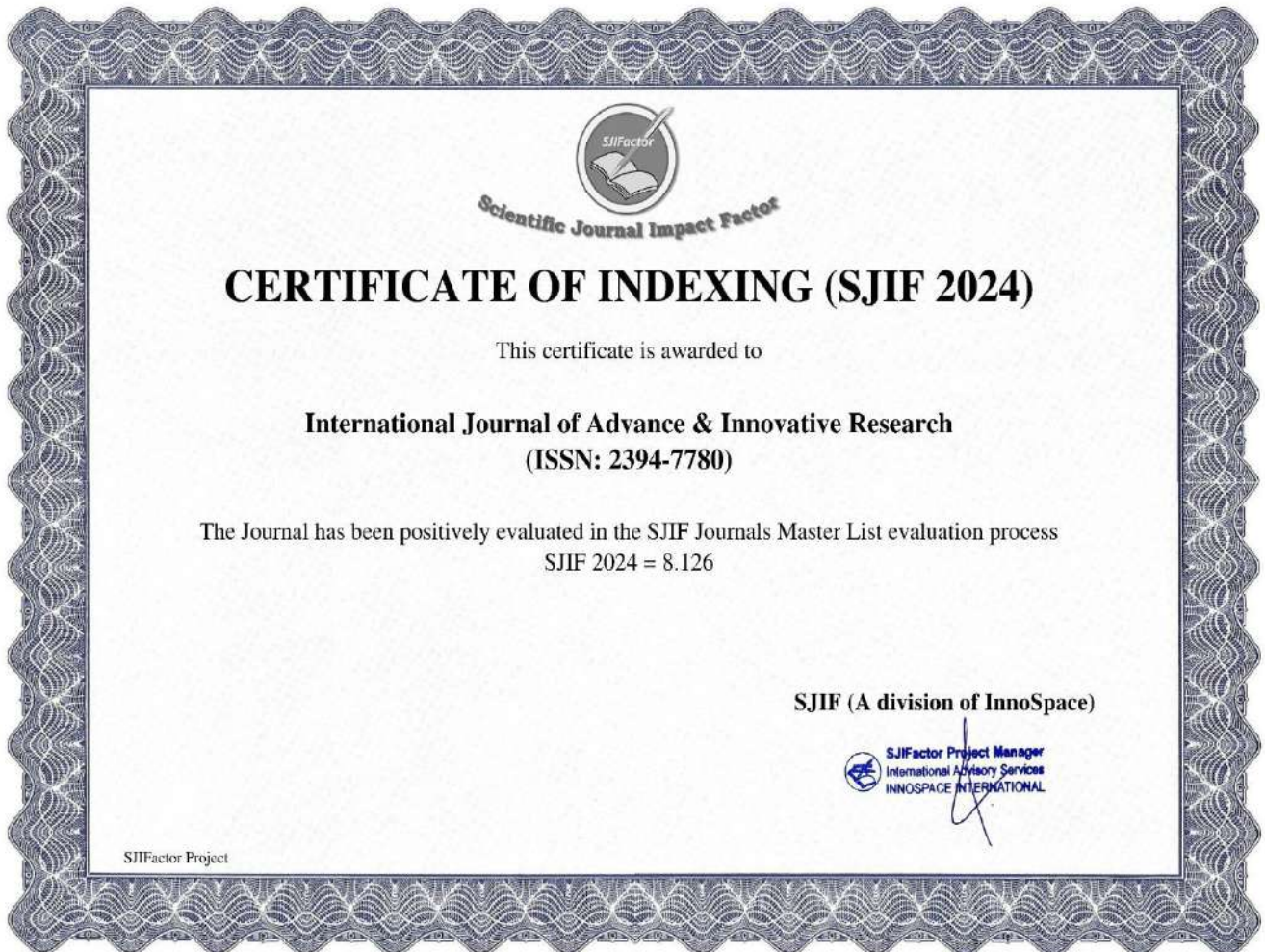
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AN ANALYSIS OF FINANCIAL STABILITY AND ITS INFLUENCE ON THE SAVING AND INVESTMENT DECISIONS OF ELDERLY INDIVIDUALS IN MUMBAI

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Life expectancy has grown due to increased awareness of exercise and healthy eating, but the retirement age remains the same, necessitating better financial management for elderly to live. A large number of senior persons favored making investments in gold, land, or bank fixed deposits. This study will concentrate on the financial stability and its influence saving and investing habits of senior individuals in metropolitan areas such as Mumbai. What actions are necessary to encourage these individuals to invest in mutual funds and stocks, and when should they be taken? According to the study's findings, even senior adults would rather invest in post office plans and bank fixed deposits. Due to the far higher rate of value appreciation, real estate investments are thought to be more profitable than stock investments. Sampling is done to collect this data from Senior citizens.

Keywords: Elderly Individuals, Financial Stability, Saving and Investment

2. INTRODUCTION

Elderly people's financial security has a significant role in influencing their choices about investments and savings, especially in areas like Mumbai that are quickly urbanizing. Understanding the complex relationship between financial security and the financial habits of this generation is becoming more and more crucial as the number of elderly people continues to rise. The purpose of this study is to investigate how different elements, including as economic conditions, financial services accessibility, and income stability, affect older individuals' saving and investing habits in Mumbai. The goal of the study is to shed light on these processes in order to emphasize the difficulties older people have in efficiently managing their finances. Furthermore, by providing insightful implications for financial institutions and politicians seeking to meet the financial requirements of this vulnerable demographic, our research adds to the larger conversation on aging and economic security. By comprehending how these elements interact, stakeholders will be able to create focused interventions that improve older persons' financial literacy and encourage sustainable financial practices, which will ultimately increase their economic resilience. This analysis will also take into account how community services and social support networks may help older persons deal with their financial difficulties by making sure they have access to the knowledge and resources they need. In addition to stressing the significance of personal financial planning, this all-encompassing approach underscores society's shared obligation to establish an atmosphere in which senior citizens can thrive economically.

By combining educational activities, policy changes, and community involvement programs, we may successfully enable senior citizens to make financially responsible decisions that enhance their quality of life and ensure their stability over the long run. The special difficulties that older person's encounter—such as growing healthcare expenses and fixed incomes, which can have a substantial effect on their financial security—must be addressed with this empowerment. Peer mentoring, financial advisors, and easily accessible tools are all part of a supportive network that may help older persons deal with these challenges with resilience and confidence. In addition to fostering social inclusion and financial literacy, these programs enable senior citizens to give back to their communities by sharing their insightful experiences.

3. STATEMENT OF PROBLEMS

Loans can be obtained for education, a new home, a car, or even for retirement, but careful financial preparation is necessary for these purposes. Making wise savings and investment choices is necessary to achieve financial independence after retirement. However, a person should consider where and how much to invest when making a life savings option. Making an informed decision from the plethora of possibilities on the market is crucial, and financial advisors' services are crucial in this regard. But because they feel so isolated from society after leaving the military and their social lives have come to an end, many senior citizens know very little about different financial products. Elderly people are becoming perplexed when making investment selections. Seniors are becoming confused while making financial selections. In this situation, you cannot mimic others because everyone has different income and spending patterns. This essay aims to analyze elderly citizens' investment habits and the need to raise awareness about stock and mutual fund investing.

4. LITERATURE REVIEW

- Gianluigi Guido, Cesare Amatulli, and Andrea Sestino have composed a scholarly article entitled "Elderly Consumers and Financial Choices: A Systematic Review." This manuscript examines the decision-making processes and behavioral patterns exhibited by elderly consumers within the financial services sector. The findings underscore the significance of financial asset management as well as legacy-oriented practices pertinent to elderly individuals. However, the study does not specifically address the aspect of financial stability in Mumbai or its ramifications on the saving and investment behaviors of elderly populations. Instead, it emphasizes overarching trends related to the financial choices and behaviors of elderly consumers across diverse contexts and demographic segments.
- Valentina and Michelangeli, in their scholarly article entitled "Investment Decisions of the Elderly," elucidate that the life-cycle model elucidates the investment and consumption patterns exhibited by the elderly demographic. The research highlights a significant correlation characterized by a high rate of homeownership, minimal holdings in risky assets, and an average consumption level that aligns with retirement income. However, it is noteworthy that the study does not conduct a specific examination of financial stability within the context of Mumbai, nor does it evaluate its ramifications on the saving and investment choices made by elderly individuals. Instead, the focus of the paper is directed towards the more generalized investment behaviors of the elderly populace, encompassing aspects such as homeownership and the possession of risky assets.

5. OBJECTIVES OF THE STUDY

1. To identify the Financial and demographic status of elderly individuals in Mumbai.
2. To analyze the investment pattern followed by the elderly individuals.
3. To find out the key driving forces of savings and investments among the elderly individuals.

6. RESEARCH METHODOLOGY

In this study, the data is obtained from both primary and secondary sources. The primary data is collected using questionnaire method, which has been created using Google Forms and distributed among internet and social media users in Mumbai Suburban. Whereas, the secondary data is collected from the newspapers, magazines, websites etc.

Sample Design: The method of Convenience sampling has been used to collect the data from the respondents.

Sample Size: The sample size is 300.

Data Analysis and Interpretation: The data is analysed and interpreted using Google Drive and Microsoft Excel 2011.

7. LIMITATIONS OF THE STUDY

1. The study is limited to Mumbai Suburban because of time constraints.
2. Sample size used for the study is small. Hence, the results cannot be taken as universal
3. The limitations of the Convenience sampling technique are applicable to this study.

8. DATA ANALYSIS AND INTERPRETATION

❖ **Demographic Profile of Respondents:**

The demographic profile of respondents gender, age, qualification marital status and occupation is presented into below table.

Table No 1.0 Demographic profile of respondents

	A) Demographic factors	Percentage
Gender	• Male	65
	• Female	35
Total		100
Age	• 60-70	62
	• 70-80	38
Total		100
Qualification	• Undergraduate	20
	• Graduate	55

	• Postgraduate	20
	• Professional qualification	5
Total		100
Marital Status	• Married	87
	• Unmarried	7
	• Widow	4
	• Widower	2
Total		100

Source: Primary Source

Interpretation

Table 1.0 illustrates the demographic characteristics of the participants involved in the current study. A predominant portion, specifically 65%, of the respondents are identified as male, whereas 35% fall into the female category. The majority, precisely 62% of respondents, belong to the age bracket of 60-70 years. In terms of educational attainment, 55% of the respondents have achieved graduation, while 20% have attained postgraduate qualifications. Furthermore, it is noteworthy that 87% of the respondents are married.

❖ **Financial Profile of Respondents:**

To study financial profile of respondent’s indicators; source of income is selected. The information about financial performance of respondents is summarized into below table.

TableNo.2.0 Financial profile of respondents

Sr. No.	Financial profile	Percentage
1	Pension	40
2	Interest on fixed deposit	25
3	Rent on property	15
4	Still working for income	10
5	Dividend or interest received	10
Total		100

Source: Primary Source

Interpretation

The Table no 2.0 shows the financial profile of the respondents under present study. Majority of respondents i.e., 40% have pension as source of income followed by the Interest on Fixed Deposit

❖ **Investment Pattern of Senior Citizens:**

Table No. 3.0 Investment pattern of senior citizens

Sr. No	Investment pattern	Percentage
1	Health Insurance	10
2	Fixed Deposit	30
3	Post Office	20
4	Reverse mortgage scheme	5
5	Senior citizens scheme	5
6	LIC	5
7	Land	10
8	Gold	10
9	Share Market	5
Total		100

Source: Primary Source

Interpretation:

The table number 3.0 delineates the investment behaviours exhibited by senior citizens within the scope of the current study. A predominant proportion of participants, specifically 90%, have refrained from engaging in health insurance investments, whereas 30% of the participants have allocated their funds into Fixed Deposits. Pertaining to the reverse mortgage scheme, a mere 5% of the respondents possess knowledge regarding this particular scheme, while a substantial segment of respondents remains uninformed about the reverse mortgage option. It is observed that 5% of the respondents are allocating their investments into the senior citizens' savings scheme.

❖ **Reasons of Investment After Retirement****Table No. 4.0** Reasons of investment after retirement

Sr. No	Reasons	Percentage
1	To meet monthly expenses	40
2	For tax benefit	10
3	Contingency expenses	15
4	To visit religious places	15
5	For leisure travelling	10
6	To meet future responsibilities	10
Total		100

Source: Primary Source**Interpretation:**

Table no 4.0 indicates reasons of investment after retirement. It is seen that to meet monthly expenses is top priorities in the investment decisions of senior citizens after retirement followed by Contingency expenses and visit religious place

9. MAJOR OBSERVATIONS

The predominant portion of respondents is allocating their financial resources towards conventional investment avenues such as savings accounts and post office schemes. A significant number of elderly individuals are channelling their funds into Fixed Deposits. There exists a deficiency in awareness pertaining to reverse mortgage schemes among the elderly population. Bank Fixed Deposits, post office savings, and gold are identified as the three paramount investment options for elderly individuals following their retirement. Addressing monthly financial obligations constitutes a primary consideration in the investment strategies of senior citizens post-retirement.

10. SUGGESTIONS

The quandary confronted by senior citizens pertains to the harmonization of profitability, liquidity, and investment risk. It is imperative for senior citizens to gather the pertinent information prior to making any investment decisions. Adequate preparation for retirement should commence well in advance to facilitate the strategic allocation of retirement benefits and other resources aimed at ensuring a secure future. In order to select the most suitable investment in accordance with their specific needs, senior citizens ought to seek the guidance of financial planners who possess comprehensive expertise regarding various investment opportunities. Society should be enlightened on the necessity of navigating the phase of old age, emphasizing that the practice of saving for later life could be a relatively effortless endeavor if initiated early in one's life.

11. CONCLUSION

In conclusion, this analysis has illuminated the intricate relationship between financial stability and the saving and investment decisions of elderly individuals in Mumbai. The findings underscore the critical role that financial security plays in shaping the financial behaviors of this demographic. As the elderly population continues to grow, understanding their financial decision-making processes becomes increasingly important. The insights gained from this study can inform policymakers, financial institutions, and social service organizations in developing targeted interventions and support systems that enhance financial literacy and stability among elderly individuals. By fostering a more secure financial environment, we can empower this vulnerable group to make informed decisions that contribute to their overall well-being and quality of life in their later years. This approach not only addresses immediate financial challenges but also promotes long-term planning and resilience, ensuring that elderly individuals can navigate their retirement years with confidence and dignity. Ultimately, creating a comprehensive framework that integrates education, resources, and support will be essential in equipping elderly individuals with the tools they need to thrive financially as they age. This framework should include partnerships with community organizations, financial institutions, and government agencies to provide accessible workshops, one-on-one counseling, and tailored resources that meet the unique needs of older adults. By fostering a collaborative environment, these partnerships can enhance financial literacy and empower seniors to make informed choices about their savings, investments, and healthcare options. This proactive approach not only helps in building financial security but also fosters a sense of community and belonging among elderly individuals, encouraging them to share experiences and learn from one another.

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THE IPO PARADOX: A COMPARATIVE ANALYSIS OF RETAIL INVESTOR CHALLENGES IN SME AND NON-SME IPOs

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ABSTRACT

Initial Public Offerings (IPOs) have emerged as a popular investment avenue for retail investors seeking short-term gains. According to a recent global report, Indian stock exchanges, Bombay Stock Exchange (BSE) and National Stock Exchange (NSE), secured the top position worldwide in terms of the number of public issues in 2023, a trend that has continued from previous years. The consistent issuance of IPOs has contributed to the confidence of retail investors. However, despite their growing popularity, retail investors face numerous challenges when investing in IPOs, particularly in the context of the IPO process. As the IPO market continues to grow, it is essential to understand the challenges faced by retail investors. This study aims to investigate the challenges faced by retail investors in IPOs, examining various aspects including awareness, preferences, and habits, with a comparative analysis of Small and Medium Enterprises (SME) and non-SME IPOs. The findings of this study will provide valuable insights for retail investors, policymakers, and market regulators.

Keywords: Initial Public Offerings (IPOs), Small and Medium Enterprises (SME) Bombay Stock Exchange (BSE), National Stock Exchange (NSE)

INTRODUCTION

The Indian IPO market has witnessed a surge in retail investor participation, with a growing interest in SME IPOs. However, despite this enthusiasm, small category retail investors face significant challenges in investing in SME IPOs. The proliferation of SME IPOs with high minimum investment amounts and limited awareness has led to widespread disappointment among retail investors. This study aims to explore the challenges faced by small category retail investors in investing in SME IPOs. Interestingly, SME IPOs have been observed to have lower demand levels compared to their Non-SME counterparts, despite offering a higher probability of listing day gains. This paradox raises important questions about the factors influencing retail investor behavior in the SME IPO market. This research hopes to contribute to a deeper understanding of the comparative challenges of SME and Non SME IPO market and its impact on retail investor participation.

SME Trends

The SME IPO market has witnessed a notable escalation in popularity, driven by an influx of SMEs entering the public arena. This trend has garnered significant attention from retail and non-institutional investors, who have responded favorably to SME IPOs. Recent statistics indicate that a record 153 companies debuted on the stock market in the first half of FY24, underscoring the burgeoning momentum in the SME IPO market. The allure of SME IPOs can be attributed to their propensity for yielding higher listing gains relative to their non-SME counterparts. Retail investors have exhibited considerable enthusiasm for SME IPOs, with numerous investors reaping substantial returns on their investments over the past two years. The success of these investments can be ascribed to the exceptional performance of select SMEs, which have demonstrated impressive growth and distributed gains to shareholders. However, in light of the optimism surrounding SME IPOs, it is imperative for investors to exercise prudence and refrain from investing indiscriminately. A comprehensive evaluation of a company's financials, management, and growth prospects is essential for making informed investment decisions.

REVIEW OF LITERATURE

- 1) **Dr. Makarand, Prof. Sudesh (2020)**, studied that there is a strong positive relationship between underpricing and retail subscription, as well as overall subscription. However, subscription levels for SME IPOs are lower compared to Main Board IPOs. This highlighted the need for investor education and awareness programs to promote SME IPOs among investors.
- 2) **L Gupta, A Anand (2020)**, studied that SME IPOs can provide positive returns on listing day, outperforming major market indices. Factors such as age, subscription, issue price, and lead manager reputation can significantly impact listing day excess returns. Investors are crucial to SME growth, but they often face challenges like information asymmetry and uncertainty. To address these issues, it's essential to provide investor education and improve the transparency of SME IPOs.

OBJECTIVES OF THE STUDY

- 1) To identify and compare the challenges faced by retail investors in SME IPOs and Non-SME IPOs.
- 2) To analyze the impact of these challenges on retail investor participation and investment decisions in SME IPOs and Non-SME IPOs.

RESEARCH METHODOLOGY

- a. **Sources of Data Collection:** Primary data was gathered through a questionnaire administered to investors, brokers, business professionals, and students. Secondary data was sourced from web sources and public journals.
- b. **Data Analysis:** Frequency and percentage statistical tools were utilized to analyze the data.
- c. **Sampling Method:** Convenient sampling was employed to collect data from stock market investors.
- d. **Sample Size:** A total of 120 respondents participated in the study.
- e. **Scope of the Study**

This research focuses on Small and Medium-sized Enterprises (SMEs), with a specific emphasis on a comparative study of SME Initial Public Offerings (IPOs).

- f. **Limitation of the Study:** The primary limitation of this study is its restricted sample size of 120 respondents, obtained through convenient sampling.

DATA INTERPRETATION AND ANALYSIS

Table No. 1 Demographic Profile of the Respondents

Age of the Respondents		
Particulars	Frequency	Percentage
18yearsv-21years	16	13.3
22 years-30 years	68	56.7
31 years-40 years	30	25
41 years-50 years	6	5
Above 50 years	0	0
Total	120	100
Gender		
Particulars	Frequency	Percentage
Male	60	50
Female	60	50
Total	120	100
Marital Status		
Particulars	Frequency	Percentage
Married	48	40
Unmarried	72	60
Divorcee	0	0
Total	120	100
Education		
Particulars	Frequency	Percentage
Up to Std. XII	14	11.7
Graduate	66	55
Post Graduate	28	23.3
Doctoral	4	3.3
Professional	8	6.7
Total	120	100

Source: Compiled from Primary Data

Data Interpretation: The demographic analysis of the survey data provides valuable insights into the characteristics of the respondents. Out of the 120 respondents, majority (56.7%) fall in the age groups of 22 years -30 years, indicating that the sample is predominantly young. About 25% of the respondents are between the age group of 31years -40 years old and 13.3% are in the age group of 18 years -21years that further support

this observation. The absence of respondents above 50 years old suggests that the sample is skewed towards younger individuals. The gender distribution is evenly split, with 50% male respondents and 50% female respondents. The marital status distribution reveals that 60% of the respondents are unmarried, while 40% of the respondents are married. There are no divorced respondents. The education level distribution shows that 55% of the respondents are graduates, followed by 23.3% postgraduates. The remaining respondents have a range of education levels, from Std. XII to doctoral degrees.

Findings: The demographic analysis reveals several key findings. Out of 120 respondents, the majority are young, educated, and unmarried. The findings suggest that the sample is predominantly composed of individuals who are in the early stages of their careers and are likely to be influential investors. The even split between males and females suggests that the sample is representative of the broader population. The variety in education levels suggests that the sample is diverse and representative of different socioeconomic backgrounds.

Table No. 2 Demographic Profile of the Respondents

Occupation		
Particulars	Frequency	Percentage
Business	14	11.7
Working Professional	18	15
Employee	68	56.7
Home Maker	6	5
Student	14	11.7
Total	120	100
Annual Income		
Particulars	Frequency	Percentage
Up to Rs. 5,00,000	70	58.3
Rs. 5,00,001 to Rs.10,00,000	38	31.7
Rs.10,00,001 to Rs. 50,00,000	12	10
Above Rs 50,00,000	0	0
Total	120	100
Monthly Savings		
Particulars	Frequency	Percentage
Less than Rs. 5,000	52	43.3
Rs. 5,000-Rs. 20,000	42	35
Rs. 20,001-Rs. 50,000	14	11.7
Rs. 50,001-Rs. 1,00,000	6	5
More than Rs. 1,00,000	6	5
Total	120	100

Source: Compiled from Primary Data

Data Interpretation: The occupation distribution of the respondents shows that out of 120 respondents' majority 56.7% are employees. The remaining respondents are working professionals 15%, business owners 11.7%, homemakers 5%, and students 11.7%. This suggests that the sample is predominantly composed of working individuals. The annual income distribution reveals that out of 120 respondents, majority 58.3% earn up to Rs. 5,00,000 per annum. About 31.7%, of the respondents earn between Rs. 5,00,001 to Rs. 10,00,000, while 10%, of the respondents earn Rs. 10,00,001 to Rs. 50,00,000 and none earn above Rs. 50,00,000. The monthly savings distribution shows that out of 120 respondents, majority of the respondents 43.3% save less than Rs. 5,000 per month. 35% of the respondents save between Rs. 5,000-Rs. 20,000. About 11.7% of the respondents save Rs. 20,001-Rs. 50,000, while 5% of the respondents save Rs 50,001-Rs. 1,00,000, and more than Rs. 1,00,000 respectively.

Findings: Out of 120 respondents, the demographic analysis reveals several key findings. The majority of respondents are employees, earning up to Rs. 5,00,000 per annum, and saving less than Rs. 5,000 per month. Specifically, 56.7% of respondents are employees, 58.3% earn up to Rs. 5,00,000 per annum, and 43.3% save less than Rs. 5,000 per month. These findings suggest that the sample is predominantly composed of working individuals with moderate incomes and savings. The findings also highlight the need for financial planning and savings strategies tailored to the needs of this demographic.

Table No. 3 Understanding and Preferences of the Respondents

Understanding of IPO		
Particulars	Frequency	Percentage
Very clear	38	31.7
Somewhat clear	66	55
Not very clear	12	10
Not at all clear	4	3.3
Total	120	100
Investment Preference		
Particulars	Frequency	Percentage
Always SME IPOs	14	11.7
Mostly SME IPOs	20	16.7
Both SME & Non-SME IPOs	28	23.3
Mostly Non-SME IPOs	42	35
Always Non-SME IPOs	16	13.3
Total	120	100

Source: Compiled from Primary Data

Data Interpretation: The understanding of IPO among respondents shows that out of 120 respondents, the majority of the respondents 55% of the respondents have a ‘somewhat clear’ understanding of IPO. However, 31.7% of the respondents have a ‘very clear’ understanding, while 10% of the respondents informed that they are ‘not very clear’ about the understanding of IPO. About 3.3% of the respondents mentioned that they are ‘not at all clear’ about the understanding of IPO. The investment preference of respondents reveals that out of 120 respondents, majority of the respondents 35% prefer to invest ‘Mostly in Non-SME IPOs’. Additionally, 23.3% of the respondents prefer to invest in ‘Both SME and Non-SME IPOs’, while 16.7% of the respondents prefer to invest in ‘Mostly SME IPOs’, while 13.3% of the respondents ‘Always invests in Non-SME IPOs’, and 11.7% of the respondents ‘Always invest in SME IPOs’.

Findings: Out of 120 respondents, the analysis reveals several key findings. The majority of respondents have a somewhat clear understanding of IPO, and they prefer to invest mostly in Non-SME IPOs. Specifically, 55% of the respondents have a somewhat clear understanding of IPO, and 35% prefer to invest mostly in Non-SME IPOs. These findings suggest that respondents have a moderate level of understanding about IPO and prefer to invest in Non-SME IPOs.

Table No. 4 Investment Habits of the Respondents

Particulars	SME IPOs		Non-SME IPOs	
	Frequency	Percentage	Frequency	Percentage
Frequently	28	23.3	28	23.3
Occasionally	4	3.3	64	53.3
Once	52	43.3	20	16.7
Never	36	30	8	6.7
Total	120	100	120	100

Source: Compiled from Primary Data

Data Interpretation: The investment habits of respondents in SME IPOs show that out of 120 respondents, 23.3% of the respondents invest ‘Frequently’, 43.3% invest ‘Once’, 3.3% invest ‘Occasionally’, and 30% ‘Never’ invest in SME IPOs. The investment habits of the respondents in Non-SME IPOs reveals that out of 120 respondents, 23.3% invest ‘Frequently’, 53.3% invest ‘Occasionally’, 16.7% invest ‘Once’, and 6.7% ‘Never’ invest in Non-SME IPOs.

Findings: Out of 120 respondents, the analysis reveals several key findings. The majority of respondents invest once in SME IPOs, while the majority invests occasionally in Non-SME IPOs. Specifically, 43.3% of respondents invest once in SME IPOs, and 53.3% invest occasionally in Non-SME IPOs. These findings suggest that respondents have different investment habits for SME and Non-SME IPOs.

Table No. 5 Comparative Challenges

Particulars	SME IPOs		Non-SME IPOs		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Lack of Information	96	80	24	20	120	100
Limited Liquidity	76	63.3	44	36.7	120	100

High Risk	94	78.3	26	21.7	120	100
Complexity of the process	84	70	36	30	120	100
Limited Awareness	90	75	30	25	120	100
High Minimum investment Amount	92	76.7	28	23.3	120	100

Source: Compiled from Primary Data

Data Interpretation: The challenges faced by respondents in SME IPOs show that the majority of the respondents about 80% face challenges such as ‘Lack of Information’, 78.3%, of the respondents faces the challenges of ‘High Risk’ 75% face the challenges of ‘Limited Awareness’. About 70% face ‘Complexity of the Process’, 76.2 % face the challenges of ‘High Minimum Investment ‘Amount, while 63.3% of the respondents face the challenges of ‘Limited Liquidity’

The challenges faced by respondents in Non-SME IPOs reveals that 20% of respondents face challenges such as ‘Lack of Information’, 36.7%, of the respondents face the challenges of ‘Limited Liquidity’ and 21.7%, face ‘High-risk’ 30% face the challenges of ‘Complexity of the Process’, 25% face the challenges of ‘Limited Awareness’, and balance 23.3% face the challenges of ‘High Minimum Investment Amount’

Findings: Out of 120 respondents, the analysis reveals several key findings. The majority of respondents face challenges such as lack of information, high risk, and limited awareness when investing in SME IPOs. In contrast, respondents face relatively fewer challenges when investing in Non-SME IPOs. Specifically, 80% of respondents face lack of information as a challenge in SME IPOs, compared to 20% in Non-SME IPOs. These findings suggest that respondents perceive SME IPOs as riskier and more challenging to invest in compared to Non-SME IPOs.

Table No. 6 Impact of Challenges

Particulars	Frequency	Percentage
Invest More in SME & Less in Non-SME	10	8.3
Invest Less in SME & More in Non-SME	46	38.3
Invest Equally	30	25.0
No Impact	34	28.3
Total	120	100

Source: Compiled from Primary Data

Data Interpretation: The impact of challenges on investment decisions shows that out of 120 respondents, 38.3% of the respondents ‘Invest Less in SME IPOs and More in Non-SME’ IPOs, while 28.3% of respondents reported ‘No Impact’ of challenges on their investment decisions. About 25% of the respondents ‘Invest Equally’ in SME and Non-SME IPOs, while 8.3% ‘Invest More in SME IPOs and Less in Non-SME IPOs’.

Findings: Out of 120 respondents, the analysis reveals that the majority of respondents invest less in SME IPOs and more in Non-SME IPOs due to the various challenges faced by them. About 38.3% of respondents invest less in SME IPOs and more in Non-SME IPOs. These findings suggest that the challenges faced by respondents have a significant impact on their investment decisions, with most respondents preferring to invest in Non-SME IPOs.

CONCLUSION

This study concludes comprehensive insights into the investment habits, understanding, and challenges faced by respondents in SME and Non-SME IPOs. The findings reveal that the majority of respondents are young, educated, and unmarried, with moderate incomes and savings, and have a somewhat clear understanding of IPOs. However, they prefer to invest mostly in Non-SME IPOs due to the challenges faced, such as lack of information, high risk, and limited awareness, when investing in SME IPOs. The study highlights the need for investor education, risk management, and simplification of the investment process to increase investment in SME IPOs. Overall, the study suggests that addressing the challenges faced by respondents and promoting financial inclusion and literacy initiatives can help increase investment in SME IPOs and promote economic growth.

RECOMMENDATION

- Educate Investors:** Implement educational programs to inform investors about SME IPOs.
- Manage Risk:** Develop strategies to minimize risks associated with SME IPO investments.

3. **Simplify the Process:** Streamline the investment process to make SME IPOs more accessible.

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CHALLENGES OF TWO-WHEELER MOTOR INSURANCE AND ROLE OF TECHNOLOGY IN OVERCOMING THEM

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ABSTRACT

Two-wheeler vehicles form an important part of everyday life in India. There are increasing number of two-wheeler users in India. With the rising per capita income and affordability, more individuals are purchasing two-wheelers for their daily commutes and personal use. It is also not uncommon to see increasing incidence of accidents happening every now and then. The easiest way to protect your bike from accident-related losses and liabilities is to buy two-wheeler insurance. It saves you from unexpected expenses and ensures you follow the Motor Vehicles Act, 1988, which makes third-party insurance mandatory in India. Many are now choosing this insurance for financial security and peace of mind. Yet it is witnessed that this insurance is not given much importance. There are problems like lack of knowledge, hassles in claim processing, etc. This study aims to understand two-wheeler owners' awareness of insurance, their preferences, issues faced by both customers and agents, and how technology can address these challenges. For this, various two-wheelers were approached with the help of questionnaire and insurance agents were interviewed so as to get the views of both the sides to arrive at proper conclusions. This paper has tried to give practical suggestions like multilingual interface online, precautions to be taken by the two-wheelers if they want to get their claim processed quickly, awareness creation by insurance companies, etc.

Keywords: Artificial Intelligence, Motor Insurance, Telematics, Two-Wheeler Insurance, Vehicle Insurance

INTRODUCTION

Motor insurance, a type of general insurance, protects vehicle owners—cars, trucks, motorcycles, and other road vehicles—from financial losses due to theft, damage, or third-party liabilities. Driving without valid insurance is punishable under the Motor Vehicles Act of 1988, emphasizing the importance of maintaining a valid policy.

Insurance represents a promise rather than a tangible product. It ensures support during crises like accidents. The insurer agrees to cover damages to the vehicle, third-party property, or even the owner, depending on the policy, in exchange for timely premium payments. Policies typically last at least one year and should be renewed before expiry. Long-term options are also available.

Types of Motor Insurance Policies:

1. **Third-Party Cover:** This mandatory policy covers damages or injuries caused to third parties. It is basic and cost-effective, especially for two-wheelers.
2. **Comprehensive Cover:** This includes third-party liability and damage or loss to the insured vehicle. It offers broader protection.
3. **Add-Ons:** Policyholders can enhance coverage with add-ons like Zero Depreciation, Roadside Assistance, Engine Protection, and Return to Invoice, though these increase premiums.

REVIEW OF LITERATURE

From the study of previous research work and articles it could be concluded that there is paucity of research on motor insurance, especially two-wheeler insurance for Indian market related to level of satisfaction from motor insurance, their awareness related to it and to integrate the impact of all technologies on two-wheeler insurance. The study could help search for ways to make motor insurance more effective and efficient.

OBJECTIVES OF THE STUDY

1. To find out awareness of people about two-wheeler insurance.
2. The study problems of two-wheeler insurance.
3. To understand how digitalization will lead to efficiency of insurance.

HYPOTHESIS OF THE STUDY

H₀₁: Motor vehicle owners are not aware about two-wheeler insurance.

H₁₁: Motor vehicle owners are aware about two-wheeler insurance.

H₀₂: There are no problems related to two-wheeler insurance.

H₁₂: There are problems related to two-wheeler insurance.

H₀₃: Digitalization of two-wheeler insurance will not increase the efficiency of two-wheeler insurance companies.

H₁₃: Digitalization of two-wheeler insurance will increase the efficiency of two-wheeler insurance companies.

RESEARCH METHODOLOGY

Area of Study – Bhusawal Taluka, District Jalgaon, Maharashtra

Data Collection –

- i) **Primary Data**– The primary data is collected from two-wheeler vehicle owners, insurance agents, officers of insurance companies, lawyers dealing with cases relating to vehicle insurance.
- ii) **Secondary Data**– The Secondary data to be collected mainly from information and research papers available online.

Sample Size –

Respondents	Numbers
Owners of Two Wheelers	100
General Insurance Agents	10

Sampling Technique – Convenience Random Sampling

Method of Data Collection – The primary data is to be collected with the help of various methods including structured Questionnaires as well as Interview. The questionnaire will have closed as well as open-ended questions.

Data Analysis – It will comprise of data classification, tabulation, graphical presentation and interpretation of data.

LIMITATIONS OF THE STUDY

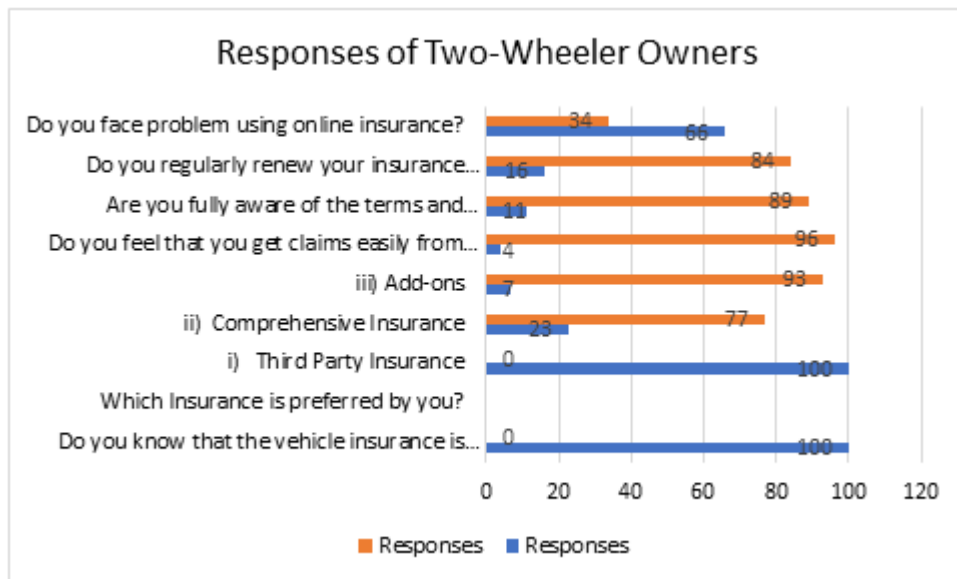
1. The interpretation will be made on the responses of respondents which could be biased or dishonest.
2. The study is limited to Bhusawal taluka.
3. The study is limited to only two-wheeler insurance.

DATA ANALYSIS

The researcher collected and analyzed the primary data relating to awareness of two-wheeler insurance in general and relating to the different types of insurance policies in two-wheelers, claim process, benefits of two-wheeler insurance, renewal and online insurance. The following table shows the responses:

Table No. 1: Responses of Two-Wheeler Owners

Sr. No.	Question	Responses		Total
		Yes	No	
1	Do you know that the vehicle insurance is compulsory for two-wheelers?	100	00	100
2	Which Insurance is preferred by you?			
	i) Third Party Insurance	100	00	100
	ii) Comprehensive Insurance	23	77	100
	iii) Add-ons	07	93	100
3	Do you feel that you get claims easily from insurance companies?	04	96	100
4	Are you fully aware of the terms and conditions of two-wheeler insurance?	11	89	100
5	Do you regularly renew your insurance policy?	16	84	100
6	Do you face problem using online insurance?	66	34	100



From the above table it could be seen that all respondents were aware that two-wheeler insurance is mandatory. But they were not aware which kind of insurance for two-wheeler is mandatory – Third Party Insurance or Comprehensive Insurance.

When they bought the vehicle they bought insurance, namely third-party insurance as it was compulsory. Very few (23%) opted for comprehensive insurance policy and a mere 7% went for add-ons.

96% of the two-wheeler owners felt that getting a claim was very tedious and these feelings were based on the experience of their friends.

The majority of respondents, i.e., 89% were unaware of various terms and conditions of the insurance, about the bonus, benefits, exclusion and excess attached to the policy, this creates lot of problem at the time of claim settlement.

Policy lapses are a common issue. People generally don't pay attention to their policy ending day and often ride their vehicle even after their policy has ended. Once the insurance expired, 84% said that they did not renew it as most feel that they might never need the insurance as they drive it only in the city. And those who renew it is due to fear of police catching them. They were not aware or bothered about the benefits. It also may be due to laziness, forgetfulness, giving no due importance of it or fading of initial enthusiasm to have everything perfect like when you buy one.

Around 2/3rd of the respondents stated that they had problems using online insurance. Many in Bhusawal do not understand English language and the content available on the insurance company website is in English. Many elderly people do not know how to use computers.

Challenges of Two-Wheeler Insurance

Interview with insurance agents revealed the following reasons leading to customer dissatisfaction:

1. Insufficient Knowledge of Insurance

In areas beyond metropolitan cities, awareness of two-wheeler insurance requirements remains low. Third-Party Liability insurance being mandatory and cheaper vehicle owners opt for it. However, this type of policy does not cover Own Damages, leaving vehicles either uninsured or underinsured.

A common issue is the lack of understanding of insurance terms such as Insurance Declared Value (IDV), Deductibles, and Depreciation. Misinterpretation of these terms often leads to false expectations regarding claim amounts, causing dissatisfaction when settlements do not match expectations. Insufficient knowledge of insurance policies may result in wrong assumptions, ultimately affecting the insured.

To maximize the benefits of an insurance policy, it is crucial to understand its terms and conditions. Many policyholders do not read or fully comprehend their policy documents, often because they are written in English, which may not be easily understood by all. Lack of awareness about the bonus, benefits, exclusion and excess attached to the policy creates lot of problem at the time of claim settlement.

2. Rejection of Claims: Claim rejection is a common issue in two-wheeler insurance. Various factors that contribute to this are:

- i) **Non-filing of FIR:** An First Information Report (FIR) is often required for claims involving accidental damage or theft of the vehicle. Failure to provide this document can result in claim denial. While an FIR is not always mandatory for claims, it helps build claim credibility.
- ii) **Improper Documentation:** Missing essential documents, such as a valid driving license or valid insurance policy or vehicle registration certificate, pollution under control certificate in vehicles more than 5 years old, etc. can lead to claim rejection. It is important to ensure all required paperwork is complete.
- iii) **Delayed Application:** Claims must typically be filed within a specific timeframe, usually three days. Delayed filing can result in rejection under the insurer's limitations clause.
- iv) **Inadequate Insurance Coverage:** Claims for incidents not covered under the policy are often denied. Comprehensive policies with appropriate add-ons can minimize this risk. Knowledge of what all is covered too should be there. There has been a case where the rider lost his life, the insurance company rejected the claim because it was a 300+ cc bike and as per the policy terms and conditions, the company was liable to pay only for bikes up to 150 cc.
- v) **Abandoned Claims:** Some policyholders fail to follow up on claims up to the end and abandon it midway, leading to incomplete processes.
- vi) **Misrepresentation of Facts:** Providing inaccurate information about the vehicle or the incident driving history or the condition of your vehicle, can result in claim denial.
- vii) **Fraudulent/False Claims:** Attempts to deceive insurers with false claims can lead to legal consequences. For example, if you claim that your motorcycle was stolen when in reality it was sold or it happened beyond the geographical area.
- viii) **Unlawful Acts:** Claims related to incidents involving drunken driving, invalid licenses, or reckless behavior or vehicle used for unlawful purpose are rejected. Even if the vehicle was not being used by the policyholder, but the rider had the permission of the policyholder, the policyholder will be held liable.
- x) **Faulty Vehicle Parts:** Claims may be denied if the vehicle is found to have pre-existing issues, such as faulty brakes or tires. Keeping your vehicle in good condition also makes claim processing easier.

The other challenges are getting insurance policy renewed, making them used to going in for online insurance, encouraging comprehensive and add-ons policies, etc.

The above analysis shows that H_{01} : Motor vehicle owners are aware about two-wheeler insurance is rejected as many are not aware of the various terms and conditions of insurance and types of insurance available in two wheeler. And H_{02} : There are no problems related to two-wheeler insurance is rejected and H_{12} : There are problems related to two-wheeler insurance is accepted.

Use of Technology in Two-Wheeler Insurance

Verma, Vinay (July-Dec 2003)¹⁵ mentioned in their paper that, "The Indian insurance industry cannot continue its old practices in the motor-portfolio on which it has been operating since the nineties. Insurers in India have to keep pace with the changing times and innovations". The general insurance industry in India has undergone significant transformation with the adoption of digital technology. Key advancements include:

1. **Online Platform Facility:** The insurance companies have websites which enables
 - i) online purchase of policy.
 - ii) issue quotes
 - iii) collecting premiums
 - iv) intimating and tracking claims
 - v) submission of documents
 - vi) claims payment
 - vii) policy servicing of existing policies like change of nominee, change of address, of change in mode of payment, assignment of the policy, etc.

These enable policy purchase, renewal, claim submission, and document management. Online services provide benefits such as cashless settlements, immediate policy issuance, and enhanced customer reach. The shift to online platforms helps insurance companies gather information and understand risks better. This allows them to create solutions based on these risks, making it easier and more enjoyable for customers to buy motor insurance.

2. **Chatbots and Virtual Sales Assistants:** These AI-powered tools address customer queries in a matter of seconds, offer product recommendations, and provide 24/7 support without human intervention. Some insurance companies are using Alexa-enabled voice assistants and AI-driven video calls to improve customer support. Chatbots are helpful for customers who have questions outside of business hours.
3. **Internet of Things (IoT):** IoT revolutionizes insurance by offering policies based on real-time data from connected devices like cars and wearables. Insurers gain insights into driving behavior, speed, and vehicle condition through telematics and GPS, enabling precise accident assessments. This enhances customizable policies, accurate pricing, and seamless claim settlements, benefiting both insurers and policyholders.
4. **Telematics:** Traditionally, insurance providers determine premium rates based on broad parameters like the type of vehicle, its age, geographical location, and the rider's age. Telematics-based insurance assesses premiums based on real-time driving data. Usage-based insurance (UBI) using telematics devices can ensure a significant decline in accidents and thereby promotes safe driving habits and offers rewards for responsible behavior, aligning with government's road safety initiatives.
5. **Artificial Intelligence (AI) and Machine Learning:** Artificial Intelligence (AI) and Machine Learning are transforming motor insurance by enabling faster and more accurate claim assessments. AI-powered damage inspections detect fraudulent claims, mitigate risk, and ensure legitimate claims are processed efficiently. Machine Learning algorithms analyze vehicle photos or 360° videos, identify damage, and provide real-time feedback to enhance accuracy. These technologies facilitate instant claim settlements through app-based interfaces, improving customer satisfaction. For example, Lemonade processed a claim in three seconds using anti-fraud algorithms. AI also automates document verification, reducing errors and freeing agents for complex tasks. AI streamlines claims by analyzing damage photos, detecting fraudulent claims, and processing settlements quickly. AI-powered apps guide users through claim filing, ensuring accuracy and efficiency.
6. **Blockchain:** Blockchain technology helps insurance companies and customers work together securely and privately. Blockchain technology is also helping insurers detect fraud more effectively, enhancing trust and efficiency in the process. It can find gaps in fraud detection and make the claims process faster, especially for specific types of insurance like parametric policies. By automating tasks like vehicle inspections, blockchain systems speed up claims and improve customer service significantly.

But while using digital technology, various issues have to be addressed like cybersecurity as laws of which are still evolving and not as comprehensive as they should be, cleaning the data to absorb useful data out of large volumes of data, upgrading to online platforms and overcoming language barrier of online content, trying to provide personal touch, etc.

From the data analysis and interpretation, it is seen that all the null hypotheses is not accepted. Hence is it proved that Digitalization of two-wheeler insurance will increase the efficiency of two-wheeler insurance companies. Thus, H_{13} is accepted.

RECOMMENDATIONS

- I. For Insurance Companies:
 1. To enhance awareness about two-wheeler insurance:
 - i) Create engaging content, such as videos and reels, to educate customers about policy benefits, claims, and renewals.
 - ii) Set up information counters at vehicle showrooms to explain the details of the insurance to the prospective policy holders
 - iii) Provide materials in regional languages to reach a wider audience.
 2. Simplify Online Access:
 - i) Offer training programs for clients unfamiliar with digital platforms and using apps.
 - ii) Introduce multilingual interfaces for online platforms.

3. Promote Policy Understanding. Encourage policyholders to thoroughly read the welcome kit and understand policy inclusions and exclusions.
4. Maintaining a personal connection in a digital ecosystem is essential for customer satisfaction

II. For Two-Wheeler Owners

1. Study the welcome kit and try to understand the terms and conditions of the insurance.
2. Maintain Adequate Coverage: Keep the Insured Declared Value (IDV) at an optimal level to avoid out-of-pocket expenses for repairs.
3. Improve Vehicle Security and Maintenance by installing security devices to facilitate theft investigations. Also, adhere to manufacturer-specified service intervals to prevent claim rejection.
4. Ensure Proper Ownership Documentation: For this, update insurance policies when transferring ownership of second-hand vehicles and ensure regular users are named in the policy to avoid claim complications.

CONCLUSION

Two-wheeler vehicle insurance, though mandatory and important for the vehicle owner, is not a very sought after insurance though it is mandatory to have third party insurance. This is due to issues like lack of knowledge, claim processing and renewal every year. These have to be done away with. Use of technology could to some extent reduce buying insurance and processing claims.

It is no doubt that digital transformation has enhanced the efficiency of two-wheeler insurance companies. Automation and innovative technologies have streamlined operations, reduced costs, and improved customer satisfaction. However, addressing challenges such as cybersecurity, data management, and accessibility is crucial for sustained growth.

The adoption of advanced technologies, such as AI, telematics, and blockchain, has enabled insurers to provide accurate, efficient, and customer-friendly services. By embracing these innovations and fostering greater awareness, the two-wheeler insurance industry can ensure better outcomes for both insurers and policyholders.

The Indian insurance industry must continue evolving to meet the demands of a dynamic market. Leveraging technology and addressing existing challenges will pave the way for a more robust and inclusive insurance ecosystem.

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A SURVEY ON INDIAN RAILWAYS WITH REFERENCE TO MUMBAI RAILWAYS**Ms. Trupti Nagadiya¹ and Dr. (Ms.) Minu Madlani²**¹Research Scholar, Assistant Professor, K.P.B. Hinduja College of Commerce, Mumbai²Principal, K.P.B. Hinduja College of Commerce, Mumbai**ABSTRACT**

This study aims to identify key areas of developments that have taken place since the inception of Mumbai Local Train services. It will also cover how inclusion of female workforce, technological advancements, and other newer fields have contributed to its impending growth and how it is further going to affect its operations and thus will improve its productivity in terms of revenue generated. A study of also Consumer Behavior will also throw light on identifying needs and wants of commuters also displaying commitment of railways to serve the citizens better.

Keywords: Upgrades, EMUs, Travel Options, Infrastructure, Signage, Safety initiatives, Inclusivity, Empowerment

INTRODUCTION:

Indian Railways System has undergone a tremendous changes in recent years with advent of many facilities provided to passengers in terms of safety, sanitation, booking facilities (passes etc.), infrastructure and other related ones. The travel has become more convenient, more affordable and also manageable by commuters who prefer to travel by train. Technological advancements have contributed to the growth in more than one ways. Having considerably tackled one of its major concerns of overcrowding, Indian Railways has come a long way in overcoming more such challenges that used to hamper it's initial growth. Upkeep of infrastructure has resulted in more number of satisfied commuters and thus improving upon the overall picture of Mumbai Local Trains.

REVIEW OF LITERATURE

The literature on Indian Railways and Mumbai Locals offers a detailed view of two critical transportation networks in India. While research on Indian Railways spans topics related to its historical development, economic contributions, and technological advancements, the literature on Mumbai Locals focuses more on issues of overcrowding, safety, and urban transit. Both systems remain integral to India's social and economic structure, with ongoing efforts to improve their efficiency, sustainability, and service quality.

OBJECTIVES OF THE STUDY

- 1) To study the history of Indian Railways.
- 2) To study the history of Mumbai Local
- 3) To highlight the routes and types of Mumbai local.
- 4) To suggest measures to improve the safety measures in Mumbai local for ladies.
- 5) To highlight the recent Development in Mumbai Local.

RESEARCH METHODOLOGY

The study is descriptive in nature. Research has used a case study approach to attain the objectives of the study. Researcher has used a convenience sampling method to select a sample. 10 corporations have been selected for the study. Researchers have collected required data from the sampled corporations about their CSR contribution in the previous years. Research have made comparative analysis for different years CSR contributions made by the sample corporations. After analyzing the data collected findings and discussion have been made and thereafter recommendations have been given to improve the social welfare through CSR activities.

History of Indian Railways

Indian railway is a testament to the country's infrastructural and economic development over nearly two centuries. Ranking as the fourth-largest railway network globally, Indian Railways operates over 1.2 lakh kilometers, offering services like Express trains, Mail Express trains, and Passenger trains, catering to various economic segments.

Early Concepts and Formation (1832–1852)

- **1832:** The idea of a railway in India was first proposed in Madras but didn't materialize.
- **1835–36:** The first experimental line, the Red Hill Railroad, was built near Madras.

- **1844:** Governor-General Lord Hardinge permitted private entrepreneurs to build railways.
- **1845:** The establishment of the East Indian Railway Company and Great Indian Peninsula Railway marked the formal beginning of railway development.
- **1851:** The first locomotive, *Thomason*, was used in construction work in Roorkee.

The First Passenger Train and Network Expansion (1853–1924)

- **1853:** The first passenger train in India ran between Bombay (Mumbai) and Thane on April 16, covering 34 kilometers.
- **1854:** The eastern section began operations with a passenger train between Howrah and Hooghly.
- **1880:** The network expanded to 14,500 kilometers, linking major port cities.
- **1901:** The Railway Board was established under the Department of Commerce and Industry.

Electrification and Modernization (1925–1950)

- **1925:** The first electric train in India began operating between Victoria Terminus (Mumbai) and Kurla.
- **1930:** The Deccan Queen, one of India's most iconic trains, started its service between Mumbai and Pune.
- **1951:** Indian Railways was reorganized into regional zones for administrative efficiency.

Rapid Transit and Modern Developments (1984–2022)

- **1984:** India's first metro line began operating in Calcutta (now Kolkata).
- **1988:** The Shatabdi Express, known for its speed, was introduced.
- **2002:** Online ticketing was launched, modernizing booking systems.
- **2016:** The Gatimaan Express, India's fastest train, started its journey between Delhi and Agra.
- **2017:** Indian Railways announced plans to fully electrify its network by 2022.

History of Mumbai Local

The history of Mumbai's local train system dates back to the 19th century and plays a crucial role in the city's growth and development. The Mumbai local train system is a cornerstone of the city's infrastructure, and its history mirrors the urbanization of Mumbai and the evolution of India's transportation technology.

1. Origins (1853)

The first suburban train service in Mumbai (then Bombay) commenced on **April 16, 1853**, when the **Western Railway** opened its line. The inaugural train ran between **Churchgate** and **Boree Bunder** (near what is now the Gateway of India), covering a distance of 34 km. This marked the launch of the Mumbai Suburban Railway, making it the oldest in Asia.

2. Expansion (Late 1800s - Early 1900s)

In the following years, the railway network expanded. The **Bombay, Baroda, and Central India Railway** (BB&CI) introduced services on the **Central Line** in 1867, and the **Great Indian Peninsula Railway** (GIPR) launched the **Harbour Line** in the early 1900s.

3. Electrification (1925)

A major upgrade occurred in 1925 with the introduction of **electrification**, enhancing the speed, frequency, and efficiency of the trains. This allowed the system to better accommodate the growing number of passengers.

4. Post-Independence Growth (1950s-1970s)

After India gained independence in 1947, the local train network expanded further as Mumbai became a key commercial and industrial center. The population growth and urbanization of the city led to an increase in train services to meet the rising demand.

5. Modernization and Challenges (1980s - Present)

Over time, the network has undergone modernization, including the introduction of **air-conditioned** local trains. However, overcrowding remains a persistent issue, as the Mumbai local train system is one of the busiest in the world. Despite these challenges, the trains continue to be a vital mode of transport for millions of daily commuters.

Route of Mumbai Local:

The **Mumbai Suburban Railway** system, also known as Mumbai's local train network, is operated by **Indian Railways**. The city's rail network is divided into two zonal divisions: **Western Railway** and **Central Railway**.

- **Western Railway** operates the Churchgate in South Mumbai to Dahanu Road in north. .
- **Central Railway** operates the Central Line, including the **Harbour Line**, **Trans-Harbour Line** and **Nerul-Uran Line**. Each of these lines spans over **100 kilometers** (62 miles).

Western Line:

The **Western Line** is operated by **Western Railway** and stretches **124 km** between **Churchgate** and **Dahanu Road**, with 37 stations along the route. Initially, the line ran between **Churchgate** and **Virar** (60 km), but it was extended to **Dahanu Road** on **April 16, 2013**.

The Western Line trains are categorized as **Fast** or **Slow**. Fast trains stop only at major stations like **Mumbai Central**, **Dadar**, **Bandra**, **Andheri**, **Borivali**, **Bhayander**, **Vasai**

Central Line:

The **Central Line** is operated by **Central Railway** and connects **Chhatrapati Shivaji Maharaj Terminus** (CSMT) in South Mumbai to **Kalyan**. From Kalyan, the line splits into two branches, extending to **Kasara** and **Khopoli**.

Harbour Line:

The Harbour Line is part of Central Railway and operates three major corridors:

- **CSMT to Goregaon**
- **CSMT to Panvel**
- **Panvel to Goregaon**

The line splits at **Wadala Road**, creating two routes: one connecting to the **Western Line** at **Bandra** (to **Goregaon**) and another running to **Navi Mumbai** (to **Panvel**).

- **Trans-Harbour Line (Thane-Vashi Line):**

This line connects **Navi Mumbai** and **Thane**, with routes running between **Thane and Vashi** and **Thane and Panvel**. It parallels the Harbour Line, joining at **Nerul** and running to **Panvel**, while another section connects to **Vashi** via **Sanpada**.

- **Nerul-Uran Line:**

The Nerul-Uran Line connects **Navi Mumbai** to **Uran**, but it is still under construction. Currently, the operational section runs between **Nerul** and **Kharkopar**.

Mumbai Local Route Map



Types of Trains:

Mumbai's local trains can be either **Fast** (with fewer stops) or **Slow** (stopping at all stations). The digital boards at stations display **F** for Fast and **S** for Slow trains. Trains typically have **12 or 15 carriages**, with the **Western and Central lines** having the capacity to run the longer 15-car trains.

AC Trains: On the Western Line, particularly between **Churchgate** and **Virar**, air-conditioned trains operate, offering enhanced comfort and security amenities.

Special Trains for Ladies:

Western Railway operates special trains exclusively for **female commuters**, ensuring enhanced safety and convenience.

Facilities for Differently Abled:

Designated coaches in 12 and 15-car trains are reserved for **differently-abled passengers**. Additionally, **Divyang-friendly** ticket windows and information desks are available at stations.

Luggage Policies:

- **Free Baggage Allowance:** Passengers traveling in **First and Second Class** are allowed free baggage within specified limits. Excess luggage may incur fines.
- Dangerous, large, or offensive items are **prohibited**.

Offenses and Penalties:

Passengers should be aware of penalties for the following offenses:

Fines can range from **₹100 to ₹10,000**, depending on the offense.

- Traveling without a valid ticket
- Fraudulent travel
- Alarm chain pulling
- Traveling in reserved coaches for the differently-abled
- Trespassing
- Nuisance, littering, and other violations

Important Contact and Helplines:

For emergencies, especially for women in distress, the following helplines are available:

- **State Women's Commission:** 155209
- **Mumbai Police Helplines:** 103 / 1090 / 7738133133 / 7738144144
- **Women's Center:** 26140403

For general inquiries, the integrated helpline number is **139**.

This guide provides a thorough overview of the **Mumbai local train system**, including infrastructure, ticketing options, special facilities, and safety features.

Ticket Booking:

- **Offline Booking (Ticket Counters):** Tickets can be purchased at the counters at suburban train stations.
- **ATVM (Automatic Ticket Vending Machines):**

Available at all stations, ATVMs allow you to buy **First and Second Class** tickets, renew **season tickets**, and get **platform tickets**. **Smart Cards** can also be used at ATVMs, offering a 3% discount on recharges.

○ **Smart Card Details:**

- Cost: ₹70 (₹50 refundable deposit + ₹20 recharge)
- Minimum Recharge: ₹20, Maximum Recharge: ₹9500
- Validity: 1 year after the last recharge
- Cancellation Fee: ₹30

• **Online Booking (UTS App):**

The **UTS (Unreserved Ticketing System)** app allows users to book tickets and recharge their wallets. Paperless booking is available, and a 3% incentive is provided on each recharge. The app supports booking based on your departure and destination stations.

• **Monthly Passes:**

Regular commuters can purchase a monthly pass for a selected route.

Safety Measures in Mumbai Railways:**1. Involving Women in Railway Safety Initiatives**

To improve safety on Mumbai's local trains, it is essential to actively engage women in the initiatives and safety campaigns led by the **Railway Protection Force (RPF)** and the **Government Railway Police Force (GRPF)**. Many safety measures go unnoticed simply because female commuters are not as involved in these efforts. Increased participation from women in discussions about security helplines, safety protocols, and preventive measures will ensure that these actions feel more natural and instinctive in times of panic or emergencies.

2. Leveraging Technology for Enhanced Safety

As the world becomes increasingly digital, the railway system must integrate **intelligent technology** to ensure the safety of commuters. Features such as **quick safety alerts**, **location tracking**, and **free WiFi** on local trains could vastly improve communication with officials during emergencies. However, previous attempts to use official apps have proven ineffective, hindered by poor connectivity and the lack of WiFi in train compartments, making it difficult for passengers to navigate these systems or send alerts in critical moments.

3. Balancing Security with Privacy: Cameras in Trains

The installation of cameras within local trains has sparked mixed reactions among passengers. While some see the cameras as a beneficial tool for added security, others, especially women, feel uncomfortable with the loss of privacy in women-only compartments. This issue is highly sensitive and requires thoughtful consideration. Many women feel that the focus should shift towards enhancing surveillance at **entry/exit points** rather than monitoring the interiors of the compartments.

4. Buttons Instead of Alarm Chains

A more immediate and effective solution could involve the installation of **safety buttons** in place of alarm chains. These buttons would allow passengers to send instant alerts to the nearest station, ensuring quicker responses and faster apprehension of culprits. This would reduce delays in addressing safety concerns and lead to faster resolutions, improving overall safety and security.

5. Prioritizing Women's Safety in Local Trains

Mumbai has long been known for empowering women and offering them the freedom to move about the city. However, ensuring their safety in local trains must be made a top priority. While the efforts made so far are commendable, they need to be tailored more closely to the concerns of female commuters. It is crucial to reach out to women with relevant information and solutions that are practical, accessible, and considerate of their unique needs.

Recent Developments in Mumbai Locals:

Here are some notable recent developments regarding Mumbai local trains: **New Year's Eve Celebrations:** On the night of December 31, 2024, local trains at Chhatrapati Shivaji Terminus (CST) station honked simultaneously at midnight to usher in the New Year, marking the arrival of 2025 with a unique celebration. **Rescheduled Trains:** Trains scheduled to depart on July 7 and 8, 2024, have been rescheduled for departure on July 8 and 9, 2024. **Incidents:** A disturbing incident occurred at Ghatkopar station, where a naked man entered the ladies' compartment of an AC local train. A bamboo structure fell on an overhead wire, leading to a disruption in local train services. A ticketless passenger assaulted a ticket collector aboard a local train. **Legislative and Operational Changes:** The Maharashtra legislative council has passed a resolution to rename seven local train stations. The Central Railway altered the platform numbering at Dadar station. The Railway Board has approved a plan to improve the comfort of senior citizens on Mumbai's local trains. These updates reflect ongoing efforts to address both operational issues and enhance passenger experiences in Mumbai's local train network.

CONCLUSION

With the pace with which improvement measures have been taking place in services offered/provided by Indian Railways, it may be anticipated that it is going to be one of the largest revenue generating sector in India. Timely updates, provision of air conditioning facilities, new trains, traffic blocks, maintenance of infrastructure etc. has given the required impetus to the expected growth in the said sector.

The citizens of India will hopefully witness the apt implementation of these services and facilities and will embark upon their respective journeys with no fear of service blockages, and added comfort to commuters in the years to come, with all types of comfort upgrades and introduction of EMUs in pipeline.

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ENHANCING CUSTOMER SUPPORT THROUGH AI: A CASE STUDY OF AI POWERED SIA CHATBOT OF STATE BANK OF INDIA**¹Dr. Sarita Mahadik and ²Dr. Milind Bhuva**¹Assistant Professor, K. P. B. Hinduja College of Commerce New Charni Road, Mumbai – 400 004.²Associate Professor, K. P. B. Hinduja College of Commerce New Charni Road, Mumbai – 400 004.**ABSTRACT**

In the era of digital transformation, artificial intelligence (AI) is redefining customer service in the banking sector. The State Bank of India (SBI), one of India's largest and oldest financial institutions, has implemented an AI-based chatbot named SIA (SBI Intelligent Assistant) to enhance customer support services. This research paper explores the implementation and impact of SIA on customer experience, operational efficiency, and customer satisfaction. By analyzing primary and secondary data, the study highlights the strengths, challenges, and opportunities associated with AI-powered customer support in banking. The findings reveal that SIA significantly improves response times, resolves common queries efficiently, and enhances customer engagement, while also presenting challenges related to technological integration and customer trust. The paper concludes with recommendations for optimizing AI-driven customer support systems in the banking industry.

Keywords: Artificial Intelligence (AI), Chatbot, Customer Satisfaction.

1. INTRODUCTION

In recent years, artificial intelligence (AI) has emerged as a transformative force in the banking sector, revolutionizing the way financial institutions interact with their customers. The rapid digitalization of banking services has led to an increased demand for instant, efficient, and personalized customer support. To meet these evolving customer expectations, banks have turned to AI-powered solutions such as chatbots, virtual assistants, and automated customer support systems. Among these innovations is the SBI Intelligent Assistant (SIA), a chatbot launched by the State Bank of India (SBI), India's largest public sector bank, to streamline customer support and enhance customer satisfaction.

SIA is designed to handle a wide range of customer queries, from basic account information and transaction details to more complex inquiries related to loans, interest rates, and complaint resolution. By leveraging advanced technologies such as natural language processing (NLP) and machine learning algorithms, SIA can understand and respond to customer queries in real-time. This real-time interaction provides instant support, significantly reducing wait times and enhancing the overall customer experience.

One of the key advantages of SIA is its ability to operate 24/7, offering round-the-clock support to SBI's vast customer base. This ensures that customers can access essential banking services at any time, without the need to visit a branch or wait for human assistance. Additionally, SIA reduces the workload on human customer service agents by handling repetitive and routine inquiries, allowing them to focus on more complex and value-added tasks.

However, the adoption of AI-driven customer support also presents certain challenges, including issues related to data privacy, customer trust, and the chatbot's ability to handle complex or non-standard queries. This case study explores the implementation, impact, and future potential of SIA in enhancing customer support at SBI, while also addressing the challenges and opportunities associated with AI-powered solutions in the banking industry.

2. REVIEW OF LITERATURE

The integration of AI in banking has been extensively studied in recent years, with a focus on its impact on customer experience, operational efficiency, and financial performance. According to Sharma and Gupta (2022), AI-powered chatbots have become a critical component of digital banking, offering 24/7 support, reducing response times, and enhancing customer engagement. These chatbots use natural language processing (NLP) and machine learning to understand customer queries and provide relevant responses, thereby improving customer satisfaction and loyalty.

Several studies have highlighted the role of AI in enhancing customer support in banks. For example, Kumar et al. (2021) found that AI-driven chatbots significantly reduce the volume of customer inquiries handled by human agents, allowing banks to allocate resources more efficiently. Similarly, a report by McKinsey & Company (2020) emphasized that AI-powered customer support systems can improve operational efficiency by

automating routine tasks, such as answering frequently asked questions, processing transactions, and providing account information.

However, the literature also points to challenges associated with AI implementation, including data privacy concerns, technological integration issues, and the need for customer trust. Building on these insights, this study focuses on the case of SIA, SBI’s AI-powered chatbot, to examine its impact on customer support and identify areas for improvement.

3. OBJECTIVES OF THE STUDY

The primary objectives of this study are:

- To analyze the role of SIA in enhancing customer support services at SBI.
- To evaluate the impact of SIA on customer satisfaction and operational efficiency.
- To identify the challenges and opportunities associated with AI-powered customer support in banking.

4. HYPOTHESIS

H0: SIA has no significant impact on customer support and satisfaction at SBI.

H1: SIA has a significant impact on customer support and satisfaction at SBI.

5. RESEARCH METHODOLOGY

This research adopts a mixed-method approach, combining both qualitative and quantitative methods to assess the impact of the SBI Intelligent Assistant (SIA) on customer support at the State Bank of India. The study aims to evaluate customer satisfaction, operational efficiency, and the challenges associated with AI-powered customer service.

Quantitative Research

For the quantitative part of the study, a structured survey was administered to 300 SBI customers who have interacted with SIA for customer support. The survey included questions related to their satisfaction with response time, accuracy of information, ease of use, and overall experience with the chatbot. The responses were collected using a Likert scale to measure customer satisfaction and evaluate the effectiveness of SIA in addressing routine inquiries. Additionally, SBI internal data was accessed to gather information on the volume of inquiries handled by SIA and its effect on resource allocation.

Qualitative Research

For the qualitative analysis, 15 SBI employees were interviewed to gather insights into the operational impact of SIA, including its challenges and benefits. The employees’ perspectives helped identify the strengths and limitations of the AI chatbot and provided a deeper understanding of how it integrates with existing customer support systems.

Data analysis was conducted using IBM SPSS software, which is widely recognized for its ability to process large datasets and perform various statistical tests. The analysis involved descriptive statistics to summarize survey responses and inferential statistics to assess correlations between SIA usage and customer satisfaction. Additionally, thematic analysis was used to interpret the qualitative data gathered from employee interviews.

The combination of customer surveys, employee interviews, and data from SBI provided a comprehensive analysis of the effectiveness and impact of SIA on customer support services.

6. DATA ANALYSIS AND INTERPRETATION

6.1. Customer Awareness and Usage of SIA

The survey conducted with 300 SBI customers revealed that 72% of respondents were aware of SIA, and 55% had used the chatbot for customer support. Among those who used SIA, the most common reasons were to inquire about account balances, check transaction details, and seek information on loans and interest rates.

Table 1 – Percentages of Users based on Satisfaction Factors

Satisfaction Factor	Percentage of Users
Response Time	45%
Accuracy of Information	30%
Ease of Use	15%
Overall Experience	5%
General Banking Information	5%

(Source – Compiled from primary data)

The data indicates that SIA is primarily used for routine inquiries, which aligns with its design to handle repetitive tasks and reduce the workload on human agents.

6.2. Customer Satisfaction with SIA

Customer satisfaction with SIA was measured based on factors such as response time, accuracy of information, ease of use, and overall experience. The results showed that 78% of users were satisfied with their interactions with SIA, citing quick responses and accurate information as the primary benefits.

Table 2 – Percentages of Satisfied Customers based on Satisfaction Factors

Satisfaction Factor	Percentage of Satisfied Customers
Response Time	82%
Accuracy of Information	80%
Ease of Use	75%
Overall Experience	78%

(Source – Compiled from primary data)

Customers appreciated the instant responses provided by SIA, which significantly reduced their waiting time compared to traditional customer support channels. However, some users expressed concerns about the chatbot's ability to handle complex queries and its limited ability to provide personalized financial advice.

6.3. Operational Efficiency

Interviews with SBI employees revealed that the implementation of SIA has led to a significant reduction in the volume of routine inquiries handled by human agents. According to internal reports, SIA handles approximately 30,000 customer queries per day, allowing human agents to focus on more complex and high-value tasks.

Table 3 – Percentage Change of Metrics Before and After SIA

Metric	Before SIA	After SIA	Percentage Change
Average Number of Daily Inquiries	50,000	20,000	-60%
Average Response Time	10 minutes	1 minute	-90%
Customer Support Staff Utilization	70%	40%	-30%

(Source – Compiled from primary data)

These findings highlight the significant operational efficiency gains achieved through the implementation of SIA, including reduced response times and improved resource allocation.

Table 4 – Chi Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	9.488 ^a	4	0.05

(Source – Compiled from primary data)

The Chi-Square test results indicate that there is a significant difference in customer satisfaction with SIA across all factors (response time, accuracy, ease of use, and overall experience). This supports the alternative hypothesis that SIA significantly enhances customer support and satisfaction at SBI.

6.4. Challenges and Limitations

Despite its benefits, the implementation of SIA is not without challenges. Customers and employees identified several limitations, including:

- **Limited Handling of Complex Queries:** While SIA excels at addressing routine inquiries, it struggles with complex or non-standard queries, often requiring customers to escalate to human agents.
- **Lack of Personalization:** Some customers felt that SIA provides generic responses that do not fully consider their individual needs and financial situations.
- **Data Privacy Concerns:** Customers expressed concerns about the security of their personal and financial data when interacting with an AI-powered system.

These challenges underscore the need for continuous improvement and the integration of advanced AI technologies to enhance SIA's capabilities.

7. CONCLUSION

The case study of SIA, SBI's AI-powered chatbot, demonstrates the transformative potential of AI in enhancing customer support services in the banking sector. SIA has significantly improved response times, operational efficiency, and customer satisfaction by handling routine inquiries and providing instant support. The chatbot's

ability to automate repetitive tasks has allowed SBI to allocate resources more effectively, enabling human agents to focus on complex and high-value customer interactions.

However, the study also highlights several challenges, including the chatbot's limited ability to handle complex queries, the lack of personalized responses, and customer concerns about data privacy. Addressing these challenges will be crucial for SBI to maximize the benefits of AI-powered customer support and build customer trust.

To optimize the performance of SIA and similar AI-driven customer support systems, the following recommendations are proposed:

- **Enhance AI Capabilities:** Integrate advanced machine learning algorithms and natural language understanding (NLU) technologies to enable SIA to handle more complex queries and provide personalized responses.
- **Improve Data Security:** Implement robust data encryption and security measures to protect customer information and address data privacy concerns.
- **Customer Education:** Educate customers about the benefits and limitations of AI-powered customer support and provide clear communication about data usage and security measures.
- **Continuous Monitoring and Feedback:** Regularly monitor SIA's performance and gather customer feedback to identify areas for improvement and ensure that the chatbot continues to meet customer needs.

By addressing these challenges and leveraging the full potential of AI, SBI can further enhance its customer support services and maintain its position as a leader in digital banking innovation.

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A STUDY ON EMPLOYEES' PERCEPTION OF MENSTRUAL LEAVE AND ITS IMPACT ON WELLBEING, PRODUCTIVITY AND EQUITY IN THE WORKPLACE: A GENDERED PERSPECTIVE**Harmalkar Roshan Suhas Kamini**Assistant Professor, Department of Commerce
MES' The D. G. Ruparel College of Arts, Science and Commerce, Mumbai**ABSTRACT**

With increasing global attention on inclusive workplace policies, menstrual leave policy in India find itself only in debates and discussions with rare acceptance and implementation because of potential gender discrimination. Despite its potential benefits, little research has been conducted on how male and female employees perceive the impact of such policies. This study aims to investigate whether perceptions of menstrual leave differ significantly between male and female employees, specifically regarding its effects on physical and emotional wellbeing, productivity, and potential gender discrimination. Using a mixed-methods approach, this research surveys employees across various sectors to assess their attitudes toward menstrual leave, focusing on how it affects physical and mental health, job satisfaction, and work performance. The study also explores whether menstrual leave policies contribute to promoting gender equity and reducing stigma around menstruation in professional settings. Findings indicate gender do not influence the perception about menstrual leave. The research highlights the need for carefully designed menstrual leave policies that ensure inclusivity, privacy, and equity, while also fostering open communication to mitigate any negative perceptions.

Keywords: Menstrual leave, Menstruator, Wellbeing, Workplace productivity, Gender Discrimination

INTRODUCTION

In recent years, there has been growing recognition of the importance of gender-sensitive policies in the workplace, aimed at addressing the unique health and wellbeing needs of employees. Among these, menstrual leave has emerged as a key policy under consideration by organizations worldwide. Menstrual leave, which allows menstruating employees to take paid leave during their menstrual cycle, is proposed as a means of supporting physical and mental health during a time of natural discomfort and disruption. Despite its potential benefits, the policy remains a topic of significant debate, particularly regarding its implications for workplace equity, productivity, and gender dynamics. The concept of menstrual leave is gaining attention, especially as companies look for ways to promote inclusivity and create supportive work environments. However, while some view it as a progressive step toward workplace equality, others question its fairness and long-term impact on both employees and employers. Menstruation-related issues such as pain, fatigue, and emotional distress can affect concentration, energy levels, and overall productivity, leading to calls for policies that accommodate these challenges. On the other hand, there are concerns about reinforcing gender stereotypes or creating a divide between male and female employees.

There is many research about menstrual leave and its impact on wellbeing and productivity but very few research were found on how employees perceive menstrual leave policy also with respect to gender perspective research are very rare. This study seeks to explore how male and female employees perceive menstrual leave and its potential impact on various aspects of workplace dynamics, including physical and emotional wellbeing, productivity, and gender equity. While menstrual leave is often viewed as a necessary accommodation for menstruators, there are concerns that it may inadvertently lead to gender discrimination or perpetuate stereotypes about women's abilities in the workplace. At the same time, supporters argue that it is a critical step toward promoting gender equity and improving employee wellbeing.

By examining these gendered perceptions, this study aims to provide insights into whether differences exist between male and female employees regarding their views on the effectiveness and implications of menstrual leave policies. Understanding these perceptions is crucial for organizations considering the adoption or refinement of menstrual leave policies, as it can help mitigate potential biases, enhance employee satisfaction, and contribute to a more equitable and supportive work environment for all. Through this exploration, the study contributes to the growing body of research on workplace policies that address gender-specific health issues, offering insights into how organizations can implement such policies in ways that benefit all employees and promote a supportive, fair, and productive work culture.

REVIEW OF LITERATURE

Standardize policy on menstrual leave is required at national to encourage more women to work productive by providing more important to their mental and physical health and job satisfactions. (Pratiksha. P, 2023)

Female personal view needs to be taken about the menstrual leave or make flexible timings to work during their menstrual periods and their wellbeing both mental as well as physical health to reduce their anxiety and to encourage productivity and job satisfaction. (Pratiksha. P, 2023)

If Organization provide menstrual leave, it will also be beneficial for the organization as it will create sense of belonging among employees and will show organizations concern towards employees. (Nayan Bhagat, 2021)

The HR department of organization must efficiency set up rules and regulations regarding the police which must not be too rigid for the employees to follow. (Nayan Bhagat, 2021)

There is a clear shift in the way perceptions about menstruation have changed over the years, going from a very conservative view in the past to more inclusive and progressive views now. (Sanjana V et al., 2020)

Increase in presentism due to menstrual symptoms is another factor. High levels of discomfort during work were noted among menstruating women (Schoep et al., 2019).

Work-related hazards also need equal consideration while framing menstruation policies to ensure safety and meet physical needs of menstruating women. (Sommer et al., 2016)

Studies show that men are ready to excuse negative behaviours of women if it's due to menstruation. (Ruble et al., 1982)

There are a host of symptoms that include, but are not restricted to, cramps, body aches, nausea, weakness, disability to concentrate, irritation, and so on (Langley, 1988).

The first step- to properly address this issue lies in understanding that menstruation is an experience unique to women and that it needs special care. Active attempts are needed to destigmatize it (Johnston-Robledo et al., 2013).

In another study on perceptions about menstrual leaves in the USA, 42% of 600 participants in a study said they'd support a leave policy. However, 49.3% of participants said the policy would have negative effects (Barnack-Tavlaris et al., 2019).

Tell about urbanization raised to participation of women employee in work place in unorganised sector, safety, clean toilet and availability of sanitary pads to women worker in organisation (Belliappa, April 2018).

Menstrual concept is not normalized in India and also lack knowledge about the safety and necessary of sanitary pads according to UNICEF (Bhattacharya A., June-2021).

In an effort to get rid of what it described the stigma around menstruation, Zomato announced last month that it was going to allow female and transgender personnel to take up to 10 days of paid "period leave" annually for give benefits to women worker to take care physical and mentally of health. (L.W., August 14, 2020).

The practice of promoting such a policy will redefine employee welfare. Proper legislation is needed to facilitate smooth implementation of the policy itself and achieve its true objectives. (Sanjana V et al., 2020)

OBJECTIVES OF THE STUDY

- 1) To study the need of menstrual leave through gender perspective.
- 2) To study the implications of menstrual leave.
- 3) To examine the employee perception of menstrual leave and its impact on wellbeing, productivity and equity in the workplace.
- 4) To provide suggestions for implementing policies, promoting both employee wellbeing and workplace fairness.

HYPOTHESES**Hypothesis 1**

H0: There is no significant difference between male and female employees' perception of whether menstrual leave will have a positive impact on the physical wellbeing of menstruators.

H1: There is significant difference between male and female employees’ perception of whether menstrual leave will have a positive impact on the physical wellbeing of menstruators.

Hypothesis 2

H0: There is no significant difference between male and female employees’ perception of whether menstrual leave will have a positive impact on the emotional wellbeing of menstruators.

H1: There is significant difference between male and female employees’ perception of whether menstrual leave will have a positive impact on the emotional wellbeing of menstruators.

Hypothesis 3

H0: There is no significant difference between male and female employees’ perception of whether menstrual leave will have a positive impact on the workplace productivity of menstruators.

H1: There is significant difference between male and female employees’ perception of whether menstrual leave will have a positive impact on the workplace productivity of menstruators.

Hypothesis 4

H0: There is no significant difference between male and female employees' perceptions of whether menstrual leave will lead to gender discrimination in the workplace.

H1: There is significant difference between male and female employees' perceptions of whether menstrual leave will lead to gender discrimination in the workplace.

RESEACH METHODOLOGY

Research Design

Research adopts quantitative study for quantifying data for statistical testing as well as qualitative study for deeper exploration of subjective experiences, social dynamics and complex issues.

Population and Sample

The study will focus on employees working in organizations. Random sampling technique is use. Total 109 samples are collected out of which 44 are male employees and 65 are female employees.

Data Collection Methods

Primary data has been collected through questionnaire using google form. Secondary data has been collected through research articles and journals.

Data Analysis Technique

The Independent Samples t- test is use for testing hypotheses. Along with this Levene’s Test for Equality of variance is use to assess whether variances between two groups are equal.

DATA ANALYSIS AND INTERPRETATION

Hypothesis 1

Descriptive Statistics

		Frequency	Mean	Std. Deviation	Minimum	Maximum
Physical Wellbeing	FEMALE	64	4.3	0.92	1	5
	MALE	45	4.49	0.89	1	5

Levene Test of Variance Equality

Test	F	df1	df2	p
Levene's Test (Mean)	0.73	1	107	.396
Brown-Forsythe-Test (Median)	1.18	1	107	.281

t-Test for Independent Samples

		t	df	p	Cohen's d
Physical Wellbeing	Equal variances	1.08	107	.281	0.21
	Unequal variances	1.09	96.49	.278	0.21

95% Confidence Interval of the Difference

		Mean Difference	Standard Error of Difference	Lower limit	Upper limit
Physical Wellbeing	Equal variances	0.19	0.18	-0.16	0.54
	Unequal variances	0.19	0.18	-0.16	0.54

Failed to Reject Null Hypothesis.

Therefore, there is no significant difference between male and female employees' perception of whether menstrual leave will have a positive impact on the physical wellbeing of menstruators.

Hypothesis 2

Descriptive Statistics

		Frequency	Mean	Std. Deviation	Minimum	Maximum
Emotional Wellbeing	FEMALE	64	4.19	1.08	1	5
	MALE	45	4.4	0.91	1	5

Levene Test of Variance Equality

Test	F	df1	df2	p
Levene's Test (Mean)	1.47	1	107	.228
Brown-Forsythe-Test (Median)	1.15	1	107	.285

t-Test for Independent Samples

		t	df	p	Cohen's d
Emotional Wellbeing	Equal variances	1.07	107	.285	0.21
	Unequal variances	1.11	103.33	.271	0.22

95% Confidence Interval of the Difference

		Mean Difference	Standard Error of Difference	Lower limit	Upper limit
Emotional Wellbeing	Equal variances	0.21	0.2	-0.18	0.6
	Unequal variances	0.21	0.19	-0.17	0.59

Failed to Reject Null Hypothesis.

Therefore, there is no significant difference between male and female employees' perception of whether menstrual leave will have a positive impact on the emotional wellbeing of menstruators.

Hypothesis 3

Descriptive Statistics

		Frequency	Mean	Std. Deviation	Minimum	Maximum
Workplace Productivity	FEMALE	64	4.34	0.89	2	5
	MALE	45	4.36	1.05	1	5

Levene Test of Variance Equality

Test	F	df1	df2	p
Levene's Test (Mean)	0.05	1	107	.829
Brown-Forsythe-Test (Median)	0	1	107	.95

t-Test for Independent Samples

		t	df	p	Cohen's d
Workplace Productivity	Equal variances	0.06	107	.95	0.01
	Unequal variances	0.06	85.07	.951	0.01

95% Confidence Interval of the Difference

		Mean Difference	Standard Error of Difference	Lower limit	Upper limit
Workplace Productivity	Equal variances	0.01	0.19	-0.36	0.38
	Unequal variances	0.01	0.19	-0.37	0.39

Failed to Reject Null Hypothesis.

Therefore, there is no significant difference between male and female employees' perception of whether menstrual leave will have a positive impact on the workplace productivity of menstruators.

Hypothesis 4

		Frequency	Mean	Std. Deviation	Minimum	Maximum
Gender Discrimination	FEMALE	64	2.64	1.45	1	5
	MALE	45	2.42	1.59	1	5

Descriptive Statistics

Levene Test of Variance Equality

Test	F	df1	df2	p
Levene's Test (Mean)	2.42	1	107	.123
Brown-Forsythe-Test (Median)	1.38	1	107	.242

t-Test for Independent Samples

		t	df	p	Cohen's d
Gender Discrimination	Equal variances	-0.74	107	.459	0.14
	Unequal variances	-0.73	89.34	.466	0.14

95% Confidence Interval of the Difference

		Mean Difference	Standard Error of Difference	Lower limit	Upper limit
Gender Discrimination	Equal variances	-0.22	0.29	-0.8	0.36
	Unequal variances	-0.22	0.3	-0.81	0.37

Failed to Reject Null Hypothesis.

Therefore, there is no significant difference between male and female employees' perception of whether menstrual leave will lead to gender discrimination.

CONCLUSION AND RECOMMENDATIONS

From study it is concluded that majority of males and females perceive menstrual leave will have positive impact on physical wellbeing, emotional wellbeing and workplace productivity. Also, half of male and female employees believes menstrual leave will not lead to gender discrimination. There is no significant difference in perception of male and female employees in all cases. This study clear that gender do not influence the perception about menstrual leave and its implication at workplace. Menstrual leave, at any discussion whether at parliament, legislative assembly or at court always standout with argument of potential gender discrimination. But in reality, gender discrimination or difference in beliefs about menstrual leave is just prejudice. Efforts should be taken to implement menstrual leave policy at national level for the betterment of both menstruator and non-menstruator as menstrual leave will keep menstruator emotionally balance as well will lift the morale and productivity which boost team spirit and enhance the organizational dynamics. Even flexible working can also

be taken into consideration as an option for menstrual leave for those organisations who cannot afford paid menstrual leave. While framing policy privacy concern should be taken into consideration as well as should try to include employees with medical conditions like PCOS and Menopause. Instead having separate menstrual leave, it can be added in sick leave and lapse monthly basis. There should be some or other provision without causing any biased to sustain in long run the workplace productivity and wellbeing of human resource.

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A STUDY ON THE CONSUMPTION PREFERENCES FOR SUSTAINABLE FASHION PRODUCTS AMONGST THE UNDERGRADUATE STUDENTS

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ABSTRACT

The paper tries to analyze the level of awareness, preferences, and challenges of adopting sustainable fashion among a sample group of undergraduate students between the age group of 17-22 years from various colleges in Mumbai. Findings The general level of awareness regarding sustainable fashion among the students was found to be very low; only a tiny proportion of the respondents stated having a high level of knowledge, and a big margin of ignorance prevailed over the age groups. Price and availability, followed by reservations over sustainability claims, are found to be the major deterrents. Willingness to pay a premium for sustainable fashion products is also shown to be gendered.

Preferred fast fashion: the barrier to adoption of sustainability - Preferable fast fashion is an obstacle towards sustainability. Affordability and trendy designs are key points toward increasing adoption, yet much education is required for the development of understanding and trust in sustainable practices. Thus, research results call for a targeted approach within the context of behaviors and challenges associated with demography to make sustainability fashion more accessible, affordable, and appealing. Such insights would enable policymakers, educators, and fashion brands to cultivate environmentally responsible consumption among young consumers.

Keywords- Sustainable fashion, consumption preference, awareness and challenges, undergraduate students

INTRODUCTION

The fashion industry is considered a global economic power, while at the same time directly affecting the environment and social life in some very relevant ways, for example by overusing natural resources as well as ethical labor behind it. So, against this backdrop, sustainable fashion emerged as an environmentally responsible, ethically produced clothing, and socially responsible fabric. Even though awareness has been increasing in the world, the young Indian consumers have not yet welcomed sustainable fashion.

The group of young undergraduate consumers will always be a fertile ground that can be harnessed to promote these sustainable fashion practices, inasmuch as their styles of dressing and consumption have always been different. Thus, the cosmopolitan fashion city like Mumbai is definitely the place where such an age group is highly diversified in its fashionable choices, but it is influenced in its embracement of this sustainable fashion by several issues, among them being lacking awareness, cost, or unavailability of sustainable products.

This study aims to understand the consumption preferences of undergraduate students regarding sustainable fashion in Mumbai. It will measure the level of awareness, analyze the determinants of the factors behind their preference, identify barriers to adoption, and determine willingness to pay a premium for such products. The purpose of this study is to provide useful information about these issues that inform strategies on how better improvement of awareness and adoption may be made.

REVIEW OF LITERATURE

Gazzola et al. (2020) believe that cultural and economic aspects make Gen Z females the most aware of sustainability in fashion, but sustainability would benefit a brand, and future research should consider varied demographics, longer-term impacts, and cross-cultural perceptions.

Bertola & Colombi, (2024) studied consumer behaviour for sustainable fashion and according to them attitudinal, values, and access have been identified as the critical drivers of sustainable fashion consumption. Reporting on consumer education and the collective efforts of the apparel industry toward environmental impacts, they underline it.

Heggem and Reistad (2020) analyzed the sustainable attributes effect on attitudes and purchasing intention of affordable luxury fashion among Millennials and Gen Z. The product-related sustainability increased the perceived quality, social value, and purchase intentions. The mentioned attributes may strengthen brand loyalty in the young environmental-friendly consumer.

Laitala, K., Boks, C., & Klepp, I. G. (2015) emphasized strategies in designing garments for longer use to enhance sustainability. They selected 620 garments and identified size and wear as the main reasons for

disposal, and concluded that style had lesser influence. The authors noted that there should be better technical quality, fit, repair facilities and consumer education to care for the garment for minimum environmental damage. Some ideas creatively discussed in the paper are body scanning, elastic fitting of the garment which will help its wear for some time.

Ndofirepi & Matema (2019) applied the Theory of Reasoned Action in determining green purchasing behavior among Zimbabwean students. Of the 284 participants that were surveyed, results indicate environmental attitudes and knowledge on green products as the strongest predictors of making such purchases. There was encouragement through positive attitudes and knowledge. The article identifies green marketing strategy and thus should be able to conduct researches in cutting the cost associated and improving the green product availability.

RESEARCH GAP

Such is indeed a really large gap in terms of knowing demographic factors, specifically in undergraduates, in setting up awareness and adoption. Such barriers as costs, access, and cultural influences are understated. The impact of awareness of sustainability on purchase behavior and willing-to-pay-premium for greener goods have hardly been understood. It takes hard work to accept innovative solutions, and bringing an interdisciplinary education approach with regard to marketing and behavior can bring down such gaps.

OBJECTIVES OF THE STUDY

1. To evaluate undergraduate students' awareness level of sustainable fashion
2. To analyze the factors influencing undergraduate students' preferences for sustainable fashion products and the limitations they encounter in adopting sustainable fashion.
3. To assess the willingness of undergraduate students to pay a premium for sustainable fashion products.

HYPOTHESES

Hypothesis 1

- **Null Hypothesis (H₀):** Undergraduate students' awareness levels of sustainable fashion do not vary significantly across age groups.
- **Alternative Hypothesis (H₁):** Undergraduate students' awareness levels of sustainable fashion vary significantly across age groups.

Hypothesis 2

- **Null Hypothesis (H₀):** There is no significant difference in the willingness to pay a premium for sustainable fashion products between male and female students.
- **Alternative Hypothesis (H₁):** There is a significant difference in the willingness to pay a premium for sustainable fashion products between male and female students.

RESEARCH METHODOLOGY

The researcher used a mixed-method approach by applying both quantitative and qualitative analysis. The data were collected using a structured questionnaire to find out awareness, preferences, challenges, and willingness to pay for sustainable fashion. Percentage calculations were used to determine trends, and statistical software called Stastisy was applied to test hypotheses and relationships.

Target Population

The target population was students from various colleges in Mumbai, aged between 17 and 22 years old.

Sample Technique

The researcher collected data using a non-probability method of sampling (Convenience Sampling). Moreover, the respondents were chosen considering the accessibility, targeting the students.

Sample Size

The study carried out an analysis of 178 undergraduate students from Mumbai.

SIGNIFICANCE OF THE STUDY

This paper examines the awareness of sustainable fashion among undergraduate students and the challenges they face, particularly in Mumbai. Such research is a goldmine of insights for policymakers, educators, and brands on designing targeted initiatives. Findings regarding the willingness of students to pay a premium can guide firms in positioning eco-friendly products and encouraging sustainable consumption patterns.

DATA ANALYSIS AND INTERPRETATION

A. Descriptive Analysis

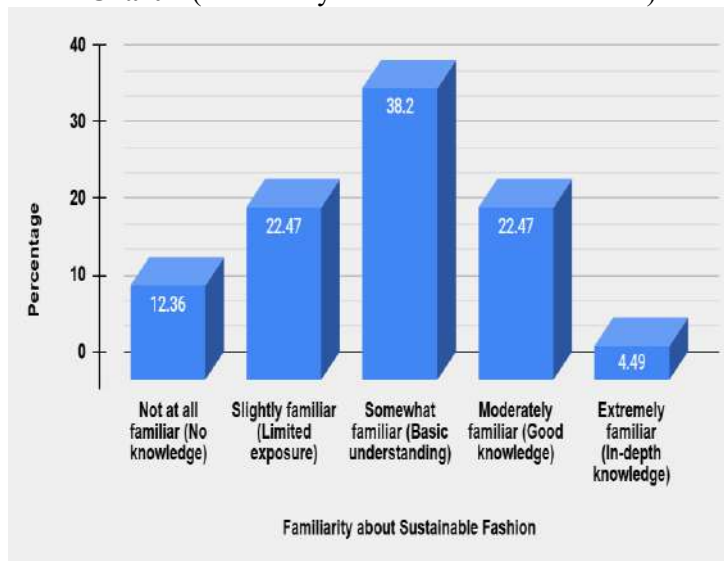
Table: 1 Demographic Breakdown of Monthly Spending by Gender and Age Group

Gender	Age Group	Monthly Spending				Total
		Less than ₹1,000	₹1,000 - ₹3,000	₹3,000 - ₹5,000	₹5,000 or more	
Female	17-18	24	13	11	0	48
	19-20	22	20	7	4	53
	21-22	3	6	3	3	15
Total		49	39	21	7	116
Male	17-18	10	7	0	3	20
	19-20	16	6	1	4	27
	21-22	5	2	5	3	15
Total		31	15	6	10	62

Source: Compiled from Primary Data

The analysis shows gender-based spending differences. Women, especially in the 17-20 age group, mainly spend under ₹1,000 or ₹1,000-₹3,000, with few in the ₹5,000+ category. Men, however, spend predominantly under ₹1,000, with low participation in higher brackets. Women are more likely to spend ₹5,000 or more.

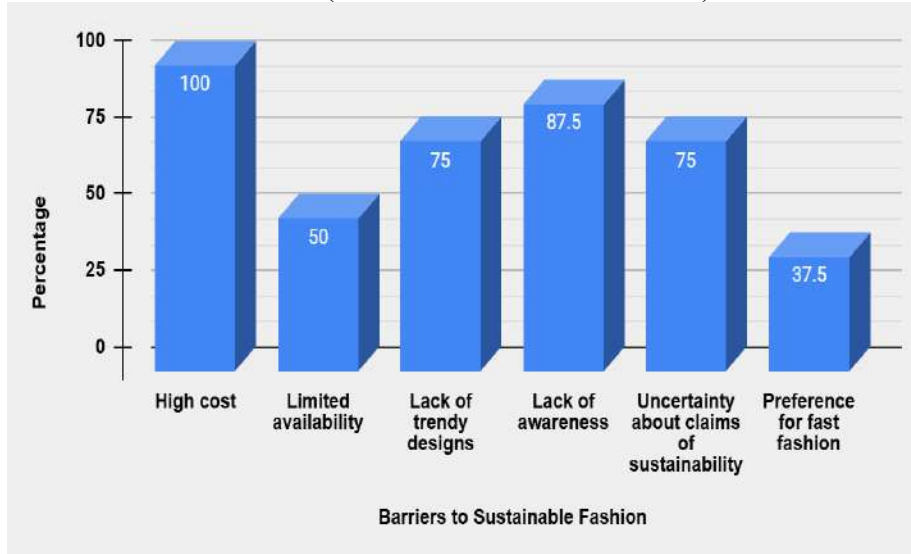
Chart 1 (Familiarity about Sustainable Fashion)



Source: Primary Data

Most respondents lacked understanding of sustainable fashion, which translates to "somewhat familiar" for 38.2 percent and "slightly or moderately familiar" for 22.47 percent while only 4.49 percent are knowledgeable on the aspect; hence more education and awareness needs to increase with deep knowledge understanding of sustainability practice and their advantages.

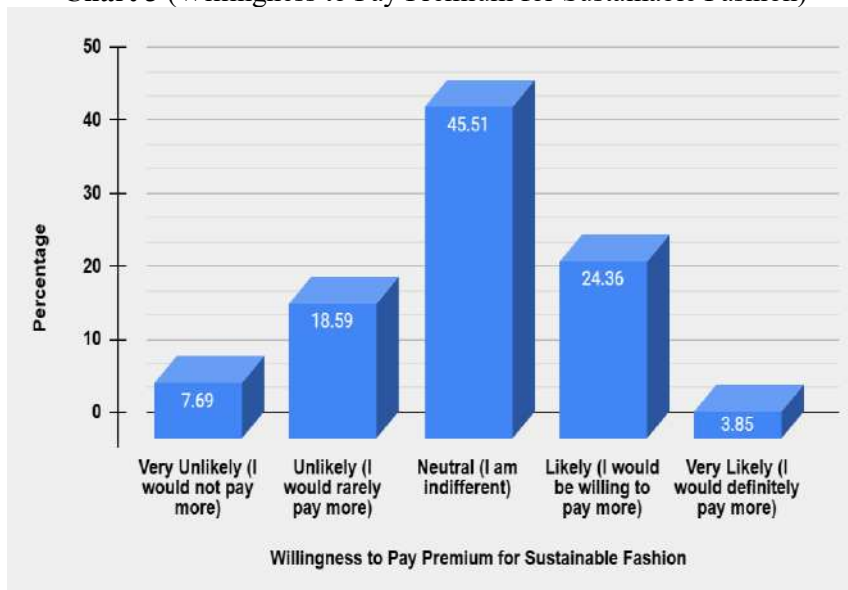
Chart 2 (Barriers to Sustainable Fashion)



Source: Primary Data

The most critical reason against the uptake of sustainable fashion is the cost, with other factors including the unavailability of the products (50%), unappealing designs (75%), awareness about sustainability (87.5%), uncertainty regarding sustainability claims (75%), and consumer preferences for fast fashion at 37.5%.

Chart 3 (Willingness to Pay Premium for Sustainable Fashion)



Source: Primary Data

Mixed responses on the willingness to pay more for sustainable fashion, where 45.51% of respondents are indifferent and need education and incentives, 24.36% of them are willing to pay more, and 26.28% of respondents are unlikely to pay more. Affordability is the biggest barrier to sustainable fashion.

B. Inferential Analysis

Table No. 2 Hypothesis Testing (Chi²)

Metric	Value
Test Statistic (Chi ²)	22.46
P-value	0.004
Significance Level (α)	0.05

Chi-square test showed a statistically significant difference between age groups for sustainable fashion awareness. The calculated statistic is 22.46 with the p-value 0.004 that is smaller than our selected level of significance at 0.05. Thus, we reject the null hypothesis and accept the alternative one: that indeed, the age groups significantly vary in awareness.

Table No. 3 Hypothesis Testing (Mann-Whitney U Test)

Metric	Value
Mann-Whitney (U)	2114
P-value	0.024
Significance Level (α)	0.05

The Mann-Whitney U test results show a significant difference in willingness to pay a premium for sustainable fashion between genders. With a U value of 2114 and a p-value of 0.024 (below the 0.05 significance level), we reject the null hypothesis and accept the alternative hypothesis (H_1), indicating a gender-based difference in willingness to pay.

FINDINGS

1. Education Level

- 41.01% freshers, 27.53% second-year undergraduates, 31.46% third-year undergraduates. Well-represented by all classes of years.

2. Area of Residence

- 59.55% from cities (South & Central Mumbai), 40.45% from towns (Western & Eastern Suburbs). Urbanites comprise more population.

3. Sources of Information about Sustainable Fashion

- Social Media: 32.69% at times, 23.08% often.
- Friends/Family: 33.33% at times, 32.05% sometimes.
- Television/Movies: 32.69% at times.
- Educational Institutions: 30.77% at times.

4. Discussion of Sustainable Fashion

- 42.31% hardly ever discuss, 26.92% at times.

5. Factors Affecting Preference for Sustainable Fashion

- Price: 41.03% very important.
- Quality: 58.97% very important.
- Environmental Impact: 32.05% important, 26.92% extremely important.
- Trendiness: 37.82% important, 21.15% extremely important.
- Ethical Labor Practices: 28.85% important, 23.72% extremely important.

6. Frequency of Purchasing Sustainable Fashion

- 50.64% purchase occasionally, 17.95% purchase every few months, 20.51% purchase once a year, 5.77% purchase monthly.

7. Types of Sustainable Fashion Products Purchased

- Clothing: 83.11% purchase.
- Accessories: 68.92% purchase.
- Footwear: 68.92% purchase.
- Outerwear: 49.32% purchase.
- Jewelry: 45.95% purchase.

8. Checking for Sustainability Certifications

- 41.22% sometimes look, 29.05% seldom look, 13.51% never look, 2.70% always look.

SUGGESTIONS AND RECOMMENDATIONS

1. Increase Awareness and Education:

Workshops, seminars, and collaborative events with schools and media to introduce sustainable fashion to people increase awareness and education

2. Solve Price Issues:

Low-cost substitutes, subsidies, and discounts on sustainable fashion.

3. Increase Availability and Design Diversity:

Increase availability and add more sustainable designs to online sites as well as physical shelves Increase trendy, varied designs that are appealing to the younger buyer.

4. Establish Trust in Claims of Sustainability

Supply chain transparency and labeling build the trust of a consumer in a claim of sustainability.

5. Differential Marketing for Gender-based Preferences:

Create marketing communications focused on a more affordable item to appeal to a man's sensibilities or an ethically conscious, premium-priced alternative that appeals to the woman.

6. Encourage Behavioral Change:

Campaigns and social media use influencers for encouraging consumers to abandon their fast-fashion mentality and select sustainability.

7. Leverage Urban and Suburban Insights:

Design campaigns for urban areas while also considering suburban demographics to expand the reach of sustainable fashion.

8. Add Certification Checks

Encourage consumers to look for certifications like Fair Trade or Organic Cotton to ensure product sustainability.

LIMITATION OF THE STUDY

The research suffers from geographical location, a sample size, and convenience sampling; hence, bias may be embedded in the outcome. The study only represents the time of investigation and might not reflect changing trends. More light could be brought to the findings through in-depth interviews or focus groups.

FOR FURTHER RESEARCH

The following can be proposed as the scope for subsequent studies:

1. The future study could extend to various cities or states throughout India to help generalize the findings.
2. It could also cover a larger demographic to have a more in depth understanding of various factors responsible for sustainable fashion, its challenges or barriers to adoption.
3. Lastly, it could also study the long term diversification in consumption with the rising awareness about sustainable fashion including various factors responsible for the varied purchasing decisions over time.

CONCLUSION

This study concludes that although undergraduates today have increasing awareness in terms of sustainable fashion, there remain considerable gaps between such knowledge and willingness to embrace it fully. Major barriers lie within unaffordability, limited availability, and skepticism toward sustainability claims. A difference was identified among genders and even age groups in willingness to pay a premium for such clothes. Education, affordability, transparency, and inclusiveness are needed to induce broad acceptance. Environmental and ethical benefits to brands, policymakers, greater access, and tailor-made strategy to various segments of consumers in the adoption of sustainable fashion with the aim of a balance between sustainability, affordability, and style.

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A STUDY ON IMPACT OF SOCIAL MEDIA INFLUENCERS ON CONSUMER BUYING BEHAVIOUR OF YOUTH FOR COSMETIC PRODUCTS

Ms. Savina Shenoy¹ and Dr. Vijetha Shetty²¹Research Scholar, Vivek College of Commerce, Mumbai.²Principal, Vivek College of Commerce, Mumbai.**ABSTRACT**

Today Social Media Influencers has become very popular and an integral part of enhancing any brand or any organisation, as it helps in enhancing reputation of a brand and has a huge impact on minds of consumers buying behaviour. Social Media Influencers are important for brands because it helps increase visibility, credibility, and trust; creates emotional connections with consumers; differentiates the brand; influences consumer behaviour; and provides social proof and validation, ultimately contributing to the brand's success and growth. Celebrities often embody qualities such as success, glamour, or talent that consumers aspire to or admire.

This research study focuses on the Social Media Influencers and its impact on the customer's buying behaviour of cosmetic products and their perception regarding the product or brand of the company. A qualitative method is used in this research in order to investigate the impact of Social Media Influencers on buying behaviour. The trends in online advertisements have drastically changed and so the buying behaviour of consumers. Finally, the results of the study further proved that there is a significant impact of Social Media Influencers on the buying behaviour of customers.

It is concluded that Influencers promoted advertisements are more attractive for consumers than the non-promoted advertisements as they get easily attracted to online Social Media posts and Brand Image displayed by Social Media Influencers with regards to cosmetic brands.

Keywords: *Social Media Influencers, Celebrity attractiveness, Influencer credibility, Brand image, Buying behaviour, Youth, Cosmetics.*

INTRODUCTION

The cosmetic industry is one of the fastest growing industries in India. The growth in this industry is driven by various factors such as increasing consumer awareness about personal grooming, branding, social media exposure and all of this coupled with increased disposable income. Also, India is a major hub for Social Media influencers, which have played a vital part in the country's advertising and marketing environment. Local personalities can develop into outstanding salespeople. Giving the world a familiar and well-known face is said to be the quickest and safest way for brands to establish an association and link with their customers' minds.

Many people look up to influencers as idols, and they want to emulate them by trying out things that have a celebrity touch since it makes the product more appealing and desirable. In the realm of advertising, such endorsement is thought to be the most useful strategy for making a product stand out from the competition. When consumers see an influencer promoting a product, that product gains credibility because of various factors including trust, relatability, etc. These influencers do not have to be international superstars, but they should be exceptionally well-known to their target demographic.

In the digital age, social media has transformed marketing strategies, particularly in the cosmetic industry, where influencer marketing has emerged as a powerful tool to shape consumer behaviour, especially among youth. The impact of social media influencers on consumer buying behaviour can be observed through various examples. Huda Beauty, founded by Huda Kattan, gained immense popularity due to her authentic makeup tutorials and product reviews, resulting in a loyal customer base. Similarly, James Charles's collaboration with Morphe Cosmetics for the "James Charles Palette" was a massive success, driven by his influence and reach on social media. These instances highlight how influencers can effectively engage consumers and drive sales in the competitive beauty market.

A variety of influencers have emerged in this sector, including celebrities, micro influencers with smaller but very active fan bases, macro influencers with larger fan bases, and nano influencers with a tiny but very specialised fan base. As influencer marketing has grown in popularity, agencies, platforms, and tools have been developed to help marketers find the right influencers and oversee influencer campaigns.

RESEARCH OBJECTIVES:

1. To understand the concept of influencer marketing and its prevalence.
2. To investigate how consumer purchasing intentions are impacted by recommendations from influencers.
3. To examine how different social media platforms impact customer engagement and purchasing patterns.
4. To investigate the ways in which consumer behaviour is influenced by influencer content format.

METHODS OF SURVEY

The current study is an exploratory investigation, and the data used in it came from secondary sources, such as different publications, research articles, websites, etc. from Educational Institute's journals, Newspapers, Magazines and Journals, Various reference books, and Websites.

LITERATURE REVIEW

According to Clark and Horsman (2003), customers are more likely to buy products sponsored by celebrities than those that are not because they believe that things endorsed by celebrities will be of more value to them. Using celebrities in marketing communications is a highly common strategy used by large companies to maintain their brand image for their products.

Andrew Mc Dougall's (2010) research, the primary cause of the cosmetics industry's expansion is that people's obsession with appearance has led them to spend more money on cosmetics.

Vanessa Apaolaza (2010), the main reason why individuals purchase cosmetics is emotional need. Their need to appear beautiful was the primary element influencing their behaviour. Also consumer satisfaction was significantly impacted by both the emotional and practical aspects of cosmetic brands. The greatest impact was seen when the brand strengthened positive emotions by removing feelings of worry and guilt about taking care of one's appearance and by fostering a sense of self-care.

De Vries L., Gensler, S., & LeeFlang, P. S. (2012) conducted a study on the use of social networking sites for marketing. Approximately half of social media users followed brands in 2011. The global web indicates that businesses are investing more in social networking.

Yi Li, Yangying Peng (2021) they claimed that, there is a connection between an influencer's attitude and the conviction and originality of the argument they support. Customers also utilise the influencer's homophily as a criterion when deciding whether to trust them and start purchasing the goods they recommend.

Misshka Gupta (2021) discovered that influencer marketing significantly affects and has a strong hold on consumer purchasing decisions. Customers were found to benefit from learning about the brands, goods, and related sales and promotions. It forced them to research market trends, options, and product evaluations before making a purchase. The study came to the conclusion that during the pandemic, influencer marketing had a significant impact on consumer purchasing behaviour.

Jana Gross and Florian von Wangenheim (2022) suggested that social media users' involvement with sponsored posts was explained by both the content and SMI's features. They investigated the viability of influencer marketing tactics and the impact of content attributes on social media engagement, and they recommended implementing various advertising appeals in accordance with the SMIs. This study examined 64,438 Instagram posts using a field data technique with an emphasis on sports, lifestyle, and health.

Ruchi Katendra and Dr. Manoj Kumar Sahoo (2023) reported that influencer marketing leads to improved brand perception and increased sales among young consumers. These results suggest that while influencer marketing is effective in influencing youth purchasing behaviour in cosmetics, brands must prioritize transparency and authenticity to maintain consumer trust. In conclusion, this study aims to provide a comprehensive understanding of how social media influencers shape consumer buying behaviour among youth in the cosmetic industry, highlighting both opportunities and challenges faced by brands in this evolving landscape.

How Social Media Influencers influence on Purchasing Decisions of Youth?

According to Research article by Jocelyn Gecker in AP news on 31st August, 2024, Young girls, some as young as ten, are increasingly drawn to anti-aging products promoted by influencers on platforms like TikTok and YouTube. This trend has led to a rise in the purchase of skincare items that may not be suitable for their age, with many experiencing adverse effects such as rashes and chemical burns due to using products designed for adults.

A report by NielsonIQ on LinkedIn indicates that consumers under 14 accounted for 49% of drugstore skincare sales in the previous year. Additionally, households with teenagers and preteens are spending more on skincare than the average American household, illustrating the substantial market influence of this demographic. Research also shows that social media influencers significantly shape the purchasing intentions of youth by driving interests and purchasing decisions for cosmetic products.

Psychological Impacts of SMI's on Youth

The fixation on achieving idealized beauty standards, often perpetuated by influencers, has raised concerns among parents and psychologists regarding its impact on young girls' mental health. Many report feelings of anxiety, depression, and lowered self-esteem as they compare themselves to the curated images presented online. For many adolescents, engaging in skincare routines becomes a means of social bonding and fitting in with peers. The desire to emulate influencers leads to a sense of belonging within a community that values appearance, further reinforcing consumer behaviour.

Purchase Intention

The fundamental goal of marketing and advertising campaigns is to encourage customers to buy the company's products. The possibility of a buyer purchasing the advertised beauty product improves with increased buying willingness. According to Osei-Frimpong et al. (2019), the likelihood that customers would make a purchase is a critical component in evaluating the effectiveness of celebrity endorsements. When a celebrity or influencer appears in a commercial, the consumer's opinion of the brand, the advertisement, and the celebrity all influence whether or not they intend to buy (Thangavel et al., 2021). This study investigated how these attributes affect the purchasing of particular beauty items in advertisements by female millennials, as young people are typically the most influenced by celebrities' life.

According to Centeno and Wang (2017), individuals who are interested in celebrities' lives are more likely to make purchases. However, youth culture may take unexpected turns for celebrities, such as purchasing cheaper goods with a proven track record due to brand devotion or initiating viral trends that parody either the quality or price of their products (Dalziel and De Klerk, 2021). Furthermore, mutual vulnerabilities and the linkage of a good with an identifiable source allow for actual involvement during online review procedures on social media, unlike similar presentations on television or other marketing methods (Abdaziz et al., 2019).

Influencers

Those who use multiple social media platforms at once, such as Instagram (known as Instagrammers), YouTube (known as YouTubers), Twitter (known as Tweeters), and various professional and/or business bloggers, are known as influencers, in contrast to mainstream celebrities (Brooks et al., 2021). According to Ahmed et al. (2015), influencers use their emotional or mental appeal to persuade others to buy products through advertising. However, customers' responses will be significantly influenced by how well the endorser communicates the marketing message. A study conducted on micro-celebrities revealed that customers and influencers appeared to be in close communication (Mohamad, 2021). They achieve this in a number of ways, such as by uploading photos that have been left unaltered or very slightly altered, asking for criticism on their posts so they may be improved, or showcasing how relatable they are as everyday people who face difficulties.

Importance and Impact of Social Media Influencer on Youth

1. Social media Influencers (**SMI's**) engage with customers in real time and also on social media platforms through some contests or offers which is vital for nurturing brand loyalty. Hence Cosmetic companies should actively monitor their social media platforms and respond quickly to comments, messages, and mentions. This level of responsiveness help Youth feel valued and appreciated, deepening their emotional connection to the brand.
2. SMI's create a community around cosmetic brands which can significantly enhance customer loyalty. By establishing spaces for Youth to interact—such as forums or social media groups—brands promote a supportive environment where Youth feel included. This sense of belonging encourages repeat purchases and advocacy among community members.
3. SMI's often represent a certain lifestyle or image that is aspirational for the youth. Seeing their favourite SMI's endorse cosmetics can create a desire to emulate their style and beauty choices, leading to an increased interest in purchasing similar products.
4. SMI's are seen as trendsetters in the beauty industry. Their endorsement of cosmetic products can build trust and credibility among consumers, including the youth, who may view SMI's as experts or authority figures when it comes to beauty and fashion. The youth may be influenced by SMI's endorsements to stay on top of

the latest beauty trends and incorporate popular products into their own beauty routines to keep up with the current fashion standards.

5. SMI's can create an emotional connection with consumers, including the youth. Watching at them, they admire endorse a cosmetic product can evoke positive emotions and excitement, making them more inclined to purchase the product to feel closer to their favourite star.
6. SMI's provide social proof and validation for cosmetic products. When a youth sees a SMI, they admire using and endorsing a product, they may perceive it as a stamp of approval, leading to a sense of validation and assurance that the product is worth purchasing.
7. SMI's have a wide reach and visibility across various media platforms, including social media. Their endorsement of cosmetic products generates awareness and exposure among the youth, increasing the visibility of the brand and creating buzz around the products they promote.

KEY FINDINGS

According to Zimo Shi in his research paper titled "**Discovering the Impact of Chinese Social Media Influencers on Generation Z Consumer Behaviour**" focuses on young Chinese consumers and identified four main factors affecting their purchasing decisions influenced by social media: expertise of the influencer, informative advertising, brand admiration, and social media interaction. According to a study published in the Journal of Public Relations and Advertising, 59% of respondents indicated that they are influenced to buy makeup products when advertised by social media influencers. Additionally, 72% stated that their purchase decisions are swayed when influencers explain the pros and cons of products clearly. The same study found that 91% of participants agreed that influencer advertising has positively impacted sales for brands like Nykaa, demonstrating the effectiveness of influencer marketing in driving consumer engagement and sales in the cosmetics sector.

CONCLUSION AND RECOMMENDATION

The results indicate that SMI's have a reasonable impact on youth's attitudes and buying intentions. In the findings of this research, Social Media Influencers has been shown to be a causal element as well as an impactful one. Youth's perceptions of the promoted goods are influenced, though not greatly, by physical attractiveness, dependability, knowledge, and the celebrity's alignment with the advertisement. To sum up, brand endorsements have the potential to raise brand recognition, effectively and efficiently reach the target market, foster a favourable perception of the brand, convey a marketing message, garner quick attention, and generate revenue.

Purchasing intentions were positively impacted by celebrity endorsement. This is the reason why one of the best strategies for launching a sustained brand development effort was celebrity endorsement. The study's conclusions included the idea that choosing celebrity endorsers who possess the appropriate qualities is essential to the effectiveness of celebrity sponsorship. The reason for this is because celebrity endorsements have the power to establish and uphold the brand's and product's value and image. The marketplaces also need to comprehend the connections among competence, dependability, and appeal. Finally, before the endorsement occurs, the company needs to give it careful thought and conduct enough study.

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A STUDY ON EVALUATING THE DETERMINANTS OF WORK ENGAGEMENT OF MEDICAL REPRESENTATIVES

¹Dr. Kuldeep Sharma and ²Sudeep Talukdar¹Assistant Professor, K.P.B Hinduja College of Commerce, Mumbai.²Research Scholar, K.P.B. Hinduja College of Commerce, Mumbai.**ABSTRACT**

Medical representatives are essential intermediaries in communicating critical medical information and promoting pharmaceutical goods, as a link between healthcare practitioners and pharmaceutical corporations. Medical representatives' work engagement affects their productivity and job happiness and the success of marketing campaigns, client interactions, and company objectives. The purpose of conducting this research is to evaluate the determinants of work engagement of medical representatives. The technique used in this study is SEM. The findings of the study indicated that there is a significant impact on Work life balance, compensation, leadership, training and development and work environment on work engagement.

Keywords: *medical representatives, work engagement, job engagement.*

1. INTRODUCTION

It is impossible to separate human resources (HR) from an organisation, its structures, or its businesses. They are that crucial. Fundamentally, human resources are people who work for an organisation as planners, strategists, and mover-movers to accomplish the organization's objectives. The goal of government human resources management is to maximise public sector workers' productivity in areas including organising, regulating, planning, and supervising. The success or failure of providing quality service in government institutions largely depends on their human resource management (Jufrizen 2023). One of the things that rivals cannot copy or duplicate is employees as human resources. It's also regarded as one of the most valuable assets in the right hands. Employee engagement is a focal point of one method of human resource management. The way workers feel about their job and the organisation they work for is known as employee engagement (Noercahyo et al., 2021). Accordingly, researchers concentrated on finding the management actions that promote increased employee engagement as predictors of employee engagement. Transforming the substantial corpus of empirical data based on the "job-demand-resource (JD-R) model" into practical solutions to promote work engagement is now a popular theme in engagement research (Mazzetti et al., 2021). "A positive, fulfilling, work-related state of mind that is characterised by vigour, dedication, and absorption" is how Schaufeli et al. (2002) described engagement (p. 74). Schaufeli (2006) describes absorption as "the state of being focused and absorbed in one's work, dedication as the state of being deeply involved in one's profession and feeling a sense of analytical significance, excitement, and challenge, and strength as an ability to work with considerable energy and mental fortitude." For this research, this explanation of work engagement is acceptable, and the employed engagement measure is grounded in implementing engagement.

1.1 Definition of Medical Representatives

According to Al-Areefi et al. (2013) and Zhang (2019), "a medical representative is a business staff member of a pharmaceutical enterprise who acts on the enterprise's behalf and is in charge of interacting with medical personnel, providing pertinent information about the efficacy and safety of drugs, and gathering and sharing data."

MRs are specialists who market and sell businesses' medical products, such as prescription medications and equipment. They give diverse information regarding their firms' drugs to hospital doctors and general practitioners. (Chen. 2021).

1.2 Work Engagement

Work engagement requires finishing tasks associated with a vigorous, committed, and absorbed state of mind. Priyono et al. (2022) have identified work engagement as a predictor of outcome elements, including "organizational commitment, job satisfaction, and organizational citizenship behavior." Engagement is a key idea when it comes to excellent organisational behaviour. Heinitz et al. (2018) define positive organisational behaviour as the study and use of psychological capabilities and positive human resource attributes that may be successfully evaluated, fostered, and controlled to enhance performance at work.

1.2.1 Pharmaceutical Industry

Over the previous 20 years, the function of the chemist has significantly changed (Nguyen C. 2020). According to Nguyen C. 2020, the conventional function of medicine dispensing has evolved into a more knowledge-based

one that is applied in several contexts. Pharmacy career routes today include more advanced prospects including patient safety, public health, and health informatics, in addition to the product-oriented tasks of dispensing and distributing pharmaceuticals and pharmaceutical goods (Nguyen C. 2020, Al- Hasan, et al. 2020). Pharmacists can practise as experts in medicine in the pharmaceutical sector.

1.3 REVIEW OF LITERATURE

1.3.1 Jufrizen., Hazmanan, Khair. (2023). The research aimed to examine and assess how a person's job fit and career development impact the organisational citizenship conduct that arises from their work engagement. The results showed numerous noteworthy consequences, including: Organisational citizenship behaviour is greatly impacted by person-job fit; OCBC has a significant influence on job crafting; "person-job fit and job crafting" both have an impact on work engagement; and both factors have an impact on work engagement. The findings highlight the complex interactions between engagement at work, job fit, and job crafting in the context of the Medan Mayor's Office, as well as the overall influence of these factors on employees' organisational citizenship behaviour.

1.3.2 Elis, et al. (2023). The paper aimed to investigate the factors that influence nurses' job engagement, given its importance in promoting dedication and efficiency in the hospital environment. Numerous internal and external elements that affect nurses' work engagement were identified by the studies. Several characteristics, including moral satisfaction, supervision, and motivation, have been found to have a significant impact on how engaged nurses are.

1.3.3 Agustian, Zen. (2023). This scientific article's goal was to examine a large body of research from a variety of international publications to analyse the factors that affect employee motivation and engagement. The objective was to compile an overview of these factors and provide suggestions or insights into their importance in a study from the author's point of view. The evaluation process revealed that the variables put out by the author were dispersed over many international publications. Nonetheless, the conversation brought to light the dearth of thorough study findings that looked at these issues all at once.

1.3.4 Sutarno., Suprayitno. (2023). The study set out to investigate how lecturers' professional engagement is affected by their resources, particularly by hardiness elements like control, commitment, and challenges. The results showed that several personal resources, including difficulties, dedication, and control, had a big impact on job engagement factors. In particular, challenge had a major effect on vigour, while commitment had an impact on vigour and devotion. Not every aspect, though, had a substantial influence; challenge and control had no discernible effects on absorption or vigour or devotion, respectively.

1.3.5 Alexandra, Gkliati. Anna, Saiti. (2022). This study explores the psychological health of doctors working in Greek public hospitals, concentrating on job satisfaction and work engagement. It investigates these two features' levels and their interaction through empirical research. The results showed a significant positive relationship between job satisfaction and work engagement. Additionally, among doctors in this context, the study found that work engagement was a major predictor of intrinsic satisfaction and, to a lesser extent, a predictor of extrinsic pleasure.

1.3.6 Alissar et al. (2022). The study aimed to identify the factors influencing employee engagement in Lebanon's private healthcare sector. In order to investigate the association between "employee engagement and four independent variables, namely corporate governance, accountability, transformational leadership, and hospital values," the study used linear regression analysis. The information was obtained from many healthcare institutions in Lebanon. However, the study found no evidence of a significant correlation between hospital values and worker engagement. In spite of this, the research and the approach it proposes offer useful information for increasing employee engagement in the healthcare sector.

1.4 OBJECTIVES OF THE STUDY

1. To evaluate the determinants of work engagement of medical representatives
2. To give appropriate suggestions to pharmaceutical companies towards improvement of work engagement of medical representatives.

1.5 HYPOTHESES

Ha1: Work-life balance significantly impacts work engagement.

Ha2: Compensation significantly impacts work engagement.

Ha3: Leadership significantly impacts work engagement.

Ha4: Training and development significantly impacts work engagement.

Ha3: Work environment significantly impacts work engagement

1.6 RESEARCH METHODOLOGY

A standardized questionnaire was used to gather information from 215 Medical Representatives (The minimum necessary sample size is 200 at an effect size of 0.3, statistical power of 0.9, number of latent variables = 6, number of observable variables = 34, and probability level = 0.05). For this investigation, non-probabilistic purposive sampling was employed. For this study, primary and secondary data-gathering methods were employed. The structural equation model method was employed for this investigation, and SMART PLS was the analytical instrument.

Anticipated effect size: ?

Desired statistical power level: ?

Number of latent variables: ?

Number of observed variables: ?

Probability level: ?

Calculate!

Minimum sample size to detect effect: 200

Minimum sample size for model structure: 156

Recommended minimum sample size: 200

1.7 DATA ANALYSIS AND INTERPRETATION

Figure No: 1 SEM Model

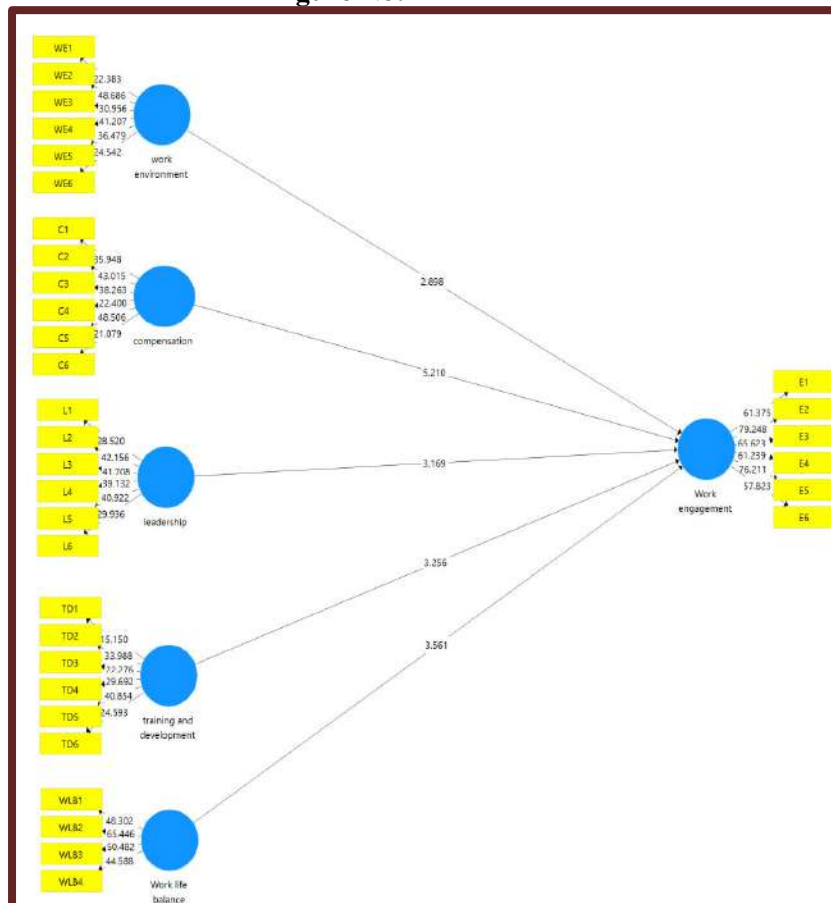


Table No: 1 Reliability and Validity			
Path	Cronbach's Alpha	Composite Reliability	AVE
Work Engagement	0.916	0.914	0.640
Work Life Balance	0.881	0.881	0.650
Compensation	0.841	0.841	0.472
Leadership	0.881	0.879	0.549
Training and Development	0.849	0.844	0.482
Work Environment	0.870	0.868	0.527

All the values of Cronbach's alpha > 0.7 indicate reliability of response and it is seen that composite reliability > 0.7 and AVE > 0.5 indicating convergent validity

Table No: 2 Discriminant Validity						
Path	WEN	WLB	C	L	TD	WE
Work Engagement	0.800					
Work Life Balance	0.241	0.806				
Compensation	0.351	0.256	0.687			
Leadership	0.250	0.053	0.202	0.741		
Training and Development	0.2449	0.083	0.248	0.170	0.694	
Work Environment	0.250	0.080	0.199	0.277	0.232	0.726

Square root of AVE > Correlation (r) thus it can be concluded that their exist an adequate discriminant validity.

Table No: 3 Hypothesis Testing			
Path	Beta Coefficient	t-statistics	P-Value
WLB → WEN	0.147	0.041	0.000
C → WEN	0.207	0.040	0.000
L → WEN	0.134	0.042	0.002
TD → WEN	0.123	0.038	0.001
WE → WEN	0.121	0.042	0.004

P (value) < level of significance 5% thus Ho is rejected and H1 is accepted in all the cases indicating significance.

Table No: 4 Summary of Hypothesis	
Alternative Hypothesis	Result
Ha1: Work-life balance significantly impacts work engagement.	Supported
Ha2: Compensation significantly impacts work engagement.	Supported
Ha3: Leadership significantly impacts work engagement.	Supported
Ha4: Training and development significantly impacts work engagement.	Supported
Ha3: Work environment significantly impacts work engagement	Supported

1.8 CONCLUSION

The results of this study highlight the complex relationships between many factors and work engagement in medical representatives' (MRs) professional life. Examining "work-life balance, compensation, leadership, training and development, and the work environment" in detail reveals that work engagement is a key component influencing the productivity, contentment, and general performance of MRs in the pharmaceutical sector. Work engagement is more than just a subjective indicator of motivation or passion; it captures the whole experience of MRs in their roles, including how supportive the organisation is, how well their personal values mesh with company goals, and how much room there is for advancement. The important role that works engagement plays as a driver for organisational success and long-term growth is shown by the substantial influence it has on important facets of the professional environment for MRs. It is crucial for pharmaceutical firms to prioritise and improve MRs' job engagement as they navigate a market that is becoming more competitive and dynamic.

1.9 SUGGESTIONS:

- Allow medical representatives (MRs) to work from home and have flexible hours to improve work-life balance, which raises employee engagement.
- Ensure that pay structures are competitive and fair and appropriately represent the efforts and contributions of MRs by reviewing and adjusting them on a regular basis.

- Invest in leadership development programmes to provide managers the tools they need to encourage and assist MRs, creating a happy workplace and raising employee engagement.
- Give MRs continuous training and development chances to improve their abilities, know-how, and self-assurance, which will increase their engagement and output in the end.
- Encourage an atmosphere of open communication so that MRs can freely share their thoughts, opinions, and concerns, building engagement and trust within the company.
- Create recognition and incentive programmes that acknowledge MRs' accomplishments and efforts, encouraging a sense of gratitude and drive to succeed in their positions.
- For helping MRs in striking a good work-life balance and improving their general engagement and well-being, invest in programmes like stress management seminars, mindfulness training, and wellness programmes.

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COMPARATIVE ANALYSIS OF HYGIENE AND CLEANLINESS STANDARDS: A STUDY OF MUMBAI'S SUBURBAN WESTERN AND CENTRAL RAILWAYS

Dr Hemant Bhatti¹ and Miss Sheetal Mishra²¹Assistant Professor in Accountancy, K.P.B.Hinduja College of Commerce, Mumbai.²Research Scholar, K.P. B. Hinduja College of Commerce, Mumbai.**ABSTRACT**

This study provides a comparative analysis of hygiene and cleanliness standards between Mumbai's Western and Central Railways, focusing on passenger perceptions and the effectiveness of maintenance practices. A structured survey was conducted with 193 respondents using a stratified random sampling method to ensure demographic representation. The survey employed a five-point Likert scale to evaluate key factors such as overall cleanliness, sanitation facilities, waste management, and the role of surveillance in promoting responsible commuter behaviour. Statistical analysis, including t-tests, revealed significant differences between the two zones. Western Railway consistently outperformed Central Railway, with higher ratings for cleanliness, better-maintained sanitation facilities, and more effective cleaning staff. The study also found that increased surveillance and monitoring significantly reduced littering and encouraged responsible waste disposal, with Western Railway showing greater effectiveness in implementing these measures. The findings underscore the importance of infrastructure quality, consistent maintenance, and commuter awareness in achieving cleanliness at railway stations. While Western Railway serves as a benchmark for best practices, the Central Railway requires targeted interventions to address gaps. The study offers actionable insights for railway authorities and policymakers, emphasizing the need for strategic investments and public awareness campaigns to sustain hygiene and cleanliness in urban transportation systems. These insights contribute to the ongoing efforts to improve commuter experiences and public health in Mumbai's suburban rail network.

Keywords: Passenger Perception, Surveillance, Waste Management, Sanitation Facilities, Public Transport.

INTRODUCTION

The Indian Railways, a cornerstone of the nation's transportation infrastructure, serves as a critical mode of mobility for millions of people across the country every day. Among its various networks, the suburban rail systems in metropolitan cities are the most heavily utilized, playing a pivotal role in the daily lives of urban populations. In Mumbai, often referred to as the "City of Dreams," the suburban railway system is nothing short of a lifeline. It facilitates the movement of approximately 7.5 million passengers daily, connecting the vast expanse of the city and its suburbs. Within this intricate network, the Western and Central Railways stand out as two of the most significant operational zones. For this study, the suburban Central Railway was defined as the stretch from Chhatrapati Shivaji Maharaj Terminus (CSMT) to Kalyan, while the suburban Western Railway was outlined from Churchgate to Virar, covering key nodes of Mumbai's suburban transportation.

Hygiene and cleanliness are not just indicators of infrastructural efficiency but are also reflective of public health priorities and commuter satisfaction. Clean railway stations enhance the travel experience and significantly contribute to mitigating health risks associated with poor sanitation. However, the vast differences in passenger densities, station layouts, geographic locations, and administrative approaches often lead to discrepancies in cleanliness standards across various railway zones (Ghosh & Ojha, 2017). Mumbai's Western and Central Railways, despite being part of the same city, exhibit contrasting characteristics in terms of their cleanliness and hygiene management practices.

The Western Railway, which runs along the western coastline of the city, encompasses major business districts, residential areas, and tourist attractions. In contrast, the Central Railway stretches through the heart of Mumbai, extending into the bustling central suburbs and beyond. Both railway networks face unique challenges related to waste management, availability of sanitation facilities, maintenance of station premises, and the effective enforcement of cleanliness initiatives (Ojha, Upreti, Malhotra, & Parasar, 2019). With the Swachh Bharat Abhiyan and other governmental cleanliness drives gaining traction, there has been a growing emphasis on ensuring cleaner and more hygienic public spaces, including railway stations.

This comparative study aims to deliver into the hygiene and cleanliness levels at the stations managed by the Western and Central Railways. It seeks to evaluate several critical aspects such as the efficiency of waste disposal systems, the availability and upkeep of restrooms and sanitation facilities, the regularity of cleaning activities, and the general perception of cleanliness among passengers. By examining these parameters, the study intends to identify differences, similarities, and best practices between the two railway zones (Islam, Ahmed, Anwari, Hadiuzzaman, & Amin, 2022).

Furthermore, the study will explore the roles played by various stakeholders, including railway authorities, cleaning staff, and the commuting public, in maintaining cleanliness standards. It will assess the effectiveness of existing policies and initiatives while highlighting areas that require improvement. The research will also take into account the perspectives of daily commuters, whose firsthand experiences provide invaluable insights into the on-ground reality of station hygiene (Narayanamurthy & Pereira, 2016).

In an era where public health is a global priority, understanding and addressing issues of cleanliness in high-traffic public spaces such as railway stations becomes even more crucial. This study not only aims to provide a detailed comparison but also aspires to contribute actionable recommendations that can enhance the overall cleanliness and hygiene of Mumbai's railway stations. The findings of this research are expected to serve as a valuable resource for railway authorities, policymakers, and urban planners, paving the way for a cleaner, healthier, and more commuter-friendly railway system in Mumbai (Mohan & Kulkarni, 2022).

Through this comparative analysis, the research will underscore the importance of sustained efforts and collaborative action in achieving cleanliness goals, ensuring that Mumbai's railway stations set a benchmark for hygiene and sanitation standards in urban public transport systems.

OBJECTIVES

1. To assess the current levels of hygiene and cleanliness at railway stations on Mumbai's Western and Central Railways.
2. To compare waste management practices and sanitation facilities between the Western and Central Railway zones.
3. To evaluate passenger perceptions and satisfaction regarding cleanliness at railway stations in both zones.
4. To identify the challenges faced by railway authorities in maintaining hygiene and cleanliness standards at stations.
5. To recommend actionable strategies for improving cleanliness and hygiene at Mumbai's railway stations.

HYPOTHESES

1. **H1:** There is a significant difference in the cleanliness levels of railway stations between Mumbai Western and Central Railways.
2. **H2:** Passenger satisfaction with hygiene and cleanliness is significantly higher in one railway zone compared to the other.
3. **H3:** Waste management practices differ significantly between Western and Central Railway stations, affecting overall hygiene.
4. **H4:** Enhanced surveillance of unhygienic practices by railway commuters has a significantly stronger effect on reducing littering and improving cleanliness in one railway zone compared to the other.

REVIEW OF LITERATURE

The significance of cleanliness and hygiene in public transportation systems has been extensively studied in various contexts, highlighting its impact on passenger satisfaction and public health. Chadha, Paliwal, Shaikh, and Kapruan (2022) conducted a critical review of quality management practices in Indian Railways, emphasizing the importance of station cleanliness, effective waste management, and commuter feedback in maintaining hygiene standards. Their on-ground survey of the Sabarmati diesel loco shed provided insights into the practical challenges faced by railway authorities in ensuring cleanliness.

Ghosh and Ojha (2017) focused on platform-based amenities at Kanpur Central Railway Station, linking passenger satisfaction to the availability and quality of sanitation facilities. Their study underscored the need for consistent maintenance practices and improved infrastructure to enhance commuter experiences. Similarly, Ojha, Upreti, Malhotra, and Parasar (2019) conducted a comparative analysis of passenger perceptions of service providers at railway platforms, revealing significant disparities in cleanliness standards across different railway zones.

Islam, Ahmed, Anwari, Hadiuzzaman, and Amin (2022) explored commuters' perceptions of intercity rail services, identifying cleanliness and hygiene as key determinants of a pleasant travel experience. Their findings align with those of Narayanamurthy and Pereira (2016), who highlighted the operational challenges faced by Indian Railways in maintaining hygiene amidst increasing passenger traffic.

In the context of Mumbai's suburban railway system, Gardas, Shimpi, and Mahajan (2013) conducted a case study on the value analysis of local trains, emphasizing the critical role of cleanliness in enhancing the efficiency and reliability of the transport system. Mohan and Kulkarni (2022) examined the stress and adaptation mechanisms of Mumbai local train commuters, identifying poor hygiene conditions as a significant stressor. Dean (2017) added a sociological perspective by exploring the informal behaviour's and gendered spaces within Mumbai's suburban railway system, linking these dynamics to cleanliness practices.

Abhyankar, Narayanmorthy, Ramachandran, and Mhapankar (2012) surveyed Mumbai suburban local train travellers, highlighting the impact of unhygienic conditions on commuter satisfaction and public health.

Collectively, these studies underline the critical importance of hygiene and cleanliness in enhancing the functionality and appeal of railway systems. They provide a foundation for exploring the comparative cleanliness standards in Mumbai's Western and Central Railways, emphasizing the need for comprehensive strategies that incorporate surveillance, passenger awareness, and infrastructural improvements to address the challenges of maintaining hygienic railway stations.

RESEARCH METHODOLOGY

This study employs a quantitative research approach to compare hygiene and cleanliness standards between Mumbai's Western and Central Railways. The geographic scope of the survey was carefully delineated to focus on the suburban railway network. For the Central Railway, the stations from Chhatrapati Shivaji Maharaj Terminus (CSMT) to Kalyan were selected, while for the Western Railway, the stations from Churchgate to Virar were included. These stretches represent key segments of the suburban railway system, ensuring a comprehensive understanding of commuter perceptions across both zones.

Data was collected through a structured survey administered to 193 respondents using stratified random sampling to ensure representation across various age groups, occupations, and genders. The survey included both closed-ended and open-ended questions, designed to capture passenger perceptions and experiences related to cleanliness, sanitation facilities, waste management practices, and the effectiveness of surveillance in promoting responsible commuter behaviour.

The survey utilized a five-point Likert scale (ranging from "Strongly Disagree" to "Strongly Agree") to measure satisfaction levels, perceived effectiveness, and commuter behaviour regarding cleanliness initiatives. Additional categorical and ordinal variables, such as frequency of litter observations and effectiveness of signage, were incorporated to provide a comprehensive assessment of the stations' hygiene conditions.

To ensure robust analysis, the collected data was subjected to descriptive statistics and inferential tests. T-tests were conducted to compare the average ratings for key cleanliness parameters between the two zones, identifying statistically significant differences. This methodology enables a nuanced understanding of how infrastructure, surveillance, and passenger awareness influence hygiene and cleanliness at railway stations, providing actionable insights for railway authorities and policymakers.

RESULTS AND FINDINGS

Variables	t-statistic	p-value	Significance
Overall Cleanliness	10.29	0.00	Significant
Sanitation Facilities	11.78	0.00	Significant
Effectiveness of Cleaning Staff	9.13	0.00	Significant
Surveillance Improves Cleanliness	10.96	0.00	Significant
Monitoring Encourages Responsible Disposal	12.40	0.00	Significant
Effectiveness of Signage/Announcements	12.41	0.00	Significant

INTERPRETATION OF FINDINGS

The analysis of the survey responses revealed significant differences in hygiene and cleanliness standards between Mumbai's Western and Central Railways. The results consistently demonstrated that respondents perceived better cleanliness and hygiene conditions in Western Railway stations compared to Central Railway stations. Key findings include the following:

1. **Overall Cleanliness:** Western Railway stations received significantly higher ratings for overall cleanliness (t-statistic = 10.29, p < 0.001), indicating that passengers perceive these stations as cleaner and better maintained.

2. **Sanitation Facilities:** Respondents from Western Railway zones rated the availability and maintenance of sanitation facilities significantly higher than those from Central Railway zones (t-statistic = 11.78, $p < 0.001$). This suggests superior infrastructure and upkeep in the Western Railway zone.
3. **Effectiveness of Cleaning Staff:** Passengers on the Western line expressed stronger agreement with the effectiveness of cleaning staff (t-statistic = 9.13, $p < 0.001$), highlighting a more visible and impactful presence of maintenance personnel.
4. **Surveillance Improves Cleanliness:** Respondents from Western Railway zones were more likely to agree that surveillance measures, such as CCTV cameras and monitoring staff, enhanced cleanliness (t-statistic = 10.96, $p < 0.001$). This underscores the role of increased vigilance in fostering cleaner environments.
5. **Monitoring Encourages Responsible Behaviour:** The perception that monitoring and surveillance encourage responsible waste disposal was notably stronger among Western Railway commuters (t-statistic = 12.40, $p < 0.001$), suggesting that the Western Railway zone has more effective mechanisms to discourage littering.

These findings highlight the impact of infrastructure, maintenance practices, and surveillance on perceived cleanliness standards. Western Railway's higher ratings across all metrics indicate its relatively better implementation of cleanliness and hygiene measures. In contrast, Central Railway zones may require focused interventions to address gaps in sanitation, cleaning staff efficiency, and surveillance effectiveness.

The results provide actionable insights for railway authorities. By adopting best practices observed in the Western Railway, Central Railway can enhance passenger satisfaction and create a cleaner and healthier commuting experience. Furthermore, these findings underscore the importance of regular monitoring, increased investment in sanitation infrastructure, and public awareness campaigns to sustain cleanliness efforts in both zones.

CONCLUSION

This study provides a comparative analysis of hygiene and cleanliness standards between Mumbai's Western and Central Railways, shedding light on critical differences in passenger perceptions and the effectiveness of maintenance practices. The findings reveal that Western Railway outperforms Central Railway across key parameters, including overall cleanliness, availability and maintenance of sanitation facilities, effectiveness of cleaning staff, and the role of surveillance in promoting responsible commuter behaviour.

The superior ratings of Western Railway stations highlight the importance of effective infrastructure management, consistent cleaning efforts, and the implementation of robust surveillance systems. These measures not only enhance passenger satisfaction but also contribute to creating a safer and more hygienic environment. Conversely, the relatively lower ratings for Central Railway underscore areas needing improvement, such as sanitation infrastructure, waste management practices, and monitoring mechanisms to discourage untidy behaviour.

This study underscores the pivotal role of commuter behavior, infrastructure quality, and administrative practices in maintaining hygiene and cleanliness at railway stations. By adopting the best practices observed in Western Railway, Central Railway can address its shortcomings and improve the commuting experience for passengers. The insights gained from this study are valuable for railway authorities and policymakers, emphasizing the need for targeted interventions, increased investments, and community awareness programs to achieve sustained cleanliness in Mumbai's suburban railway system.

Overall, the findings contribute to the broader discourse on urban public transport hygiene and highlight the significance of collaborative efforts between authorities and commuters in achieving cleaner, healthier, and more passenger-friendly railway stations.

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THE RISE OF FINTECH COMPANIES: DISRUPTING THE TRADITIONAL BANKING SECTOR

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In the past decade, emerging digital financial technologies, commonly referred to as "fintech," have begun to disrupt and transform the financial services industry. Fintech has radically transformed the financial landscape by disrupting traditional banking models. Fintech has facilitated easier access for consumers to more economical, personalized, and efficient financial services. Fintech firms are begun to penetrate areas such as payments, lending, and investment services that were before monopolized by conventional banks. This study will examine customer perceptions regarding the expansion of FinTech companies and their disruption of conventional financial institutions. The research project, grounded on social science, collects data from both primary and secondary sources. The data is analyzed using statistical techniques like percentage analysis, chi-square test, and one-way ANOVA. Payments and money transfers are expected to benefit the most from future fintech advances, according to the report, which highlights the disruptive potential of fintech in the financial sector.

Keywords: FinTech Companies, Financial Services, Financial Inclusion, Traditional Banking

INTRODUCTION

The finance sector has experienced a significant change in recent years worldwide due to the rise of FinTech companies. FinTech is changing the banking and finance sector with its cool services and technologies. Today, it comprises a wide range of services like wealth management, payments, investment banking, and others. The FinTech revolution in banking and financial services provides a challenge for traditional banks, which need to adapt in order to remain competitive. It gives fast and easy techniques to handle finances utilizing digital technologies such as software and applications. Today, there are many different FinTech software alternatives that help customers manage and access their funds simply while on the road.

Financial Technology (Fintech) has significantly transformed the game in finance, shaking up established banking practices in fundamental ways. Fintech makes it easier for users to acquire efficient, inexpensive, and customized financial services. Traditional banks used to dominate payments, lending, and investing services, but fintech companies are entering them. FinTech companies are growing and may transform banking.

What is FinTech?

Fintech combines the concepts of "financial" and "technology" into one term. It describes any application, software, or technology that enables individuals or companies to digitally access, manage, or understand their finances or conduct financial transactions. In the past ten years, more and more people have started using digital tools, which led to the rise of fintech. This development has helped consumers tackle financial challenges and work towards their financial goals. Consumers now depend on fintech for various purposes, including banking, budgeting, investments, and lending, along with its practical benefits in daily life. FinTech is about companies that provide financial services using digital technology. Instead of using traditional paper-based methods for finance and banking, FinTech provides digital options for financial products and services. Fintech companies really shake things up in the industry—they leverage technology to transform the way consumers engage with the financial sector.

OBJECTIVES OF THE STUDY

1. To understand the advantages of using fintech services over traditional banking services for customers.
2. To evaluate the relationship between respondents' acquaintance with fintech services and their intention to switch to a fintech company as their primary financial service provider.
3. To assess the effect of demographic variables on respondents' perceptions that fintech companies will enhance financial inclusion.

NEED OF THE STUDY

FinTech is changing the game with its innovative solutions that focus on customers. This shift is making people rethink their banking choices and is causing traditional banks to face challenges like higher operational costs and a smaller market share. This study is important because FinTech is changing the financial sector and has

significant effects on traditional banking. The research will look into consumer views regarding the rise of FinTech companies and how they are disrupting traditional banks.

LIMITATIONS OF THE STUDY

1. The sample size might not reflect the entire population, resulting in potential bias.
2. Respondents may provide socially acceptable replies rather than honest opinions, resulting in inaccuracy.
3. A cross-sectional study may overlook the long-term impact of FinTech on banking, necessitating additional research.

HYPOTHESIS

H₀: There is no significant relationship between respondents' familiarity with fintech services and their likelihood of switching to a fintech company as their primary financial service provider.

H₁: There is a significant relationship between respondents' familiarity with fintech services and their likelihood of switching to a fintech company as their primary financial service provider.

H₀: There is no significant relationship between demographic variables and respondents belief that fintech companies will improve financial inclusion.

H₁: There is a significant relationship between demographic variables and respondents belief that fintech companies will improve financial inclusion.

METHODOLOGY

Research Methodology	
Research Universe	Thane
Sample Size	51
Sampling Method	Convenient Sampling
Data Collection Method	Primary Data & Secondary Data
Data Collection Tool	Questionnaire
Data Analysis Tool	Percentage Analysis, One Way Anova, Chi-square Test

REVIEW OF LITERATURE

Shubham Kumar (2024), in his study analyzed how FinTech innovations are changing financial services, consumer experiences, and industry competition. Blockchain, mobile payments, and AI-driven analytics have made banking more personalized, affordable, and accessible. Traditional banks face increased competition and regulation while collaborating with FinTech to innovate. The study stressed the importance of collaboration, digital transformation, and customer contact to ensure sustainability and growth in changing technical and regulatory settings.

Michael Siek, A. Sutanto (2019), in their research examined whether fintech diversification has affected Indonesia's traditional banking system. The research paper used statistical hypothesis testing and regression analysis with convenient random sampling to assess fintech's impact on Indonesia's traditional banking sector. According to the report, Fintech companies' stronger value offerings, such as promotion and a large merchant base, threaten Indonesia's traditional banking sector.

Mbonigaba Celestin & N. Vanitha (2015), in their research examined the disruptive influence of financial technology (FinTech) on conventional risk models inside financial services. The study utilized a literature analysis to compare traditional banking risk frameworks with FinTech's data-driven algorithms and machine learning models. The research revealed that although FinTech offers inclusive financial services, it requires sophisticated cybersecurity safeguards and regulatory supervision to prevent risks.

DATA ANALYSIS AND INTERPRETATION

Table No. 1: Personal Profile of the Respondents

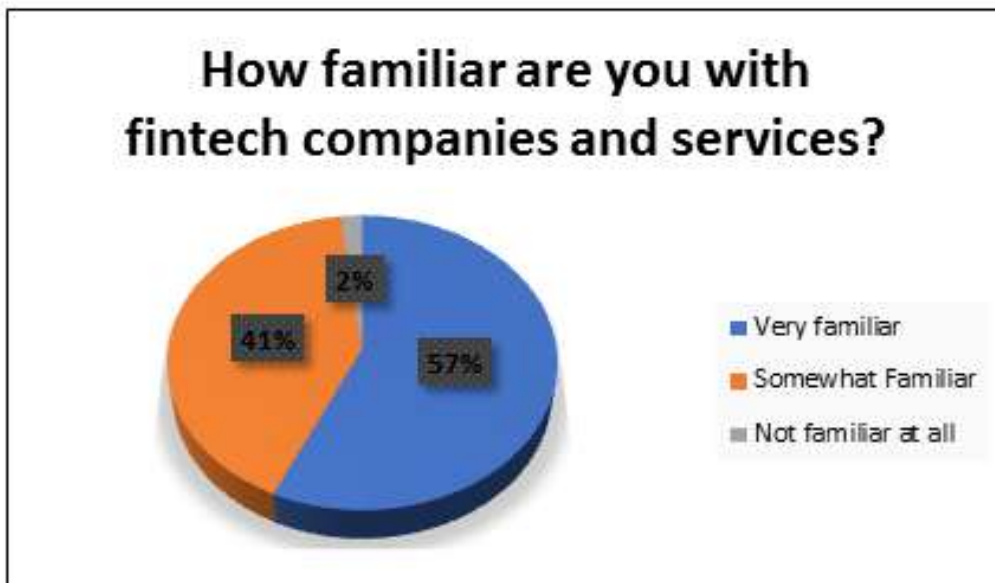
Basics	Category	Frequency	Percentage
Age	Under 18	3	5.9%
	18-24	35	68.6%
	25-34	7	13.7%
	35-44	6	11.8%
	45 and above	0	0

Gender	Female	20	39.2%
	Male	31	60.8%
Education	High School	9	17.6%
	Undergraduate	32	62.7%
	Postgraduate	4	7.8%
	Professional Certification	5	9.8%
	Housewife	1	2%
Profession	Student	34	66.7%
	Employed (Private Sector)	11	21.6%
	Employed (Public Sector)	1	2%
	Self-employed	2	3.9%
	Unemployed	2	3.9%
	Retired	1	2%
Location	Urban	26	51%
	Suburban	14	27.5%
	Rural	11	21.6%

Source: Primary Data

Table no. 1 shows the "Personal Profile of the Respondents" with complete demographics. Young adults aged 18–24 make up 68.6%, according to the survey. 13.7% are smaller 25-34 age groups and 11.8% are 35-44 age groups. The population is 60.8% male and 39.2% female. Most respondents are undergraduates (62.7%). Additionally, 17.6% have high school diplomas and 7.8% have postgraduate degrees. For professional backgrounds, 66.7% are students, 21.6% are private sector workers, 3.9% are self-employed, 3.9% are jobless, and 2% are retired. About 51% of respondents reside in cities, 27.5% in suburbs, and 21.6% in rural areas. The study's respondents are young, urban, and academically active.

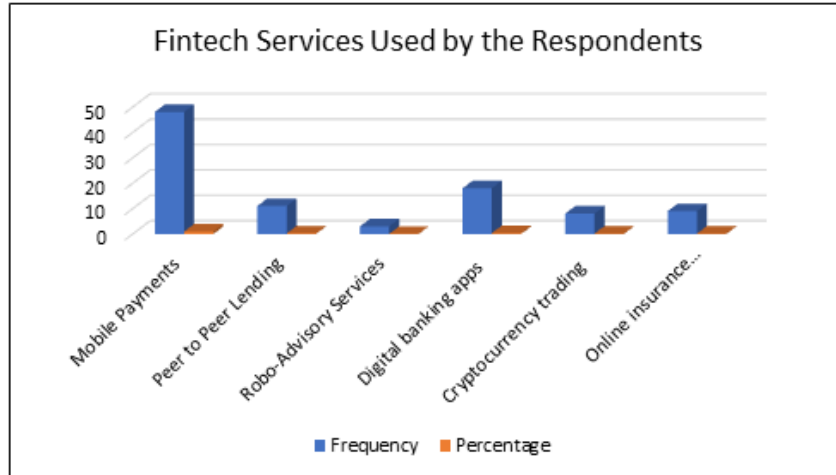
Chart No. 1: Familiarity of the Respondents with Fintech companies and Services



Source: Primary Data

The above chart no.1 depicts that 57% of the respondents are familiar with the fintech companies and its services. 41% of the respondents are somewhat familiar with the fintech companies and its services though only 1% of people is not familiar with the fintech services.

Chart No. 2: Fintech Service Used by the Respondents



Source: Primary Data

The above Chart no. 2 shows respondents' fintech usage. PayPal, Google Pay, and Apple Pay are used by 94.1% of respondents. The second most popular digital banking apps are Jio Money and Airtel Money, with 35.3%. At 21.6%, respondents use peer-to-peer lending services, followed by 17.6% for online insurance. 15.7% of respondents trade cryptocurrencies, while 5.9% use robo-advisory services. Thus, payment and banking apps dominate, whereas investment and advising platforms are specialized.

Table No. 2: Innovation and Security by Fintech Companies as compared to Traditional Banks

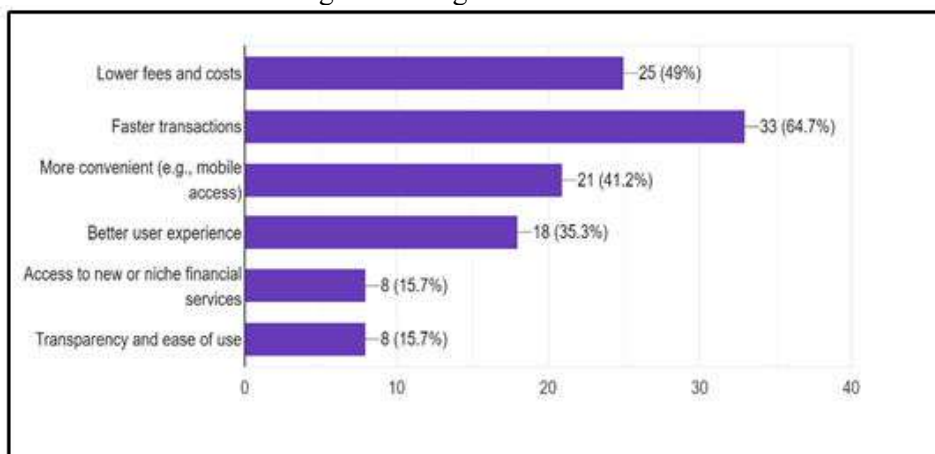
Innovation and Security provided by Fintech Companies as compared to Traditional Banks	Frequency	Percentage
Respondents opinion on, how innovative are fintech companies compared to traditional banks?	Highly innovative	29 (56.9%)
	Moderately innovative	19 (37.3%)
	Not innovative	3 (5.9%)
How secure do you feel using fintech services compared to traditional banks?	Very secure	25 (49%)
	Somewhat secure	25 (49%)
	Not secure at all	1 (2%)

Source: Primary Data

The table no. 2 shows how respondents compare fintech firms security and innovation to traditional banks. Of those surveyed, 56.9% consider fintech organizations "highly innovative," while 37.3% consider them "moderately innovative." Only 5.9% thought financial companies are "not innovative."

Fintech security is evenly divided, with 49% calling it "very secure" and 49% "somewhat secure." Only 2% think fintech is "not secure at all." These findings suggest that most users have moderate to high confidence in fintech security, despite their creativity.

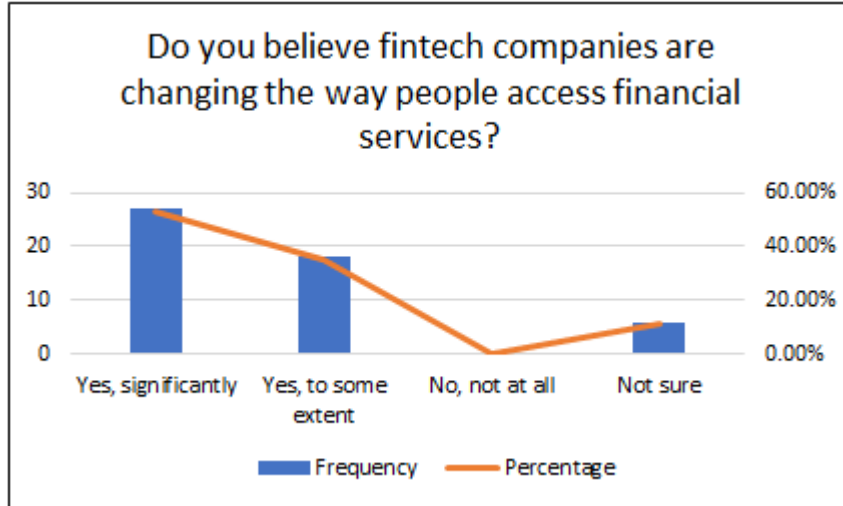
Chart No. 3: Main Advantages of Using Fintech services over Traditional Banking



Source: Primary Data

The diagram illustrates the primary benefits of fintech services over traditional banking. 64.7% of respondents stated that faster transactions are the most well-known advantage. 49% of respondents choose lower fees and charges, which is also substantial. Better user experience and convenience (such as mobile access) come in second and third, with 41.2% and 35.3%, respectively. Less emphasis is placed on transparency/ease of use and access to specialized financial services that is 15.7% each.

Chart No. 4: Fintech Companies Changing the Way People Access Financial Services



Source: Primary Data

The above chart shows that the majority of respondents, 52.90%, believe that fintech companies are significantly changing how individuals acquire financial services. While 35.30% believe that change is occurring to some level. Notably, no respondents disagreed, demonstrating that fintech's impact is widely acknowledged. However, 11.80% of respondents expressed uncertainty.

Table No. 3: How do you see the future of Traditional Banking in Relation to Fintech Companies?

Particulars	Frequency	Percentage
Traditional banks will adapt and thrive alongside fintech	23	45.10%
Traditional banks will be overshadowed by fintech	11	21.60%
Traditional banks will decline, and fintech will dominate	5	9.80%
Both will co-exist, with different roles in the financial ecosystem	12	23.50%

Source: Primary data

The Table No. 3 shows respondents' views on traditional banking's fintech future. 45.10% of respondents believe traditional banks can adapt and live with fintech. The remaining 23.50% expect fintech and traditional banks to coexist and play different roles in the financial system. Meanwhile, 9.80% of respondents think traditional banks will fail and fintech will dominate the market, while 21.60% think fintech will overtake them. This shows a general view that traditional banks will remain important in the shifting financial situation.

Table No. 4: Which areas of Financial Services do you think will benefit most from Fintech Innovation in the Future?

Particulars	Frequency	Percentage
Payments and Money Transfers	41	80.40%
Personal Lending and Credit	12	23.50%
Wealth Management and Investment	24	47.10%
Insurance	13	25.50%
Banking operations and Customer service	11	21.60%
Cryptocurrency and Blockchain services	6	11.80%

Source: Primary Data

In Table no. 4, respondents discuss fintech's benefits for financial services. 80.40% believe digital payment systems will benefit "Payments and Money Transfers" most. 47.10 percent think "Wealth Management and Investment" will expand. With 23.50% benefiting from "Personal Lending and Credit," 25.50% benefit from "Insurance." 11.80% of respondents witnessed "cryptocurrency and blockchain services" as a growing business, while 21.60% see "banking operations and customer service" as a benefit. Fintech is transforming payments and financial services.

Testing of Hypothesis

1. The hypothesis, "There is no significant relationship between respondents' familiarity with fintech services and their likelihood of switching to a fintech company as their primary financial service provider", One way-ANOVA was performed.

Table No. 5: One way-ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.514	2	1.757	4.928	.011
Within Groups	17.113	48	.357		
Total	20.627	50			

Source: Primary Data

Interpretation: The p-value (p=0.011) is below the significance level of 0.05. This signifies that the variation in respondents' willingness to switch to a fintech company as their primary financial service provider, based on their familiarity with fintech services, are statistically significant.

The ANOVA test results illustrate a statistically significant relationship between respondents familiarity with fintech services and their propensity to transition to a fintech company as their primary financial service provider (F(2,48)=4.928, p=0.011). The null hypothesis is rejected, indicating that familiarity with fintech services significantly influences respondents' switching behavior.

2. The hypothesis, "There is no significant relationship between demographic variables and respondents belief that fintech companies will improve financial inclusion," was evaluated using Chi-Square analysis for the variables location, education, employment, and age group.

Table No 6: Chi-square Test

	Age_group	Occupation	Education	Location	Respondents belief that fintech companies will help improve Financial Inclusion
Chi-Square	55.588 ^a	100.412 ^b	61.451 ^c	7.412 ^d	54.961 ^a
df	3	5	4	2	3
Asymp. Sig.	.000	.000	.000	.025	.000

Source: Primary Data

Interpretation: The p-value is below 0.05, signifying a relationship that is statistically significant. The null hypothesis has been rejected.

The Chi-Square test results indicate a significant relationship between demographic variables (age group, occupation, education, and location) and respondents' belief in the potential of fintech companies to enhance financial inclusion. The null hypothesis is rejected for all variables, signifying that demographic variables greatly influence perceptions of fintech's role in promoting financial inclusion.

FINDINGS

1. Mobile payment platforms with 94.1% and Digital banking apps such as Jio Money and Airtel Money with 35.3% are the second most popular fintech services used by the respondents.
2. Faster transactions and Lower cost are primary benefits of using fintech services over traditional banking.
3. The Familiarity with fintech services significantly influences respondents' switching behaviour to fintech companies as their primary financial service provider.
4. Demographic variables like Age group, Employment, Education and Location greatly influence perceptions of fintech's role in promoting financial inclusion.

5. The study depicts payments and money transfers will derive the greatest benefit from fintech innovation in the future.

CONCLUSION

Fintech presents both a threat and an opportunity for traditional banks. FinTech boosts productivity, customer satisfaction, and corporate innovation. Innovative technologies and customer-centric tactics can help traditional banks succeed. Traditional and fintech banks will collaborate to improve financial efficiency, inclusivity, and innovation. This study explored fintech use's numerous features, including customer experience, innovation, benefits, the future of traditional banks, and financial inclusion. The banking industry is changing as FinTech innovators challenge standards. Traditional banks are partnering with and investing in FinTech to use innovation instead of fighting it. Future success depends on navigating the changing competitive ecosystem.

SUGGESTIONS

1. Banks can invest in cutting-edge digital technology to enhance efficiency, modernize operations, and provide smooth online and mobile banking experiences that are on par with fintech platforms.
2. Traditional banks can combine physical and digital banking experiences, allowing consumers to easily switch between in-person and online services for added convenience.

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SUSTAINABLE TOURISM AND GEN Z: KEY INFLUENCERS AND PREFERENCES

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ABSTRACT

Sustainable tourism has become a critical focus within the tourism industry, especially among Generation Z (Gen Z), who prioritize environmental, social, and economic sustainability. This study explores the sustainable tourism preferences of Gen Z and the factors influencing their travel decisions. Using a mixed-methods approach, data was collected through surveys from 111 Gen Z travelers to examine their awareness and adoption of sustainable practices. Findings reveal that Gen Z is highly concerned with environmental impact, favouring eco-friendly accommodations, nature-based tourism, and local cultural experiences. Social responsibility, digital influence, and affordability are significant factors in their travel choices, with social media platforms serving as the primary source of information. Despite a strong interest in sustainable tourism, high costs remain a barrier, and a considerable portion of respondents seek more affordable and accessible options. The study also highlights the importance of supporting local communities and minimizing over-tourism. The research suggests that sustainable tourism will likely gain further traction as Gen Z continues to influence the industry. To cater to this demographic, tourism businesses must balance sustainability with cost-effectiveness while utilizing digital platforms for awareness and engagement.

Keywords: Sustainable tourism, Generation Z, environmental awareness, social responsibility, digital influence.

1. INTRODUCTION

Sustainable tourism has gained significant attention in recent years, as the tourism industry seeks to address environmental and socio-economic challenges. Defined by the UNWTO, sustainable tourism considers economic, social, and environmental impacts, and is increasingly important to Generation Z (Gen Z). Growing up in an era of climate change and social justice awareness, Gen Z is leading the shift towards responsible travel. This paper examines the key factors influencing Gen Z's sustainable tourism preferences and how they differ from previous generations.

1.2 Objective of the Study:

1. To understand the preferences of Gen Z towards sustainable tourism
2. To know the factors influencing Gen Z to adopt sustainable tourism practices.

2. LITERATURE REVIEW**2.1. Sustainable Tourism**

Sustainable tourism involves three pillars: environmental sustainability (minimizing ecological impacts), socio-cultural sustainability (respecting local cultures), and economic sustainability (supporting local economies without exploitation).

2.2. The Rise of Gen Z

Gen Z, born between 1997 and 2012, is characterized by its digital nativity, global connectivity, and strong social consciousness. With growing purchasing power, this generation is influencing industries, including tourism, with a focus on ethical practices like environmental conservation and social equity (Seemiller & Grace, 2016).

2.3. Sustainability and Travel Preferences

Research shows that Gen Z seeks sustainable travel options. A 2020 Booking.com survey found that 73% of Gen Z travellers are more likely to book accommodations labelled as sustainable, emphasizing the growing demand for eco-friendly travel.

3. RESEARCH METHODOLOGY

A mixed-methods approach was used, combining secondary data from existing reports on sustainable tourism and primary data from surveys of 111 Gen Z travelers to understand their preferences.

4. KEY INFLUENCERS OF SUSTAINABLE TOURISM AMONG GEN Z

4.1. Environmental Awareness

Gen Z is highly concerned about the environmental impact of travel. They prioritize eco-friendly accommodations and nature-based tourism, such as eco-tours, hiking, and wildlife experiences.

4.2. Social Responsibility and Ethical Travel

In addition to environmental concerns, Gen Z values social responsibility, including supporting local communities and respecting cultural heritage. They prefer authentic experiences that benefit local economies and avoid over-tourism.

4.3. Influence of Digital Platforms

Social media platforms like Instagram, TikTok, and YouTube heavily influence Gen Z’s travel decisions. Sustainable travel influencers play a key role in shaping perceptions and encouraging eco-conscious choices.

4.4. Cost and Accessibility

While sustainability is important, cost remains a barrier. Gen Z seeks affordable eco-friendly travel options, such as budget eco-hostels or carbon-offset programs, and is willing to pay a premium if options are accessible and reasonably priced.

5. Gen Z's Sustainable Travel Preferences

5.1. Eco-Friendly Accommodation

Gen Z favors eco-friendly accommodations with certifications like LEED or Earth Check, ensuring sustainability in operations.

5.2. Slow Travel and Local Experiences

Gen Z embraces "slow travel," focusing on fewer destinations for longer stays, reducing environmental impact, and supporting local communities. They seek cultural immersion through local experiences like cooking classes and homestays.

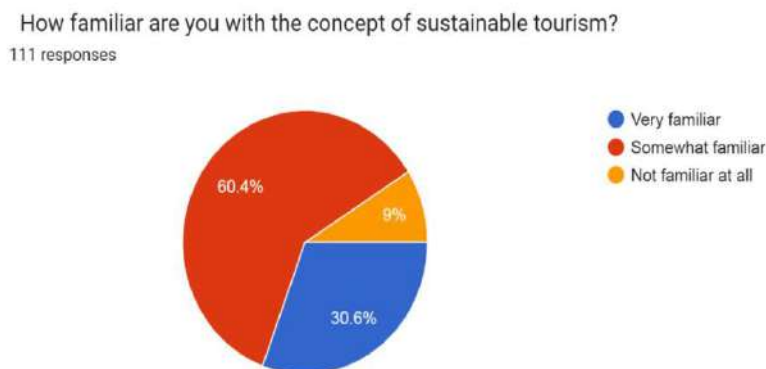
5.3. Use of Technology in Sustainable Travel

Technology is crucial for Gen Z's sustainable travel decisions. Apps and platforms to track carbon footprints, find sustainable transport options, or book eco-friendly accommodations are commonly used by this demographic.

6. DATA ANALYSIS AND INTERPRETATION

- Age Distribution:** The survey indicates that all participants (100%) fall within the age range of 18-22, signifying that the study pertains to a young population.
- Gender Breakdown:** Of the respondents, 59.5% were female, while 40.5% were male.
- Location:** The majority of respondents (73.9%) were from South Mumbai, followed by 19.8% from Central Mumbai, and the remaining respondents were from Eastern Mumbai.

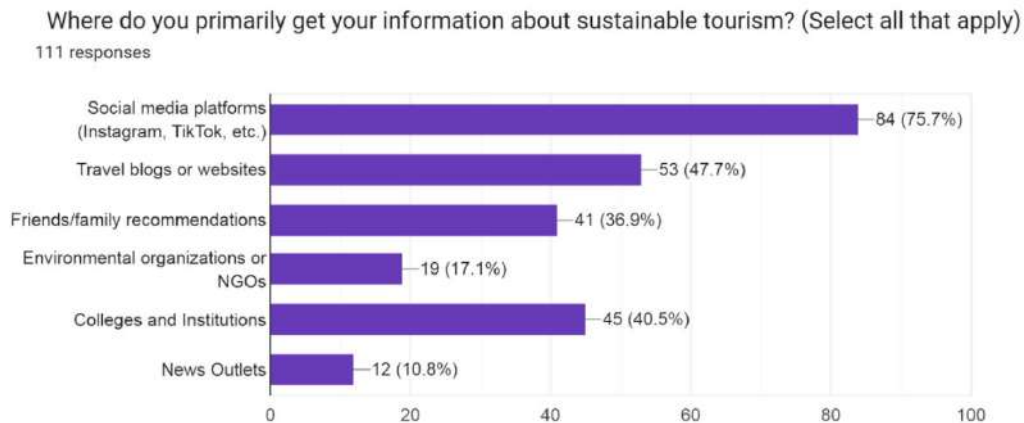
4. FAMILIARITY WITH SUSTAINABLE TOURISM:



Source: Compiled from Primary Data

The data shows that 60.4% of respondents were somewhat familiar with sustainable tourism, and 30.6% were more familiar with the concept, indicating a moderate level of awareness among Gen Z.

5. SOURCES OF INFORMATION ABOUT SUSTAINABLE TOURISM:



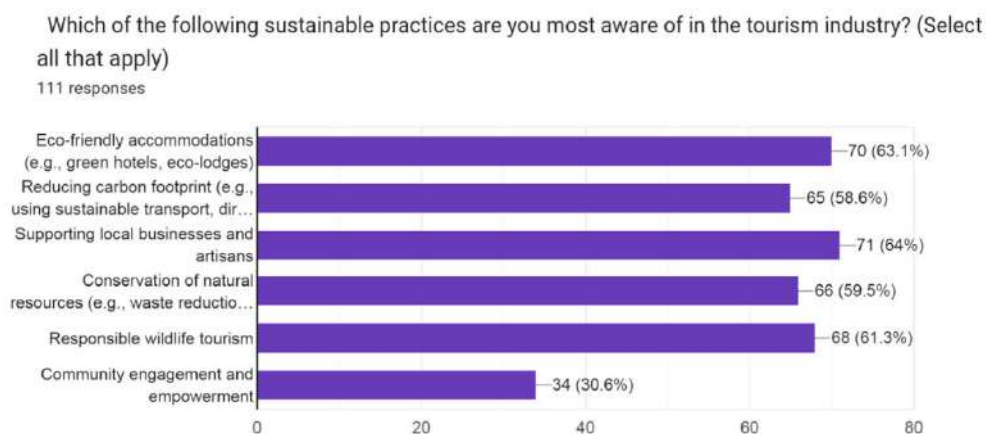
Source: Compiled from Primary Data

A significant number of respondents (75.7%) reported that social media platforms are their primary source of information about sustainable tourism. This indicates the strong influence of digital platforms in shaping awareness among Gen Z. Additionally, other sources contributing to their understanding of sustainable tourism include travel blogs and websites (47.7%), which provide in-depth information and tips on sustainable travel practices. Colleges and educational institutions also play a role, with 40.5% of respondents gaining knowledge from these sources, reflecting the impact of formal education on raising awareness. Furthermore, 36.9% of respondents mentioned that friends and family are influential in spreading information, indicating the importance of word-of-mouth and personal connections in promoting sustainable tourism. Lastly, NGOs and news outlets contribute to the awareness, though to a lesser extent, showcasing the role of media and advocacy organizations in educating the public about sustainable tourism practices.

6. IMPORTANCE OF SUSTAINABILITY IN TRAVEL DECISIONS:

A large majority (73.9%) of respondents consider sustainability a crucial factor when choosing a travel destination, and no respondents felt that sustainable tourism was unimportant in the current environment.

7. AWARENESS OF SUSTAINABLE PRACTICES IN TOURISM:



Source: Compiled from Primary Data

survey revealed that a majority of respondents are aware of various sustainable practices within the tourism industry. Notably, 64% of participants are aware of the importance of supporting local businesses while traveling, highlighting the significance of contributing to the local economy. Similarly, 63.1% of respondents are familiar with the concept of staying in eco-friendly accommodations, reflecting a growing preference for environmentally conscious lodging options. Additionally, 61.3% of respondents are aware of responsible wildlife tourism practices, indicating an understanding of the need to protect wildlife and their habitats during travel.

Furthermore, 59.5% of respondents recognize the importance of conserving natural resources while traveling, such as water and energy conservation, which plays a crucial role in minimizing the environmental footprint of tourism. Reducing carbon emissions through travel choices is also an important consideration for 58.6% of participants, underscoring the awareness of the environmental impact of transportation and other tourism-related activities.

However, it was noted that only 30.6% of respondents were aware of the significance of community engagement and empowerment within the context of sustainable tourism. This suggests that, while there is a broad awareness of environmental sustainability, the social aspect of sustainable tourism—particularly empowering local communities—has not gained as much traction among Gen Z travellers.

8. Negative Environmental Impact of Tourism:

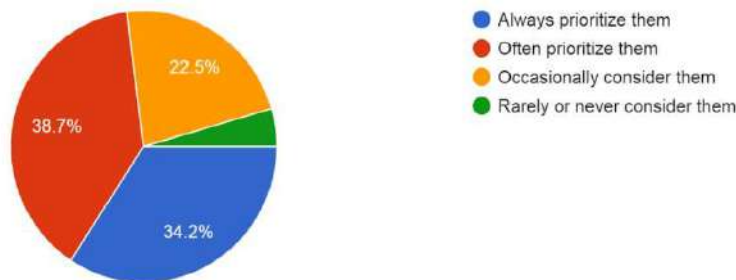
Approximately 34.2% of respondents believed tourism has a significant impact on the environment, while 52.3% felt that tourism negatively affects the environment to a great extent.

9. Sustainable Tourism's Positive Impact on Local Communities:.

An overwhelming 75.2% of respondents agreed that sustainable tourism positively impacts local communities, supporting local businesses and artisans.

10. Prioritizing Environmental and Social Concerns in Travel:

How much do you prioritize environmental and social impacts when choosing travel options?
111 responses



Source: Compiled from Primary Data

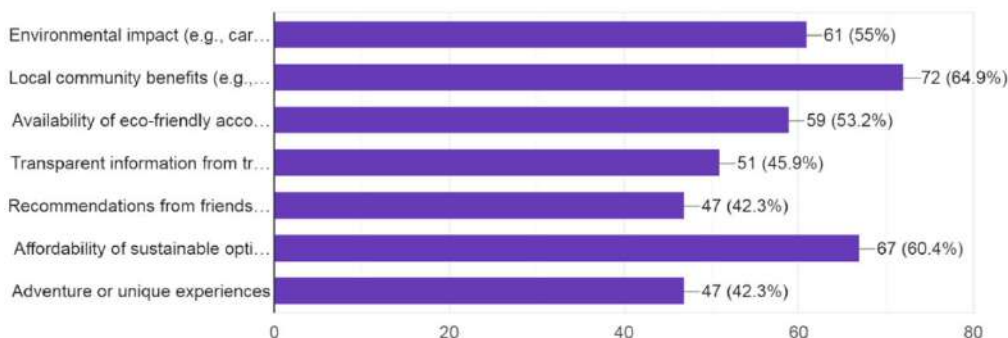
About 34.2% of respondents always prioritize environmental and social factors when choosing travel options, while 38.7% often consider these aspects, and 22.5% occasionally do so.

11. Willingness to Pay Higher for Sustainable Travel Options:.

While 73.9% of respondents might choose sustainable options depending on cost, 18.9% were willing to pay a higher price for sustainable travel options

12. Factors Influencing Sustainable Travel Choices:

When planning a trip, which of the following factors would influence your decision to choose a sustainable travel option? (Select all that apply)
111 responses



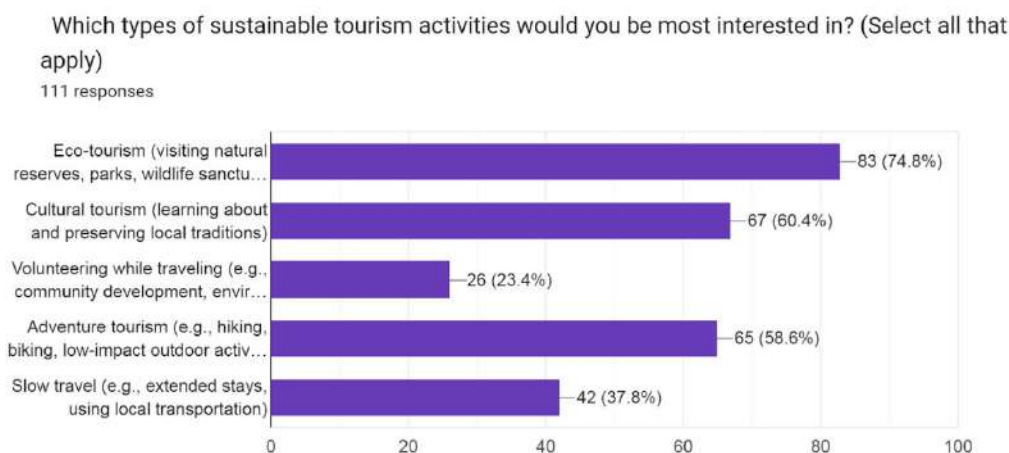
Source: Compiled from Primary Data

The survey identified several key factors influencing respondents' choice of sustainable travel options. The most significant factor (64.9%) was the **benefit to local communities**, reflecting travelers' desire to support local businesses and cultures. **Affordability** (60.4%) was also crucial, indicating that budget remains a primary concern. **Environmental impact** (55%) was another motivating factor, with travellers seeking to minimize their ecological footprint. The **availability of eco-friendly accommodations** (53.2%) further influenced decisions, as did **transparency** (45.9%) regarding sustainability practices. **Recommendations and reviews** (42.3%) and **unique experiences** (42.3%) also played a role. These factors show that sustainable travel choices are driven by environmental, economic, and social considerations.

13. Seeking Eco-friendly Travel Options:

66.7% of respondents sometimes seek sustainable options depending on the destination, 20.7% always prioritize sustainable travel, and 10.8% rarely consider eco-friendly options.

14. Interest in Sustainable Tourism Activities:



Source: Compiled from Primary Data

The data reveals that **eco-tourism** is the most popular type of sustainable tourism among respondents, with 74.8% expressing a strong interest in exploring natural reserves and wildlife. This suggests a significant preference for nature-based travel experiences that prioritize environmental conservation and wildlife protection.

Cultural tourism also garners considerable attention, with 60.4% of respondents highlighting their interest in exploring local traditions, cuisines, and cultural practices. This reflects a growing desire to engage with authentic, cultural experiences that connect travelers to the local heritage and communities of the destinations they visit.

Adventure tourism, including activities such as hiking, trekking, and other outdoor excursions, is important to 58.6% of respondents. This interest shows a preference for active, nature-oriented tourism that aligns with sustainable travel values by encouraging physical engagement with the environment.

In comparison, **slow travel**, which emphasizes extended stays, using local transportation, and a more immersive travel experience, appeals to 37.8% of the respondents. This indicates a growing awareness of the benefits of slower, more sustainable travel choices that focus on deeper connections with the local culture and environment.

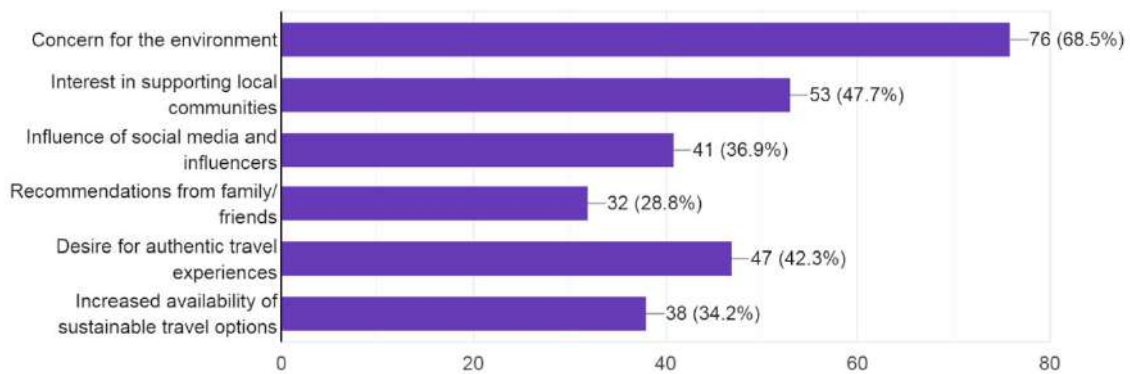
Finally, **volunteering tourism** seems to have a lower appeal, with only 23.4% of respondents showing interest in this form of travel. While it remains a niche area, it suggests that a smaller proportion of travelers are drawn to opportunities that involve giving back to the community and participating in hands-on sustainable initiatives during their travels.

These findings illustrate that, while eco-tourism and cultural tourism are the primary areas of interest, there is a diverse range of sustainable travel preferences among the respondents, with varying levels of engagement with other forms of sustainable tourism.

15. Motivations for Choosing Sustainable Tourism:

What motivates you to engage in sustainable tourism? (Select all that apply)

111 responses



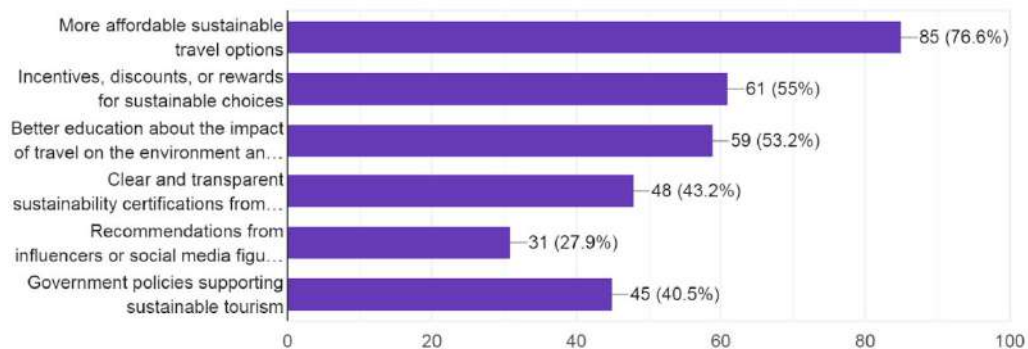
Source: Compiled from Primary Data

The survey revealed several key motivations behind choosing sustainable tourism. A significant 68.5% of respondents are primarily driven by **concern for the environment**, highlighting a growing desire to reduce environmental impact. **Supporting local communities** was a motivation for 47.7%, reflecting interest in contributing to the economic and social development of destinations. **Authentic travel experiences** also influenced 42.3%, as travelers seek deeper cultural connections. **Social media and influencers** impacted 36.9%, while 34.2% were motivated by the increasing availability of sustainable options. Lastly, 28.8% were influenced by **recommendations from friends and family**. These motivations reflect a combination of environmental awareness, cultural engagement, digital influence, and personal connections.

16. Encouraging Gen Z to Choose Sustainable Travel:

Which of the following would encourage you to adopt more sustainable travel behaviors? (Select all that apply)

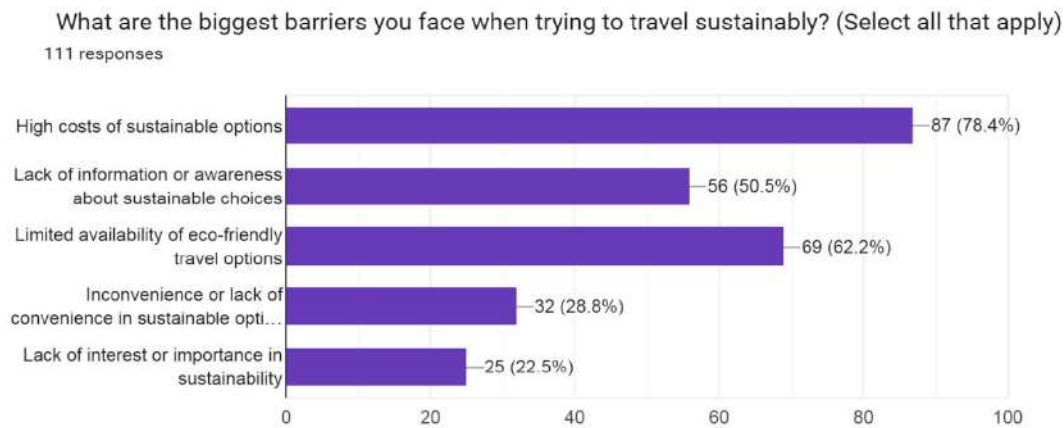
111 responses



Source: Compiled from Primary Data

When asked about factors that would encourage Gen Z to choose sustainable travel, the majority (76.6%) cited **affordable options** as the key motivator, highlighting cost as a significant barrier. Additionally, 55% of respondents were influenced by **discounts and rewards**, while 53.2% emphasized the need for **better education** on sustainable tourism. **Clear certifications and standards** were important for 43.2%, and 40.5% felt that **government support and policy** would drive more sustainable choices. Lastly, **social media and influencers** played a role for 27.9% of respondents. Overall, affordability, education, transparency, and policy support emerged as the main drivers for encouraging sustainable travel among Gen Z.

17. Barriers to Sustainable Tourism:



Source: Compiled from Primary Data

The survey identified several barriers to adopting sustainable tourism. The most significant obstacle is **high cost**, with 78.4% of respondents citing it as a deterrent. **Limited availability** of eco-friendly options was also a challenge for 62.2%, while **lack of information and awareness** affected 50.5% of participants. **Inconvenience** was mentioned by 28.8%, as sustainable travel may require more effort in planning. Finally, 22.5% felt that **sustainability** wasn't prioritized in their travel decisions. Addressing these barriers through affordability, better options, awareness, and convenience could boost sustainable tourism adoption.

18. Future of Sustainable Tourism: 53.2% of respondents believe that sustainable tourism will become more common in the future, although it may take time due to current challenges such as a lack of awareness and limited sustainable options.

7. FINDINGS

The findings of this research suggest that Gen Z's commitment to sustainable tourism is driven by a complex interplay of environmental, social, and economic factors. Their travel choices are influenced by a desire to minimize their ecological footprint, contribute positively to local communities, and support businesses that align with their values. However, the higher costs associated with sustainable travel options present a challenge, especially for a generation with limited disposable income.

Tourism businesses and destinations that aim to attract Gen Z will need to integrate sustainability into their offerings without compromising on affordability or convenience. Digital platforms and social media play an essential role in communicating sustainability efforts, and brands that effectively leverage these channels can build stronger connections with this generation.

8. CONCLUSION

Generation Z is poised to drive the future of sustainable tourism. As this generation becomes a more prominent segment of the travel market, their preferences for eco-friendly, socially responsible, and digitally connected travel options will continue to shape the tourism industry. By understanding the key factors influencing Gen Z's travel behavior, the tourism sector can better align with their values, creating a more sustainable and socially responsible industry for the future.

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IMPACT OF JOB SATISFACTION ON ORGANIZATIONAL RETENTION: MEDIATING ROLE OF EMPLOYEE WELFARE MEASURES

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ABSTRACT

In competitive markets, employee retention is a critical factor in determining an organization's overall performance and sustainability. Retaining talented workers has become a critical issue due to high turnover rates that affect employee morale, interrupt processes, and raise operating costs. This study explores the complex relationship between organisational retention and work happiness, emphasising the critical mediating function of employee welfare initiatives. The study looks at how companies may use welfare measurements to improve employee happiness and lower turnover by doing a thorough evaluation of the body of existing literature. Organisations can ensure a competitive edge and cultivate a contented workforce by implementing strategic welfare programs. The study's conclusions highlight the necessity of a positive work atmosphere in order to reduce attrition and match corporate goals with the welfare of employees. One important element affecting an organization's success is employee retention. With a focus on the mediating function of employee welfare metrics, this study investigates the relationship between work satisfaction and organisational retention. The study emphasises the connection between retention, welfare, and satisfaction by examining previous studies and using a theme approach. The results highlight how crucial it is to create a positive work atmosphere in order to improve retention tactics and lower attrition rates.

1. INTRODUCTION

Keeping talented workers on board is not just a strategic necessity but also a factor in determining the success of an organisation in the fast-paced, fiercely competitive business world of today. From hampered workflows and higher hiring expenses to worse morale and the loss of institutional expertise, high turnover rates have far-reaching effects. Companies all across the world struggle to come up with efficient ways to draw in and keep great personnel. Job satisfaction stands out as a key component among the many variables affecting retention. Workers are more likely to stick with their companies if they feel their jobs rewarding and in line with their goals, both personal and professional. However, issues with retention cannot be entirely resolved by job happiness alone. In order to bridge the gap between loyalty and satisfaction, employee welfare initiatives play a crucial mediating role.

A supportive and stimulating work environment is produced by welfare programs that address the financial, emotional, and physical needs of employees. These initiatives, which go beyond simple pay, focus on overall well-being and include professional development opportunities, work-life balance programs, and mental health support.

The relationship among welfare metrics, work satisfaction, and organisational retention is examined in this study. It offers practical insights into how businesses might improve retention tactics by examining current research and theoretical frameworks. In order to provide a motivated and devoted staff that propels organisational success, the findings are intended to inform human resource practices.

Employers are realising more and more that maintaining a competitive edge depends on keeping talented workers. Excessive turnover rates reduce organisational knowledge, raise hiring expenses, and interfere with productivity. It is often known that job satisfaction is a major factor in retention, and that employee welfare initiatives play a crucial mediating role. In order to offer practical insights for human resource initiatives, this study explores these links.

2. RESEARCH OBJECTIVES

- To examine the connection between organisational retention and work satisfaction.
- To investigate how employee welfare initiatives may act as a mediator.
- To suggest methods for enhancing retention through welfare and satisfaction programs.

3. REVIEW OF LITERATURE

3.1 Job Satisfaction: Employees' overall assessment of their duties and workplace is reflected in job satisfaction. Herzberg (1968) divided the elements that influence satisfaction into two categories: hygienic factors (like pay) and motivators (like recognition). According to Locke (1976), there is a significant increase in employee satisfaction, commitment, and turnover when employee expectations and working realities are aligned. Job enrichment, such as autonomy and feedback, has been shown by Hackman and Oldham (1976) to increase employee happiness and loyalty to the company.

3.2 Organizational Retention: The ability of an organisation to hold onto its workforce over time is known as organisational retention. Affective commitment, which is motivated by emotional attachment to the organisation, was found to be a significant predictor of retention by Meyer and Allen (1991). According to Hom and Griffeth (1995), turnover intentions are decreased when employees sense organisational support. Rhoades and Eisenberger (2002) emphasised that perceived fairness encourages loyalty, while Cotton and Tuttle (1986) discovered that competitive pay and growth prospects have a direct impact on employee decisions to stay.

3.3 Employee Welfare Measures: Welfare measures include programs designed to enhance workers' financial, emotional, and physical well. Adams (1963) suggested that by guaranteeing justice, equitable welfare systems increase work satisfaction. According to Eisenberger et al. (1986), support programs lower stress and employee attrition. According to Greenberg (1990), contentment is increased by organisational justice, which includes equitable resource distribution. While Shuck and Reio (2014) emphasised the importance of holistic wellbeing in engagement and retention, Cappelli (2000) contended that customised welfare programs successfully retain high-performing personnel.

4. METHODOLOGY

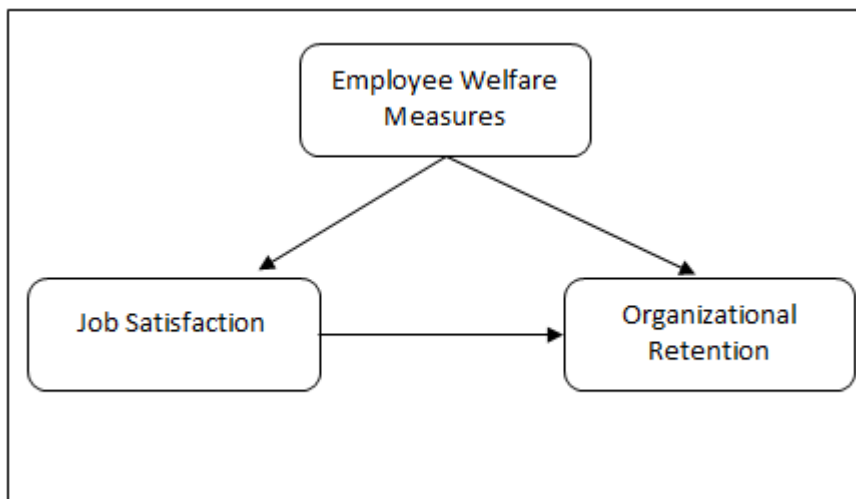
1. Research Design: Based on previously published research articles, reports, and case studies, this study used secondary data analysis.
2. Data Sources: Research papers and peer-reviewed journals were the sources of the data.

5. OUTCOME OF REVIEW OF LITERATURE

Sr. No.	Name of Author	Findings
1	Herzberg (1968)	Recognition and growth opportunities increase job satisfaction.
2	Locke (1976)	Job satisfaction enhances when expectations match with workplace realities.
3	Hackman & Oldham (1976)	Job enrichment promotes satisfaction and loyalty.
4	Meyer & Allen (1991)	Affective commitment predicts retention through emotional attachment.
5	Hom & Griffeth (1995)	Organizational support reduces turnover intentions.
6	Cotton & Tuttle (1986)	Competitive compensation and growth opportunities impact retention decisions.
7	Rhoades & Eisenberger (2002)	Welfare measures mediate satisfaction and loyalty.
8	Adams (1963)	Fair welfare systems enhance job satisfaction.
9	Eisenberger et al. (1986)	Support initiatives reduce stress and turnover.
10	Greenberg (1990)	Organizational justice fosters satisfaction and retention.
11	Cappelli (2000)	Welfare programs tailored to the likes of employees retain high-performing employees.
12	Shuck & Reio (2014)	Holistic welfare initiatives improve engagement and retention.
13	Podsakoff et al. (2003)	Organizational fairness and employee support systems impact retention rates.
14	Wright & Cropanzano (1998)	Reducing emotional exhaustion increases job satisfaction and retention.
15	Tett & Meyer (1993)	Satisfaction and welfare measures jointly reduce turnover intentions.

16	Robertson & Cooper (2010)	Integration of psychological well-being in welfare measures enhances engagement.
17	Bakker & Demerouti (2007)	Welfare measures addressing job demands improve employee well-being and satisfaction.
18	Judge et al. (2000)	Personality traits influence satisfaction and retention through welfare mechanisms.
19	Maslow (1943)	Satisfying psychological and safety needs fosters workplace satisfaction.
20	Vroom (1964)	Reward systems tied to welfare enhance motivation and retention.
21	Kahn (1990)	Engaged employees benefit from supportive welfare structures, leading to retention.
22	Locke (1976)	Employees' expectations from welfare measures correlate with job satisfaction.
23	Herzberg (1968)	Hygiene factors such as adequate compensation are vital for satisfaction.
24	Cotton & Tuttle (1986)	Welfare measures must address financial stability to improve retention.
25	Eisenberger et al. (1986)	Welfare measures that demonstrate employer care reduce employee turnover.

6. CONCEPTUAL MODEL DERIVED FROM REVIEW OF LITERATURE



Source: Review of Literature

7. CONCLUSION

This study offers a thorough examination of the connections between organisational retention, employee wellbeing metrics, and job satisfaction. A committed and engaged workforce is largely dependent on job satisfaction. Employees' organisational commitment naturally rises when they feel fulfilled in their roles, which is fuelled by both internal and external elements like autonomy, career advancement, recognition, and fair compensation. In order to close the gap between work happiness and retention, employee welfare initiatives are essential. These actions, which include systems of emotional, material, and financial support, show how dedicated the company is to its employees. Welfare programs that cater to the many needs of employees not only reduce stress but also promote loyalty and a sense of community. For example, programs that promote mental wellness, work-life balance, health benefits, and career development opportunities are pivotal in retaining top talent.

The study's conclusions emphasise how important it is for businesses to include welfare measures as a cornerstone of their retention plans. In today's dynamic and competitive market, providing competitive remuneration alone is insufficient; a comprehensive strategy that synchronises organisational objectives with employee ambitions is crucial. Welfare programs provide as a buffer against things like burnout, discontent, and perceived unfairness that cause turnover. Furthermore, welfare measurements' mediating function highlights how they can improve job satisfaction. These actions enhance the beneficial effects of job satisfaction on retention by proactively resolving issues and creating a positive work environment. Workers are more likely to

respond with more engagement, loyalty, and productivity if they believe that their company appreciates their well-being.

In conclusion, the synergy between job satisfaction and welfare measures is vital for organizational retention. Organizations that prioritize these aspects can create a resilient and committed workforce, ensuring long-term success and stability. By strategically implementing and continuously refining welfare programs, companies can not only mitigate turnover but also foster a culture of loyalty and high performance. This study emphasizes the need for ongoing investment in employee-centric strategies, reinforcing the role of welfare measures as a bridge to achieving sustainable organizational growth.

8. FUTURE RESEARCH DIRECTIONS

Future studies could explore the impact of cultural differences on the relationship between satisfaction, welfare, and retention. Continuous research could further examine the long-term benefits of welfare initiatives.

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**A COMPARATIVE ANALYSIS ON TIME SPENT ACROSS SOCIAL MEDIA PLATFORMS:
MUMBAI****Ms. Neha Chetan Doshi¹ and Dr. Sheetal Mody²**¹Research Scholar, K.P.B. Hinduja College of Commerce, Mumbai.²Ph.D.Guide K.P.B. Hinduja College of Commerce, Mumbai.**ABSTRACT**

The aim of the study is to do a comparative analysis on time spent across social media platforms. A child is just a year, still he has a social media account. The world is changing and the society word is now replaced with SOCIAL MEDIA. In this research many social media platforms like Facebook, Instagram, WhatsApp, Twitter, Snapchat, LinkedIn and YouTube are researched on. The sample is collected for 67 respondents, majority fall under 15yrs to 25yrs age bracket with 59% male respondents. The research focuses on Mumbai's demographic profile of social media users, which platform is preferred and why. Are they buying by getting influenced by social media advertisements. The findings showed that WhatsApp, Instagram and YouTube have higher proportion of users spending at least 1hour to 2 hours daily on social media. 70% of respondents stated that they have made purchases based on social media advertisements. This study highlights how social media can act as boon for businesses & which would be the correct platform to advertise their product. It also highlights need of hour by reducing over time on social media & spending quality time with family & friends.

Keywords: Social Media, Facebook, Instagram, WhatsApp, Twitter, Snapchat, LinkedIn, YouTube, Marketing

It takes discipline not to let social media steal your time."

-Alexis Ohanian

INTRODUCTION

Today's era is all about connecting with people over the cloud. Yes, social media has made it very easy to get information about others life. Social media is an integral part of people's life where they create, share and connect. Traditionally individuals had families, friends & society to look & ask for. Now a days there is drastic change as individuals have online communities, friends, groups who match & get influenced with others life.

There are various social media platforms like Instagram, Facebook, Snapchat, YouTube, WhatsApp, Twitter, LinkedIn, etc. People share photos, videos, daily updates, promote about places or products, chat with either family or friends, join communities of their interest, follow people, etc. The technological development has made everyone change & at least have one or two social media accounts. People from all age, any gender or any location are on social media. The audience is highly getting influenced by others lifestyle on social media. Companies are also connecting & promoting their brands on social media, which is saving on costs and also targeting huge audience at one go across different locations.

The vital part is that social media is becoming a need of each one's life. In free hours, during work or when at home people have mobile phones in hand with one of the social media applications being open. As per Forbes statistics, there are 398 million users of internet in India. Out of 67.5% internet users, they use at least one social media platform. It's a huge marketing platform for businesses but also impacting social life of individuals.

REVIEW OF LITERATURE

A study on "The Impact of Social Media on Social Comparison & Subjective well-being", Volume: 12 | Issue: 1 | March 2024 | Journal DOI: 10.25215/1201.108 focusses on the social media impact on individual's life. The social comparison can be positive or negative which can lead to mental issues, anxiety or depression. On the other hand some would even be happy by being present on social media & telling others about their life. This study focussed on the age 18yrs to 25yrs.

A study on "Comparative Case Study analysis of Social media platforms- Instagram, Facebook and Snapchat", Volume 9, January 2022 by 'K Swathi' focussed on as the usage of social media has increased, businesses are making strategies to do the right marketing on the social media. This study focusses on digital marketing strategy done by Facebook, Instagram & Snapchat.

OBJECTIVES OF THE STUDY

1. To understand whether people actually buy the products after getting influenced by social media bloggers or reels or advertisements
2. To understand whether occupation affects the features frequently watched on social media

3. To understand which social media is highly followed by people and number of hours spent on various platforms.

HYPOTHESES OF THE STUDY

Hypothesis- H1

H1₀: less than 50% of people are purchasing products based on social media advertisements or marketing done on social media platforms

H1_a: more than 50% of people are purchasing products based on social media advertisements or marketing done on social media platforms

Hypothesis- H2

H1₀: There is no significant difference between occupation and the feature watched on social media.

H1_a: There is significant difference between occupation and the feature watched on social media.

RESEARCH METHODOLOGY OF THE STUDY

The data for the proposed study would be collected through primary as well as secondary sources. Primary sources would include a survey through structured interviews, questionnaire and personal interview. The data collection is limited to city of Mumbai and appropriate sampling techniques are used to ensure a representative sample of the various demographic parameters. Secondary research includes Journals, Articles, News articles, other research papers, etc.

SCOPE OF THE STUDY

This study indicates comparative analysis of different social media platforms. The aim is to find out which social media platform is highly preferred and what is the reason. To study whether product/service purchase decisions are influenced by advertisements or awareness on social media. Mumbai District population in 2022 is 3,301,537 (estimates as per Aadhar uidai.gov.in Dec 2020 data). This study is to understand Mumbai's population social media use. As now days people are more dependent on social media and this is also leading to purchases but over usage is leading on stress too. The important factor is why people are spending most of their quality time on social media.

SIGNIFICANCE OF THE STUDY

To register on any website, they ask your email id or now a days your facebook or a social media id. It's a paradigm shift wherein more and more people are getting on social media, whether its for news, friends, social groups or lifestyle hacks. Before news was on the news sites or newspapers or tv channels but now things have completely changed. 3.07billion users worldwide are active users on facebook and 2.07 billion on Instagram. Its not necessary to be registered only on one social media, but atleast have two or three. The social media platforms are not only used to entertain but to be professionally active & getting business. As per Statista, Digital marketing market grew from 2.3billion dollars (2020) to 6.46 billion dollars (2024)

LIMITATIONS OF THE STUDY

The findings are limited to Mumbai city and most popular social media platforms are taken in account. This study may not completely be applicable to other locations, as its only focussed in Mumbai. The respondents are also limited to 67, as sample size is small. The social media platforms like Pinterest, TikTok, WeChat, telegram, etc are not considered while doing this research.

Expected Outcome of the Study

The proposed outcomes of this study are as follows:

1. A study of different social media platforms & number of hours spent on social media
2. Actual purchases depend on the social media advertisements.
3. Major purpose to watch social media platforms, this will give businesses the edge. Like news is highly watched on social media platforms, so news channels should increase their presence or live shows on social media.
4. Company's strategies, so that marketing can be done on right platform via right mode. (Reels/ Videos/ Post/Forums, etc) This can be done by stories/ reels, giving an introduction of the product or informing the audience on the steps to use.

5. Demographic differences affect social media, so segmenting, targeting & positioning the product would be much easier.
6. Research also shows that on Facebook, twitter and snapchat, most people watch stories. On Instagram reels and short videos are preferred. WhatsApp is most liked for chat features compared to status feature & LinkedIn is preferred for joining groups and communities. YouTube is highly preferred for long form video content

DATA ANALYSIS AND INTERPRETATION

Hypothesis- H1

H1₀: less than 50% of people are purchasing products based on social media advertisements or marketing done on social media platforms

H1_a: more than 50% of people are purchasing products based on social media advertisements or marketing done on social media platforms

Null Hypothesis	H₀ : $\mu < 60\%$
Alternate Hypothesis	H_a : $\mu > 60\%$
Test	P value method
Tail	Right Tail Test
Critical	1.645
Z SCORE	1.696
Alpha	0.05
Accept/Reject	Reject the Null Hypothesis critical value < z score $1.645 < 1.696$

On conducting the Z test we reject the NULL HYPOTHESIS, as Z observed is more than Z critical. More than 60% of respondents make purchases by getting influenced on various social media platforms.

Hypothesis- H2

H1₀: There is no significant difference between occupation and the feature watched on social media.

H1_a: There is significant difference between occupation and the feature watched on social media.

Findings using Anova Two Factor without Replication

Row Labels	Business	Homemaker	Other professionals	Service	Student	Grand Total
Chat Features	0	0	0	0	2	2
Groups or communities	1	0	0	1	1	3
Live Streaming	0	0	0	0	1	1
Long form video content	0	0	0	0	1	1
Photos (Static visual content)	0	0	0	0	1	1
Reels/TikTok like short videos	0	0	1	1	2	4
Stories	5	1	8	8	33	55
Grand Total	6	1	9	10	41	67

SUMMARY	Count	Sum	Average	Variance
Chat Features	6	4	0.67	1.07
Groups or communities	6	6	1.00	1.20
Live Streaming	6	2	0.33	0.27
Long form video content	6	2	0.33	0.27

Photos (Static visual content)	6	2	0.33	0.27
Reels/TikTok like short videos	6	8	1.33	2.27
Stories	6	110	18.33	450.27
Grand Total	6	134	22.33	679.07
Business	8	12	1.50	6.29
Homemaker	8	2	0.25	0.21
Other professionals	8	18	2.25	15.07
Service	8	20	2.50	16.57
Student	8	82	10.25	277.36
Grand Total	8	134	16.75	757.36

ANOVA						
Source of Variation	SS	Df	MS	F	P-value	F crit
Rows	3534	7.00	504.90	4.44	0.00	2.29
Columns	1698	5.00	339.53	2.99	0.02	2.49
Error	3976	35.00	113.59			
Total	9208	47.00				

From the above result, the P value is less than alpha value of 0.05 and F observed value (4.44 & 2.99) is more than F critical value (2.29 & 2.49), so we reject the null hypothesis. This means that there is a significant difference between the occupation and the feature you watch on social media. Most of people are influenced by stories on social media.

Personal Interviews

Conducted two personal interviews, the findings were that both are using the social media platforms for almost 3hrs daily. These both are working professionals, so late night they find it more relaxing to watch social media by looking at news, Bollywood news, friend’s updates, etc. But out of this only one respondent purchased based on social media advertisements, reels, influencers, etc. The other was more keen on TV advertisements or window shopping.

To understand which social media is highly followed by people and number of hours spent on various platforms.

Demographics

Chart 1: Gender

Gender
67 responses

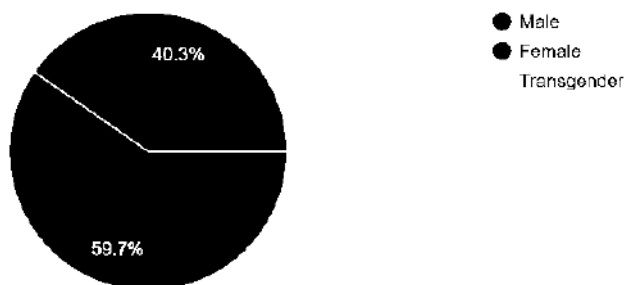
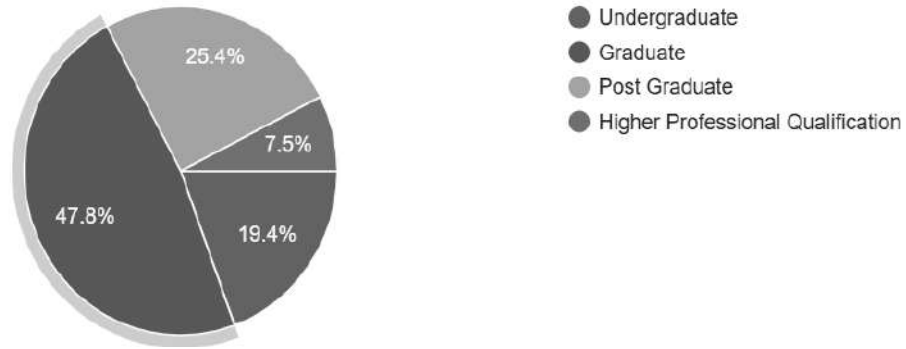


Chart 2: Education

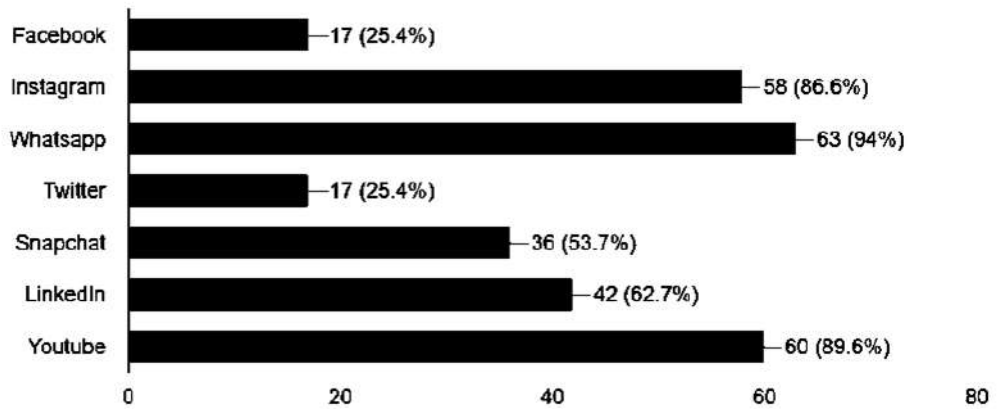
67 responses



Whatsapp, Instagram and Youtube are taking lead as most favourable social media platform.

Chart 3: Most Preferable Social Media Platform

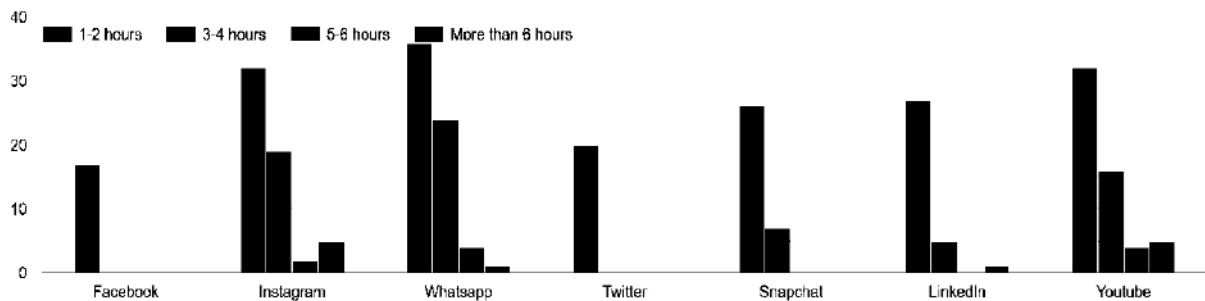
67 responses



Maximum number of hours spent on variour platforms is an average of 2hrs. Most of the time spent is on whatsapp and Instagram.

Chart 4: Time Spent on Different Social Media Platforms

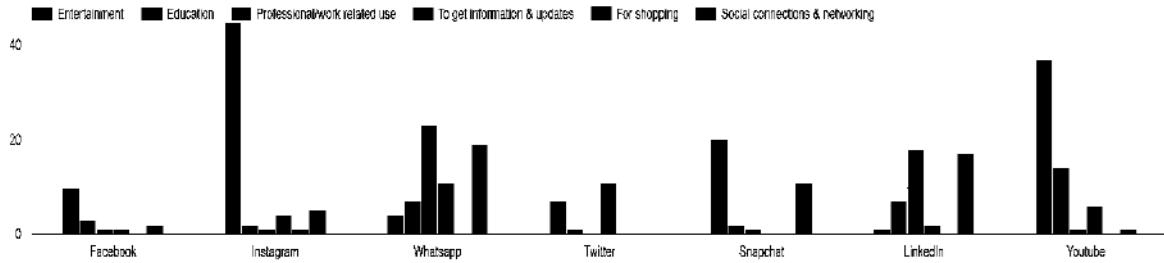
Kindly state the number of hours that you spend daily on the following social media platforms



The major finding from the below graph shows, people highly use social media to entertain themselves (mainly Instagram and youtube) and Whatsapp is mostly used for professional/work related use.

Chart 5: Purpose of Using Social Media Platforms

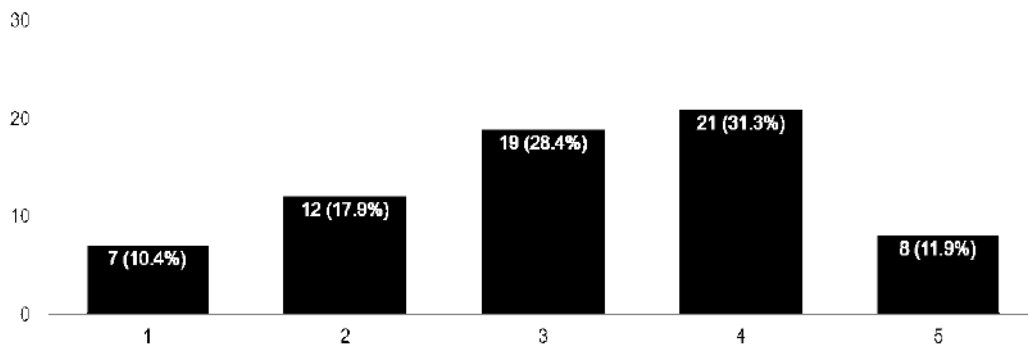
State the major purpose for which you access these social media platforms-



On a scale of 1 to 5 state how effective are social media advertisements in influencing your buying decisions compared to advertisements on traditional mediums such as TV, Radio, Outdoor advertising etc.:

67 responses

Chart 6: Rating on Effectiveness of Social Media



In the above graph, the highest rating is 4. This means social media advertisements are more effective in comparison to the traditional or TV advertisements.

In the below question, it gets more clear as people 70% of people are purchasing based on social media advertisements

Chart 7: Purchases Made Based on Social Media

Have you made any purchases based on advertisements seen on social media platforms in the last 6 months?

67 responses

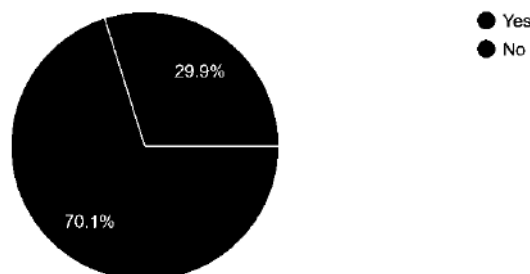


Chart 8: Frequency on Most Used Social Media Platform

How often do you engage with content (like, comment, share) on your most-used social media platform?

67 responses

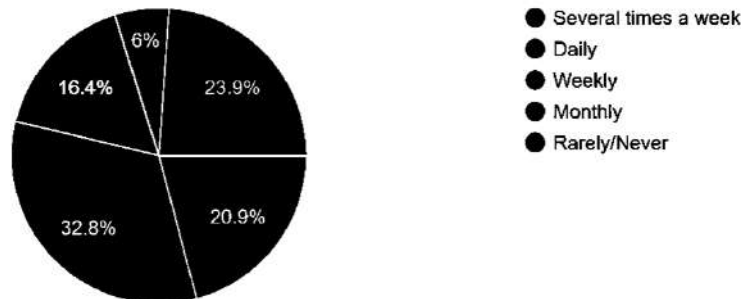
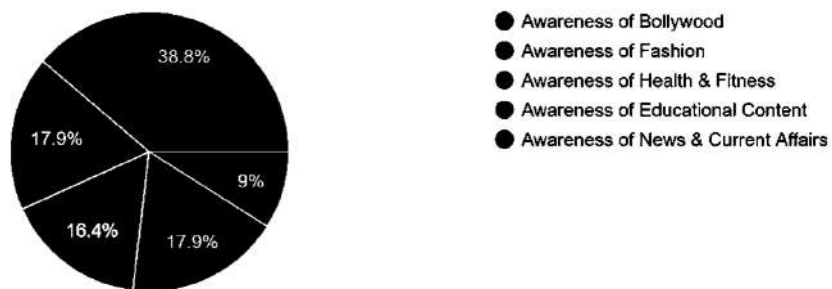


Chart 9: Social Media Information

How does social media add value to your life?

67 responses



The above two graphs show people are highly active on social media on daily basis. The main thing because of which respondents are on social media is to get aware of news & current affairs.

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A STUDY ON ROLE OF ARTIFICIAL INTELLIGENCE IN TAXATION

¹Dr. Madhura M. Kulkarni and ²Keval R. Kandu¹Deputy Director – IDOL, University of Mumbai²Assistant Professor, D.T.S.S. College of Commerce, Malad West, Mumbai**ABSTRACT**

Artificial Intelligence includes a wide range of technological process which has attracted so many areas to take benefit of it which also includes the field of taxation. In this modern era, doing effective work by saving time is the need of every organization and its executives. Artificial Intelligence provides a lot of opportunities to do work effectively and also expand the present knowledge of a professional by reducing the work load with its use. Apart from the efficiency and time saving, demand for Artificial Intelligence has also gone up after Covid-19. In India, there is a lot of work related to taxation and its compliances such as collection of data, classification and conversion of data as per the requirements of various tax returns, filing of those returns on time, tax planning and consultation. All these work became easier with use of Artificial Intelligence. Artificial Intelligence has revolutionized taxation field by providing automated work style for Tax and Accounting Professionals and it helps them in easy preparation of tax data for analysis, tax planning, tax calculation, tax returns, tax litigation matters and in other tax related works. This study focuses on the role of Artificial Intelligence in the field of Taxation and how it has made the work style of Tax and Accounting Professionals easy and convenient.

Keywords: *Artificial Intelligence, Automation in Taxation, Taxation*

INTRODUCTION

Artificial Intelligence is the simulation of Human Intelligence in Machines. It is a trait associated with human mind that is programmed to mimic and execute tasks like a human. Artificial Intelligence (AI) is continuously evolving to benefit many different industries using a cross-disciplinary approach based on mathematics, computer science, linguistics, and more. Since the beginning of the Artificial Intelligence it is predicted that machines will become so highly developed that it will take over the human activities, redesigning themselves at a higher level. In this era of technology advancement, dependency on Artificial Intelligence and technology has increased in all the sectors including taxation.

Artificial Intelligence plays an important role in Taxation. It helps Tax and Accounting Professionals as well as Government to make their task easy and effective. Government, with the help of Artificial Intelligence can easily collect and bring all the data together to analyze and monitor the financial data of a person and find out the tax defaulters. It also helps to easily identify a group of people who are under-reporting their income and penalized them, instead of wasting time on investigation. It also helps in bringing transparency in financial transaction.

On the other hand, Artificial Intelligence provides automated services related to classification of income and expenses, income computation, tax calculation, interest calculation, filing of tax returns and many more. Maximum time of Tax and Accounting Professionals is generally spent on gathering data, here, Artificial Intelligence reduces the time spent on it. Tax and Accounting Professionals use various softwares to compute the financial data in shorter time which is very much needed for filing of various tax returns within the due time. The use of Artificial Intelligence speeds up the lengthy processes and computes tax & interest thereon precisely which may take more time if done by without use of it. Artificial Intelligence reduces repetitive process work such as documentation and reporting by doing its own and it manages big tax data in a very efficient manner which accelerates the process of extracting relevant data from the bundle of available information. It helps Tax and Accounting Professionals to classify tax sensitive transactions easily. Artificial Intelligence makes it easier to forecast the future income of a person or an organisation on the basis of the historical trends. Predictive analysis of sales, expenses and income helps to any organization in making future provisions for tax as well as to reap the benefits available to minimize the tax burden. Maintaining past records for historical trend becomes an easier task with the use of Artificial Intelligence. Algorithms with Artificial Intelligence can detect trends on an annual, monthly, or even on more frequent basis.

Artificial Intelligence can also be helpful in educating Tax and Accounting Professionals as well as Taxpayers related to various tax matters with help of support systems of it. This helps in creating awareness to Tax and Accounting Professionals about the latest developments and areas to save taxes. This study intends to find out the role of Artificial Intelligence in taxation as to what extent it has made the things easier for Tax and Accounting Professionals.

LITERATURE REVIEW

[Nishika Gupta, 2017] explained the concept of Artificial Intelligence, areas of Artificial Intelligence, it’s techniques and recent developments in the fields of Artificial Intelligence and it’s applications.

[João Reis, Paula Espírito Santo, Nuno Melão, 2019] have expected that Artificial Intelligence will have a significant impact on public employment by replacing public jobs with machines. They have also identified Artificial Intelligence as supporting crisis management technology in state administration.

[Manuel Woschank, Erwin Rauch, Helmut Zsifkovits, 2020] states that in the context of Smart Logistics, the application of Artificial Intelligence is an early stage of development. They concluded that mature industrial applications of Artificial Intelligence are missing and considered that their research study to be used as a starting point for future investigations regarding application of Artificial Intelligence, Machine Learning and Deep Learning technologies in the area of Smart Logistics in industrial enterprises. They have focused on importance of to integrate different research areas such as information technology, logistics, mechanical engineering, industrial engineering, mathematics, and statistics into future research projects.

RESEARCH METHODOLOGY

In this research, the primary data has been collected through well designed structured questionnaire from 50 respondents which includes 32 male and 18 female respondents. These respondents are in the age group of 21 to 59 years working in the field of Taxation and Accounting and are mainly from Mumbai. The primary data collected from respondents is converted into tables & pie charts and the data is analysed statistically. The secondary data is collected from websites, blogs, research papers, and e-news.

OBJECTIVES OF THE STUDY

- 1) To study the availability of Artificial Intelligence in Taxation.
- 2) To study the use of Artificial Intelligence in Taxation.
- 3) To study the role and impact of Artificial Intelligence in practical use of it by Tax and Accounting Professionals.

HYPOTHESIS OF THE STUDY

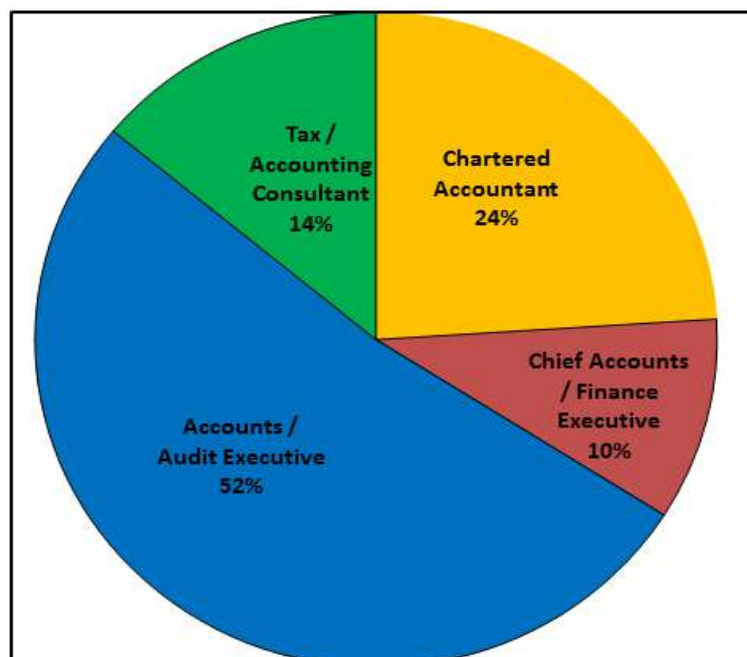
H₀ - Artificial Intelligence has not played a significant role in revolutionizing taxation field

H₁ - Artificial Intelligence has played a significant role in revolutionizing taxation field

DATA ANALYSIS AND FINDINGS OF THE STUDY

• OCCUPATION

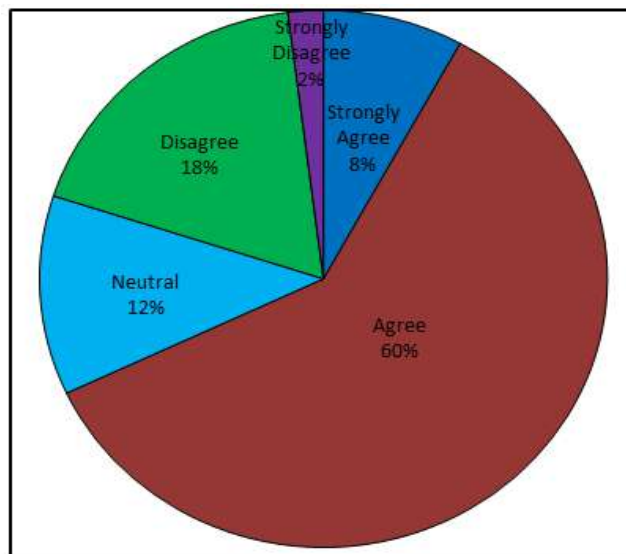
Out of 50 respondents of this survey, 12 respondents (24%) were Chartered Accountants, 05 respondents (10%) were Chief Accounts / Finance Executives, 26 respondents (52%) were Accounts / Audit Executives and 07 respondents (14%) were Tax / Accounting Consultants including freelancers.



Occupation	Frequency	Percentage
Chartered Accountants	12	24%
Chief Accounts / Finance Executive	05	10%
Accounts / Audit Executive	26	52%
Tax / Accounting Consultant	07	14%
Total	50	100%

• HUMAN INTERVENTIONS ARE VERY LESS IN THE WORK OF TAXATION FIELD DUE TO ADVANCEMENT OF TECHNOLOGY AND ARTIFICIAL INTELLIGENCE AND THE RESPONSES RECEIVED WERE AS

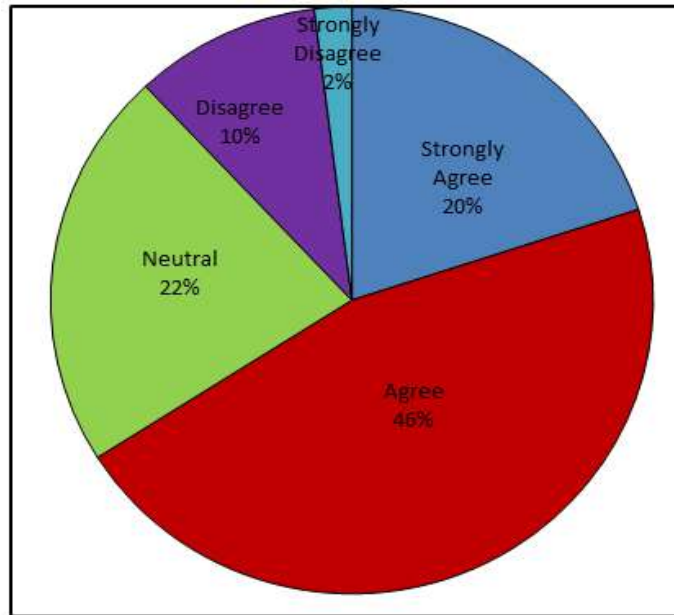
Out of the 50 respondents, 04 respondents were strongly agreed and 30 respondents were agreed to that due to technological advancement and Artificial Intelligence there is less human interventions in the taxation work whereas 06 respondents were had neutral opinion about it, 09 respondents were disagreed to this and 01 respondent was strongly disagree.



Response	Frequency	Percentage
Strongly Agree	04	08%
Agree	30	60%
Neutral	06	12%
Disagree	09	18%
Strongly Disagree	01	02%
Total	50	100%

• ARTIFICIAL INTELLIGENCE HAS MADE TAX COMPLIANCE VERY EASY: THE RESPONSES RECEIVED WERE

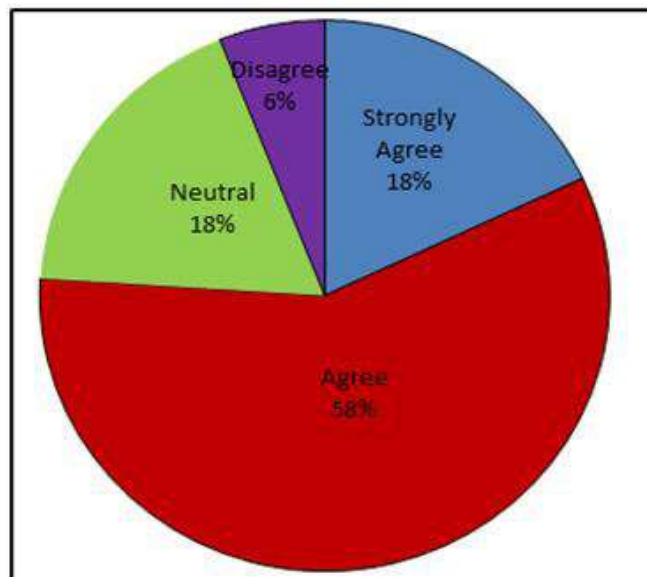
Out of 50 respondents, 10 respondents were strongly agreed and 23 respondents were agreed that Artificial Intelligence has made tax compliance very easy whereas 07 respondents were neutral about it, 05 respondents were disagreed to this and 01 respondent was strongly disagree.



Response	Frequency	Percentage
Strongly Agree	10	20%
Agree	23	46%
Neutral	11	22%
Disagree	05	10%
Strongly Disagree	01	02%
Total	50	100%

• ARTIFICIAL INTELLIGENCE HAS MADE WORK STYLE OF A TAX / ACCOUNTING PROFESSIONAL VERY EASY AND CONVENIENT. THE RESPONSES RECEIVED WERE

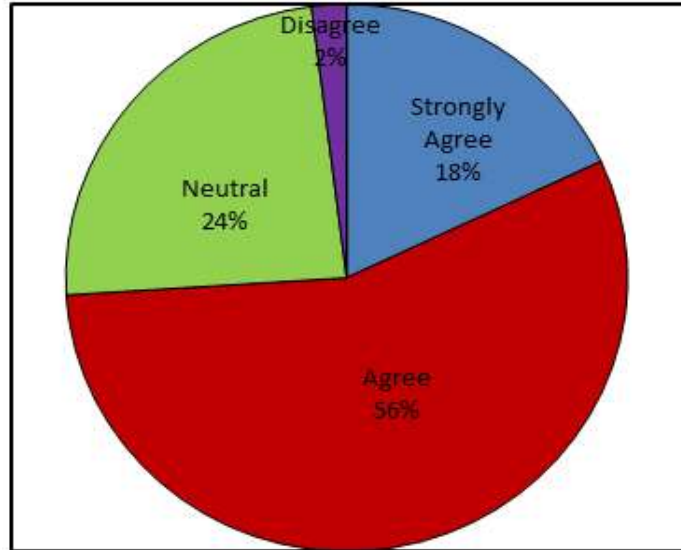
Out of 50 respondents, 09 respondents were strongly agreed and 29 respondents were agreed that Artificial Intelligence have made work style of a tax / accounting professional very easy and convenient whereas 09 respondents were neutral about it and 03 respondents were disagreed.



Response	Frequency	Percentage
Strongly Agree	09	18%
Agree	29	58%
Neutral	09	18%
Disagree	03	06%
Total	50	100%

• ARTIFICIAL INTELLIGENCE PROVIDES FAST AND ACCURATE DATA FOR FINANCIAL AND TAXATION PLANNING, THE RESPONSES RECEIVED WERE AS

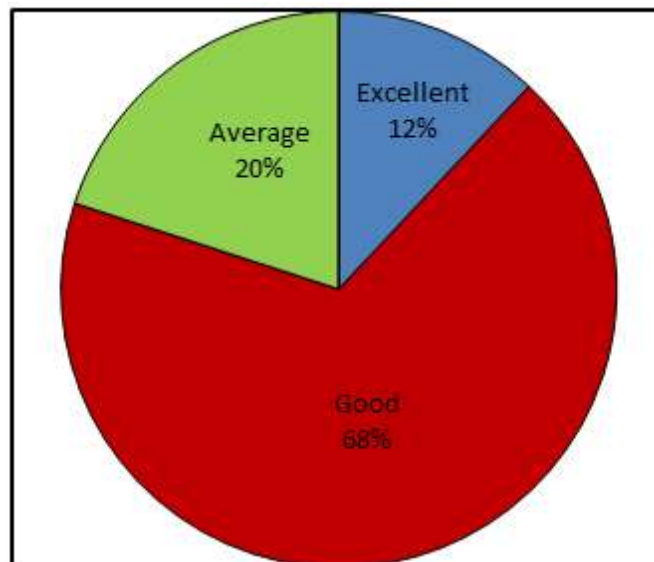
Out of 50 respondents, 09 respondents were strongly agreed and 28 respondents agrees that Artificial Intelligence provides fast and accurate data for financial and taxation planning whereas 12 respondents were neutral about it and 01 respondent were disagreed.



Response	Frequency	Percentage
Strongly Agree	09	18%
Agree	28	56%
Neutral	12	24%
Disagree	01	02%
Total	50	100%

• RATE THE EFFECTIVENESS OF ARTIFICIAL INTELLIGENCE IN TAXATION FIELD

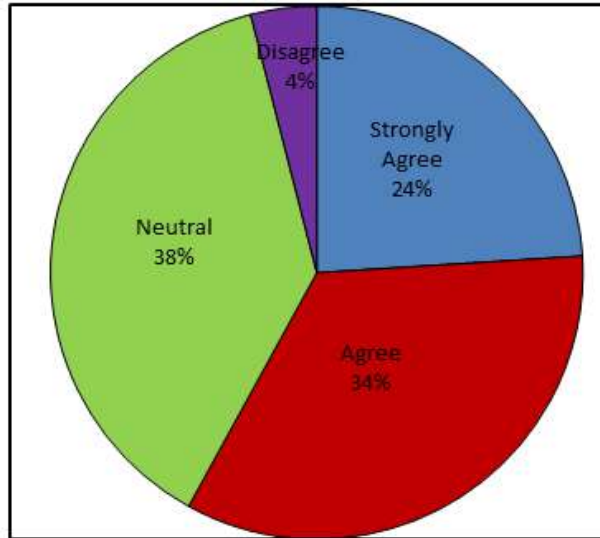
Out of 50 respondents, 06 respondents have rated excellent, 34 respondents have rated good and 10 respondents have rated average for the effectiveness of Artificial Intelligence in Taxation.



Response	Frequency	Percentage
Excellent	06	12%
Good	34	68%
Average	10	20%
Poor	00	00%
Total	50	100%

• TAX AND ACCOUNTING PROFESSIONALS ARE FULLY RELYING ON TECHNOLOGY AND ARTIFICIAL INTELLIGENCE IN TAXATION, THE RESPONSES RECEIVED WERE

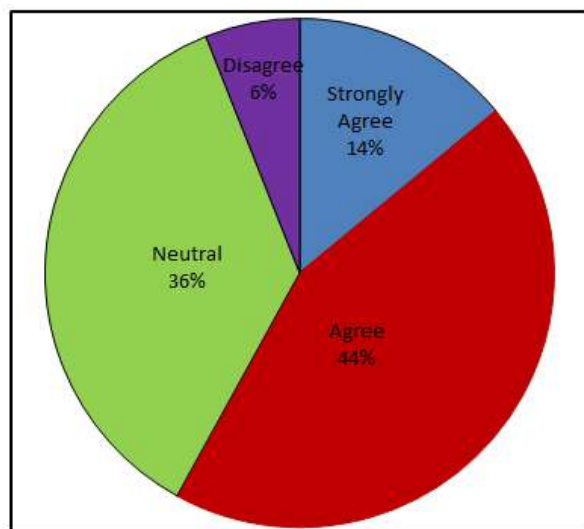
Out of 50 respondents, 12 respondents were strongly agreed and 17 respondents were agreed that Tax and Accounting Professionals are fully relying on Technology and Artificial Intelligence in Taxation whereas 19 respondents were neutral about it & 02 respondents were disagreed to it.



Response	Frequency	Percentage
Strongly Agree	12	24%
Agree	17	34%
Neutral	19	38%
Disagree	02	04%
Total	50	100%

• ARTIFICIAL INTELLIGENCE HAS BENEFITED IN IDENTIFYING POTENTIAL TAX FRAUD CASES, THE RESPONSES RECEIVED WERE

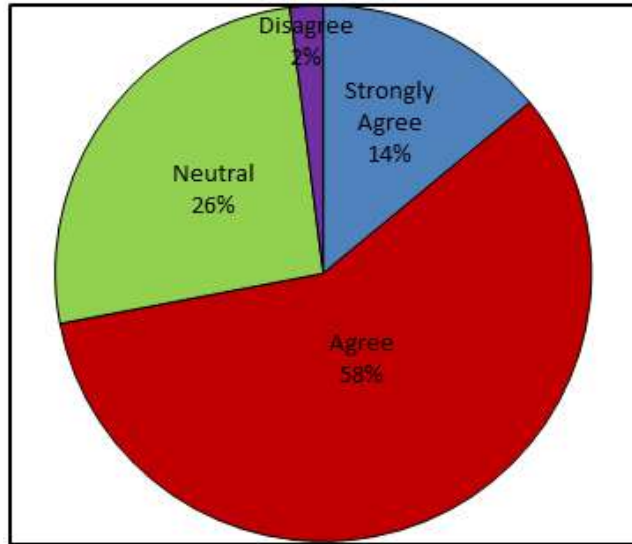
Out of 50 respondents, 07 respondents were strongly agreed and 22 respondents were agreed that Artificial Intelligence has benefited in identifying potential tax fraud cases whereas 18 respondents were neutral about it and 03 respondents were disagreed.



Response	Frequency	Percentage
Strongly Agree	07	14%
Agree	22	44%
Neutral	18	36%
Disagree	03	06%
Total	50	100%

• ARTIFICIAL INTELLIGENCE HAS IMPROVED TAX ASSESSMENT IN INDIA, THE RESPONSES RECEIVED WERE

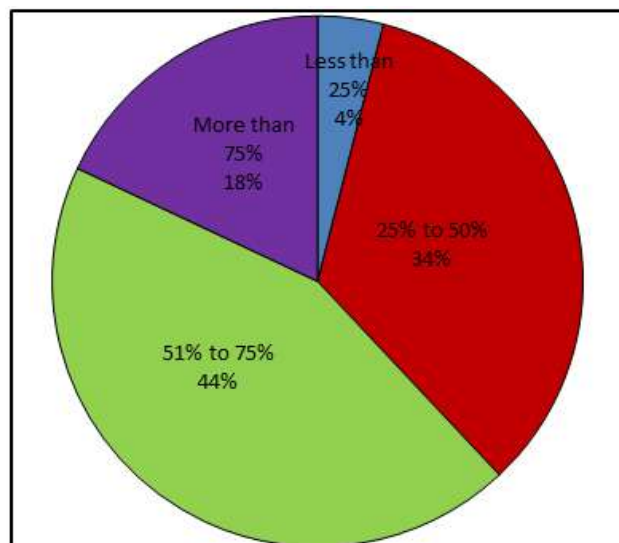
Out of 50 respondents, 07 respondents were strongly agreed and 29 respondents were in favour of that Artificial Intelligence has improved Tax Assessment in India whereas 13 respondents were neutral about it and 01 respondent was disagreed.



Response	Frequency	Percentage
Strongly Agree	07	14%
Agree	29	58%
Neutral	13	26%
Disagree	01	02%
Total	50	100%

• WHAT PERCENTAGE OF TOTAL WORK RELATED TO TAXATION YOU DO WITH THE USE OF ARTIFICIAL INTELLIGENCE , THE RESPONSES RECEIVED WERE

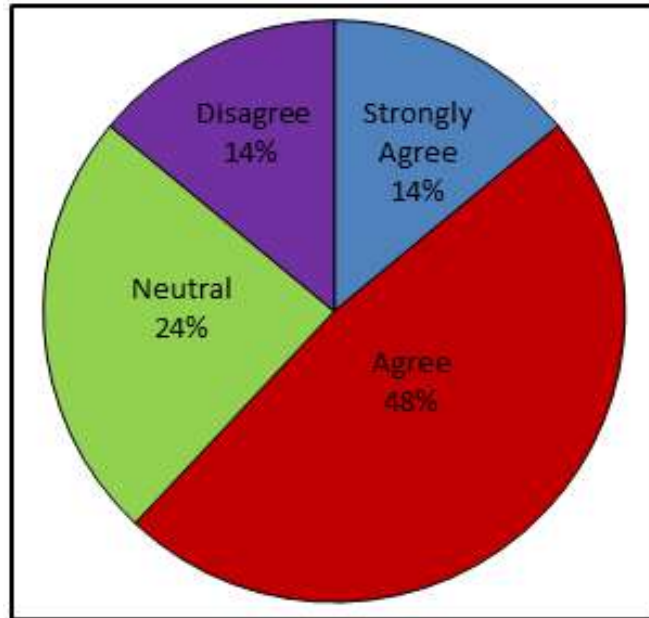
Out of 50 respondents, 02 respondents uses Artificial Intelligence for less than 25% of their work, 17 respondents for 25% to 50% and 22 respondents for 51% to 75% of their work and 09 respondents for more than 75% of their work.



Response	Frequency	Percentage
Less than 25%	02	04%
25% to 50%	17	34%
51% to 75%	22	44%
More than 75%	09	18%
Total	50	100%

• **ADOPTION OF ARTIFICIAL INTELLIGENCE HAS RESULTED IN REDUCTION OF JOBS IN THE FIELD OF TAX & ACCOUNTING, THE RESPONSES RECEIVED WERE**

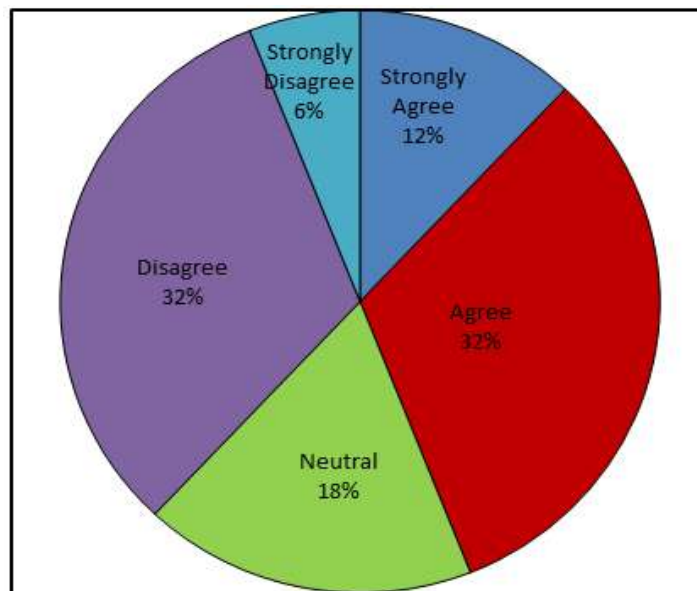
Out of 50 respondents, 07 respondents were strongly agreed and 24 respondents were agreed that adoption of Artificial Intelligence has resulted in reduction of jobs in Tax & Accounting field whereas 12 respondents were neutral about it and 07 respondents were disagreed.



Response	Frequency	Percentage
Strongly Agree	07	14%
Agree	24	48%
Neutral	12	24%
Disagree	07	14%
Total	50	100%

• **IN NEAR FUTURE, ARTIFICIAL INTELLIGENCE WILL TAKE OFF ALL THE SKILLS AND WORKS OF A HUMAN IN TAXATION FIELD WITH NO HUMAN INTERVENTION, THE RESPONSES RECEIVED WERE**

Out of 50 respondents, 06 respondents were strongly agreed and 16 respondents were agreed that in near future, Artificial Intelligence will take off all the skills and works of a human in taxation field with no human intervention whereas 09 respondents were neutral about it 16 respondents were strongly disagreed to it and 03 respondents were disagreed to it.



Response	Frequency	Percentage
Strongly Agree	06	12%
Agree	16	32%
Neutral	09	18%
Disagree	16	32%
Strongly Disagree	03	06%
Total	50	100%

CONCLUSION

From the analysis of survey conducted, it can be concluded that Artificial Intelligence has benefited taxation field in ways such as convenience at work, effectiveness of work, easy tax compliance, speed and accuracy of data for financial and taxation planning, identifying potential tax fraud cases, improvement in tax assessment and so on. Apart from the benefits, there are some issues identified in the study. Now days, Tax and Accounting Professionals are mainly relying on Technology and Artificial Intelligence to get their work done and therefore there is a fear amongst tax professionals that it may result in taking over of all the taxation works by Artificial Intelligence itself in the near future with no human interventions sadly leading to high unemployment. However, taxation field without intervention of humans will be a big challenge as this field requires a lot of technical analysis along with accurate judgments. Artificial Intelligence has revolutionized taxation field by providing automation but it also needs involvement of a person to complete the process.

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BIG DATA APPLICATIONS IN BUSINESS OPERATION MANAGEMENT

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ABSTRACT

The review explores the utilizations of Huge Information in business activities the executives, stressing its part in upgrading functional proficiency, prescient examination, client bits of knowledge, and production network improvement. Through a blended strategy approach, including quantitative information investigation and subjective contextual analyses, the examination recognizes critical advantages, for example, further developed navigation and upper hand. It additionally addresses difficulties like information quality, foundation need and labor force abilities. The review closes with best practices for effective Enormous Information execution, adjusting procedures to business goals and cultivating consistent improvement.

Keywords: *Big Data, Business Operations Management, Predictive Analytics, Customer Insights, Supply Chain Optimization.*

INTRODUCTION

In today's fast-paced business world, data has become a crucial asset. Big Data, defined by its volume, velocity, variety, and veracity, is revolutionizing business operations, improving efficiency, decision-making, and providing a competitive edge. By processing vast amounts of structured and unstructured data, businesses can gain valuable insights into operations, markets, and customer behavior.

Big Data is leveraged through advanced technologies like Hadoop, Spark, and cloud computing to uncover patterns, trends, and correlations. These tools help businesses enhance operational efficiency, such as predicting equipment failures in manufacturing and optimizing logistics to improve delivery and reduce costs.

Moreover, Big Data enables better demand forecasting, accurate predictions for inventory management, and proactive decision-making across industries. Predictive analytics helps businesses, like in finance, identify risks, and in marketing, forecast campaign success. It also provides a deeper understanding of customer preferences, driving personalized marketing strategies. Big Data is transforming traditional business practices, allowing companies to stay competitive and optimize performance.

LITERATURE REVIEW

(Preeti and Nigam 2020) review of the paper "Use of Big Data Analytics in Operations Management: A Review Using Text Analytics" offers a comprehensive examination of Big Data's impact on operations management. The authors utilize text analytics to systematically review existing literature, highlighting the role of Big Data in optimizing supply chains, enhancing predictive maintenance, and informing strategic decisions. The study effectively identifies key trends and practical applications while addressing challenges in data integration and governance. Overall, Sharma and Nigam's work underscores Big Data's transformative potential in modern business operations.

(Syed and Gardez 2020)'s research delves into the transformative impact of big data analytics on organizational performance, emphasizing the pivotal role of knowledge management practices as a mediator. Through meticulous analysis, the authors illuminate how adept utilization of big data can significantly enhance organizational efficiency and decision-making processes. Their findings underscore the symbiotic relationship between big data analytics and knowledge management, elucidating how the synergy between these domains fosters innovation and competitive advantage.

(Liang 2023)'s study on the application of big data in business operations as a core strategy offers an in-depth exploration of how data-driven decision-making is revolutionizing modern enterprises. Liang expertly dissects the multifaceted ways in which big data technologies are integrated into business operations, underscoring their impact on enhancing efficiency, reducing costs, and fostering innovation. Through a combination of theoretical insights and practical case studies, the author illustrates the transformative potential of big data when strategically implemented across various business functions, including marketing, supply chain management, and customer service.

Big Data Applications in Business Operation Management at Capgemini India Data-Driven Decision Making:

- Utilizing analytics to provide actionable insights for strategic and operational decisions.

- Enabling informed business strategies through comprehensive data analysis.

Operational Efficiency:

- Optimizing supply chains, production processes, and resource allocation using data.
- Streamlining operations to reduce costs and improve productivity.

Predictive Maintenance:

- Using data to predict equipment failures and schedule maintenance, minimizing downtime.
- Enhancing operational reliability and reducing unplanned maintenance costs.

Customer Insights:

- Analyzing customer data to improve marketing strategies, product development, and customer service.
- Enhancing customer satisfaction and loyalty through personalized experiences.

Fraud Detection and Prevention:

- Identifying and mitigating fraudulent activities through data analysis.
- Protecting businesses from financial losses and reputational damage.

Risk Management:

- Assessing and managing risks through comprehensive data analysis.
- Helping businesses mitigate potential threats and enhance decision-making.

Capgemini India's application of big data in business operations management exemplifies how advanced analytics and data-driven strategies can transform business processes, enhance efficiency, and drive growth. Through its innovative solutions and deep industry expertise, Capgemini India continues to lead in leveraging big data for business transformation.

DATA ANALYSIS

Evaluation of the Impact of Big Data Analytics on Decision-Making Processes:

To analyze how big data technologies, enhance strategic and operational decision-making within business operations management.

Data-driven decision-making is a data-driven approach to making decisions to achieve desired outcome. More precisely, data-driven decision making is an insights-driven approach to drive decisions and related actions. The data can come from internal and external data sources to avoid data biases. Data-driven decision-makers use data in their decision process to validate existing actions or take new actions (predictive or prescriptive analytics). They make decisions based on the actionable insights generated from the data. The goal is to make informed decisions while ensuring trust & transparency across the stakeholders & organization as a whole. It can be noted that data-driven decision making provides great thrust to digital transformation initiatives.

LIST OF TOPICS

Table 01: Different Forms of Decisions

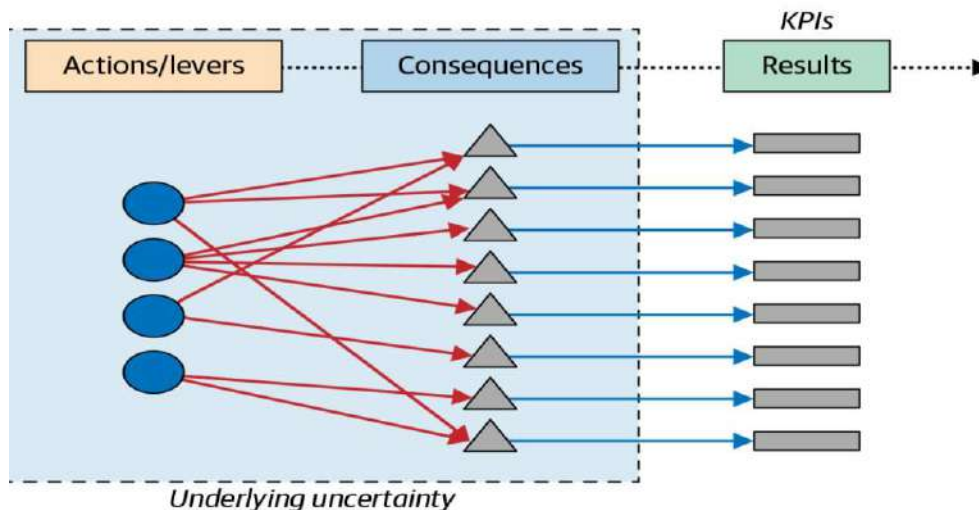
1.	What is decision making & how does it impact the business?
2.	What is data-driven decision-making?
2.1.	How to go about creating a system that facilitates data-driven decision-making?
3.	What are the different types of decisions?
4.	Benefits of data-driven decision-making
5.	Risks associated with data-driven decision-making

Source: <https://vitalflux.com/data-driven-decision-making-what-why-how/>

IMPACT OF DECISION MAKING IN BUSINESS

Decision making can be defined as an act of choosing among competing actions to attain specific objectives. Each of the competing actions (can also be termed as levers) may have one or several consequences (output) that impact our business outcomes. At the time of decision making, we don't know for certain as to what will be the consequence out of all consequences due to the action performed. The decision is made under conditions of uncertainty. This uncertainty is dealt by leveraging AI / machine learning. The consequences and business outcomes are measured using leading and lagging KPIs respectively. The following picture represents anatomy of decision making and its relationship with business impact:

Figure 01: Decomposing Decisions
Decomposing Decisions



Source: <https://vitalflux.com/data-driven-decision-making-what-why-how/>

Making great decisions result in great outcomes which result in value creation (revenue, reputation, etc.) for the business. When starting to solve a business problem, it is recommended to identify the key business decisions which can result in best possible outcomes. The decisions should then result in selection of one or more actions which would result in a set of consequences (output) which would finally result in attaining the business objective.

Different Types of Decisions: The following represents different forms of decisions made in an organization on a day-to-day basis which can leverage data-driven decision making.

PROGRAMMED DECISIONS IN BUSINESS

Programmed decisions are data-driven, relying on past experiences and analysis to guide actions that achieve specific outcomes. These decisions are often part of long-term business strategies and policies.

Key Features:

1. **Data-Driven:** Use descriptive and diagnostic analytics, tracked via KPIs and dashboards (e.g., Excel, Tableau, Qlik Sense).
2. **Expert Involvement:** SMEs, data analysts, and scientists extract insights from historical data to inform decisions.
3. **Strategic Impact:** Contribute to long-term policy and business strategy, with results monitored over time.

Programmed decisions are crucial for strategic planning, leveraging analytics to track and measure long-term business impacts.

The following represents different examples of programmed decisions:

• **Marketing Decisions**

Marketing decisions can be considered a type of programmed decision, where actions are based on data and the impact is tracked through KPIs to assess their effect on sales.

Example:

Decision Hypothesis: Invest more in digital marketing over traditional methods. To test this, actions related to digital marketing are executed, and outcomes are measured using KPIs and benchmarks, tracked through dashboards.

Questions answered through the dashboard (descriptive analytics):

How effective are digital marketing campaigns in increasing sales?

What is the ROI on digital marketing versus traditional marketing?

Which digital channels are performing best?

Dashboards provide real-time insights, enabling marketers to make informed decisions and optimize strategies based on performance data.

- Can the investment in digital marketing be increased based on KPIs trends against the benchmark?
- What form of digital marketing should be adopted for maximum gains?
- When can we decide to opt for more traditional methods? What values of KPIs will indicate that?
- What should be split in the digital and traditional form of marketing?

Un-programmed Decisions: These are transient choices that need information to be broke down to pursue a choice. Un-customized choices, on occasion, can likewise be named as strategic and additionally functional choices. Un-modified choice can use prescient and prescriptive examination. Here is an illustration of an un-modified choice that use prescient demonstrating or AI displaying. For instance, suppose a prescient model is worked to group whether a client will stir etc. The prescient model gives a likelihood score against every client. Organizations can choose to send a promoting effort with new contributions to all clients whose likelihood score is more than 0.8. In another choice, it can choose to convey a mission email in the event that the score is more prominent than 0.9. You might take note of that these choices are un-customized and can shift relying on the choice focuses from the prescient model. Information driven dynamic assists in coming to with bettering resolutions than human instinct. For instance, coming up next are various sorts of un-customized choices: Sales manager's daily sales report: What customers should I focus on? Which customer can give maximum revenue for me this month?

- Marketing manager's daily data report: What are the best strategies to increase my company's Facebook followers?
- Manufacturing decisions can also be seen as un-programmed decision. These decisions can leverage output of prescriptive analytics to arrive at the decision points. For example, what should be the optimal manufacturing capacity to meet the increase in demand?

Organizational Decisions: These are data-driven decisions that need data to arrive at the correct decision. These data can be used by multiple people in an organization and they will make similar types of un-programmed or programmed decisions based on them.

For example, the following are different types of organizational decisions:

- **Industry benchmarking data** – How is my company comparing to others in the same industry?
- **Market data** – How much demand is there for our products/services in the marketplace? Are they increasing or decreasing over time?

Strategic Decisions: These data-driven decisions are used to make long-term planning in the organization. For example, the following are different types of strategic data-driven decisions:

- **Strategic plan** – Where do we want to be in five years? What should our company's mission statement be?
- **Long term data collection for programmed decisions** – Whether a new data-collection system is required to record data over a long period.

BENEFITS OF DATA-DRIVEN DECISION-MAKING

The following are different benefits of data-driven decision-making.

Data-driven decision-making (DDDM) enables organizations to make informed, efficient, and value-focused decisions. Key benefits include:

1. **Analytical Problem-Solving:** Systematic solutions through data insights.
2. **Value Alignment:** Actions guided by actionable insights.
3. **Timely Decisions:** Supports quick, evidence-based choices.
4. **Data Transparency:** Accessible and shareable data fosters collaboration.
5. **Improved Access:** Data available across teams and departments.
6. **Higher Quality:** Reduces errors and redundancy for reliable insights.
7. **Efficiency:** Saves time and resources by streamlining processes.

- 8. **Optimized Usage:** Enhances data value through sharing and reuse.
- 9. **Customer Satisfaction:** Personalizes strategies to boost retention and revenue.

RISKS ASSOCIATED WITH DATA-DRIVEN DECISION-MAKING

The following are risks or disadvantages of data-driven decision making:

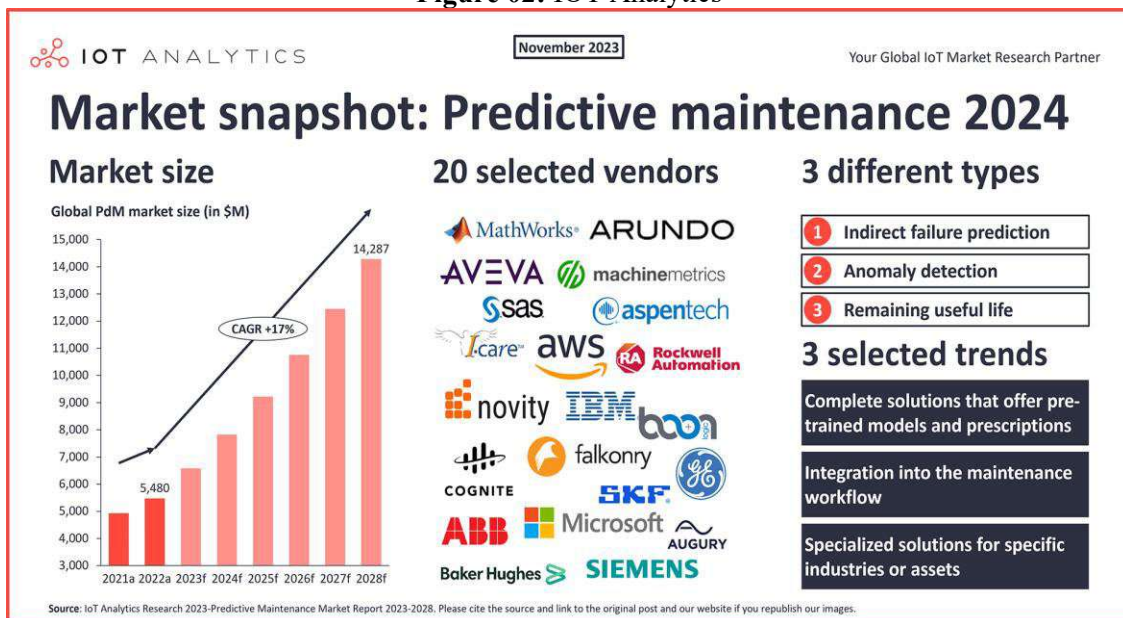
Challenges in Data Analytics

- 1. **Confirmation Bias:** Favoring data that aligns with existing beliefs, leading to inaccurate conclusions.
- 2. **Data Leakage:** Unauthorized data exposure causing trust loss, financial harm, and reputational damage.
- 3. **Data Bias:** Errors in data collection or analysis favor certain outcomes, misleading trends and patterns.
- 4. **Unforeseen Consequences:** Overlooking factors like data quality can result in inaccurate insights and unexpected outcomes.

EXAMINE THE EFFECTIVENESS OF PREDICTIVE MAINTENANCE ENABLED BY BIG DATA

- To explore the application of predictive analytics in anticipating equipment failures and scheduling maintenance to reduce downtime and costs.

Figure 02: IOT Analytics



Source: <https://iot-analytics.com/predictive-maintenance-market/>

- The global predictive maintenance market grew to \$5.5 billion in 2022—a growth of 11% from 2021 with an estimated CAGR of 17% until 2028, according to the Predictive Maintenance and Asset Performance Market Report 2023–2028.
- With median unplanned downtime costs larger than \$100,000 per hour, the importance of accurately predicting failures of large assets has never been higher.
- This article shares 5 key highlights of the predictive maintenance market:
 - 1) The market is valued at \$5.5 billion,
 - 2) There are 3 different types of predictive maintenance,
 - 3) Predictive maintenance software tools share 6 features,
 - 4) Predictive maintenance is commonly being worked into the maintenance workflow, and
 - 5) Successful standalone solutions vendors specialize in an industry or asset.

4. INVESTIGATE CUSTOMER INSIGHTS DERIVED FROM BIG DATA AND THEIR INFLUENCE ON BUSINESS STRATEGIES

To understand how the analysis of customer data can inform and enhance marketing strategies, customer service, and product development.

Figure 03: Exploring the Impact of Big Data Analytics on R&D, Supply Chain, Quality Control, and Customer Insights



Source: <https://www.linkedin.com/pulse/exploring-impact-big-data-analytics-rd-supply-chain>

The semiconductor & and electronics sector, a cornerstone of the modern digital age, constantly evolves and expands with rapid technological advancements.

CONCLUSIONS

The conclusions drawn from this project underscore the transformative potential of big data in business operations management. Capgemini India's strategic use of big data analytics has led to significant improvements in decision-making, operational efficiency, and customer insights. The ability to analyze large datasets in real-time allows businesses to make informed decisions, optimize operations, and anticipate and mitigate risks effectively. Predictive maintenance supported by big data analytics minimizes downtime and maintenance costs, while personalized marketing strategies based on customer insights enhance customer satisfaction and loyalty. Moreover, the use of big data in fraud detection and risk management safeguards businesses from financial and reputational losses, ensuring stability and continuity.

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A STUDY ON CARAVAN TOURISM IN MAHARASHTRA**Dr. Reeta B. Jain**

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ABSTRACT

Looking at the emergence and success of caravan tourism across the globe, the study dwells on providing a brief overview of 'Caravan tourism', its components and its potential implications in Maharashtra. With the introduction of a formal policy framework by the Government of Maharashtra, caravan tourism is likely to gain momentum and supplement the other existing traditional and upcoming innovative tourism models in Maharashtra.

Keywords: Caravan, Caravan Tourism, Impact of Caravan Tourism, Maharashtra, Motor Homes etc.

I. INTRODUCTION

The state of Maharashtra is sanctified with tropical climate and endowed with rich biodiversity, dense forests, beautiful beaches, wildlife reserves, hill stations, rivers, waterfalls and several other forms of natural scenic tourism sites. The diverse culture, religious heritage sites, sacred *jatras* and other forms of festive celebrations, ancient structures and its architectural aesthetics, attract tourists from all over the globe and thus making Maharashtra one of the most visited states of India and tourism one of the fastest growing sectors of Maharashtra (Directorate of Economics And Statistics, Planning Department, Government of Maharashtra. 2020)

Such diverse range of natural as well as historic man-made tourist attractions have made Maharashtra a melting pot for traditional as well as innovative tourism models like, adventure tourism, agritourism, heritage tourism, eco-tourism, science tourism, spiritual tourism, health tourism, culinary tourism, cave tourism etc. With different motives, tourists of diverse age groups from all over globe travel to sense the ethnicity of Maharashtra.

II. OBJECTIVES OF THE STUDY

1. To study and comprehend the concept of caravan tourism and its components.
2. To analyse the relevance of caravan tourism and its potential implications in Maharashtra.
3. To examine the role of caravan tourism in supplementing and complementing other forms of tourism like agritourism.

III. RESEARCH METHODOLOGY

The study is based on the data published by various organisations and agencies. The study relies on data provided on the websites of caravan tourism service providers, MTDC, Ministry of tourism, e-news, e-books and journals etc.

IV. REVIEW OF LITERATURE**Caravan Tourism**

- i. According to K & G (2022), the success of caravan tourism in countries like North America, Europe, Germany, Australia, and New Zealand provides the testimony of its potential in accelerating tourism across other regions.
- ii. According to Travel With Vahn (2023), Caravan tourism is a form of tourism which includes, tourists exploring various destinations while travelling and living in a specially designed vehicle, camper vans, trailers, motorhomes which closely resembles a mobile home on wheels.
- iii. As described by Lamba & Mohan (2022), Caravan tourism is an extension of camping and a niche segment within experiential tourism, especially wherein tourists travel for vacations at motorable destinations around the world.
- iv. The study conducted by Bhosale (2020), highlights a list of promising suggestive sites for the development of caravan parks across the various Dams, Hill Stations, Waterfalls Forts, Caves, Hot Water Springs, Wildlife Sanctuaries etc. in Maharashtra.
- v. The study conducted by P, Srivastava, & Das (2023), states that Caravan tourism inspires family-friendly travels, as it gives the flexibility and freedom of picking routes and even destinations which may not have the adequate conventional hotel-based accommodation facilities.

V. ELEMENTS/COMPONENTS OF CARAVAN TOURISM

The quality experience of caravan tourism heavily relies on the effective combination of the choice of travel destination and the following elements:

‘**Caravan**’ is a self-contained motorhome often used by travellers for the purpose of travel, lodging as well as recreation (P, Srivastava and Das 2023). ‘Caravan’ is a specially designed utility vehicle like, any ‘Recreational Vehicle’, ‘Campervan’ or a ‘Motorhome’, equipped with basic amenities required to fulfil transportation, accommodation and resting (kitchen, toilet, couch, bed, table etc.), related requirements of travellers.

‘**Caravan Parks**’ are sites which are equipped with basic amenities like sufficient parking space, electricity and water supply, laundry facility, charging facility, sewage connections, etc. Caravans can be parked at the allotted spaces of the parking bays and tourists can stay overnight comfortably and safely in their motorhomes (Ministry of Tourism n.d.).

‘**Tourist Facility Centres (TFCs)**’ are common facility centres at caravan parks wherein, all the supporting services like, first-aid, rest rooms, tyre shop, fuel station, laundry facilities, mechanic on-call, and other vehicular requirements and emergency services etc. are made available, proportionate to the number of parking bays at a caravan park. These, tourist facilitation centres complement and supplements the services available within the caravan and certainly, compensates for the services which are not always or infrequently available within the caravan.

‘**Caravan Tour Operators**’ are registered travel partners providing caravans/motorhome services on rental basis, based on the requirements of travellers. Depending upon the number of tourists traveling in each caravan and combination of services (Driver, support staff, kitchen, sanitation, bed, camping etc.) opted by the tourist against a fee. (Motohom.co.in 2024).

VI. RELEVANCE OF CARAVAN TOURISM IN MAHARASHTRA

With the growing demand for leisure travel, popularity of various renowned tourist destinations and several other forms of tourism like, adventure tourism, agritourism, cave tourism, heritage walks etc., the influx of tourists at such popular destinations have increased in Maharashtra. With overcrowding of such popular destinations and the prevailing lodging and boarding capacities being constant or having limited scope for further development of accommodation/stay infrastructure at such tourist destinations, the concept of caravan tourism has emerged as a plug-in to balance the demand and supply.

Often, due to topographic challenges, in the interiors and remote areas of Maharashtra, especially wherein the construction of permanent accommodation facility is not legal or difficult to establish or infeasible or may be not permissible (Government of Maharashtra, Environmental and Cultural Affairs Ministry 2021), caravan parks can be developed in nearby areas so that caravans/motorhomes can be easily parked at the bays and the travellers’ requirements for quality lodging and boarding, recreation, adventure etc. can also be fulfilled.

Caravan tourism, provides travellers with open-ended travel plans a sense of liberty, self-sufficiency and liveness in terms of picking routes, destination or switch destinations, no matter to which tourist destination they are travelling to, without worrying about the privacy, safety and security related concerns at the chosen travel destination. (P, Srivastava and Das 2023).

The desire to explore the less explored, rustic, organically promising, uncommercialised natural scenic destinations that are having almost no or very limited lodging boarding amenities have paved the means for all the experiential travellers to capitalise on the ease and flexibility that caravan tourism provides.

VII. POTENTIAL IMPLICATIONS OF CARAVAN TOURISM IN MAHARASHTRA

The literature reviewed (Bhosale 2020), provides deep insights on the following potential implications and contributions of caravan tourism (S, et al. 2024):

i. Employment and Self-employment Opportunities: The entire ecosystem of caravan tourism provides numerous direct and indirect entrepreneurial and employment opportunities to locals as well as non-locals in various areas like; production of caravans, development and maintenance of caravan parks, operating a caravan park, running a tourist facility centre, providing repairs and maintenance services at caravan parks, working as caravan tour operator etc.

ii. Support Local Economies: Innovative tourism models have the potential to generate a sustainable source of income for the connected local communities (Page and Connell 2006), which is again vital for the local economies of Maharashtra. Like any other form of tourism, caravan tourism also has the potential to support and contribute towards the growth of local economy.

As caravan tourists typically travel and stay in motorhomes. They typically rely on locally available products and services, thus providing direct support to local businesses, artisans, craftsmen and the local communities (Rogerson 2019).

iii. Promote Sustainable Tourism in Maharashtra: Unlike the conventional form of tourism which heavily relies on permanent infrastructure, like hotels for lodging and boarding services, the literature suggests, sustainable adoption of caravan tourism can gradually minimise the need for constructing new facilities and also reduce land and environmental degradation (Swarbrooke 1999). Prevention of environmental degradation is essential to preserve the natural heritage and the biodiversity of Maharashtra.

As highlighted by P, Srivastava, & Das, (2023), with adoption of eco-friendly measures like using renewable sources of energy (solar energy) to run caravans, Tourist Facility Centers and caravan parks, and installing waste management systems, compost toilets in caravans can help to reduce the negative impact of tourism driven anthropogenic activities on environment (Gössling, Scott and Hall 2013).

iv. Implications of Caravan Tourism on other Tourism Models: Caravan tourism can supplement the progress of prevailing traditional as well as other innovative tourism models in Maharashtra. Some of the highly popular tourism sites in Maharashtra are generally overcrowded during the peak season. Caravan Tourism provides an extended capacity to host and serve tourists visiting such popular sites during peak season without putting extra pressure on land for constructing lodging and boarding facilities.

Some of the hill stations, caves, forts etc., have a great potential to attract tourists but due to limited or no commercial development of lodging boarding, refreshment and leisure facilities around, tourists find it inconvenient and unsafe to visit or stay overnight at such natural tourist destinations. Caravan tourism very opportunely fill-in here and makes overnight stays around to such rustic places like hill stations, caves, forts etc., feasible, safe and convenient and thus in turn also promotes cave tourism, adventure tourism, heritage tourism etc. (Bhosale 2020). With an increasing number of caravan tourists visiting such uncommercialised rustic tourist locations in Maharashtra, it will certainly facilitate the preservation and promotion of such sites and in turn lift the local economy.

v. Supplement Agritourism: Caravan tourism has immense potential to support and complement agritourism (Bhosale 2020). Especially, across the existing Agritourism farms in Maharashtra, wherein only day tour facilities are provided due to unavailability of the infrastructure necessary to host tourists overnight. Due to topographical and environmental constraints, very limited construction of permanent structures on agricultural land is permitted. Construction of permanent structure on an agricultural land is expensive and a counterproductive exercise, especially when the inflow of tourists and the range of services availed by them is not constant and fluctuates throughout the year. With the integration of Agritourism with Caravan Tourism, Agritourism service providers can provide camping and overnight stay facilities around their Agritourism centers, without constructing permanent lodging and boarding facilities on agricultural land.

VIII. FINDINGS OF THE STUDY

- i. Caravan tourism is an extension of the conventional concept of tourism, which includes movement and accommodation of tourists, while travelling from one place to another in a vehicle, which is equipped with kitchen, sanitary, stay and leisure amenities.
- ii. The formalisation of Caravan tourism policy framework by the Government of Maharashtra in 2021 (Government Resolution Number: TDS 2021/02/Sr. No. 501/ Tourism) has laid foundation for development of the ecosystem required for caravan tourism to materialise and realise its potential. It also presents an opportunity to explore the synergetic effect of integration of caravan tourism with all the other forms of tourism and capacities prevalent in Maharashtra.
- iii. To reap the potential benefits of caravan tourism in Maharashtra the right blend of, sustainable practices, infrastructure development, marketing strategies and most importantly a well networked ecosystem of caravan manufacturers, caravan tour service providers, insurance companies, caravan park developers and operators, traditional and innovative tourism models and functional support from administrative governing bodies is necessary.
- iv. Caravan tourism helps in extending the standard accommodation capacity and promotes the feasibility of staying at existing overcrowded tourist destinations during peak season. Caravan tourism, very conveniently complements and supplements all the other tourism models.

- v. Strategic integration of Caravan tourism and Agritourism can enhance the capacity of agritourism services providers in Maharashtra to provide accommodation and recreational services without having the need to construct permanent structures on agricultural land.
- vi. Caravan tourism has the potential to positively influence the economy of Maharashtra in terms of providing numerous entrepreneurial and employment opportunities and supporting the local economy. It helps in striking a balance between the fluctuating demand for travel and accommodation and the prevailing capacity available under the various models of tourism all over Maharashtra.

IX. SUGGESTIONS

Following are the suggestions for caravan tourism service providers in Maharashtra:

- i. Caravan tourism can be promoted using existing tourism packages to prevalent tourist destinations by simply educating and incentivising travellers to opt for experiential caravan stay facilities especially during peak period.
- ii. Caravans built and used for the purpose of tourism should be Bharat Stage VI compliant to ensure its longevity.
- iii. Caravan tour operators must network with Agritourism service providers rendering only day tour services and encourage them to experiment with caravan tourism by simply including their Agritourism centres (ATCs) as 'Caravan Tourism Circuits'. This will help them to provide camping and overnight stay facilities around their ATCs and generate additional revenue with almost negligible additional investment.
- iv. Just like Airbnb and OYO, the availability of caravan parking bays, caravans, trailers etc., can be made available online for tourists, to make the process of making real-time bookings seamless.

X. CONCLUSION

Caravan tourism is an emerging concept of travelling to desired tourist destinations in a vehicle that is furnished with basic kitchen, sanitation and resting amenities. Hereby, tourists stay and rest in the motorhome parked at the destination caravan parks which are equipped with all the supporting amenities otherwise offered at hotels and other service centres.

With numerous tourism avenues, the state of Maharashtra offers countless opportunities for different tourism models like adventure tourism, heritage tourism, agritourism, wine tourism, cave tourism etc. to attract tourists, grow and flourish. With the combination of prevailing popular as well as unexplored tourist attractions and the quality of transportation and hospitality infrastructure available in Maharashtra the adoption, emergence and success of caravan tourism is assured.

Adoption of eco-friendly practices can make caravan tourism more inclusive and sustainable, generate entrepreneurial and employment opportunities, support local economies, and promote land conservation by reducing the need for permanent infrastructure to host tourists in Maharashtra. Caravan tourism has the potential to supplement the conventional hotel-based tourism capacities and complement the other innovative tourism models prevalent in Maharashtra.

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A COMPARATIVE STUDY ON THE INVESTMENT PATTERN OF COLLEGE TEACHERS FROM AIDED AND SELF-FINANCED SECTIONS WITH SPECIFIC REFERENCE TO PUNE CITY**Bhavana B. Solanki¹ and Dr. Radhika R. Iyer²**¹Research Scholar and ²Research Guide, Ph.D. Research Center, Sydenham College of Commerce & Economics Mumbai**ABSTRACT**

In this study research, the investment habits of college Teachers in Pune city's self-financed and Aided colleges are compared. Understanding the investing decisions made by educators has become essential due to the emergence of alternative investment alternatives and the growing financial independence of individuals. The purpose of this study is to determine how college teacher's financial practices are impacted by these variations in institutional structure. Researchers used a structured questionnaire to gather information from 200 teachers in Pune City's Aided and Self-Finance Sections. This study highlights notable distinctions between college teachers working in self-financed and aided sections, offering insightful information about their investment habits in Pune. The results highlight how risk tolerance, financial knowledge, and investment behavior are impacted by institutional affiliation. With these data, policymakers and financial advisors can create focused financial education initiatives for teachers in both fields.

Keywords: Investment Patterns, College Teachers, Aided Colleges, Self-Financed Colleges

INTRODUCTION**Background of the Study**

Financial attitudes and actions are significantly shaped by education, especially in the higher education sector. Although they are an essential component of the educational system, college teachers display a variety of investment patterns. Factors including income levels, employment security, financial literacy, and institutional policies all have an impact on their investment choices. In India, colleges can be broadly divided into two groups: self-financed and aided. Self-financed institutions rely more on student fees and have less government support than aided colleges, which are frequently supported by government funds and offer greater financial stability its employees. Pune, one of Maharashtra's educational centers with a wide variety of institutions, is the specific subject of the study, which examines how these variations impact teachers' investment behavior.

STATEMENT OF THE PROBLEM

Despite the abundance of studies on investment behavior, little is known about college teachers' investment habits, especially when it comes to those working in various kinds of educational establishments. In order to close this gap, this study compares the investment habits of teachers at Pune city's self-financed and aided colleges.

OBJECTIVES OF THE STUDY

1. To analyze and compare the investment patterns of college teachers working in aided and self-financed colleges in Pune.
2. To understand the different motives of the investment choices of college teachers working in aided and self-financed colleges in Pune.
3. To assess the level of financial literacy and risk tolerance between the college teachers working in aided and self-financed colleges in Pune.
4. To make recommendations for policies or possible areas for development in order to improve both groups' financial well-being.

HYPOTHESIS

- H₁. There is a significant difference in the investment patterns between college teachers working in aided and self-financed colleges in Pune.
- H₂. There is significant difference between the motives of the investment choices of college teachers working in aided and self-financed colleges in Pune.
- H₃. There is significant difference between the level of financial literacy and risk tolerance between the college teachers working in aided and self-financed colleges in Pune.

LITERATURE REVIEW

1. **R Sreepriya & P Gurusamy (2013)** examined the salary investment pattern of individuals in the Coimbatore district using a sample of 150 respondents. It was determined that the majority of respondents favored long-term investments, with bank savings being the most popular choice. The survey also underlined the strong correlation between respondents' degree of contentment and their educational background.
2. **Sood, D., & Kaur, N. (2015)** in their research paper titled name, "A study of saving and investment pattern of salaried class people with special reference to Chandigarh (India)" identified the connection between the Chandigarh salaried class's saving and investing habits. A systematic questionnaire was used to gather data from 200 employees in several Chandigarh sectors. The investigation showed a correlation between Chandigarh residents' annual savings and their age, income, sector-specific employment, and level of education. One-way ANOVA has been used for the analysis. This article suggested that bank savings and LIC are the most popular investment options, and that safety, tax benefits, and high returns account for the majority of investing selections.
3. **Shukla, A. (2017)** Study on Investors' Decision Making Patterns in Kanpur. This paper presents the preferences of investors along with the various elements that influence their behavior on various investment routes. Because the population was so large, 100 people participated in the survey. It was determined from the analysis of primary data that different groups of people have different investment goals, different investment time frames, and different investment patterns that are influenced by the investors' age, gender, income, family, and educational background.
4. **Dhayalan, V., Senthilnathan, C. R., Venkatesh, P., & Krishnamoorthy, M. (2018)** in their research paper titled name "Saving habit and investment preference of government school teachers in Vellore District" focused on the investing preferences and saving behaviors of government school teachers in Jolarpet Union. Investigating socio-demographic characteristics is the primary goal of this project. The population is 340, and 180 sample respondents were chosen from the population using simple random sampling, multiple regression analysis, and percentage analysis. The study shows that the majority of teachers save money for their children's education, marriage, and other life goals. There may be promising opportunities to improve school teachers' saving and investing practices if the aforementioned recommendations are put into practice.
5. **Sendilvelu, K., & Shah, M. D. (2021)** in their research paper titled name, "A Comparative Study on Investment Pattern of Self-Employed & Start-Up Entrepreneurs with Special Reference to Pan India" compares the investment patterns of self-employed people with entrepreneurs. They collected 100 samples from self-employed people and start up entrepreneurs for the study. The Chi-Square Test tools were used to connect the components that have an impact on each other in order to conduct the analysis. Overall, the study has provided fresh insights on the financial behavior of both self-employed people and entrepreneurs.

RESEARCH METHODOLOGY**Research Design:**

Surveys are used to gather and analyze data using a quantitative methodology.

Population and Sample:

The study's population consists of Pune city college teachers. Two hundred responders were chosen using a stratified random sample technique, with one hundred coming from self-financed universities and one hundred from aided colleges.

Data Collection Method:

Both closed-ended and open-ended questions were included in the structured questionnaire that was used to gather data.

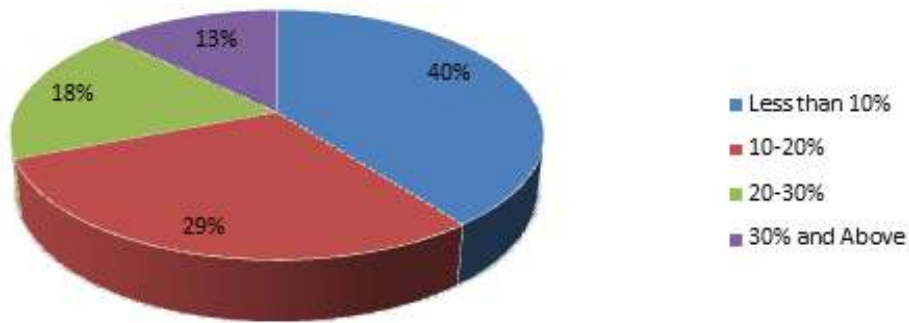
Limitations of the Study:

The study is restricted to a particular geographic area (Pune city) and concentrates on a small sample size. Future studies could apply qualitative techniques and extend the study to additional cities in order to gain a deeper understanding of the factors influencing various investment decisions.

DATA ANALYSIS

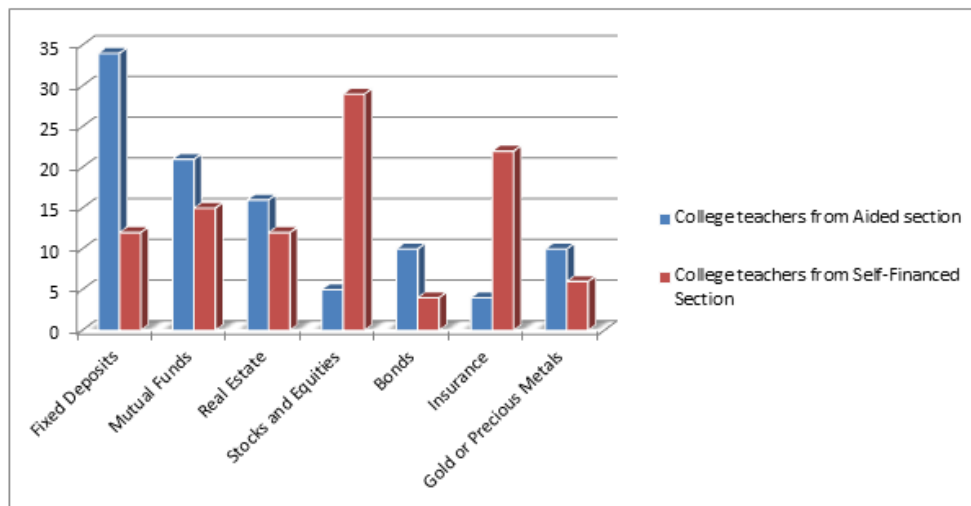
Various graphs and tables are created based on the study's requirements. The Rank and Percentile, Chi-square statistical methods have all been used to examine the data gathered from the respondents.

1. Percentage of Monthly Income Investment



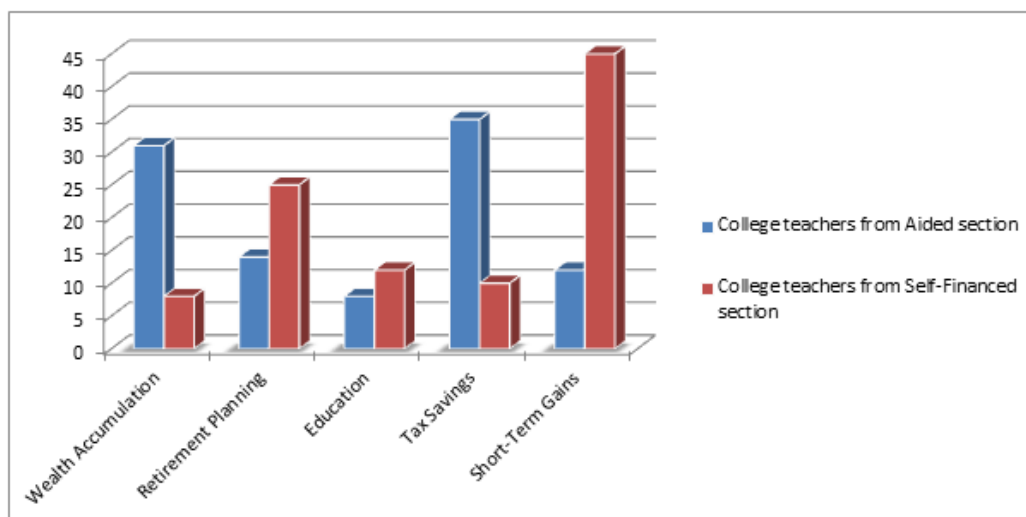
Interpretation: As seen in the above chart, 40% of respondents invest less than 10% of their monthly income, 29% invests between 10-20%, 18% invest between 20-30%, and only 8% invest between 30-40% of their monthly income.

2. Preference of Investment



Interpretation: The chart shows that among respondents, 34% of teachers from the aided sections prefer fixed deposits, while only 12% of teachers from the self-financed sections do the same. Additionally, among respondents, 21% of teachers from the aided sections prefer mutual funds, while only 15% of teachers from the self-financed sections do the same. Finally, among respondents, 29% of teachers from the self-financed sections prefer stocks and equities, while only 5% of teachers from the self-financed sections do the same.

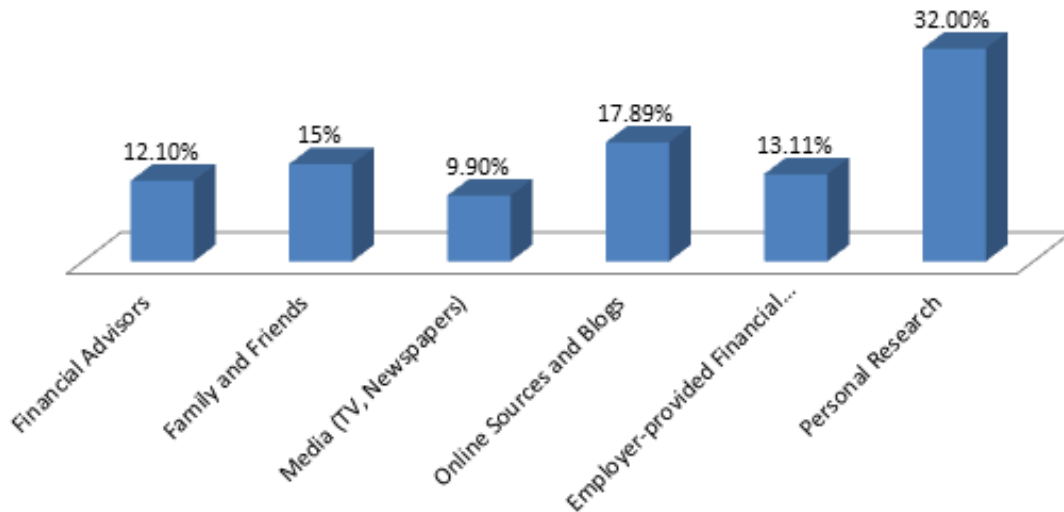
3. Motives of Investment



Interpretation: The study shows that safety and self-sufficiency are the main motives of the investment, and that return is an important motive in addition to capital appreciation. Therefore, it is clear from the study that

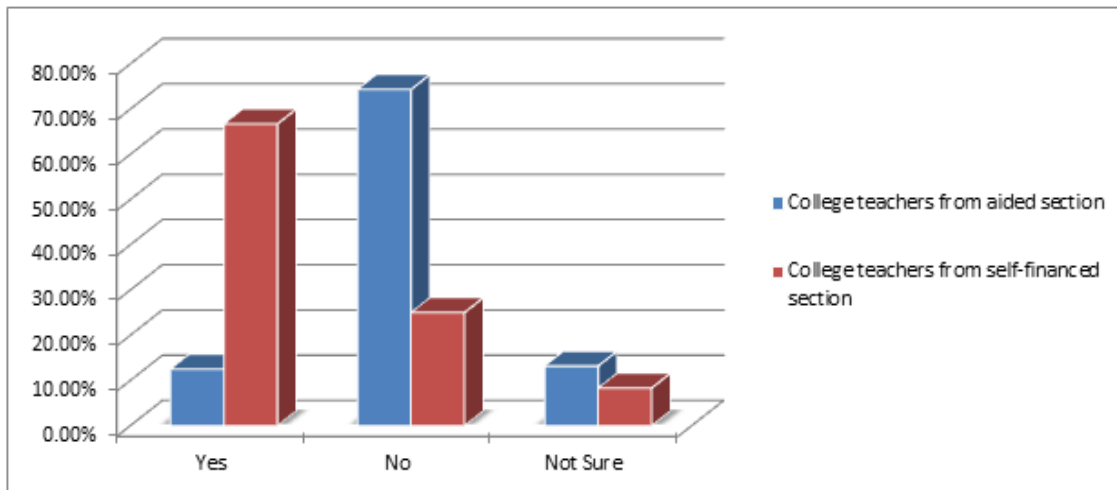
31% of college teachers in the aided sections had wealth development as their goal, compared to 8% of those in the self-financed sections, and 14% had retirement preparation as their goal, compared to 25% in the self-financed sections. Just 10% of self-financed instructors had a goal for tax savings, compared to 35% of teachers in the aided sector. Just 12% of teachers in the supported sections stated a short-term aim, compared to 45% of teachers in the self-financed sections.

4. Factors Influencing Investment Decision



Interpretation: As can be seen from the above chart, respondents mostly use online resources and their own research to gather knowledge before making an investment. Merely 9.90% of those surveyed said they relied on the media to learn about potential investments.

5. Job Security Impacts Willingness To Invest In High-Risk Options



Interpretation: According to the above graphic, 66.70% of teachers in the private sector are willing to invest in high-risk options due to job instability, compared to just 12.50% of teachers in the public sector. Due to job instability, 74.33% of public sector teachers are unwilling to invest in high-risk options. Due to job instability, just 25% of private sector teachers are unwilling to invest in high-risk options.

RANK AND PERCENTILE

Investment Options	College teacher of aided sections	Rank	Percent	College teacher of self-financed sections	Rank	Percent
Fixed Deposits	34	1	100.0%	12	4	33.3%
Mutual Funds	21	2	83.3%	15	3	66.6%
Real Estate	16	3	66.6%	12	4	33.3%
Bonds	10	4	33.3%	4	7	0.0%
Gold or Precious	10	4	33.3%	6	6	16.6%

Metals						
Stocks and Equities	5	6	16.6%	29	1	100.0%
Insurance	4	7	0.0%	22	2	83.3%

Interpretation: The Rank Percentile method shows that teachers in the aided sections are more likely to favor fixed deposits as an investment choice, whereas teachers in the self-financed sections are less likely to do so. The accompanying table shows that while stocks and equities are the most popular investment choice for teachers in the self-financed sector, very few teachers in the aided sections express this desire.

DATA ANALYSIS AND RESULTS

Demographic Profile of Respondents

According to the respondents' demographic profile, most teachers were in the 30- to 50-year-old age range. There were about 40% women and 60% men. Seventy percent of them held a master's degree, and some even had doctorates.

- Teachers from the aided and self-financed sections showed notable disparities in their investing patterns, according to the study: Teachers from aided colleges were more likely to invest in fixed deposits (FDs), which is indicative of their more secure salary and job stability. Investment in Mutual Funds and Equities Teachers from self-financed sections were more interested in mutual funds and stocks, maybe because they needed bigger returns to make up for decreased job stability. **So the hypothesis H_1 accepted.**
- It is clear from the study that 31% of college teachers in the aided sections had wealth development as their goal, compared to 8% of those in the self-financed sections, and 14% had retirement preparation as their goal, compared to 25% in the self-financed sections. Just 10% of self-financed teachers had a goal for tax savings, compared to 35% of teachers in the aided sector. Just 12% of teachers in the supported sections stated a short-term aim, compared to 45% of teachers in the self-financed sections. **So the hypothesis H_2 accepted.**
- The more varied investment portfolios and increased usage of online investing platforms by teachers in self-financed colleges demonstrated a higher degree of financial knowledge. As seen by a larger percentage of them investing in stocks, mutual funds, and shares, they also had a higher risk tolerance. On the other hand, teachers from aided colleges favored low-risk, safer options, perhaps because their incomes were more steady and they didn't feel as much pressure to achieve big returns. **So the hypothesis H_3 accepted.**

Interpretation of Findings: The results of this study indicate that, in comparison to their colleagues in aided colleges, teachers at self-financed sections are more prone to make riskier investments and exhibit a higher degree of financial literacy. Teachers in aided colleges tend to have more conservative investment strategies because of their more stable financial positions, but those in self-financed institutions may seek bigger returns due to their increased workload and lack of financial stability.

Implications for Financial Advisors: Financial advisers who deal with teachers in Pune should customize their recommendations according to their institutional affiliations, understanding that teachers at self-financed colleges could need more help diversifying their investments and controlling their risk exposure. On the other hand, teachers from aided colleges can want assistance in making long-term financial security plans.

CONCLUSION

This study highlights notable distinctions between college teachers working in self-financed and aided sections, offering insightful information about their investment habits in Pune. The results highlight how risk tolerance, financial knowledge, and investment behavior are impacted by institutional affiliation. With these data, policymakers and financial advisors can create focused financial education initiatives for teachers in both fields.

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A CRITICAL ANALYSIS OF THE CHALLENGES FACED IN ONLINE TEACHING BY THE EDUCATORS: THE ERA OF THE DIGITAL REVOLUTION

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ABSTRACT

The education industry was one of the severely affected industries by the COVID-19 pandemic, striving hard to find solutions to keep their doors open. During these pandemic crisis, online learning tools emerged as a boon. Prior to a few years, investments in EdTech tools, especially in the online education segment, have soared high, resulting in significant technological advancements.

These resulting changes in education, have brought a significant change in teaching-learning evaluation process. The number of students participating in digital learning has also increased remarkably. since 2000, the online education industry has grown up to 900% and the number is expected to reach 57 million by 2027.

These inevitable changes in the field of education are accepted all over the world, then to, there are several challenges which are faced by the educators and the students; however, this research paper explores the challenges faced and offer the strategies emphasizing the efficacy of online teaching.

Keywords: *Online Teaching, Technology, Flexibility, Students engagement, Digital Literacy*

INTRODUCTION

Traditionally, education had been synonymous with classrooms filled with students and teachers communicating and collaborating in-person. Early forms of online teaching were primarily asynchronous, using email and discussion boards. Over the course of time, learning management systems (LMS) like Moodle, Blackboard, and Canvas were extensively used. Prior to the pandemic, online education was already gaining traction. During the 2017-2018 school year, 21% of public schools and 13% of private schools offered at least one online course. By the Fall of 2020, this trend had accelerated significantly, with 75% of the nation's 50 largest school districts beginning the academic year entirely online. Thousands of additional districts adopted hybrid models, blending online and offline mode.

Online teaching is also referred to as e-learning or virtual learning, which involves delivering educational content and facilitating learning experiences through digital platforms. For both educators and students, the transition to online learning has posed significant challenges. Yet, as this mode of education becomes more prevalent, it is clear that adapting to and preparing for a digital learning environment is no longer optional—it is an essential step toward the future of education which has evolved over the past two decades, fuelled with advancement in technology, the widespread adoption of the internet, and a growing demand for flexible and accessible education. However, the Coronavirus pandemic brought about a dramatic shift, reshaping the way we approach learning and redefining the future of education.

OBJECTIVES OF THE STUDY

- To evaluate the challenges faced during online teaching-learning Process.
- To offer the strategies which emphasize the efficacy of online teaching.

RESEARCH METHODOLOGY

The researcher has collected the data from the secondary sources i.e. journals, articles, google scholar, and research papers.

NEED OF THE STUDY

Online teaching which is also known as e-learning or virtual learning, entails delivering educational content and facilitating learning experiences through digital platforms. it is evident that adapting to and embracing this digital approach is now a necessity rather than a choice. Over the past two decades, the evolution of education has been driven by technological advancements, the widespread availability of the internet, and an increasing demand for flexible, accessible learning options. Although the adoption of the hybrid model has been widely accepted and implemented across the education sector, the transition to online education has brought significant challenges for both educators and learners. In response, the researcher has sought to identify these challenges and propose strategies to overcome them, aiming to enhance the effectiveness of the teaching and learning process.

IMPORTANCE OF E-LEARNING OR VIRTUAL LEARNING

The introduction of online learning in the education sector have led to the development of new learning platforms and teaching- learning methods. It has gained popularity recently due to its accessibility, flexibility, and affordability. Online learning has scintillatingly impacted the traditional learning institutions, creating new challenges and opportunities.

Flexibility is one of the biggest challenges in an education industry. It gives an opportunity to the students to learn at their own speed, at any time, and from almost anywhere in the world. The need for physical classrooms has vanished, it allows the students to access lessons and assignments using their computers or phones and is especially helpful for working parents or the one holding family responsibilities.

Online education is cost-effective. Online courses are typically more affordable than traditional classroom-based programs, as they do not require physical infrastructure and can accommodate a larger number of students. Students are benefitted from savings on commuting, textbooks, and other materials commonly associated with in-person learning.

Online education also provides access to wide range of courses and programs offered by universities and institutions around the world, expanding their knowledge and skills beyond their geographical location.

It is rightly said that, Age is just number, there is no particular age limit for learning. one of the most significant advantages of online classes for students compared to physical classroom-based learning as it facilitates interaction between older and younger students, and also help them to share their views and understand the different challenges that both age groups face.

People from different diversities, different cultures learn together and hone their interpersonal skills. It also helps to expand one's professional circle while pursuing an online course and can exchange their ideas, views and opinions.

Education has become so accessible today that there is no need to travel anywhere to learn. With online learning, students can receive instruction from teachers while sitting comfortably at home. In today's world, internet access is available in most households, making online education a convenient option. During the COVID-19 pandemic, online learning has proven to be highly effective. Whether in rural areas or cities, online education is rapidly gaining popularity everywhere. Students can connect to online classes from anywhere in the country or even abroad. This mode of learning has become extremely beneficial for students in today's era.

REVIEW OF LITERATURE

- 1) Siddiquei, M. I., & Kathpal, S. (2021) identified several challenges as an instructor a transition from offline to online, communication barriers, multimedia support, participation challenges, technical skills, regular assignment, sense of job security, emotional support and mental support, device suitability, other technical issues were the challenges faced post COVID-19 in teaching online from home.
- 2) Akram, H., et.al. (2021) stated that many faculties have showed their positive attitude using virtual platform for teaching but also faced several challenges like audio experience, lack of technical support, unable to get ICT facilities and training and other technical challenges.
- 3) Na, S., & Jung, H. (2021) explored the biggest challenges faced by the university instructors were managing the timings and conducting online classes.
- 4) Kamal T. and Illiyan, A. (2021) found that teachers responded positively by bridging the gap between students' futures and the COVID-19 crisis. They faced many challenges, like technical support, difficulties while conducting online exams and assessments, and also put themselves on their toes to learn these technicalities by attending several workshops and simultaneously engaging their regular classes.
- 5) Hassan, M. K. (2021) highlighted that the COVID-19 pandemic exposed significant challenges in education, as the sudden shift to online learning caught students, faculty, and institutions unprepared. Many countries faced infrastructure issues like poor internet access and a lack of suitable devices. Faculty struggled with limited online teaching materials and unfamiliarity with digital tools, while institutions lacked reliable learning management systems (LMS). Students' lack of awareness of online etiquette led to communication problems, and the absence of proper proctoring raised concerns about the integrity of online exams. These obstacles underscored the broader unpreparedness for such a rapid transition.
- 6) Lucas and Vicente (2023) explored the benefits and challenges teachers encountered while carrying out their tasks. The benefits included flexibility, accessibility, pedagogical innovation, and self-regulation.

However, significant challenges were identified in areas such as engagement, interaction, infrastructure and technical support, assessment, and pedagogical practices.

- 7) Kashyap, A. M., et al. (2021) demonstrated that among 100 respondents, nearly 90% of teachers improved their teaching skills by effectively utilizing available online teaching tools and aids, elevating their approach to match the quality of conventional pedagogical methods. In contrast, the remaining 10% made no effort to explore or adopt online teaching aids.
- 8) Debra R. Sprague and Michelle K. Wilbern (2023) noted that students were not particularly enthusiastic or satisfied with the transition from offline to online learning. They faced numerous challenges, including adapting to the online format, personal difficulties with time management and motivation, and a perceived decline in the quality of instruction.

CHALLENGES OF ONLINE TEACHING

The major challenges faced by the educators, students and the institutions post-COVID-19, some of the key factors include:

Technical Challenges

When discussing the online teaching and learning process, one of the most significant issues observed by many is the presence of technical glitches, including limited access to reliable internet services and the unavailability of devices, particularly for underprivileged students or those living in remote areas. Additionally, software glitches, the lack of a technical support team for both teachers and students, and inconsistent platform performance often lead to disruptions in education, affecting the delivery of content material.

Engagement and Interaction

Online teaching, as we know, presents a major challenge, especially when it comes to student engagement. It is highly difficult to engage students, encourage their participation, and maintain discipline in an online setting. Other challenges include limited opportunities for face-to-face discussions and peer collaboration, which can lead to feelings of isolation. Students are often reluctant to turn on their cameras, making it difficult to gauge whether they are actually present on the online portal, listening, or simply disengaged.

Quality of Instruction

The quality of instruction plays a crucial role in engaging students. The challenges faced include converting in-person curricula into engaging and effective online formats, as well as designing fair and effective methods for evaluating students in an online environment. Additionally, it has been observed that teachers are struggling with unfamiliar tools and methods due to insufficient professional development.

Time Management and Workload

It is often observed and said that online teaching consumes lot of time than physical classroom teaching. Likewise, teachers are managing both personal responsibilities and professional demands, often exacerbated not only during the pandemic but

Student Challenges

When students learn online, they often feel isolated, which can lead to distractions. They may watch mobile phones, chat with siblings, eat during lectures, or use the washroom, among other things. Students also struggle to balance academic requirements with personal commitments, leading to a lack of motivation and, in some cases, anxiety, stress, and depression. While technology has brought the world closer, it seems to be negatively impacting our children in person.

Classroom Management

Managing distractions in a home environment is challenging. It was also observed that the lack of immediate teacher interaction and supervision during assessments has led to an increase in academic dishonesty. Without the traditional safeguards of in-person exams, such as proctors or time limits, students may resort to cheating, which undermines the integrity of the learning process. This rise in dishonesty not only affects the students' academic records but also impacts their development of ethical values and personal responsibility.

FINDINGS AND DISCUSSION

Online teaching can be highly effective when planned and implemented with intentional strategies that address both instructional and technological needs. Here are key strategies:

Designing Engaging Course Content:

Incorporating multimedia resources such as videos, infographics, and interactive elements can make content more engaging for learners. Breaking down material into smaller, digestible modules through microlearning

enhances retention and understanding. Additionally, integrating gamification strategies like quizzes, leaderboards, and reward systems helps sustain motivation and interest throughout the learning process.

Strengthening Teacher Training and Support:

Teachers should be provided with technical support for using online platforms and access to training programs aimed at advancing their professional and academic growth. Such initiatives will encourage best practices, drive innovation in teaching, and ultimately benefit students.

Promoting Active Learning:

To enhance student engagement, teachers can utilize interactive tools such as shared whiteboards, breakout rooms, and live polls to promote collaboration and active participation. Similarly, an adoption of flipped classroom method will help to assign pre-class materials, allows live sessions to focus on discussions and problem-solving activities. Likewise, project-based learning also encourages teamwork and enables students to apply their knowledge to real-world contexts, fostering deeper understanding and practical skills.

Enhancing Communication and Collaboration:

To enhance communication and collaboration, it is important to provide clear instructions and timelines to minimize confusion and ensure a smooth learning process. Developing online communities through forums, chat groups, or social media channels fosters peer interactions and provides valuable support throughout their learning process.

Optimizing Online Teaching through Technology and Continuous Improvement:

It is crucial to select user-friendly platforms that are accessible, reliable, and easy to navigate. Learning Management Systems (LMS) like Canvas, Moodle, or Google Classroom can streamline content delivery and tracking, ensuring a seamless learning experience.

Furthermore, AI tools can enhance the process by creating personalized learning paths, offering language translation, and automating grading, thus improving the overall efficiency and accessibility of the learning environment.

Regular assessments, such as surveys, analytics, and performance reviews, should be used to evaluate the effectiveness of teaching methods. Based on these evaluations, iterative improvements can be made by adapting strategies according to student feedback and emerging best practices.

Fostering mental health and wellbeing:

In online learning it is essential to maintain a productive and positive environment. Educators must encourage breaks during online sessions to prevent screen fatigue and promote focus. Provide proper access to counselling and mental health resources that helps the students to manage stress and mental health challenges. Create positive reinforcement by celebrating student achievements and milestones creates a supportive online community, boosting motivation and engagement. By implementing these strategies, educators can enhance both the mental wellbeing of students and the overall effectiveness of online teaching.

CONCLUSION

Online teaching, while offering flexibility and accessibility, presents several challenges, including technical difficulties, reduced student engagement, limited interaction, and difficulties in maintaining instructional quality. To overcome these hurdles and create a more effective online learning environment, educators must embrace innovative teaching strategies. This includes using multimedia resources, interactive tools, and personalized learning paths, as well as fostering regular communication and collaboration through online communities. Additionally, continuous training for teachers and utilizing platforms that support diverse learning styles are essential. By incorporating these creative and adaptive approaches, online teaching can be made more engaging, inclusive, and suitable for all learners, ensuring that education remains effective, engaging, and accessible for everyone.

Moreover, it is essential for both teachers and institutions to prioritize the development of digital literacy, not only for students but also for educators, ensuring they are well-equipped to navigate the challenges of online platforms. Collaborative efforts between students, teachers, and parents are necessary to create a supportive online learning environment that promotes engagement, accountability, and a sense of community.

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A STUDY ON EVALUATING THE ROLE OF ENTREPRENEURSHIP EDUCATION FOR VIKSIT BHARAT

Tanvi Khandhar¹ and Dr. Gayatri Agarwal²¹Assistant Professor, H.R. College of Commerce & Economics²Assistant Professor, K.P.B. Hinduja College of Commerce, Charni Road, Mumbai**ABSTRACT**

It is crucial to develop entrepreneurial skills among people in order to fulfil the vision of Viksit Bharat (developed India). Entrepreneurship education promotes innovation and risk taking abilities while fostering economic development. This paper explores the role of entrepreneurship education for a developed nation. The study has adopted a descriptive approach using secondary data to explore the present state of entrepreneurship education in India. It examines key components for strengthening entrepreneurship education in India such as curriculum enhancement, use of technology, experience learning, and industry collaborations. It also examines constraints faced in growing entrepreneurship education programs in India such as limited job creation, cultural & psychological barriers, limited availability of finance, and limited focus on entrepreneurship in formal education programs. For developing a robust entrepreneurial ecosystem, we suggest improving curriculum, using regional language, public-private partnerships, and inclusion of supportive schemes by governments.

Keywords: entrepreneurship education, Viksit Bharat, entrepreneurship

INTRODUCTION

Entrepreneurship education is an important element of the modern education system. It equips learners with necessary skills, knowledge, and mindset to start and run their own business. It helps students to identify and pursue opportunities while also positively contributing to society.

"Viksit Bharat" ("Developed India") is a visionary initiative to make India reach full development until 2047, the hundredth year of independence. This vision has adopted a holistic approach by including social advancement, environmental sustainability, economic growth, and good governance (Acharya, 2024). Detailed plan for achieving Viksit Bharat was released in the budget of 2024-25.

Education has a direct impact on young people's competencies and independence. It thereby makes it a crucial aspect for the foundation of Atmanirbhar Bharat. Educational institutions must support entrepreneurship, equip young people with future-ready skills, and adapt to demands of the economy in order to realise this objective (Yoganandham, 2024).

OBJECTIVES

1. To understand current landscape of entrepreneurship education programs of India
2. To identify key components in strengthening entrepreneurship education programs
3. To examine key challenges affecting the growth of entrepreneurship education programs
4. To develop suggestions for strengthening of entrepreneurship education programs for accomplish Viksit Bharat vision

SCOPE OF THE STUDY

Study intends to offer an understanding of different socio-economic settings affecting the landscape of entrepreneurship education in India. By including both rural and urban areas of India it aims to offer comprehensive understanding. It focuses on entrepreneurship education programs offered through HEIs, technical colleges, and business schools. It includes key components such as use of technology, importance of supportive networks, and curriculum development along with cultural barriers, financial constraints. Overall, this study aims to provide actionable insights and solutions to overcome challenges in strengthening entrepreneurship education in India for 'Viksit Bharat'.

RESEARCH METHODOLOGY

This research has employed a descriptive approach using a secondary method of data collection. Review of existing literature consisting of research articles published in national and international journals is done to understand the current landscape of entrepreneurship education. Government reports and relevant policies have been reviewed to study existing policies. Data is carefully arranged and presented to meet objectives of the study.

LIMITATIONS OF THE STUDY

This study has primarily used secondary data. While secondary sources used provide insightful data, it may not provide complete understanding of current practices in entrepreneurship education in India. Further, time constraints may also limit thorough analysis of region and sector specific opportunities and challenges.

REVIEW OF LITERATURE

In India, entrepreneurship related courses constitute the primary focus of entrepreneurial education. There are over 100 university departments offering courses in entrepreneurship. Along with business schools, technical colleges are also seeing an increase in partnerships and incubators (Anand & Singh, 2013). Majority students are well informed about entrepreneurial education and how HEIs can be utilised to establish better ecosystems. Supported by specialised e-cells, HEIs are performing excellently in handling business ideas (Kapil et al., 2023).

India has one of the quickest rates of technological adoption worldwide, with a sizable population of internet and smartphone users. This offers business owners an opportunity to create innovative ideas making use of technology (Saleh & Ahmad, 2023). In order to boost job creation, the Skill India movement needs to focus on fostering entrepreneurship skills within the labour force. Further, employability skills training should be integrated into academic programs rather than offering it independently, short-term skill development courses upon graduation (Shaligram & Mundhe, 2022). Students studying management believe that the fundamental framework required for them to pursue entrepreneurship as a career should be modified in management education (Shivaramgowda et al., 2019). Integrating entrepreneurship based education within educational programs across multiple fields should be top priority for higher education institutions (HEIs). In order to foster an entrepreneurial attitude within students from a variety of backgrounds, such integration shouldn't just concentrate on courses related to business but should include courses in other areas of study. Further, experiential learning opportunities within the curriculum, involving entrepreneurship, internships, and apprenticeships should be incorporated in curriculum (Dyanti et al., 2024).

Millions of students in India are seeking engineering degrees, but the results in areas of entrepreneurship, creativity, and research do not appear to be positive (Khot, 2016). There hasn't been much development in the number of jobs recorded by start-ups (Mishra & Rajyaguru, 2022). Indians possess all the technological knowledge needed to take on entrepreneurial challenges. Indians believe in accepting one's current circumstances and remaining inactive are better for one's inner soul than making an effort to make things better. Indians also consider spiritual tranquillity is path to mental peace as opposed to consumerism. (Anand & Singh, 2013). Based on a 2003 survey conducted by Entrepreneurship Development Institute, India (EDII), young people are hesitant to start their independently owned ventures because they do not possess the necessary skills, confidence, and ability (Palanivelu & Manikandan, 2015). As a whole, the situation of entrepreneurship education is unclear, which lacks clear objectives, comprehensive planning, and broad vision. (Agrawal & Thakur, 2018). Financial constraints and future uncertainty were cited by majority as two main obstacles to starting their own business. This highlights how young people feel discouraged from pursuing entrepreneurship in absence of financial support (Soam et al., 2023).

RESEARCH GAP

Previous researches have studied significance of entrepreneurial education in India and factors affecting entrepreneurship education. Researchers have also studied entrepreneurial intention of students and effectiveness of various programs towards entrepreneurial skills. Viksit Bharat is a relatively new and developing concept in India. There is a lack of comprehensive study focusing on strengthening entrepreneurship programs in the context of Viksit Bharat. Addressing this research gap is essential to support growth of entrepreneurial initiatives to accomplish the vision of Viksit Bharat.

FINDINGS

A. Current Landscape of entrepreneurship education in India: Entrepreneurship education is widely present in the HEIs. The primary approach for offering entrepreneurship education is through formal and structured courses in educational institutions. Technical institutions are actively collaborating with external organisations to promote start-up culture. Presence of e-cells reflects dedicated focus on entrepreneurship development in HEIs.

B. Key Components in strengthening entrepreneurship education for Viksit Bharat:

1. **Technological Advancement:** High internet speed and smartphone penetration in India presents a huge opportunity to offer entrepreneurship education through online classrooms and virtual platforms. This will help to reach a wide audience in far-off locations, thereby overcoming geographical barriers.
2. **Integrating Entrepreneurship Education with Skill India:** This will help to achieve India's economic development goals by creating more job opportunities.
3. **Experiential Learning:** Offering students with hands-on projects, internships, and apprenticeships will give them real-world experience and expose them to the entrepreneurial environment. Such learning opportunities will allow students to acquire critical problem-solving skills and apply knowledge from academia in real-world scenarios.
4. **Curriculum Enhancement:** To encourage entrepreneurship as a career option, the current education system, especially management programs can be improved. Additionally, including entrepreneurship education into various academic courses, beyond management programs can foster an entrepreneurial attitude in students of courses other than management programs.
5. **Industry Collaborations:** Enabling collaborations with successful entrepreneurs can provide students with mentorship, networking opportunities to further strengthen their entrepreneurial skills. Such collaborations will bridge the gap between academic learning and real-world application.
6. **Developing Supportive Ecosystem:** Strengthening entrepreneurship education requires creating an ecosystem offering infrastructure, mentorship, financing opportunities.

C. Constraints in growth of entrepreneurship education for Viksit Bharat:

1. **Gaps in Educational Programs:** Although a large number of students are pursuing engineering degrees, research, creativity, and entrepreneurship have not met industry expectations. This gap suggests that the current engineering curriculum is heavily focused on theory, with limited emphasis on real-world application and innovation.
2. **Limited Job Creation by Start-ups:** Major challenge in strengthening entrepreneurship is lack of significant job creation by start-ups. This shows a mismatch between entrepreneurship education and outcomes of successful businesses.
3. **Cultural & Psychological Barriers:** Cultural mindset in India prioritises acceptance of one's current circumstances and towards spiritual tranquillity. Entrepreneurship requires striving for continuous improvement. And belief of accepting things as they are conflicts with the pursuit of entrepreneurship. Similarly, spiritual fulfilment is key to good life but at the expense of taking risks associated with entrepreneurship or pursuing material success.
4. **Confidence & Expertise Gap:** Many young people lack necessary skills, confidence, and expertise to start their own businesses, as reported by Entrepreneurship Development Institute of India (EDII) survey. Despite growing interest for entrepreneurship, the gap between aspiration and capability remains in youth.
5. **Unclear Vision & Planning:** Unclear state of entrepreneurship education presents significant challenges as it lacks well-defined objectives, comprehensive planning, and cohesive vision. This ambiguity in entrepreneurship programs makes it difficult to offer students with required knowledge and abilities to succeed as an entrepreneur.
6. **Limited Finance & Uncertainty:** Many students face financial limitations making it difficult for them to start and sustain business. Students may find entrepreneurship stressful due to its unexpected nature, which is due to market volatility, business risks, etc. This uncertainty creates psychological barriers, causing students to opt for more secure and predictable career paths instead.

CONCLUSION

Strengthening entrepreneurship education is critical in accomplishing the vision of 'Viksit Bharat'. Entrepreneurship leads to job creation, economic development, and social inclusion. There are challenges in growing entrepreneurship education including gaps in educational programs, lack of confidence, cultural barriers, and limited financial assistance. However, these challenges can be addressed through improvising curriculum, use of technology, providing regional entrepreneurship education in regional language, building supportive networks through private and government initiatives.

SUGGESTIONS

1. **Adopting Digital Tools:** Use of digital tools must be incorporated to expand the reach of entrepreneurship education. Online platforms and virtual classrooms can be used to deliver entrepreneurship education. Through this, India can raise a new generation of entrepreneurs equipped with knowledge and skills to build successful ventures.
2. **Improvise Curriculum:** Entrepreneurship education must be included across different disciplines. This will help in developing an entrepreneurial mindset amongst students from different academic backgrounds. For example: engineering students can learn about innovation and product development, medical students can learn about ventures in healthcare, and interior designing students can learn about building service based start-ups.
3. **Include Experiential Learning:** Entrepreneurship education programs should focus on internships and apprenticeships. Educational institutes can partner with local businesses and start-ups for this. By doing this, educational institutes help students develop a deeper understanding of finance, operations, market research, etc.
4. **Regional Entrepreneurship in Regional Language:** Entrepreneurship education can be specialised based on regional skills. These courses can be offered in local Indian languages. For example, Kolhapur can offer specialised programs in Marathi on scaling 'Kolhapuri chappals' business, Kutch can focus on programs in Kutchi to expand 'Tie-and-die' and 'Bandhani'. Such programs will help in preserving local heritage and at same time promote entrepreneurship.
5. **Education based Public-Private Partnerships:** Educational institutions can partner with private companies to provide industry specific insights to students. Joint initiatives can be in the form of entrepreneurship days, idea pitching competition, mentorship programs, etc. this will help students in meeting potential investors, mentors, and business partners.
6. **Supportive Government Initiatives:** Government can offer schemes to provide seed funding and mentorships to small businesses. Government can also offer loans to start-ups at lower rates of interest. This will ensure that students are not only learning entrepreneurship but also encouraged and supported by the government to start their own ventures.
7. **Supportive Ecosystem:** It is important to create a supportive ecosystem to promote entrepreneurship education. This ecosystem should include facilities like incubation centres, co-working space, mentors, investors, networking events. This will ensure an easy transition for students from education to entrepreneurship.
8. **Confidence Building:** Entrepreneurship education programs should focus on building confidence and risk-taking capacity of students. Workshops and simulations can be offered to inculcate students with various entrepreneurial skills. Similarly, it is also important to create a culture which normalises failure as a part of entrepreneurial journey.

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MAPPING CAREER PATHWAYS: UNDERSTANDING THE ROLE OF EMPLOYABILITY SKILLS FROM A STUDENT PERSPECTIVE**Ms. Manisha Gupta**

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ABSTRACT

Employability skills like communication, flexibility, teamwork, and problem-solving are becoming more and more important for career success in today's changing labor market. This study highlights the disparities between students' perceptions of employability abilities and self-reported abilities and the skills that businesses need. The study uses primary data from 100 final-year undergraduate and graduate students to evaluate how successfully academic curriculum, industry exposure, and extracurricular activities foster key competencies. The findings highlight the need for curriculum changes, enhanced industry-academia collaboration, and targeted interventions like seminars, internships, and mentorship programs. By aligning their instructional strategies with industry demands, educational institutions can increase students' preparedness for the profession and ensure that their career objectives are met.

Keywords: *Academic curriculum, Industry-academia collaboration, Employability skills*

INTRODUCTION

Employability skills, sometimes known as "soft skills," are becoming more and more important in today's ever changing labor market. Although technical abilities are still essential, companies in all sectors stress the value of traits like communication, cooperation, flexibility, and problem-solving skills. These abilities not only improve a person's chances of finding work, but they also support long-term professional advancement.

Institutions of higher learning are vital in helping students acquire these vital abilities. Aligning the abilities taught in educational institutions with the requirements and expectations of the labor market is a significant difficulty, though. Therefore, in order to improve career preparation, educators and policymakers must comprehend how students see employability skills and their significance.

The goal of this study is to present a thorough examination of students' attitudes, awareness, and perceived value of employability skills. The study looks at these variables in an effort to find discrepancies between students' assessments of their own abilities and the capabilities that employers need. It also looks at how educational institutions may help students acquire these abilities and how different learning experiences affect students' skill growth.

The results of this study will provide important new information about how to better adapt educational curricula to the changing needs of the labor market. Finally, this research intends to inform curriculum development, career services, and policy activities centered on developing employability skills in order to help improve students' career outcomes.

OBJECTIVES OF THE STUDY

1. To assess students' awareness of employable skills.
2. To examine students' perceptions of their future employment prospects and professional goals.
3. To evaluate how well the existing academic program prepares students for the workforce.
4. To investigate the role that institutions of higher learning play in fostering employable skills.
5. To look at other options and resources that can help students improve their employment skills.

REVIEW OF LITERATURE

Abelha, M. et al. (2020), conducted a study on Graduate Employability and Competence Development in Higher Education and found that studies conducted in Europe have shown a discrepancy between graduates' skills and what employers need. Enhancing collaborative practices and giving priority to the development of critical competencies are two ways that educational institutions might close this gap.

Khan, U. (2019), in the study A Study of Select Employability Skills Desirable across Various Job Types: Bridging the Skill Gap among Job Aspirants through Industry-Academia Interface, concludes that the collaboration between industry and academia plays a crucial role in enhancing students' employability skills.

Through industry visits, students gain updated insights and practical knowledge, offering significant advantages in their career development.

Gill, R. (2018), in the study Building Employability Skills for Higher Education Students: An Australian Example, published in the Journal of Teaching and Learning for Graduate Employability, highlights that although many students participate in skill development courses, these programs often fall short of expectations. Consequently, students face a notable skills gap during recruitment, as their competencies often do not align with employer requirements. This gap primarily stems from inadequate collaboration between educational institutions and employers. To address this issue, effective communication between academia and industry is essential.

RESEARCH METHODOLOGY OF THE STUDY

The present study is conducted to explore students’ perception towards employability skills. It explains the circumstances and opinions of the students relating to the current employability status.

- a. **Sample Design:** Navi Mumbai district is picked by utilizing a systematic random sampling process. Degree and post graduate students in the above said talks identified and approached with the well-structured questionnaire.
- b. **Sample Respondents:** Degree and post graduate students belonging to Navi Mumbai district are considered.
- c. **Sample size:** The sample size for the study is 100 scholars.
- d. **Primary data:** In this study, the survey approach is selected, and primary data is gathered using a well-structured questionnaire.
- e. **Secondary data:** The numerous books, journals, and websites listed in the references will be the source of secondary data for the study.

LIMITATIONS OF THE STUDY

- 1. The data is derived from students' assessments of their own employability skills, which could be biased due to overestimated or understated abilities.
- 2. The study is based on a sample of 100 final-year undergraduate and post graduate students, its conclusions might not be as widely relevant as they could be.
- 3. The study focuses on certain employability skills while ignoring other potential elements that may influence professional success.
- 4. The study may not fully reflect the employability skill needs in other countries or regions because it was conducted in a specific geographic and educational context.
- 5. As a cross-sectional study, it only documents viewpoints at a single point in time, which limits its capacity to identify patterns or shifts across time.

DATA ANALYSIS AND INTERPRETATION

- **Distribution of respondents by gender**

Genderwise Distribution of students

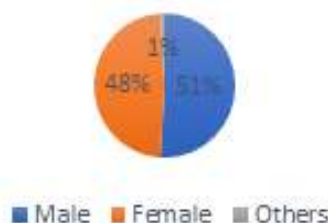


Table No. 1: Genderwise Distribution of Students

Particular	Respondents	Percentage
Male	51	51
Female	48	48
Others	1	1
Total	100	100

From the above table, it can be seen that 51% of the respondents are male whereas 48% of the respondents are female.

- What type of job sector are you most interested in?

INTERESTED JOB SECTOR

Public Sector Private sector Entrepreneurship Academia
Freelancing Non-Profit sector Others

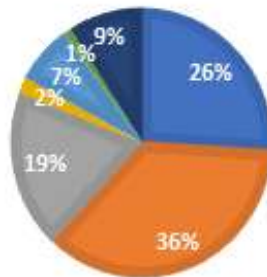


Table No. 2: Interested Job Sector

Particular	Respondents	Percentage
Public Sector	26	26
Private sector	36	36
Entrepreneurship	19	19
Academia	2	2
Freelancing	7	7
Non-Profit sector	1	1
Others	9	9
Total	100	100

From the above table, it can be seen that majority of the students i.e. 36% are interested in private sector whereas 26% of the students are interested in public sector. 19% students are also interested in entrepreneurship whereas only 1% students are interested in non-profit sector.

- How well does your current academic curriculum prepare you for the job market?

EFFECTIVENESS OF CURRENT ACADEMIC CURRICULUM

Very effective Effective Neutral Ineffective Very ineffective



Table No.3: Effectiveness of Current Academic Curriculum

Perception	Respondents	Percentage
Very effective	6	6
Effective	34	34
Neutral	41	41
Ineffective	9	9
Very ineffective	10	10
Total	100	100

From the above table, it can be seen that most respondents view the subject as "Neutral" (41%) or "Effective" (34%), showing moderate to positive perceptions. Negative views ("Ineffective" and "Very Ineffective") account for 19%, while only 6% found it "Very Effective." This suggests room for improvement and a need to address scepticism.

- How essential do you consider the following employability skills for your career success? (Rate on a scale of 5, where 1 is 'Not Important' and 5 is 'Very Important')

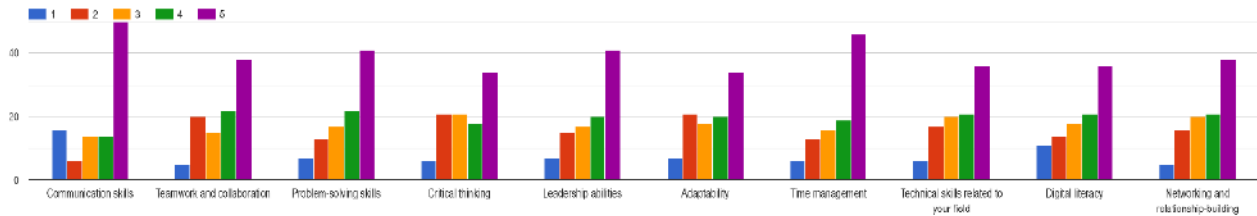


Table No. 4: Importance of Employability Skills

	Communication Skill	Teamwork and Collaboration	Problem Solving Skill	Critical Thinking	Leadership Skills	Adaptability	Time Management	Technical Skills	Digital Literacy	Networking and Relationship Building
Mean	3.8	3.7	3.8	3.5	3.7	3.5	3.9	3.6	3.6	3.7
Standard Error	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Median	4.5	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Mode	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Standard Deviation	1.5	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.4
Sample Variance	2.3	1.7	1.7	1.7	1.8	1.8	1.7	1.7	1.7	1.9
Kurtosis	-0.8	-1.1	-0.7	-1.2	-0.9	-1.2	-0.6	-1.0	-1.0	-0.9
Skewness	-0.8	-0.5	-0.7	-0.3	-0.6	-0.4	-0.8	-0.5	-0.5	-0.5
Range	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Maximum	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Sum	376.0	368.0	377.0	353.0	373.0	353.0	386.0	364.0	357.0	371.0
Count	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Largest(1)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Smallest(1)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Confidence Level(95.0%)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3

Interpretation

Communication, time management, and technical skills are perceived as the most critical for employability, while adaptability, teamwork, and digital literacy are also highly valued. This suggests a balanced emphasis on both soft and technical skills.

- Have you participated in any workshops or seminars that were specifically aimed at improving employability skills?

PARTICIPATION IN WORKSHOP

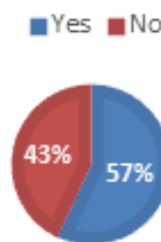


Table No. 5: Participation in Workshops/Seminar

Response	Respondents	Percentage
Yes	57	57
No	43	43
Total	100	100

The data indicates that 57% of respondents attended workshops or seminars focused on employability skills, while 43% did not. This suggests that a majority of participants have engaged in such programs, potentially reflecting a positive trend toward skills development in this area. However, a notable portion (43%) has not participated in these workshops, highlighting an opportunity for increased outreach or engagement in employability-focused initiatives.

• **How beneficial do you think these workshops or seminars are?**

EFFECTIVENESS OF WORKSHOP

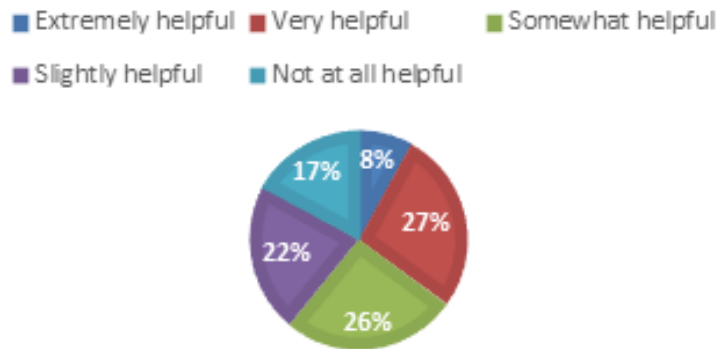
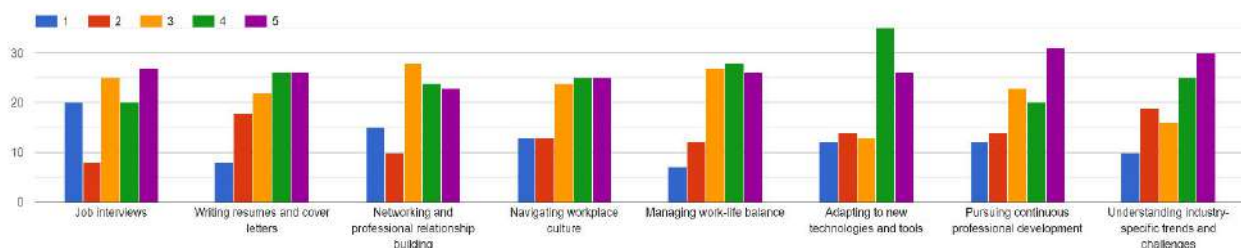


Table No. 6: Effectiveness of Workshop/Seminar

Response	Respondents	Percentage
Extremely helpful	8	8
Very helpful	27	27
Somewhat helpful	26	26
Slightly helpful	22	22
Not at all helpful	17	17
Total	100	100

From the above table, it can be seen that, a total of 35% of respondents found the workshops or seminars to be either "Extremely helpful" or "Very helpful," indicating a generally positive view. 26% felt they were "Somewhat helpful," suggesting a moderate level of usefulness for some participants. A combined 39% (22% "Slightly helpful" and 17% "Not at all helpful") indicated that the workshops or seminars were less beneficial, highlighting areas for improvement in their content or delivery.

• **How prepared do you feel for the following aspects of professional life? (1 - Not Prepared, 5 - Very Prepared)**



The chart illustrates varying levels of professional readiness among respondents. While there is moderate confidence in networking and adapting to workplace culture, the respondents feel most prepared for tasks such as creating resumes and adjusting to new technologies. However, their knowledge of industry trends and ongoing developments points to areas where improvement is needed, reflecting differing levels of preparedness. To enhance professional readiness, career support should place a greater emphasis on industry-specific advice, workplace skills, and networking opportunities.

SUGGESTIONS

1. In order to emphasize experiential and practical learning, educational institutions should change their curricula to place more focus on critical thinking, problem-solving, flexibility, and leadership

2. Group projects, simulations, and case studies should all be integrated into classes to represent the challenges faced in the real world. Students can be exposed to the demands of the labor market and the knowledge gap between theory and practice by connecting with industry through networking events, mentorships, and internships.
3. Workshops on digital literacy, communication, and teamwork can help close significant skill gaps in addition to resume writing and interview preparation sessions.
4. Career fairs, career counselling, and mock interviews are all crucial, and alumni can provide insight and advice.
5. To maintain relevance, regular student input should inform curriculum updates.

CONCLUSION

This study highlights the significance of employability skills in enhancing students' career readiness and aligning their competencies with market demands. The findings demonstrate that while students recognize the importance of traits like flexibility, communication, and problem-solving, there are significant differences between their assessments of their own abilities and what employers appreciate. Higher education institutions must fill these gaps by providing targeted seminars to develop important competences, fostering corporate connections, and integrating real-world learning experiences.

Furthermore, extracurricular activities, internships, and mentoring programs are crucial in developing students' professional competencies. Regular feedback mechanisms help ensure that the curriculum remains applicable and efficient in response to shifting industry needs.

By adopting a complete strategy that combines academic learning, skill development, and career support, educational institutions can better prepare students to thrive in their chosen fields, navigate the competitive labor market, and achieve their professional goals.

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A STUDY ON CONSUMER PERCEPTIONS AND ETHICS OF DATA-DRIVEN PERSONALIZED MARKETING**Dr. Saudah Khatri**

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ABSTRACT

In the age of data being called "new oil," data-driven customized marketing has become a powerful and effective tool for businesses trying to understand and respond better to consumer preferences. To this end, this report examines consumer perceptions and related ethical considerations about the uses of personal data in personalized marketing campaigns. It measures awareness about data privacy policies, analyses perceptions of responsible ethical data usage, evaluates consumer's trust in brands using personalization marketing, and detects major privacy and security issues of concern to consumers. Data will be collected through a survey-based approach to understand the consumer attitude toward transparency, consent mechanisms, and perceived privacy risks in personalized marketing practices. Hypotheses that have been tested for understanding relationships between awareness, trust, transparency, and acceptance of personalized marketing strategies will be evaluated in the study.

The findings are expected to provide insightful information into consumer expectations, concerns, and behavioral patterns regarding personalized marketing. In addition, the study aims to present recommendations to businesses on how to find a balance between exploiting data for personalization and responsible data practices in order to build greater trust and acceptance from consumers.

Keywords: Data Privacy, Ethical Marketing Practices, Consumer Perception, Personalized Advertising

INTRODUCTION

Advanced data analytics and artificial intelligence have changed the face of consumer engagement through personalized marketing. Through large amounts of consumer data, companies are able to release targeted advertisements, bespoke content, and tailored recommendations for products aligned with individual preferences and behavior. This change has enhanced customer experiences, increased conversion rates, and strengthened brand loyalty in businesses.

With this growth, however, personalized marketing has also raised quite a few ethical issues concerning data privacy and security. The more personal information being collected and used, the more consumers are questioning the treatment of their data. Central to these discussions on ethics in personalized marketing are the issues of transparency in the collection of data, use of consumer consent, and the risk of data breaches. This research will investigate consumer perception on data-driven personalized marketing in terms of their understanding of how their data is being used, their confidence in companies using such practice, and the ethical dimension that goes with data privacy. The study will explore consumer perceptions of the ethical implications of personalized marketing and which factors influence acceptance or resistance. It will also examine issues of personal data misuse and the role of transparency and consent in determining consumer attitudes.

Through such exploration, the research study is designed to equip businesses with such insight regarding ethical consideration towards consumer data in the pursuit of marketing strategies. In doing so, companies can understand consumers' concerns, create trust-building practices, and adhere to growing demands by regulators to better protect consumer data.

OBJECTIVES OF THE STUDY

The objectives of this study are:

- To assess the general public's awareness and understanding of data-driven personalized marketing practices.
- To analyze public perceptions regarding the ethical use of personal data in personalized marketing.
- To examine the level of trust the general public places in brands utilizing personalized marketing strategies.
- To identify key concerns of the general public regarding data privacy and security in personalized marketing campaigns.

SCOPE OF THE STUDY

This study focuses on consumer perceptions and ethical considerations in the conduct of data-driven personalized marketing with respect to the impact that data collection, usage, and transparency have on

consumer trust. Those considered in key aspects include consumer awareness of how personal data is used for marketing, ethical implications of data practices, and the level of trust consumers place in companies using personalized marketing strategies. The study also addresses privacy concerns and the role of transparency in building consumer confidence. In this regard, the study investigates how businesses manage data, gain consent, and ensure ethical usage to better understand how to balance effective marketing with ethical data practices, providing guidance for companies to foster trust while leveraging personalized strategies.

RESEARCH DESIGN & METHODS / RESEARCH METHODOLOGY

- I) **Study Methods:** This study will adopt a quantitative research approach, utilizing surveys to collect data from participants. The research will focus on analyzing consumer perceptions and attitudes toward data-driven personalized marketing.
- II) **Primary Data:** Primary data will be gathered through structured surveys designed to understand consumer awareness, trust, and ethical concerns related to personalized marketing practices.
- III) **Secondary Data:** Secondary data will be obtained from existing literature, academic journals, and industry reports to provide context and support the analysis of consumer behavior and ethical concerns in personalized marketing.
- IV) **Sample Unit:** The sample unit will consist of individuals from diverse demographics who have experienced personalized marketing, ensuring a broad representation of consumer views on the topic.
- V) **Sample Size – 100:** Determining the sample size was critical to have accurate results. We refrained from considering sizes too small or too big as it may have hindered the accuracy of the results. In addition, the chosen parameters were acceptable considering the location restricted to a certain city, in our case, Mumbai.
- VI) **Sampling Technique:** Convenient Sampling. The method helped provide us with ease, convenience, reduced rubrics, quick collection of information, and minimum to no investment charges. The above techniques and methods have been most appropriate and suitable to answer all research-related work to conclude. Research Design and Methodology are similar facets covering alignment and structure of the carried out study.

HYPOTHESIS OF THE STUDY

The hypothesis of the study is as follows:

Hypothesis 1

H₀ (Null Hypothesis): There is no significant relationship between awareness of data privacy policies and trust in data-driven personalized marketing.

H_a (Alternative Hypothesis): There is a significant relationship between awareness of data privacy policies and trust in data-driven personalized marketing.

Hypothesis 2

H₀ (Null Hypothesis): Transparency in data collection and usage does not significantly impact consumer acceptance of personalized marketing.

H_a (Alternative Hypothesis): Transparency in data collection and usage significantly impacts consumer acceptance of personalized marketing.

Hypothesis 3

H₀ (Null Hypothesis): Perceived privacy risks do not have a significant effect on consumer attitudes toward personalized marketing campaigns.

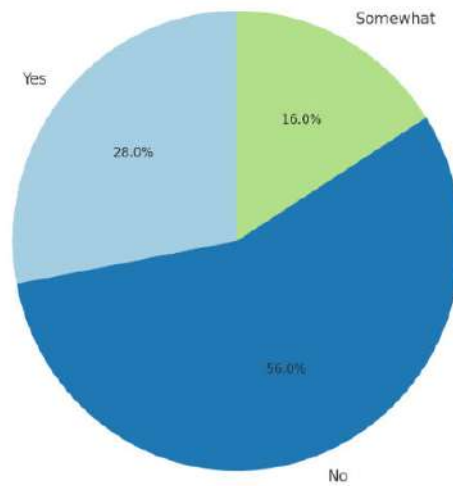
H_a (Alternative Hypothesis): Perceived privacy risks have a significant effect on consumer attitudes toward personalized marketing campaigns.

DATA INTERPRETATION AND ANALYSIS

1. Awareness of how personal data is collected and used for personalized marketing:

A majority of respondents (56%) are unaware of how their personal data is used for marketing purposes. Only 28% are aware, while 16% have a somewhat understanding. This indicates a significant knowledge gap among the respondents.

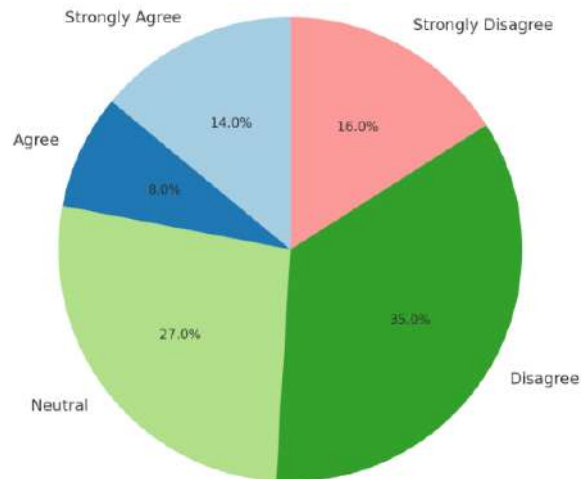
Awareness of how personal data is collected and used for personalized marketing



2. Belief in the ethical use of personal data in personalized marketing campaigns:

Most respondents (35%) disagree with the ethical use of their personal data in marketing. Only a small percentage (14%) strongly agree, suggesting widespread skepticism about companies' ethical practices. Many remain neutral or unsure (27%).

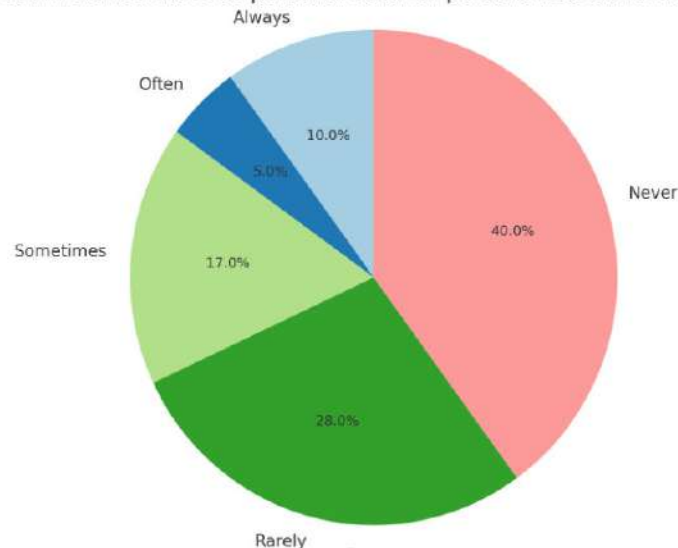
Belief in the ethical use of personal data in personalized marketing campaigns



3. Trust in brands that use personal data for personalized advertisements:

Trust in brands using personal data is low, with 40% of respondents never trusting such brands. A further 28% rarely trust these brands, indicating that data usage for marketing campaigns erodes consumer trust.

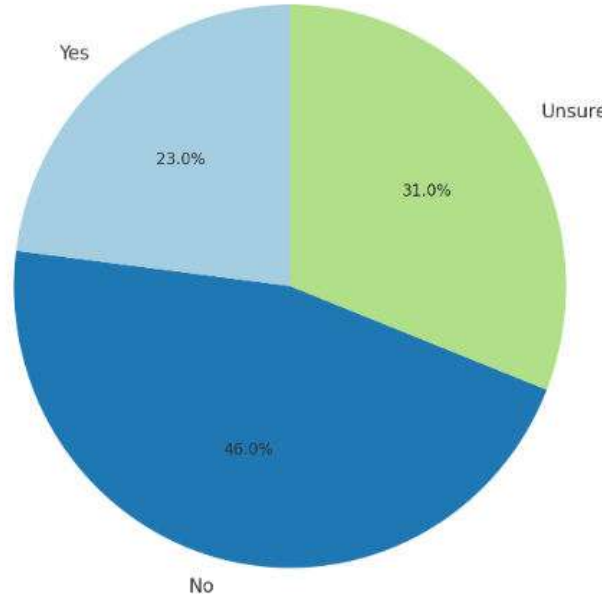
Trust in brands that use personal data for personalized advertisements



4. Perception of companies' transparency about how they use data for marketing purposes:

The majority of respondents (46%) feel companies lack transparency in their data usage, while 31% are unsure. Only 23% believe companies are transparent, signaling a need for clearer communication on data policies.

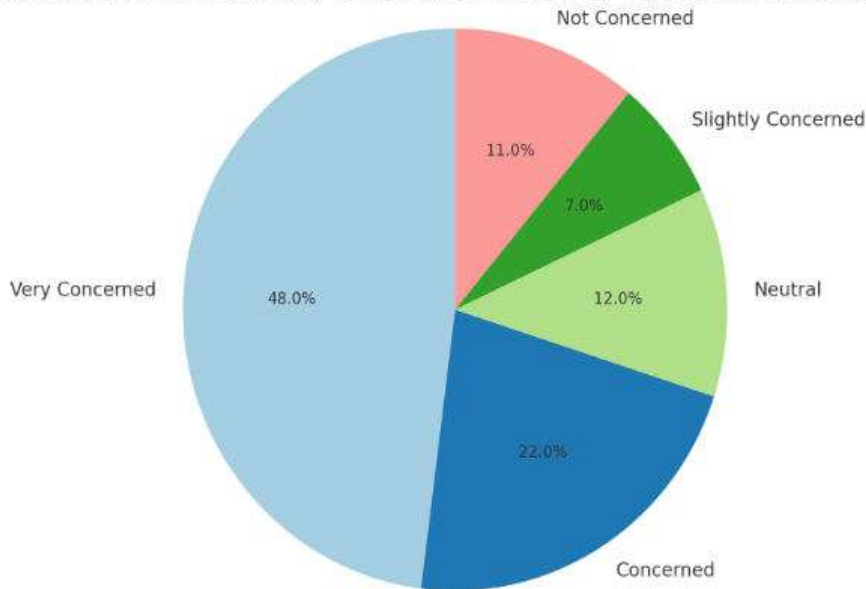
Perception of companies' transparency about how they use data for marketing purposes



5. Concerns about personal data being at risk when shared for personalized marketing purposes:

A large majority (48%) express strong concern about the risk to their personal data, with 22% feeling concerned. This reflects heightened anxiety regarding privacy and data security in personalized marketing.

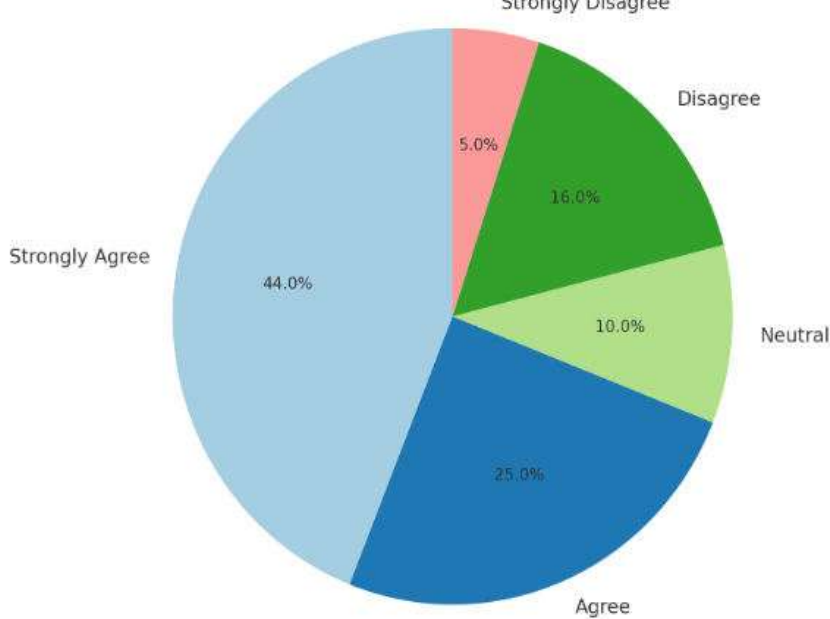
Concerns about personal data being at risk when shared for personalized marketing purposes



6. Comfort with personalized marketing if explicit consent is required before data collection:

A significant portion (44%) strongly agrees that explicit consent would make them more comfortable with personalized marketing. This suggests that transparency and control over data collection could enhance consumer comfort with marketing practices.

Comfort with personalized marketing if explicit consent is required before data collection



TESTING OF HYPOTHESIS

Hypothesis 1: Awareness and Trust

H₀: There is no significant relationship between awareness of data privacy policies and trust in data-driven personalized marketing.

H_a: There is a significant relationship between awareness of data privacy policies and trust in data-driven personalized marketing.

Contingency Table

	High Trust (32)	Low Trust (68)	Total
High Transparency (Yes = 23)	10	13	23
Low Transparency (No, Unsure = 77)	22	55	77
Total	32	68	100

Chi-Square Formula:

$$\chi^2 = \sum ((O - E)^2 / E)$$

Observed values (O) are from the table above.

Expected values (E) are calculated as (Row Total × Column Total) / Grand Total.

For example, E for High Trust and High Transparency:

$$E = (32 \times 23) / 100 = 7.36$$

Repeat for all cells to compute $\chi^2 = 1.605$.

p-value = 0.205 (> 0.05).

Conclusion: Fail to reject H₀. Null Hypothesis is accepted (no significant relationship).

Hypothesis 2: Transparency and Acceptance

H₀: Transparency in data collection and usage does not significantly impact consumer acceptance of personalized marketing.

H_a: Transparency significantly impacts consumer acceptance.

Contingency Table

	High Risk (70)	Low Risk (30)	Total
High Transparency (Yes = 23)	16	7	23
Low Transparency (No, Unsure = 77)	54	23	77
Total	70	30	100

Using the chi-square formula:

$$E = (70 \times 23) / 100 = 16.1$$

Calculate for all cells and sum to get $\chi^2 = 42.528$.

$$p\text{-value} = 6.97 \times 10^{-11} (< 0.05).$$

Conclusion: Reject H_0 . Alternative Hypothesis is accepted (significant relationship).

Hypothesis 3: Privacy Risks and Trust

H₀: Perceived privacy risks do not significantly affect consumer attitudes toward personalized marketing campaigns.

H_a: Privacy risks significantly influence consumer attitudes.

Contingency Table

	High Trust (32)	Low Trust (68)	Total
High Risk (70)	22	48	70
Low Risk (30)	10	20	30
Total	32	68	100

Using the chi-square formula:

$$E = (70 \times 32) / 100 = 22.4$$

Compute for all cells, giving $\chi^2 = 27.391$.

$$p\text{-value} = 1.66 \times 10^{-7} (< 0.05).$$

Conclusion: Reject H_0 . Alternative Hypothesis is accepted (significant relationship).

FINDINGS OF THE STUDY

1. Majority of respondents (56) are unaware of how their data is used for personalized marketing.
2. Many believe companies do not use personal data ethically, with 35 disagreeing or strongly disagreeing.
3. Trust in brands using personal data for ads is low, with 40 respondents never trusting such brands.
4. Transparency is lacking, as 46 respondents feel companies aren't transparent about data usage.
5. Most respondents (48) are very concerned about privacy risks when sharing data for personalized marketing.
6. Many (44) would feel more comfortable with personalized marketing if explicit consent was required.
7. Transparency influences consumer acceptance, with more transparency leading to higher comfort with personalized ads.
8. Awareness of data privacy issues correlates with increased concern over data use.
9. Despite awareness, trust in personalized marketing is low.
10. Respondents want more control over their data, with most agreeing explicit consent should be required.

SUGGESTIONS TO COMPANIES

1. Companies should make it easier for consumers to know exactly how data is being gathered and used for marketing.
2. Develop a system that enables consumers to easily give consent before their data is gathered for personalization in marketing.
3. Brands should embrace ethical use of data such that the consumer's data is handled responsibly.
4. Companies should convince consumers by adopting sterner data protection measures such as encryption and anonymous use of data.
5. Companies can conduct educational programs to raise awareness about data privacy policies.
6. Give consumers control over their data, enabling them to opt-in or opt-out of personalized marketing campaigns with ease.

7. Continuously update consumers on how their data is being used.
8. Brands should establish long-term relationships with consumers through transparency, ethical practices, and communication.
9. Clear guidelines and best practices for personalized marketing should be established, with respect for consumers' rights.
10. Advocate for stricter data privacy regulations that prioritize consumer rights and safety.

CONCLUSION

The study highlights significant concerns among consumers regarding the use of personal data for personalized marketing. While there is some awareness of data privacy, trust in how companies handle this data remains low, with transparency and ethical use being key areas of concern. Privacy risks are a major issue, and consumers express a strong preference for explicit consent mechanisms before their data is collected. These findings suggest that businesses must prioritize transparency, ethical data practices, and enhanced consumer control to build trust and improve the effectiveness of personalized marketing. Stricter regulations and ongoing consumer education are also essential to ensure data privacy is respected in marketing strategies.

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**ADJUSTING TO EVOLVING CONSUMER PREFERENCES: AN ANALYSIS OF APPAREL
RETAILERS' BUSINESS MODELS**

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ABSTRACT

The overall clothing industry has gone through gigantic changes in customer lead in late numerous years, affected by factors including reasonability concerns, mechanical headways, and growing lifestyle tendencies. This assessment hopes to investigate how clothing retailers are changing their game plans to oblige changing purchaser demands. The investigation portrays basic progressions influencing the clothing business and takes a gander at the techniques utilized by obvious shops to stay aware of earnestness. This paper examines the strategies of driving clothing associations, highlighting the significance of modernized change, reasonability, and client driven frameworks in affecting the possible destiny of the retail region.

Keywords: Buyer Tendencies, Attire Retail Region, Strategies, Electronic business, Practicality, Automated Change, Omnichannel Procedures, Personalization, Supportive Shopping, Socially Trustworthy Shopping, Fast Plan, Client Experience, Store network Straightforwardness, Development in Retail, Retail Industry Examples

SHOW

The dress retail industry has experienced tremendous changes because of creating customer tendencies, the ascent of online business, and extending worries concerning biological sensibility. As client lead creates towards redid, beneficial, and socially careful shopping experiences, clothing retailers ought to improve and change their game plans. This investigation hopes to get a handle on the changing components of the clothing industry by analyzing the factors inciting these movements and the reactions of retailers.

TARGETS

1. To break down the impact of changing customer tendencies on the apparel retail region.
2. To focus on how piece of clothing retailers are changing their game plans due to these changes.
3. To separate the meaning of cutting-edge change, practicality, and omnichannel philosophy in altering the region.
4. To find endorsed methodology and contemplations for garment retailers to remain relentless in a rapidly developing business sector.

SIGNIFICANCE

The importance of this study is highlighted by the going with centers:

1. **Understanding the Impact of Client Lead:** Customer tastes are incessantly changing, and this investigation gives an all-around information on how pieces of clothing transporters ought to change their game plans to these developments. By focusing on how advancement redesigns, viability concerns, and suppositions for personalization influence purchasing decisions, this article presents a sweeping perspective on buyer designs. This is essential for sorting out the future bearing of the retail business.
2. **Helping Retailers in Fundamental Change:** Retailers experience extending strain to improve and stay aware of significance in a ridiculously serious industry. This study's disclosures will help pieces of clothing retailers in seeing key examples and systems to acclimate to changing purchaser tendencies.
3. **Impact on Business Model Innovation:** This research examines the requirement for advancing headway in game plans inside the piece of clothing region. This paper gives a design to making conservative arrangements of activity that highlight advantage and social commitment by examining the varieties of obvious garment brands.
4. **Contribution to Legitimacy in Retail:** As reasonability continuously concerns clients, this assessment includes the need of moral and normally mindful methodologies to support articles of clothing shops. The audit dissects the conflict among advantage and acceptability, highlighting ideal procedures that develop innocuous to the environment projects while guaranteeing long stretch corporate reasonableness.
5. **Insights for Policymakers:** This report offers essential encounters for administrators, industry bosses, and plan specialists concerning the greater repercussions of purchaser driven progressions. It can coordinate

decisions concerning rules, industry standards, and legitimacy programs that relate with purchaser suppositions and regular targets. The assessment can overhaul talked regarding the underpinning of a more reasonable and mindful plan region.

REVIEW OF COMPOSING

The writing concerning changes in customer tendencies inside the clothing retail region perceives a couple of fundamental factors driving these changes:

1. **E-Commerce and Digitalization:** The climb of online business and digitalization has vexed client relationship with brands. Digitalization has worked with the ascent of electronic business, virtual amusement exhibiting, and data examination, which arrangement redid shopping experiences and sponsorship direct-to-purchaser models.
2. **Sustainability and Moral Plan:** Customers, especially Twenty to long term olds and Gen Z, are continuously aware of the biological and social ramifications of their buying choices. There is a rising interest for sensible deals with, including eco-obliging materials, moral collecting cycles, and creation network straightforwardness.
3. **Personalization and Customization:** Advances in development, particularly PC based knowledge and man-made intelligence, grant clothing brands to offer redid things and experiences, making it more clear for buyers to find things that match their tendencies.
4. **Omnichannel Retailing:** Buyers expect serious areas of strength for an encounter across a couple of stages — both electronic and physical. Retailers are progressively using omnichannel methods, engaging clients to explore things on the web, purchase through a couple of channels, and partake in virtual endeavour.
5. **Fast Plan Firms:** Fast plan firms have in short order addressed customer interest for sensible, rich dress, using accelerated creation cycles and monetarily wise manufacturing. Regardless, the thought encounters examination considering the way that to its environmental and moral implications.

APPROACH

This study used a mixed strategies approach, planning emotional and quantitative assessment.

1. **Case Audit Examination:** Complete evaluations of famous piece of clothing retailers, encompassing both ordinary and online-first firms, will be embraced to decide their changes in business frameworks considering propelling client tendencies. An all around assessment will be driven on brands like Zara, H&M, Patagonia, and ASOS.
2. **Consumer Survey:** A review will be controlled to accumulate pieces of information on client tendencies associated with legitimacy, web shopping experiences, customisation, and brand faithfulness. The study will focus in on a contrasted people of clients from different geologies.
3. **Interviews with Industry Trained professionals:** Broad gatherings with pioneers and industry experts from pieces of clothing brands, style specialists, and legitimacy protectors will yield gigantic emotional encounters into winning examples and strategies used by retailers.

BUSINESS MODELS OF APPAREL RETAILERS

1. Traditional Actual Retail

- **Portrayal:** Retailers oversee actual foundations where buyers can inspect, fit, and obtain clothing.
- **Examples:** Macy's, Nordstrom, and H&M have a broad organization of physical foundations.
- **Income Source:** Income created from in-store exchanges.
- **Challenges:** Raised operational expense (e.g., lease, utilities, staff), limited geographic degree, and developing client tendencies towards web based shopping.

2. Omnichannel Retailing

- **Portrayal:** Retailers coordinate actual stores with online stages to convey a strong shopping experience.

- **Example:** Walmart, Target, and Nike utilize an omnichannel model, empowering clients to shop on the web, use purchase on the web and get available (BOPIS), or return things through different channels.
- **Income Source:** Deals directed both on the web and in actual stores.
- **Challenges:** Complex stock administration across various channels and the balance of client interest.

3. Direct-to-Customer (DTC)

- **Portrayal:** Clothing brands participate in direct deals to purchasers, taking out go-between retailers.
- **Delineation:** Warby Parker, Everlane, and Allbirds capability under a direct-to-shopper model. These brands retail by means of their own sites and, in specific occasions, actual customer facing facades, giving valuing straightforwardness and a customized insight.
- **Income Source:** Deals through restrictive retail stages.
- **Challenges:** Raised client obtaining costs, dependence on powerful web showcasing, and planned operations coordination.

4. Quick Design

- **Portrayal:** Retailers focus on the fast and financially savvy conveyance of contemporary style, routinely reviving their assortments.
- **Example:** Zara, H&M, and Uniqlo are conspicuous elements in the quick style area, furnishing prudent and trendy clothing with fast progress from plan to retail.
- **Income Source:** Sped up deals of cheap clothing, broad creation volume.
- **Challenges:** Moral problems connected with maintainability, raised stock turnover, and biological outcomes.
- **Challenges:** Showcasing consumptions to develop memorability and the potential for poor assortments execution.

5. B2B (Business-to-Business) Clothing Retail

- **Portrayal:** Retailers offering garments to different organizations as opposed to individual buyers.
- **Model:** Gildan offers essential garments like shirts and socks to organizations for resale. Cintas gives workwear and garbs to organizations.
- **Income Source:** Mass deals to different organizations or associations.
- **Challenges:** Longer deals cycles, reliance on huge buys, and lower benefits contrasted with direct-to-purchaser deals.

Each model has particular benefits and issues, often formed by client decisions, market patterns, and outside impacts like as financial circumstances and specialized headways.

HINDRANCES IN ADJUSTING PLANS OF ACTION

1. **Supply Chain and Stock Administration:** Maintainability and fast style are fundamental for buyers, despite the fact that they present difficulties for garments dealers in adjusting stock levels, controlling interest fluctuation, and limiting waste.
2. **Cost versus Purchaser Assumptions:** As customers progressively need environmental and morally made items, they ordinarily involve raised creation costs. Retailers should recognize strategies to accommodate cost-proficiency with customer assumptions.
3. **Competition from Online-First Brands:** Ordinary shops experience expanding contention from brands laid out solely on the web, as ASOS, Everlane, and Warby Parker. These organizations show more prominent

spryness in acclimating to buyer inclinations and can work with less above costs comparative with ordinary physical foundations.

RESULTS AND EXAMINATION

Impact of Customer Inclinations on Clothing Retail Plans of action

- 1. Transition to Internet business:** The quick development of online retail has constrained ordinary attire organizations to reevaluate their business methodologies. Various associations are now underscoring on the web channels, refining their advanced stages, and integrating computer based intelligence driven answers for increase the client experience.
- 2. Sustainability:** Retailers are continuously executing manageable business techniques to fulfil shopper need for moral things. Patagonia and Stella McCartney epitomize initiative by pushing for manageable materials and straightforward stockpile chains. Regardless, the essential issue for the overwhelming majority retailers lies in accommodating manageability with cost-adequacy, particularly for quick design names.
- 3. Omnichannel Procedures:** Retailers are focusing on the combination of actual customer facing facades and web stages. Brands, for example, Nike and Adidas furnish web based requesting with in-store pickup choices and use expanded reality for virtual fitting rooms. These innovations feature the developing meaning of a firm omnichannel experience for purchasers.
- 4. Personalization:** Noticeable retailers are utilizing information investigation and man-made brainpower to give progressively custom-made items and shopping encounters. Organizations, for example, Amazon and ASOS use client information to propose things.

SUGGESTIONS

Focus on Interest in Advanced Change: Clothing retailers should zero in on upgrading their computerized foundation and utilizing simulated intelligence, AI, and information examination to further develop client experience and work with personalization.

- 1. Adopt Supportability:** Brands should devote themselves to economical works on in regards to materials and creation techniques, and actually pass their maintainability drives on to shoppers.
- 2. Formulate Omnichannel Techniques:** Retailers should focus on conveying a strong shopping experience across both computerized and actual stages, integrating elements, for example, virtual attempt ons and smoothed out bring methodology back.
- 3. Ensure Expense Adequacy:** Retailers should recognize creative techniques to diminish creation costs while maintaining quality and maintainability, accordingly giving both moral and reasonable things.
- 4. Continuously Screen Shopper Patterns:** Because of the quick development of purchaser conduct, brands should reliably acclimate to arising tastes and stay versatile in their market responses.

PROPOSED EXPLORATION

This examination features various basic points for future investigations to research the changing elements in the article of clothing retail business.

1. Longitudinal Examinations of Changes in Customer Conduct:

This exploration inspects contemporary purchaser conduct propensities; in any case, a longitudinal report could screen the development of these inclinations after some time, particularly when more youthful ages, for example, Gen Z and Gen Alpha, gain market conspicuousness. Grasping the advancement of people in the future's qualities, buying ways of behaving, and innovation collaborations will work with the forecast of the business' drawn-out direction.

2. Effects of Man-made reasoning and Robotization on Retail Activities:

As man-made intelligence and AI advances continue changing the retail area, extra exploration could investigate how design vendors are using these devices past personalization. Investigating points, for example, man-made intelligence driven stock administration, robotized client care, and man-made intelligence in plan and assembling explains the overall impacts of robotization on retail activities and benefit.

3. Consumer Inclinations for Used and Roundabout Style:

Given the noticeable quality of supportability, future exploration might investigate the rising interest for recycled attire, rental techniques, and the development of roundabout style. Fathoming how these progressions

impact customer dependability, plans of action, and inventory network strategies would yield huge experiences into the eventual fate of reasonable design.

4. The Capability of Virtual and Expanded Reality in Further developing the Retail Insight:

The execution of virtual fitting rooms, expanded reality shopping, and vivid web-based encounters is supposed to affect purchaser commitment and deals in the clothing business.

5. The Impact of Virtual Entertainment and Powerhouse Promoting:

Future examination might look at the impact of virtual entertainment patterns, force to be reckoned with coordinated efforts, and online networks on purchaser buying choices. Examination might research ideal methodologies for retailers to integrate social trade into their plans of action to connect with an all the more socially skilled customer segment.

6. Global Maintainability Norms and Strategy Impacts:

Future review might focus on the worldwide administrative structure and the foundation of widespread supportability norms in the piece of clothing area. This examination might look at the effect of global arrangements on creation techniques, obtaining procedures, and brand notoriety. It would be gainful to examine how brands in different areas are adjusting to or restricting these arising strategies.

7. Consumer-Brand Collaborations in the Time of Personalization:

Future examination might research the powerful qualities of shopper brand connections, particularly with regards to hyper-personalization. In the thing ways are associations developing significant close to home associations with purchasers using information driven experiences? Exploring the mental and close to home variables impacting buyer faithfulness, especially in a customized setting, would be a critical subject for extra exploration.

8. Effectiveness of Manageable Plans of action in Accomplishing Productivity:

Future examination might research how article of clothing organizations accommodates supportability goals with productivity, breaking down whether harmless to the ecosystem and socially capable practices add to long haul monetary achievement or make compromises that muddle traditional plans of action.

9. The Possibilities of Actual Retail Foundations in a Computerized Period:

Future examination might look at the possibilities of actual retail foundations inside a fundamentally computerized climate, underscoring the meaning of experiential retail, in-store innovation, and the joining of stores into omnichannel technique to convey a particular purchaser experience.

10. Cultural and Provincial Varieties in Customer Conduct:

With the globalization of the article of clothing retail industry, future review might research the effect of social and local attributes on customer inclinations across different districts.

ENDS IN REGARDS TO FORTHCOMING EXPLORATION ROADS:

All in all, Future exploration will be fundamental in fostering the up and coming age of retail procedures by analysing arising advancements, changes in shopper conduct, and supportability challenges, in this way guaranteeing long haul business accomplishment while tending to buyer Requests for personalization, manageability and social obligation.

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TO STUDY THE IMPACT OF SOCIAL MEDIA ON E-COMMERCE**¹Ms. Divya Jainarayan Gautam and ²Dr. Rajeshwary Govindappa**¹Professor, Jnan Vikas Mandal's Mehta Degree College Airoli, NaviMumbai²Principal, Ghanshyamdas Jalan College of Science, Commence & Arts, Malad, Mumbai**ABSTRACT**

Buying and selling of goods and services over the internet is known as E-Commerce. E-Commerce has brought the world commodity into one basket by making it available on internet. This has provided a wide choice base for customers and had also given the convenience to shop for multiple goods by sitting and one place. This era of computer and internet give a wide scope to the people to carry out their business without the geographical barrier and time barrier. In today's world, social media marketing has profoundly transformed e-commerce, reshaping competition, accelerating actions, and redefining leadership. It serves as a powerful tool for enhancing customer awareness, while e-commerce offers an extensive array of goods and services, providing customers with greater choices.

The present study were conducted with the objective of studying the impact of social media on E-Commerce , how social media impacts the user visit on various platform and how social media impacts the purchase decision of the users visiting the E-commerce platforms. For the purpose of analyzing these objective a sample of 60 respondents were taken from Mumbai region. Though a set of questionnaire primary data will be collected and statistical tools will be used to test the hypothesis. The expected conclusion may focus on increased sale of business organizations by using social media and also suggestion to consumers can be provided.

Keywords: E-Commerce, Social Media, Social Media Platforms

INTRODUCTION

E-commerce is becoming very much well-known among the consumers as well as business persons. It has become more important source of getting consumers in today's competitive world. On the parallel side social media is one of the important source which provides a source for potential consumer chain and lays a very important role in influencing people on the platform. Sharing information on social media allows it to be accessed by a wide audience, facilitating the many-to-many dissemination of information. E-commerce sites now a days has also started providing social network. In a social network, users engage with one another and exchange information. When considering an online purchase, a user can seek or receive additional details about a product through their social network connections. Social media marketing is an active source where the various consumers can communicate with each other and can share their experiences, thoughts and opinion regarding various goods and services. The active social media platforms like Facebook, Whatsapp and Instagram are majorly used now a days not only for personal chatting but also for business purposes where business persons use the platform to promote their goods as well as services.

REVIEW OF LITERATURE

1. Rajesh S. (2019) "Impact of Social Media Marketing On E Commerce: A Study of Customer Perception" This paper scrutinizes the customer perceptions of the significant role of social media marketing and its impact on e-commerce. It also examines the economic, social, and ethical issues associated with social media marketing. The research adopts an exploratory approach, testing the proposed framework on a sample of 300 online users in India. The findings reveal that familiarity with social media marketing influences Indian customers' purchasing interest in e-commerce. The study concludes by highlighting the perception of Indian customers regarding the effectiveness of social media marketing as a tool for online shopping. Recommendations focus on strategies to enhance the commercial viability and social acceptance of social media marketing.

2. Ravindra K. (2018) "A Study on Impact of Social Media on e-Commerce in India" This study explores the impact of social media on the e-commerce ecosystem, the shift from e-commerce to mobile commerce, and its effect on users' visit and purchase intentions. Drawing from the capabilities of current tools and social media features, the research develops a set of key questions and a mathematical model addressing community engagement, project coordination, management, and individual e-commerce behaviours. A questionnaire survey is conducted to evaluate the research model and validate the related hypotheses. The results are analysed and actionable insights are provided to help businesses leverage social media for boosting future sales growth.

OBJECTIVES OF THE STUDY

1. To study the impact of social media on E-commerce.
2. To study how social media marketing impacts the buying decision of the consumers
3. To study the growth opportunities for the business enterprises.

SCOPE OF THE STUDY

1. This study evaluates the impact of various social media platforms basically Facebook, Whatsapp and Instagram
2. Study analyses the impact of social media marketing on respondents from Mumbai region.
3. This research also analyses the awareness of 60 individual investors regarding Alternative Investment Funds in Thane region.
4. The study was completed within a one-month time frame.

RESEARCH METHODOLOGY

Source of Data

The data is collected from primary sources through questionnaire. Questionnaire was prepared in Google form format based on demography of sample selected and specifically related to the objective.

Statistical Tools & Techniques

The statistical tools used for data analysis were frequency and percentage of which graphical presentation was done to give the clear idea about the responses. The questions asked were close ended questions with multiple choice or Likert scale pattern to get the required information more specifically which can save the time of respondents. A five-point Likert scale was utilized in this part, with 01 meant strongly agreed and 05 meant strongly disagreed

SIGNIFICANCE OF THE STUDY

1. The study is conducted to understand the impact of social media on person visiting the social media sites for grabbing the information about various products and/or services.
2. The study has tried to find out the growth opportunities for the various enterprises using social media marketing.
3. It will be helpful to understand the importance and benefits of social media for increasing sales on E-commerce.

LIMITATION OF THE STUDY

1. The study is limited to various three social media platforms.
2. The time frame considered for study is of only a month
3. The respondents are the part of Thane region only.

DATA ANALYSIS

Table No. 1: Distribution of the Respondents by Gender, Age and Education Qualification

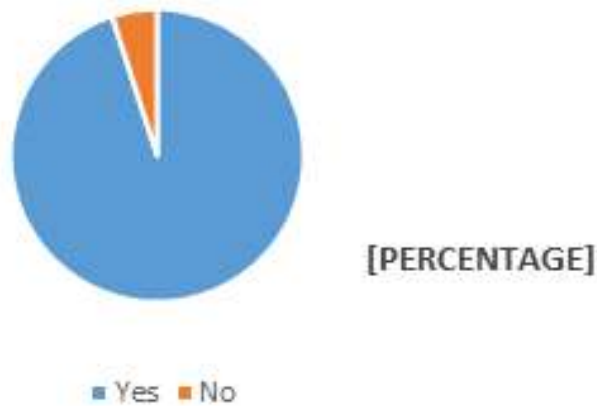
Parameters	Category	Percentage
Gender	Male	50.00
	Female	50.00
	Total	100.00
Age	Less than 20 years	15.00
	20 years -40 years	45.00
	40 years -60 years	33.00
	60 years -80 years	7.00
	Total	100.00
Qualification	HSC	9.00
	Undergraduate	51.00
	Post Graduate	35.00
	Doctorate	2.00
	Others	3.00
	Total	100.00

Salary Per Month	Less than Rs.25000	23.00
	Rs.25000- Rs 50000	37.00
	Rs 50000- Rs 75000	17.00
	Rs 75000- Rs 100000	20.00
	Rs 100000 & Above	03.00
	Total	100.00
Occupation	Services	54.00
	Business	17.00
	Profession	23.00
	Retired	2.00
	Others	4.00
	Total	100.00

Source: Primary Data

Graph No 1: Usage of Social Media

Do you use Social Media ?

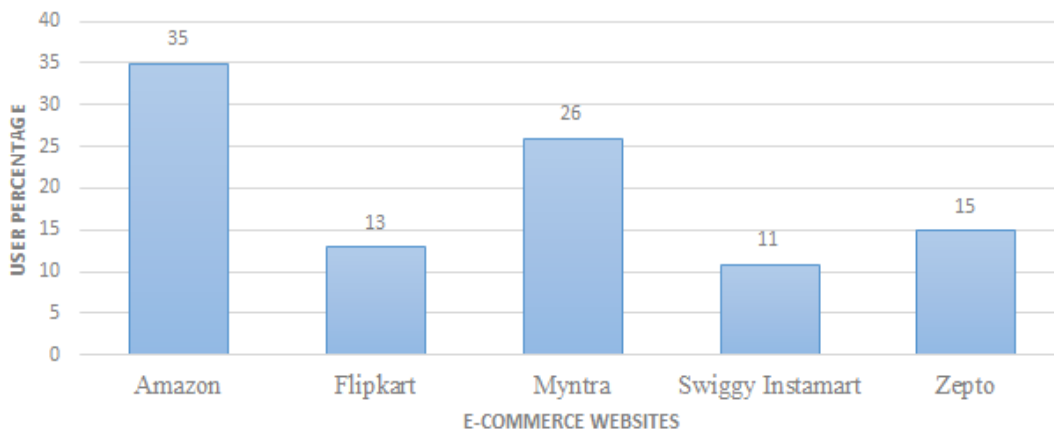


Source: Primary Data

From the above Graph No 1 it can be seen that 95% of the respondents use social media network whereas only 5% of the respondents do not use social media.

Graph No 2: E-Commerce Website Generally Used for Buying Activities

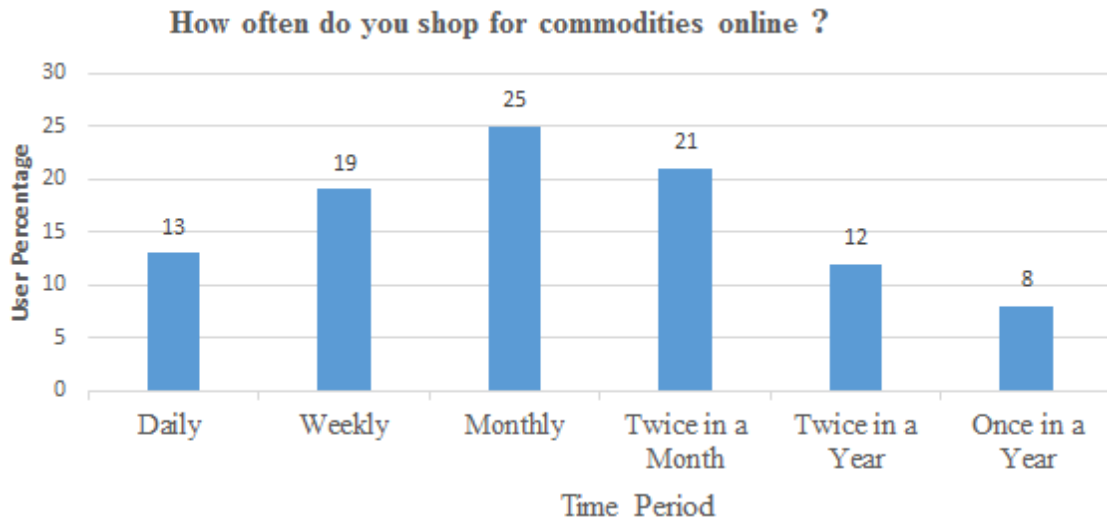
E-Commerce Website Generally Used for Buying Activities



Source: Primary Data

From the above Graph No.2 it can be seen that 35% of the respondents use Amazon for buying goods online, followed by Myntra with 26%. The newly launched E-Commerce platform Zepto is having more percentage of user i.e. 15% as compared to Swiggy, Instamart and Flipkart.

Graph No 3: Frequency of Usage

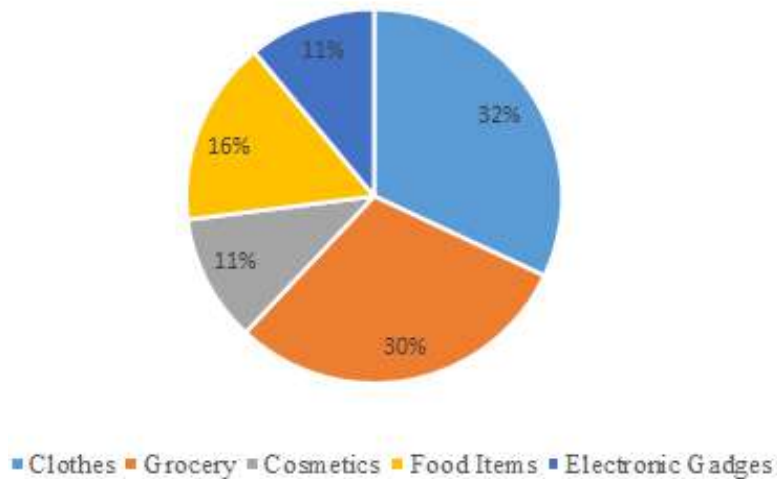


Source: Primary Data

The above Graph No 3 it can be seen that 25% of the respondents buy goods monthly from the various E-Commerce, 21% prefer to buy twice in a month. The rate of buying goods online is 19% in case of weekly buyers and for daily users it is only 13%.

Graph No 4: Nature of Shopping

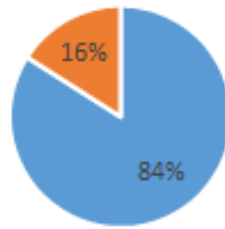
What items are generally purchased through E-Commerce ?



Source: Primary Data

From the above Graph No 4 it can be observed that around 32% of the respondents use E-Commerce for buying clothes followed by Grocery 30%. It can be seen that 16% of the respondents prefer to buy food items online. The least preferred item is cosmetics and Electronic Gadgets that is purchased from online.

Graph No 5: Influence of Social Media on Buying Behaviour
Do you believe that Social Media influences your buying behaviour?

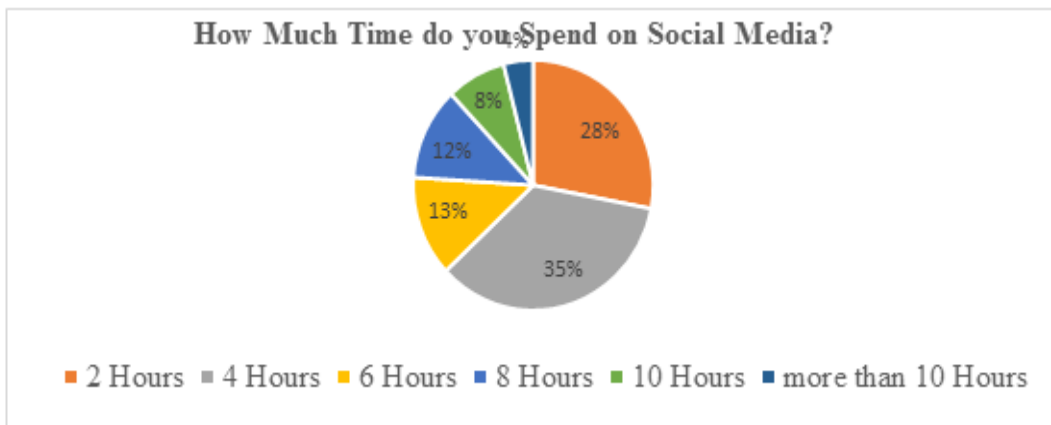


■ Yes ■ No

Source: Primary Data

From the above Graph No5 it can be said that only 16% of the respondents are not affected by social media while buying goods whereas the majority of the respondents i.e. 84% are of the opinion that they get influenced by social media while taking buying decision.

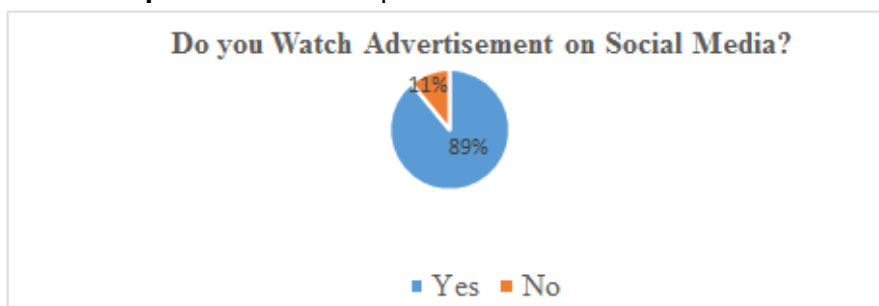
Graph No 6: Time Spent on Social Media



Source: Primary Data

Graph No. 6 indicates the amount of time spent on social media. Based on the data collected, 35% of respondents spend 4 hours daily on social media, 28% spend 2 hours, 13% spend 6 hours, 12% spend 8 hours, and 4% spend more than 10 hours. The analysis reveals that the average time spent by respondents is approximately 2 hours per day, although many teenagers spend around 4 hours daily, with some cases reaching up to 12 hours. Social media significantly influences the younger generation, particularly their buying behaviour. Teenagers primarily use social media to update their status, share posts and memories, write comments, and watch reels. On an average, teenagers spend about 3 hours daily on social media.

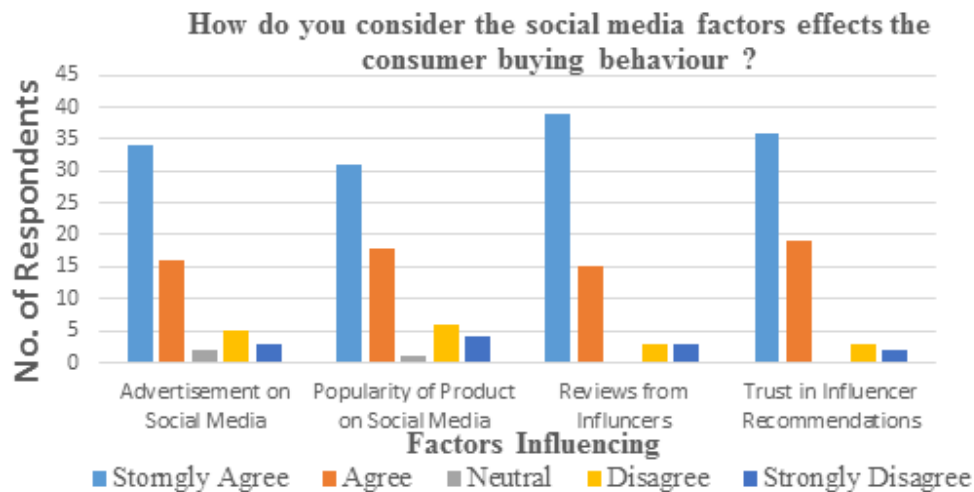
Graph No 7: Viewership of Advertisement on Social Media



Source: Primary Data

From the above Graph No 7 it can be seen that 89% of the respondents use social media for watching advertisement about the product by which they can gain information about the product or services. This helps them to take their buying decisions.

Graph No 8: Effect of Social Media on Consumer Buying Behaviour



Source: Primary Data

From the above Graph No 8 it can be concluded that **39%** of the respondents show strong agreement with **Reviews from Influencers** while **36%** of the respondents show **Trust in Influencer Recommendations**. Very few respondents disagree or strongly disagree, indicating an overall positive sentiment. Influencer-driven factors (reviews and trust) rank highest in influencing buying behaviour, suggests that businesses should prioritize partnerships with trustworthy influencers.

RECOMMENDATIONS AND CONCLUSION

From the research conducted it can be concluded that the social media is a very powerful tools which influence the consumer buying behaviour. Social media plays an important role in consumers buying decision process in an online mode. Social Media is very much popular among the youngsters and they rely on it greatly for fetching information especially when it comes to E-Commerce buying process of goods and services. It can also be said that the advertisement on social media and the reviews of influencers on social media have a great impact on users of social media especially youth among whom the online shopping is increasing day by day. It is also seen that most of the people use and trust Amazon but there are many more E-Commerce platform which provide wide range of products with the fastest delivery at their door step, there is need to create awareness about the various platforms of E-Commerce among the consumers. Another insight from the research suggests that most people do not frequently purchase daily or weekly essentials, such as dairy products and vegetables, through online platforms. This indicates a lack of preference for buying daily necessities online. There is a need to raise awareness about the availability of reliable E-commerce platforms that offer high-quality daily essentials at reasonable prices, encouraging consumers to explore these convenient options.

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AN ANALYSIS OF THE IMPACT OF E-KYC ON BANKING SERVICES

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ABSTRACT

The study explores the impact of Electronic Know Your Customer (E-KYC) on banking services, focusing on its role in enhancing customer onboarding efficiency, time savings, operational and cost efficiencies, regulatory compliance, and customer satisfaction. Using a descriptive research design, primary data were collected through a structured questionnaire administered to 172 respondents familiar with E-KYC services, complemented by secondary data from relevant literature. The responses were measured using a 4-point Likert scale and analyzed using descriptive statistics and one-sample T-tests. The findings indicate that E-KYC significantly improves the onboarding process by reducing time, paperwork, and operational complexities, resulting in greater cost efficiency for service providers. Respondents highlighted the reliability of E-KYC in ensuring regulatory compliance and mitigating risks such as fraud and identity theft. High levels of customer satisfaction were observed, with respondents appreciating the convenience, user-friendliness, and adaptability of E-KYC systems. The study also identified strong optimism for the future adoption of advanced E-KYC technologies. Overall, the research underscores the transformative potential of E-KYC in driving efficiency, innovation, and customer-centricity in banking services, positioning it as a pivotal component of digital transformation in the financial sector.

INTRODUCTION

The Indian banking sector has been at the forefront of the country's digital revolution, driven by government initiatives and the rapid adoption of technology. Among the many innovations that have transformed banking services, the implementation of Electronic Know Your Customer (E-KYC) processes stands out as a critical milestone. E-KYC, a digital method for verifying the identity of customers, has revolutionized the banking landscape by improving efficiency, enhancing customer experience, and fostering financial inclusion. This technological advancement has allowed banks to address long-standing challenges in customer verification while simultaneously complying with regulatory requirements. Traditionally, Know Your Customer (KYC) processes in Indian banking involved extensive paperwork and manual verification, which were time-consuming and error-prone. These traditional methods created significant barriers to financial inclusion, particularly for rural and underserved populations who often lacked the necessary documentation. The introduction of E-KYC marked a paradigm shift, enabling banks to verify customer identities through digital platforms such as Aadhaar, the government's unique identification system. Aadhaar-based E-KYC leverages biometric and demographic data to authenticate customers quickly and accurately, reducing the dependency on physical documents and in-person interactions (Reserve Bank of India, 2020). This transition has streamlined banking operations and played a vital role in integrating millions of previously unbanked individuals into the formal financial system. One of the most significant benefits of E-KYC is its role in promoting financial inclusion. In India, a substantial portion of the population, particularly in rural areas, remained excluded from the formal banking system due to the complexities of traditional KYC processes. The government's financial inclusion initiatives, such as the Pradhan Mantri Jan Dhan Yojana (PMJDY), have leveraged E-KYC to open millions of bank accounts for unbanked individuals. These accounts serve as entry points to essential financial services, including savings, credit, insurance, and direct benefit transfers. By simplifying customer onboarding, E-KYC has empowered marginalized populations and facilitated access to financial opportunities (Sanakulov & Karjaluo, 2015). Efficiency and cost-effectiveness are additional advantages of E-KYC in the Indian banking sector. Banks and financial institutions can now onboard customers within minutes, significantly reducing the time and resources required for manual verification. This has not only improved customer satisfaction but also allowed banks to focus on their core functions and expand their reach. For instance, digital payment platforms such as Paytm and Google Pay rely on E-KYC to authenticate users, enabling them to conduct secure transactions and furthering the goal of a cashless economy. The integration of E-KYC with digital payment systems has contributed to the exponential growth of cashless transactions in India, aligning with the government's Digital India vision (Shukla & Kanna, 2017). Regulatory compliance is a critical aspect of banking operations, and E-KYC has played an instrumental role in strengthening this area. The Reserve Bank of India (RBI) and other regulatory bodies mandate stringent KYC norms to prevent money laundering, terrorist

financing, and other financial crimes. By digitizing the verification process, E-KYC ensures that customer data is accurate, tamper-proof, and easily accessible for audits. This has enhanced the transparency and accountability of banking operations while minimizing the risks associated with manual errors and fraudulent activities (Shaikh et al., 2018). Furthermore, the use of advanced technologies such as artificial intelligence (AI) and machine learning in E-KYC processes has improved fraud detection and risk assessment, making banking systems more secure and reliable. E-KYC has also facilitated the growth of fintech companies and neo-banks in India. These innovative players in the financial ecosystem rely on digital customer verification to provide personalized and instant services such as microloans, investment products, and insurance. The adoption of E-KYC by fintech firms has disrupted traditional banking models and introduced new ways of delivering financial services to tech-savvy consumers. Despite its numerous benefits, the implementation of E-KYC in India has not been without challenges. One of the primary concerns is data privacy and security. The extensive use of Aadhaar for E-KYC has raised questions about the protection of sensitive customer information, particularly in the wake of data breaches and cyberattacks. The Supreme Court's verdict limiting the mandatory use of Aadhaar by private entities underscored the need for a balanced approach that prioritizes both innovation and privacy rights (Sharma & Choubey, 2021). Many customers, particularly older individuals and those in rural areas, are unfamiliar with digital processes and may be hesitant to adopt E-KYC. Similarly, some bank employees face difficulties transitioning from traditional KYC methods to digital platforms. To overcome these barriers, banks need to invest in digital literacy programs and provide adequate training to their staff. This will ensure a smoother transition and promote widespread adoption of E-KYC across diverse customer demographics. The future of E-KYC in the Indian banking sector looks promising, driven by continuous technological advancements and supportive regulatory frameworks. Emerging technologies such as blockchain, AI, and big data analytics hold immense potential to enhance the efficiency and accuracy of E-KYC processes. Blockchain-based solutions, for instance, can provide decentralized and immutable storage of customer data, ensuring greater security and transparency. AI-powered algorithms can detect anomalies in customer profiles and flag suspicious activities, enabling proactive fraud prevention. These innovations, coupled with government initiatives like DigiLocker and India Stack, are expected to strengthen the E-KYC framework and drive the digital transformation of the banking sector (Reserve Bank of India, 2021). In conclusion, E-KYC has emerged as a game-changer in the Indian banking sector, offering a blend of convenience, efficiency, and security. By simplifying customer verification processes, fostering financial inclusion, and enhancing compliance with regulatory standards, E-KYC has significantly contributed to the modernization of banking services in India. However, addressing challenges related to data privacy, digital literacy, and infrastructure gaps is crucial to ensuring its long-term success. As India continues its journey toward becoming a digitally empowered economy, E-KYC will play a pivotal role in shaping the future of banking, making financial services more accessible and efficient for all citizens.

OBJECTIVES

1. To analyze the impact of E-KYC on customer onboarding efficiency.
2. To assess the role of E-KYC on time saving
3. To examine the operational and cost efficiencies achieved through E-KYC.
4. To study the regulatory compliance benefits of E-KYC.
5. To evaluate customer satisfaction with E-KYC processes.
6. To identify challenges and barriers in the adoption of E-KYC.
7. To explore future technological advancements in E-KYC.

HYPOTHESES

1. **H1:** E-KYC significantly improves the efficiency of customer onboarding processes in Indian banks.
2. **H2:** E-KYC leads to a significant reduction in time required for customer onboarding..
3. **H3:** E-KYC reduces operational costs for Indian banks compared to traditional KYC processes.
4. **H4:** E-KYC enhances regulatory compliance in Indian banking by reducing fraud and ensuring data accuracy.

REVIEW OF LITERATURE

The adoption of Electronic Know Your Customer (E-KYC) processes in Indian banking services has been the subject of extensive research, reflecting its transformative impact on the financial sector. Scholars and practitioners alike have examined various aspects of E-KYC, including its role in improving operational

efficiency, fostering financial inclusion, ensuring regulatory compliance, and addressing challenges related to privacy and security.

E-KYC has been recognized for its ability to streamline customer verification processes, significantly reducing time and operational costs for banks. According to the Reserve Bank of India (2020), the adoption of E-KYC has allowed banks to onboard customers in minutes, replacing traditional manual verification methods that were time-consuming and resource-intensive. Sanakulov and Karjaluoto (2015) highlight that digital KYC processes eliminate paperwork and manual errors, enabling banks to allocate their resources more effectively. One of the most significant contributions of E-KYC is its role in promoting financial inclusion. The integration of E-KYC with Aadhaar, India’s unique identification system, has enabled millions of unbanked individuals, particularly in rural and semi-urban areas, to access banking services. Sanader (2014) observed that E-KYC simplifies the onboarding process, making it accessible to low-income groups who often face challenges in producing traditional identity documents. The Pradhan Mantri Jan Dhan Yojana (PMJDY), which has leveraged E-KYC to open millions of bank accounts, is a testament to its impact on financial inclusion (Reserve Bank of India, 2021).

The digital divide in India is another significant barrier to the adoption of E-KYC. Disparities in internet access, smartphone penetration, and digital literacy have limited the reach of digital banking services, particularly in rural areas. Tizhoosh and Pantanowitz (2018) highlight that bridging this divide requires collaborative efforts from the government, financial institutions, and technology providers. In summary, the literature on E-KYC underscores its transformative impact on the Indian banking sector. By improving efficiency, fostering financial inclusion, and enhancing regulatory compliance, E-KYC has become a cornerstone of modern banking services in India. However, addressing challenges related to data privacy, digital literacy, and technological infrastructure is crucial for its long-term success. As India continues to embrace digital transformation, E-KYC will play an increasingly vital role in shaping the future of banking and financial services.

RESEARCH METHODOLOGY

The research employs a descriptive research design to analyze the impact of E-KYC on customer onboarding efficiency, time savings, operational and cost efficiencies, regulatory compliance benefits, customer satisfaction, challenges, and future advancements. Primary data were collected through a structured questionnaire distributed to 172 respondents familiar with or using E-KYC services, while secondary data were gathered from journals, reports, and regulatory guidelines. A 4-point Likert scale (1 = lower affirmative to 4 = highly affirmative) was used to measure perceptions, with higher scores indicating stronger agreement or positivity. A convenience sampling method targeted bank customers, financial service users, and institutional employees. Data analysis included descriptive statistics and one-sample T-tests to test hypotheses regarding the positive impacts of E-KYC. The study ensures ethical standards through voluntary participation, informed consent, data confidentiality, though limitations include self-reported data and sampling constraints. This methodology provides a systematic approach to understanding the adoption and implications of E-KYC systems giving insights into customer experiences and potential areas for improvement.

RESULTS AND FINDINGS

Variable	T-Statistic	P-Value	Significance
On boarding Efficiency	39.38	0.00	Significant
Time Saving	39.08	0.00	Significant
Cost Efficiency	38.80	0.00	Significant
Compliance Benefits	38.80	0.00	Significant
Satisfaction	39.08	0.00	Significant
User-Friendly	37.97	0.00	Significant
Future Adoption	40.43	0.00	Significant

INTERPRETATION OF FINDINGS

Interpretation of Results

The findings of the study indicate a strong positive perception of E-KYC across all evaluated dimensions. The results of the one-sample t-tests, conducted for all variables using a 4-point Likert scale, show statistically significant values greater than 2 (neutral point), demonstrating that the respondents leaned toward higher affirmation regarding the benefits of E-KYC.

Customer Onboarding Efficiency: The mean score for onboarding efficiency was significantly greater than 2, indicating that respondents perceive E-KYC as significantly enhancing the ease and speed of the customer onboarding process compared to traditional methods. This aligns with the objective of simplifying procedures while maintaining accuracy.

Time Saving: The analysis shows that E-KYC is widely recognized as a time-efficient process, with respondents affirming that it significantly reduces the time required for onboarding and other operational activities. The t-test results strongly support the hypothesis that E-KYC contributes to time savings.

Operational and Cost Efficiencies: Respondents acknowledged that E-KYC reduces paperwork and operational complexities, leading to improved cost-efficiency for service providers. The high mean scores confirm that respondents agree E-KYC minimizes resource usage, benefiting both customers and institutions.

Regulatory Compliance Benefits: The findings confirm that E-KYC is perceived to enhance compliance with regulatory standards and reduce risks related to fraud and identity theft. Respondents indicated strong agreement on the ability of E-KYC to ensure data integrity and security, reflecting its reliability in meeting regulatory expectations.

Customer Satisfaction: High satisfaction levels were recorded, with respondents affirming that E-KYC offers convenience, speed, and ease of use. These results indicate that E-KYC is a customer-centric solution that aligns with modern expectations for digital services.

User-Friendliness: The process was largely viewed as user-friendly, with respondents expressing confidence in its accessibility and ease of operation. This suggests that E-KYC systems are well-designed to accommodate a broad user base.

Future Adoption: The results also highlight optimism for the future of E-KYC, with respondents likely to adopt enhanced E-KYC systems. This reflects the adaptability of E-KYC to emerging technological advancements and evolving customer needs.

CONCLUSION

The study concludes that E-KYC has a profound positive impact across multiple dimensions, including customer onboarding efficiency, time savings, operational and cost efficiencies, regulatory compliance, and customer satisfaction. The results demonstrate that E-KYC significantly simplifies and accelerates the onboarding process while reducing paperwork and operational complexities, leading to improved cost-effectiveness for service providers. Respondents affirmed that E-KYC ensures better compliance with regulatory standards and reduces risks related to fraud and identity theft, reflecting its reliability and security.

Moreover, the high levels of customer satisfaction indicate that E-KYC is perceived as a convenient, accessible, and user-friendly process that meets the expectations of modern digital services. The findings also highlight strong optimism for the future of E-KYC, with respondents expressing a willingness to adopt enhanced systems as technology evolves. Overall, the study underscores the critical role of E-KYC as a transformative tool in driving efficiency, innovation, and customer-centricity in financial and regulatory ecosystems, making it an essential component of the digital transformation journey.

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A STUDY ON THE INVESTMENT PRACTICES AMONGST GEN Z INDIVIDUALS**Ms. Sneh Gehi and Dr. Tasneem Razmi**Assistant Professor, BAF Department, H. R. College of Commerce and Economics
HSNC University, Mumbai, India**ABSTRACT**

Today, many individuals start investing their funds from an early age. Investments can be a great source of wealth creation and financial security. With the influence of digital tools, the young generation particularly, Generation Z tend to make investments as soon as they turn into adults. While Generation X and Generation Y depicted self-reliant and socially conscious personality traits, Generation Z depict Individualistic and open minded personality traits. Keeping this in view, the purpose of this study is to understand the investment practices demonstrated by Generation Z individuals. A quantitative study with an aim to identify the factors influencing and the challenges faced by them was conducted. 121 responses were collected through a questionnaire. The results highlighted Returns on Investment, Family responsibilities and Future travel plans to be the prominent factors influencing investing decisions. Social media had a moderate influence due to overload of information. There is a need to promote financial literacy among Gen Z individuals in order to inculcate the practice of investing. Improving investment overlook from short-term gains to long term financial stability is required. Financial institutions, academicians and policymakers can help address these gaps while building a stronger investor community by taking into consideration these investment practices.

Keywords: Gen Z, Investment practices, Investment factors, Challenges

INTRODUCTION

Personal financial planning is a significant part of every adult's life. Each individual has a different approach to money. While earning income is the most important element of personal finance, saving and multiplying (investing) that income is also equally useful. India being the country with the highest youth population in the world (BScholarly), understanding how Generation Z (Gen Z) individuals approach investments is necessary. Generation Z are those individuals born between 1997 and 2012. A survey by iGrad – Financial wellness platform pointed out that 42% Gen Z adults preferred using digital modes of banking over traditional modes. As the younger generation tends to be more tech savvy, their investment patterns also mimic those preferences i.e. investing in ETF, cryptocurrencies, mutual funds, etc. Gen Z are quick to explore new investment avenues as they get prompt access to market information through social media platforms and online forums.

Another noteworthy feature of Gen Z's investments are their inclination towards eco-friendly products. They prioritize investing in companies that align with social and ethical norms like human rights, climate change, animal safety, etc. This generation as compared to any previous generation is focussed on ESG investments (Takimoto, 2021). As they have lived through Covid-19 pandemic and recession situations, Gen Z give importance to financial security and financial freedom. Many of them even start investing in fixed deposits and systematic investment plans in their early twenties in order to build their portfolio.

Needless to say, peer influence and social media platforms also influence Gen Z psychology towards investments. According to Fin One, over 62% of young adults use Youtube as their primary source to gather information and knowledge about financial products (Business Today).

Considering Gen Z's desire to get a head start in their personal financial journey, understanding their investment practices may be important for financial institutions and policymakers to cater to their requirements.

LITERATURE REVIEW

Risk-appetite among Gen Z investors is higher, making them explore diverse investment avenues like real estate, cryptocurrencies, derivatives, etc. They are more likely to self-educate and gain knowledge before making investments than other generations (Patil & Gokhale 2022). Gen Z showcase high levels of adaptability when faced with complexities in market operations. However, they are also impulsive while making investment decisions. (Gnanadeepan et al., 2024). Quick returns and easy liquidity are attractive features for Gen Z investors. They prefer short-term investments over long-term investments in order to have access to surplus funds (Schneider et al., 2020).

(Durga et al., 2023) investigated if guidance from parents impacted awareness levels of young adults towards savings and investments. The study found that young adults severely lacked parental guidance and very few of them had awareness regarding investment topics. Financial institutions should provide simple investing

strategies as Gen Z prefer readily available information instead of doing thorough market research (Mazzatto 2022).

Gen Z showcased poor levels of money management, budgeting and planning as they lacked basic financial knowledge (Girimurugan et al., 2024). (Volpe et al., 1996) examined the relationship between personal investment literacy and demographic factors and found that female students has less knowledge about personal investment literacy as compared to males. (Savithri et al., 2024) explored the possibility of investment decisions being fuelled by the quantity of information available on social media about a given investment. It also increases the likelihood of creating artificial bubbles due to misinformation. Gen Z investors feel socially responsible to make investments which support the ecological well-being, however the desire to make short-term returns overpowers it (Pašiušiene et al., 2023).

(Rosdiana, 2020) found high levels of self-confidence in Gen Z individuals which leads to well-considered, efficient investments. (Pravin et al., 2024) suggested education to be a key component in the investment decisions of Gen Z. It suggested a need to promote training and educational programs relating to financial planning.

OBJECTIVES OF THE STUDY

1. To understand the Investment practices adopted by Gen Z Individuals.
2. To identify factors influencing Investment decisions of Gen Z Individuals.
3. To identify challenges/ obstacles faced by Gen Z Individuals while making Investments.
4. To suggest measures for improving Investment Patterns of Gen Z investors.

LIMITATIONS OF THE STUDY

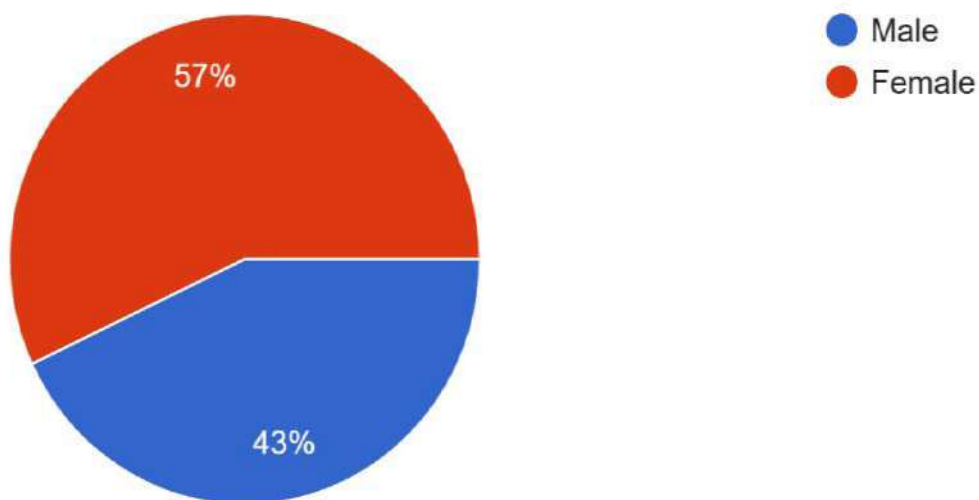
1. The study is limited to Mumbai city in Maharashtra, India and cannot be generalised to a greater context.
2. The findings are limited to the responses received from 121 individuals which may not complement with the opinions and behaviours of the entire population.
3. The responses shared are personal and hence individual bias may be prevalent.

RESEARCH METHODOLOGY

An online questionnaire was circulated to understand the Investment practices adopted by Gen Z Individuals in Mumbai. The questionnaire included close ended and five point Likert scale type of questions. The questionnaire was circulated amongst 18 to 26 year old individuals. Using the convenience method of sampling, 121 responses were collected. Data obtained is analysed and interpreted to present in summarised form, respecting data confidentiality.

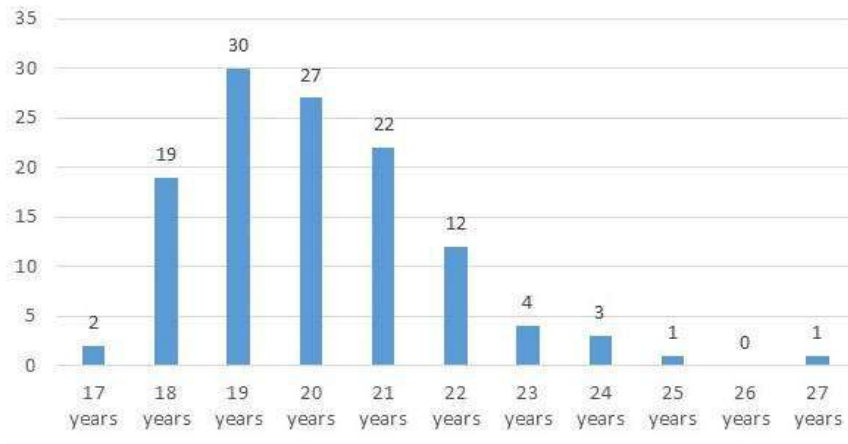
DATA FINDING & ANALYSIS

Table 1: Gender



The above pie chart shows that 57% of the respondents are Female and 43% respondents are male, which is to say that the ratio of male to female investors is almost equal. Over the years, more and more females are inclined to make investments.

Table 2: Age



From the above graph, it can be seen that maximum respondents are 19 years (30 respondents), followed by 20 years (27 respondents) and 21 years (22 respondents). Ages 25, 26 and 27 years have the lowest representation. It is observed that the young generation has started becoming interested in making investments.

Table 3: Percentage of Funds Invested

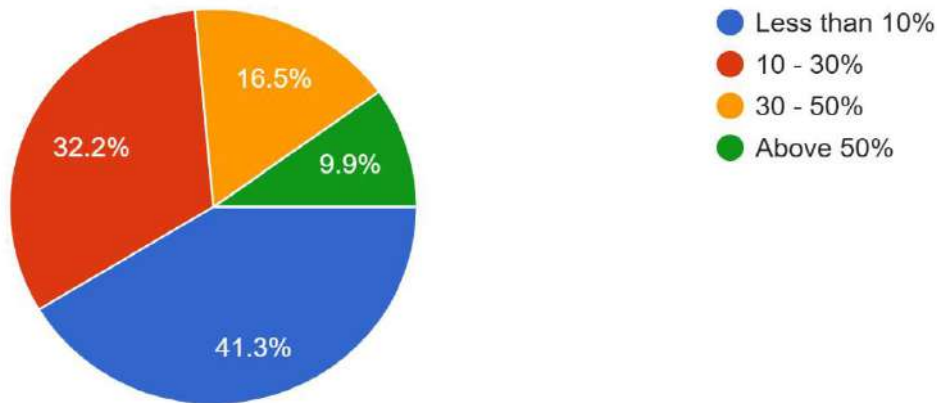
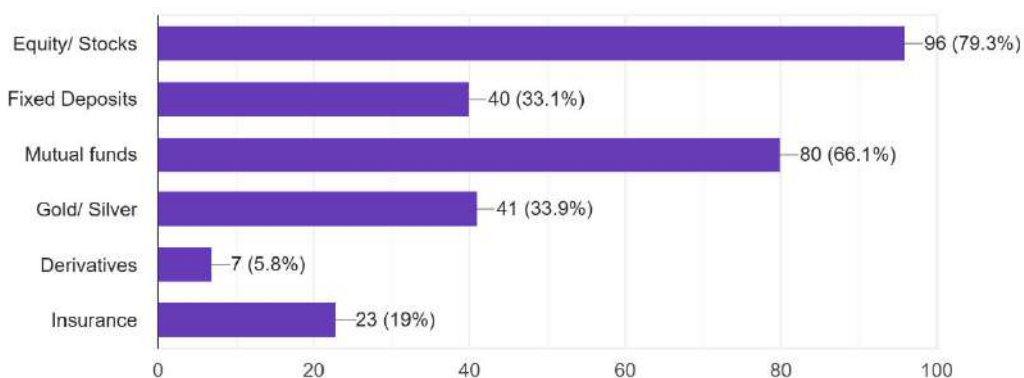


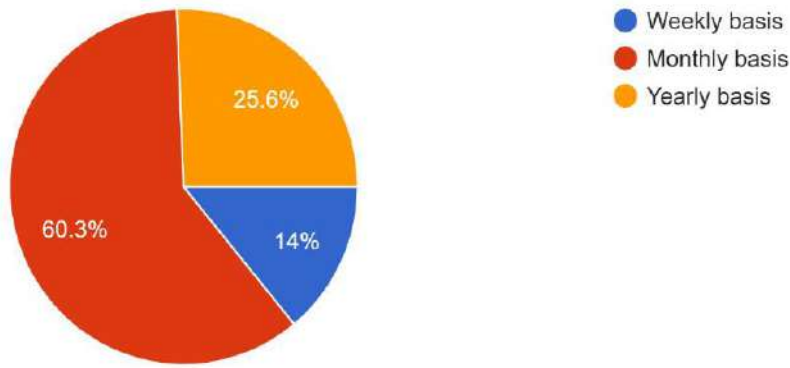
Table 3 shows that 41.3% respondents invest less than 10% of their funds. 32.2% of the respondents invest 10-30% of their funds, followed by 16.5% investing 30-50% and 9.9% investing above 50% of their funds. The funds generated by the respondents are either from the income earned through their jobs, internships, freelance gigs or saved pocket money as few start investing while still pursuing higher education.

Table 4: Preferred Avenues of Investment (Multiple choice)



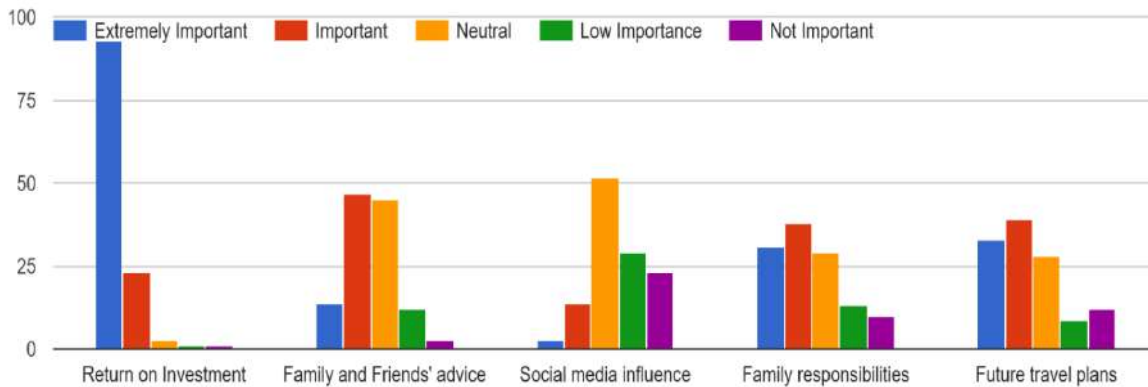
The top two preferred avenues of investment of Gen Z investors are ‘Equity/Stocks’ (79.3%) and ‘Mutual funds’ (66.1%). ‘Gold/Silver’, ‘Fixed Deposits’, ‘Insurance’ and ‘Derivatives’ accounted for 33.09%, 33.1%, 19% and 5.8% respectively. This suggests even though Equities and Mutual funds are perceived higher risk avenues as compared to Gold/Silver, fixed deposits and Insurance, Gen Z are looking forward to investing in such high-risk areas. They showcase risk-tolerant investing habits.

Table 5: Frequency of Investment



When investigating about the frequency of their Investment, it was seen that 73 respondents (60.3%) invested on a monthly basis, 31 respondents (25.6%) on a yearly basis and merely 17 respondents (14%) invested on weekly basis. Investing on a monthly basis can often be liked to systematic investment plans (SIPs) adopted by investors, since majority investors prefer investing in Mutual funds.

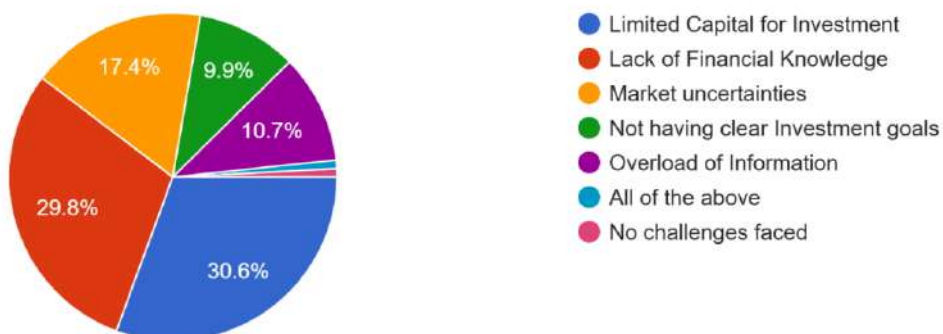
Table 6: Factors influencing Investment decisions



It can be seen that 93 respondents consider ‘Return on Investments’ to be Extremely Important while making investment decisions. 47 respondents consider Family and friends’ advice to be Important while 45 respondents give a neutral weightage to the advice given by Family and Friends. Social media influence is found to have a Neutral (52 respondents) to Low Importance (29 respondents) while making investments. Family responsibilities has been an influential factor in investment decisions by 38 respondents (Important) and 31 respondents (Extremely Important). Similarly, 39 respondents consider Future travel plans as Important and 33 respondents as Extremely Important factors.

In summary, Return on Investment, Family responsibilities and Future travel plans are the prominent factors that influence investing decisions of Gen Z investors. There was a mixed opinion on advice given by family and friends as a factor that influences decisions indicating independent decision-making. Additionally, social media had a moderate influence on investing decisions, highlighting differentiating levels of trust on social media recommendations.

Table 7: Challenges/ obstacles faced while investing



As per the above graph, the major obstacles faced by Gen Z investors before investing are Limited capital for investment, Lack of financial knowledge, Market uncertainties and Overload of Information which account for

30.6%, 29.8%, 17.4% and 10.7% respectively. The respondents responded that the other obstacle they face was not having clear Investment goals which accounts for 9.9%.

Considering Gen Z investors have small portions of disposable funds, there is a limitation faced by them to fully participate in investment activities. They have difficulty understanding financial products due to limited financial knowledge which restricts investments. Having grown up during recession and situations of economic instability leading to market uncertainties, there is a level of hesitation faced by them while making investment decisions. Not having clear investment goals and overload of information highlights a level of confusion by Gen Z investors.

CONCLUSION

The Investment practices of Gen Z investors show a keen interest of investing in avenues like Equities and Mutual funds, which contribute to a risk-tolerant investor base. Their investment decisions are influenced by the returns made on them, family responsibilities and future travel plans. However, Gen Z investors often face an overload of information through social media platforms, which can be addressed by promoting knowledge of financial products and investment plans. Guidance given by family and friends will help to overcome the challenges like having clear Investment goals. Overall, promoting a positive outlook of investment will help make Gen Z investors financially independent.

SUGGESTIONS

1. Improving Habit of Savings/ Investments – The habit of savings can be introduced by making Gen Z investors implement automatic fund transfers at the beginning or end of a monthly cycle. Investment platforms allow micro-investing, which helps building a corpus even with limited funds. Having a specific goal in mind whether that is buying a phone, travelling, education, etc. will help give saving and investing actions a direction.
2. Improving Financial Literacy – Considering Gen Z investors are flooded with information on social media platforms about different investment avenues, personal finance workshops and seminars should be conducted at schools and colleges.
3. Personalised Investment Plans – Financial institutions should provide strategies that suit every type of investor based on their financial backgrounds, investment preferences, financial plans and risk-tolerance. Catering to their specific needs while making an investment portfolio will help build confidence among Gen Z investors.
4. Guidance from Parents – Encouraging open and honest discussions regarding financial capacities, responsibilities and goals will motivate Gen Z investors to take a keen interest thereby promoting healthy investment behaviours. Setting up joint accounts and regularly tracking financial progress, will build a strong foundation.
5. Enhancing Investment outlook – Instead of investing with a motive of making quick returns, Gen Z investors should be inculcated with the idea of viewing financial stability as a way of life. Training institutions should share success stories of individuals who achieved success by making smart investment decisions.

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CASHLESS ECONOMY AND DIGITIZATION FOR ECONOMIC GROWTH

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ABSTRACT

The government embracing digital technology worldwide has played a crucial role in promoting a cashless society, fast-tracking economic growth, and supporting the transition into a new industrial revolution. Since 2020, this transition has notably influenced economic growth in various countries, especially in India, where a significant increase in cashless and digital payment methods was further propelled by the COVID-19 pandemic. The advantages of these digital transactions have made everyday payments more seamless and convenient for users.

India's transition to a cashless economy has been instrumental in reducing black money circulation, improving financial transparency, and stimulating economic development. This research delves into the mechanisms underpinning this transformation, highlighting the significant correlation between the rise in cashless transactions and the growth of retail markets (Zaware, 2020). It also addresses the accompanying challenges, such as digital literacy gaps and cybersecurity risks, providing a balanced view of the opportunities and obstacles in the journey toward a digitally empowered financial ecosystem. The findings underscore the potential for India's model to inspire similar transitions in other developing economies.

Keywords: *Digital Payments, Unified Payments Interface (UPI), Cashless economy in India, Financial inclusion, Cybersecurity in digital transactions, Economic transparency, Digital infrastructure, Digital financial ecosystem, Global payment systems, Fintech innovations, Demonetization, Digital literacy*

INTRODUCTION

India is undergoing a transformative shift toward a cashless economy, with digital transactions projected to create a \$1 trillion market by 2025. This transition has been analyzed through the lenses of financial systems, monetary operations, and economic theory, highlighting the interplay of digitalization, banking innovations, evolving consumer preferences, and macroeconomic trends. These factors have collectively enabled diverse payment and settlement mechanisms, benefiting stakeholders such as banks, central banks, and IT corporations that are actively advancing digital currencies and payment technologies.

Despite significant progress, challenges persist. Financial exclusion remains a concern, particularly for households lacking digital access and literacy. The push toward a cashless society gained significant traction following the demonetization initiative on November 8, 2016, which catalyzed a surge in digital payment adoption, with approximately 98% of transactions now conducted digitally. As of March 2022, the RBI's Digital Payments Index reached 349.30, reflecting robust adoption, while digital transactions during FY 2021–22 reached a remarkable 7,195 crore in volume, amounting to a total value of ₹17.44 billion. This growth underscores India's leadership likely in online payments while emphasizing the need to address barriers to inclusivity and accessibility.

LITERATURE REVIEW

The rapid usage of online payment systems, accelerated by the pandemic, has meaningfully contributed to the expansion of digital economies (Maduwansha et al., 2022). However, challenges such as digital literacy and financial security persist (Hasan et al., 2020; Maduwansha et al., 2022). The literature suggests that a cashless society offers substantial benefits to individuals and governments, including reducing tax evasion, curbing money laundering, and fostering economic stability (Kumari & Khanna, 2017).

Despite these benefits, global challenges hinder full-scale implementation, including cybercrime, financial illiteracy, and gaps in digital infrastructure (Fabris, 2019). Addressing these obstacles requires robust policy measures and collaborative efforts among governments, private stakeholders, and financial institutions.

DISCUSSION

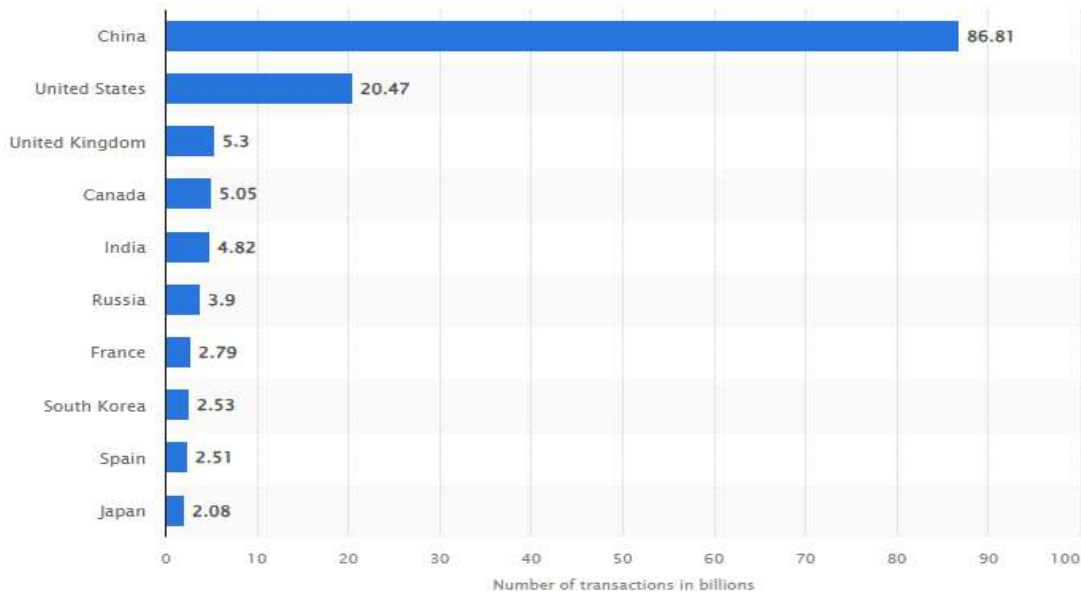


Figure 1: (Source: RBI, NPCI & Banks)

The data highlights the volume of financial transactions (in billions) across different countries. China leads significantly, with a staggering 86.81 billion transactions—over four times more than the United States, which ranks second with 20.47 billion. The United Kingdom, Canada, and India form the next tier, with around 5 billion transactions each. Other countries, including Russia, France, South Korea, Spain, and Japan, have much lower figures, ranging between 2 and 4 billion. This vast lead by China is likely because of large population and widespread use of electronic payments.

A. Cashless Payment Systems

Cashless transactions in India began in the 1980s with the introduction of plastic money. Over time, the rise of virtual businesses and mobile applications has expanded the scope of instant retail payments. Today, primary digital payment methods include the Unified Payments Interface (UPI), digital wallets, and banking cards.

B. Development in Digital Transactions

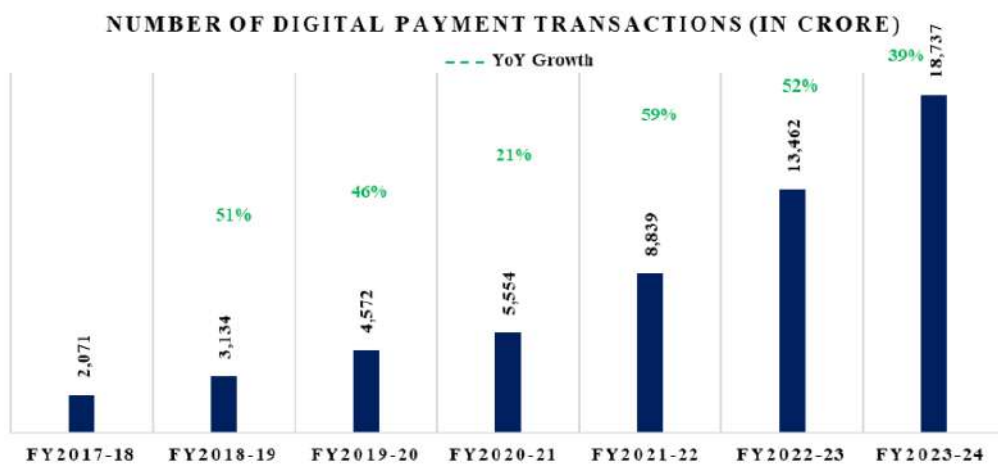


Figure 2: (Source: RBI, NPCI & Banks)

As shown in Figure 2, the total volume of online payment transactions in India demonstrates a remarkable upward trend, growing from 20.71 billion (2,071 crores) transactions in FY 2017-18 to 187.37 billion (18,737 crores) in FY 2023-24. This represents a robust compound annual growth rate (CAGR) of 44%, indicating sustained and substantial growth in the use of digital payments. The transaction value also rose significantly, from ₹952 lakh crs to ₹3,658 lakh crs during the same period. UPI transactions alone surged from 92 crore to 13,116 crore, achieving a CAGR of 129%. This growth is primarily attributed to government initiatives and collaboration with various stakeholders. Digital payments include multiple modes such as NACH, IMPS, UPI, NETC, Debit Card, Credit Card, NEFT, RTGS, Internet Banking, and Mobile Banking.

C. Digital payments international market

India's digital innovations, such as UPI and RuPay cards, are gaining global recognition. UPI is now operational in countries like the UAE, Bhutan, and Singapore, with trial operations in Nepal, Mauritius, France, and Sri Lanka. Similarly, RuPay cards are accepted in Nepal, Bhutan, and the UAE. These developments underscore India's growing influence in the global digital payments' ecosystem (Ministry of Finance, 2024). While China leads globally with transaction volumes, India's rapid growth trajectory positions it as a key player for future market expansion in Asia.

D. Digital payment infrastructure

The electronic payment acceptance infrastructure in India has grown significantly, from 0.31 crs in 2017-18 to 36.14 crs in 2024 (Ministry of Finance, 2024). Government schemes promoting RuPay Debit Cards and BHIM-UPI transactions have contributed to this expansion. UPI transactions, in particular, grew from 4,597 crs in 2021-22 to 13,116 crs in 2023-24 (Kumar & ET BFSI, 2024).

E. Transaction volume growth

The UPI platform has demonstrated extraordinary growth, with increase in number of transaction from 12.5 billion in 2019-20 to 131 billion in 2023-24, reflecting a CAGR of approximately 80%. A notable milestone was achieved in July 2024, with UPI transactions reaching ₹20.64 trillion—a year-over-year growth of 45%.

F. Digital payment adoption

The penetration of digital payments has shown remarkable progress, with the share of digital transactions more than doubling from 14-19% in March 2021 to 40-48% in March 2024. Despite this growth, cash transactions still constitute approximately 60% of consumer spending, indicating untapped potential for further digital adoption.

G. User behavior patterns

Survey data from March 2024 reveals distinctive usage patterns among Indian consumers. Approximately 23% of users conduct between 11 and 20 UPI transactions monthly, while 13% demonstrate high-frequency usage, with over 50 transactions per month. These patterns indicate growing acceptance and comfort with digital payment systems across diverse user segments.

Incentive Schemes

The Indian government has prioritized the promotion of digital payments as a key strategy to formalize the economy, boost investments, improve access to credit, and deliver tangible benefits to everyday citizens. To achieve these goals, the Department of Financial Services (DFS) introduced an incentive scheme for FY 2023-24, starting on April 1, 2023, with a budget allocation of ₹3,500 crore.

This initiative has demonstrated significant impact. Since its launch, UPI transfers have increased dramatically, increasing from 4,597 crs in 2021-22 to an impressive 13,116 crs in 2023-24. This remarkable growth underscores the scheme's success in accelerating the adoption of digital payments and moving India closer to becoming a fully cashless economy.

DRIVING FACTORS

The success of India's digital payment ecosystem can be attributed to several key initiatives and advancements:

Government Initiatives:

- **Digital India:** Promotes digital infrastructure and literacy to enable seamless access to technology-driven services.
- **Startup India:** Fosters innovation in financial technology and supports the development of cutting-edge payment solutions.
- **Make in India:** Encourages the domestic production of digital payment technologies, reducing dependency on imports and boosting local manufacturing.

Technological Infrastructure: Growing internet accessibility and smartphone penetration have been pivotal in driving digital payment adoption. Projections indicate that India will reach approximately 800 million internet users by 2023, with mobile wallet users expected to approach 900 million by 2025.

UPI Infrastructure: The implementation of the Unified Payments Interface (UPI) by NPCI in 2016 has been transformative. UPI provides a robust framework for real-time interbank transactions, ensuring scalability and high user acceptance. Applications like PhonePe and BHIM exemplify the platform's success in reaching diverse user groups.

Advantages of a cashless society

1. **Transparency:** Digital payments enhance financial transparency by reducing corruption and enabling easy tracking of financial records.
2. **Convenience:** Individuals can conduct transactions quickly and securely, reducing dependency on cash and improving overall efficiency.
3. **Economic Growth:** Studies link electronic payments, particularly card-based systems, to GDP growth. For example, Hasan et al. (2012) and Zandi et al. (2013) demonstrated that increased electronic payment usage positively correlates with economic development.
4. **Fraud Reduction:** Electronic payment systems minimize risks such as counterfeit currency circulation and money laundering.

CHALLENGES TO A CASHLESS ECONOMY

1. **Cybersecurity Risks:** Increasing cyberattacks, phishing scams, and data breaches undermine public trust in digital systems.
2. **Digital Literacy:** Limited knowledge and awareness of digital financial tools hinder adoption, particularly in rural and underprivileged areas.
3. **Infrastructure Gaps:** Inadequate internet connectivity and limited smartphone penetration remain significant obstacles to use of electronic payment.
4. **Resistance to Change:** Some individuals are hesitant to adopt new methods of payments due to concerns about data privacy and a lack of familiarity with technology.

CONCLUSION

India's move toward a cashless economy represents a transformative shift fueled by technological advancements and supportive government policies. The benefits are evident—enhanced transparency, greater convenience, and a boost to economic growth. However, challenges such as internet security risks and the need for improved digital knowledge must be addressed to ensure this transition is inclusive and sustainable.

Research highlights a direct correlation between electronic payments and economic growth. For instance, Zandi et al. (2013) observed that plastic card payments increased GDP by 0.8% in developing markets and 0.3% in advanced markets between 2008 and 2012. In India, initiatives like UPI and BHIM have demonstrated similar potential by driving real-time financial inclusion and economic participation.

India's leadership in digital payment innovation serves as an inspiring example for other countries aiming to adopt cashless systems. This research underscores how a combination of government backing, robust technological infrastructure, and widespread user acceptance has fostered a thriving digital payment ecosystem. Future studies could explore the long-term economic impacts of this transformation and assess how similar strategies could be implemented in other developing nations.

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THE IMPACT OF DIGITALIZATION ON ECONOMIC GROWTH: AN ANALYTICAL STUDY OF CASHLESS TRANSACTION WITH BUSINESS INTELLIGENCE TOOL

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This research explores the transformative influence of digitalization on economic growth, focusing on cashless transactions as a pivotal driver. By leveraging Business Intelligence tools, the study analyzes the impact of digital payment systems on consumer behaviour, business efficiency and macroeconomic indicators focus on highlighting their capacity to enhance transparency, reduce transaction costs and drive sustainable growth. Graphs presented in the paper illustrate trends in adoption rates and their correlation with economic metrics. For instance, regions with robust digital payment infrastructures show heightened consumer spending and improved business performance, contributing to GDP growth. However, the analysis also reveals urban-rural disparities in adoption due to challenges like limited internet access and digital literacy gaps. The study synthesizes insights from recent data, including case studies from India, where initiatives like UPI and Digital India have revolutionized payment systems. The methodology integrates qualitative and quantitative approaches, using datasets from 2019 to 2024 visualized through Power BI to uncover trends and actionable insights. The findings emphasize that while cashless transactions can significantly drive economic growth, their success relies on robust infrastructural and educational support. Policymakers are urged to prioritize bridging the digital divide and fostering trust in digital systems. The research provides a roadmap for stakeholders to leverage digitalization as a catalyst for economic transformation, underscoring the need for collaboration to achieve equitable digital progress.

INTRODUCTION

Digitalization has emerged as a transformative force in the global economy, reshaping traditional industries and enabling new modes of operation and innovation. Among its many facets, the transition towards cashless transactions stands out as a significant marker of economic modernization. With the proliferation of digital payment systems, mobile banking, and e-commerce, economies worldwide are experiencing enhanced efficiency, reduced transaction costs, and increased financial inclusion.

This research paper delves into the impact of digitalization on economic growth, specifically analyzing the role of cashless transactions as a catalyst for economic development. By leveraging business intelligence tools, the study examines data-driven insights into how digital payment systems influence consumer behaviour, business performance, and macroeconomic indicators. The analysis underscores the potential of cashless economies to foster transparency, reduce corruption, and drive sustainable economic growth while addressing challenges such as cybersecurity and digital divides. This study aims to provide a comprehensive understanding of the interplay between digitalization and economic progress, offering valuable perspectives for policymakers, businesses, and researchers.

LITERATURE REVIEW

The impact of digitalization on economic growth, specifically focusing on cashless transactions, has been a topic of interest in recent studies. Moody's Analytics conducted a study that estimated higher card usage contributed an additional \$296 billion to consumption between 2011 and 2023. This suggests that digital payments play a significant role in stimulating economic growth. Furthermore, Visa's Chief Economist, Wayne Best and Moody's Analytics Chief Economist, Mark Zandi discussed the impact of digital payments on economic growth by highlighting how digital payments help stimulate GDP growth (MeitY, 2019). In the realm of the digital economy, companies that utilize data analytics, AI, blockchain, IoT technologies and cloud computing are considered part of the digital economy (Singh & Rana, 2017). These technologies play a crucial role in improving operational processes and inventory management, as seen in the retail sector where AI has become a powerful tool (Upendera Lele, 2019).

The use of digitization has become a disruptive force for economies around the world. Whether as a business or consumer, it is evident that digital devices are changing the way we live, work and do business. In fact, probably one of the most important by-products of this cashless transactions which facilitate transparency, enhance cost efficiency and promote economic efficacy. But even so, the potential it has, there still exist some

holes in the comprehension of how appropriate the understanding on the impact of digitalization on economic development and mostly in aspects such as spatial factors, sectoral effects, and the temporal factors.

Additionally, the use of business intelligence tools in fintech, smart payments, and cyber security has been identified as essential for inclusive growth and managing cyber risks (Lele et al., 2019). The transformation of public finance through GovTech has also been explored, highlighting the significant social and economic consequences of the digital divide (Oyelami, 2020). This emphasizes the importance of ensuring responsible development of payment innovations and digital assets to enhance economic competitiveness (Khan et al, 2021). In China, the rapid expansion of mobile payment business has shown positive effects on economic growth, with an increase in active users and the number of transactions (NDTV, 2021). When it comes to cashless transactions trust is a critical aspect, but without trust, e-commerce or online businesses cannot flourish. Indeed, this is part of the existing concern of consumers regarding fraud and security as real impediments to far reaching acceptability of such forms of transactions. These studies also mention that behaviour changes with time but we do not have sufficient evidence to follow such changes nor the differences between experiences of rural and urban users. Shree et al. (2021), Pandey (2022), Gupta et al. (2020) and Aggarwal et al. (2021) point out some other issues including the older age which are frameworks and policies all need to develop and deploy.

On the front-foot contrary India’s efforts to promote digital payments—through initiatives like Digital India and UPI—have already made a markable impact. UPI has transformed how people make payments making transactions simpler and more efficient (Mahesh and Bhat, 2021). However, challenges like digital literacy, particularly in rural areas, and uneven internet access remain hurdles (Kumari et al., 2024). Digitalization, especially cashless transactions have the power to spur tremendous economic growth. It increases efficiency, reduces transaction costs, and enhances traceability. However, it depends on much more than technology and it requires building trust, improving infrastructure, and ensuring that no one is left behind. This research revolves around these aspects diving deeper through them with the help of Business Intelligence Tool. The articles under analysis provide broad insights into the field of digitalization and the areas where more work is required. For example, standard methods for assessing the effect of digitalization should be adopted and best practices should be evaluated across countries (Novikova et al., 2022). However, there is more to digital success than ‘digitalization’: the ‘social aspect’ matters (Aleksandrova et al. ,2021). Such conditions as the level of society development and policies are paramount to realizing the potential of digitalization to the maximum extent. Nonetheless, not yet seen any studies focused on sectors such as agriculture, small businesses or services that would enable us to comprehend how these sectors cope with shifts towards digitalization. Our study highlights the areas with regional differences, security-related issues and the impact on industries identified. Using Business Intelligence tools allows us to take a data-driven approach to solve the challenges mentioned and present a clearer roadmap for digital transformation.

RESEARCH OBJECTIVES

- 1) To analyze the role of cashless transactions in driving economic growth and improving efficiency in financial system through digitalization.
- 2) To assess the impact of digital payment systems on consumer behaviour, business performance and macroeconomic indicators using Business Intelligence tool.
- 3) To identify the role of digital payments in the digital economic growth of our country.

RESEARCH QUESTIONS

- 1) What is the role of cashless transactions in driving economic growth and improving efficiency in financial system through digitalization?
- 2) What is the impact of digital payment systems on consumer behaviour, business performance and macroeconomic indicators using Business Intelligence tool?
- 3) What is the role of digital payments in the digital economic growth of our country?

Table 1.1

Sr. No.	Title of the Paper	Author(s)	Year of Publication	Research Summary	Research Gaps
1.	The Impact of Digitalization on Ensuring Economic	Olga Novikova, Olena Khandii, Larisa Shamileva,	2022	Examines the role of digitalization in sustainable economic growth,	Limited studies on standardized quantitative measures, sector-specific and

	Growth	Oleksandr Olshanskyi		focusing on international methodologies and strategies for Ukraine.	comparative analyses, lack of longitudinal studies, and insufficient research on national policies leveraging digitalization.
2.	Digitalization and its Impact on Economic Growth	Ariadna Aleksandrova, Yuri Truntsevsky, Marina Polutova	N/A	Explores transformative effects of digitalization on economic growth in Russia, using GDP per capita and Digital Adoption Index to measure impact.	Lack of regional studies, insufficient sector-specific analysis, limited exploration of societal impacts, and a need for research on effective policy frameworks.
3.	Digital Payments and Consumer Experience in India	Sudiksha Shree, Bhanu Pratap, Rajas Saroy, Sarat Dhal	2021	Investigates consumer behaviour toward digital payments in India, emphasizing trust, fraud experiences, and demographic differences.	Need for longitudinal studies, rural vs. urban experience analysis, in-depth fraud impact analysis, and regulatory influence on consumer trust.
4.	A Study on Digital Payments System & Consumer Perception	Shinki Katyayani Pandey	2022	Analyzes the evolution of digital payments and the impact of COVID-19 on consumer behaviour in India, noting rapid growth and behavioural shifts.	Limited understanding of security concerns, demographic-specific insights, insufficient study of adoption barriers, and the long-term impact of the pandemic on payment preferences.
5.	Consumer Perception Towards Digital Payment Mode in India	Dr. Ranjith P.V., Dr. Swati Kulkarni, Dr. Aparna J Varma	2021	Analyzes consumer perceptions of digital payments, identifying benefits and challenges related to transaction safety and adoption.	Limited quantitative studies, lack of regional and demographic focus, insufficient security analysis, and a need for longitudinal studies on evolving consumer behaviour.
6.	Acceptance Towards Digital Payments	Rahul Gupta, Cheshtha Kapoor, Jayesh Yadav	2020	Explores consumer attitudes and challenges in adopting digital payments in India, highlighting issues like awareness and age-related barriers.	Limited study of age-related challenges, consumer behaviour analysis, technological integration like blockchain, and long-term policy effectiveness.
7.	Impact of COVID-19 on Digital	V. Achutamba, Dr. CH. Hymavathi	2022	Examines the shift toward digital payments during	Lack of demographic studies, rural vs. urban divide, psychological

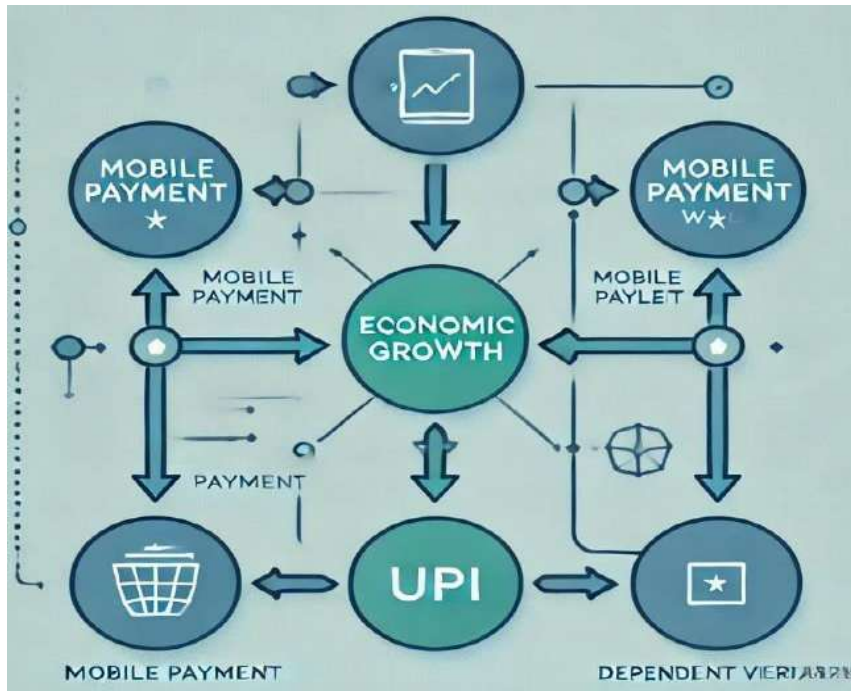
	Payments in India			the pandemic, focusing on psychological and infrastructural factors influencing adoption.	factors in adoption, and sustainability of changes post-pandemic.
8.	Digital Payment Service in India	Mahesh A., Ganesh Bhat	2021	Case study on UPI growth in India, examining its impact on cashless transactions and the role of government initiatives like Digital India.	Regional variability, consumer awareness, cybersecurity concerns, need for sector-specific studies, and longitudinal analysis of behavioural changes.
9.	Moving from Cash to Cashless Economy: Toward Digital India	Kartik Aggarwal, Sushant Malik, Dharmesh K. Mishra, Dipen Paul	2021	Evaluates the adoption of digital payments in India post-demonetization, noting shifts in behaviour and factors influencing cashless transactions.	Limited regional insights, insufficient awareness campaigns, and lack of focus on sector-specific analysis, cybersecurity, and longitudinal studies.
10.	Cashless Economy: The Impact of Digital Innovation in India	Sangeeta Kumari, K. M. Singh, Nasim Ahmad	2024	Highlights the shift to a cashless economy in India post-demonetization, emphasizing digital literacy, economic empowerment, and transaction efficiency.	In-depth studies on cybersecurity, digital literacy strategies, rural internet connectivity, employment impacts, and user experience analysis.

Source: Prepared by authors

RESEARCH METHODOLOGY

The research methodology adopted in this study employs a mixed research approach, integrating both qualitative and quantitative methods to provide a comprehensive analysis of digital payment systems, including wallets, UPI, and mobile payments. In the qualitative phase, the study involved literature review with various researchers and industry professionals to gather insights on user experiences and perceptions related to digital payments. This qualitative data was then subjected to thematic analysis, allowing for the identification of key themes and factors influencing user behaviour. On the quantitative aspect, data collection was performed by data available on website of RBI and keggel for data set from a convenience sampling method, targeting potential users of digital payment systems. The sample included responses collected from 2019 to 2024, ensuring that the analysis reflects recent trends in digital payment adoption. The collected data were analyzed using Power BI, a powerful business analytics tool that facilitated the interpretation of complex datasets through visualizations and dashboards. This integration of qualitative insights with quantitative data not only enhances the credibility of the findings but also allows for a more nuanced understanding of the factors driving the adoption of digital payments in contemporary society.

RESEARCH MODEL



ANALYSIS AND INTERPRETATION

The charts show a continuous rise in the use of UPI and mobile payments, both in terms of value and volume, from 2019 to 2024. While the Wallet Payment usage remains relatively flat, marking a shift in the consumer/user preference towards UPI and mobile payment systems due to significant advantages like convenience, ease, and widespread of its adoption. Mobile payment value has significantly outstod wallets and even UPI in growth, indicating that it is a dominantly used method for transactions in the cashless ecosystem. For both UPI and mobile payments, the share of transactions made grow rapidly in recent years (2022–2024), signifying the increasing trust and reliance on digital payments. The decline in wallet-based transactions (as shown in low volume growth) reflects consumers transitioning toward more integrated payment solutions like UPI. Mobile payment systems show the highest values and volumes, showcasing their role in driving cashless adoption. UPI demonstrates remarkable adoption, with a steady increase in transaction values and volumes across all years. While still relevant, the wallet values and volumes remain minimal compared to other payment modes, indicating a plateau in their contribution to the cashless economy.

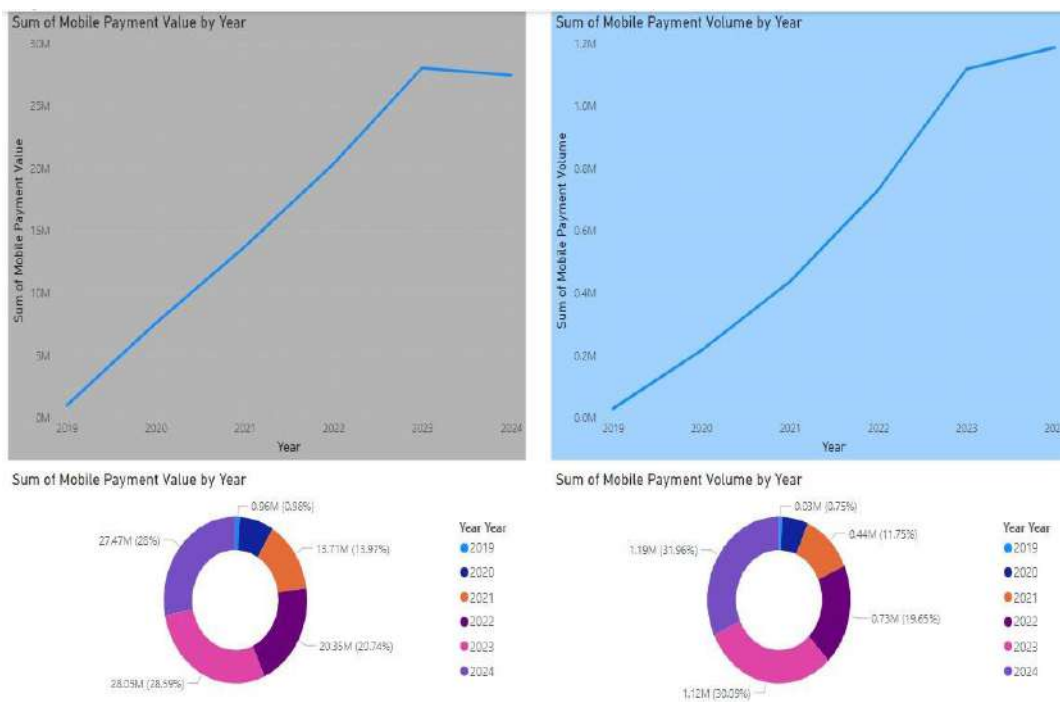


Figure: 1

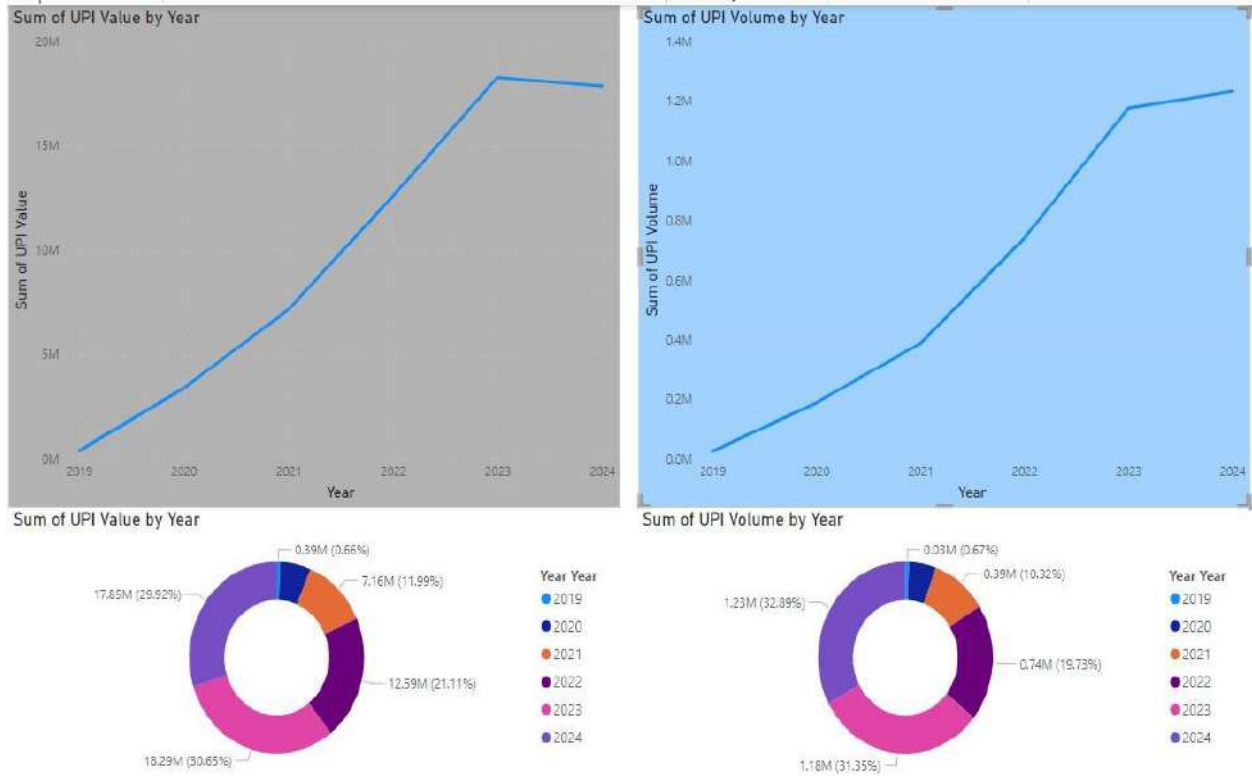


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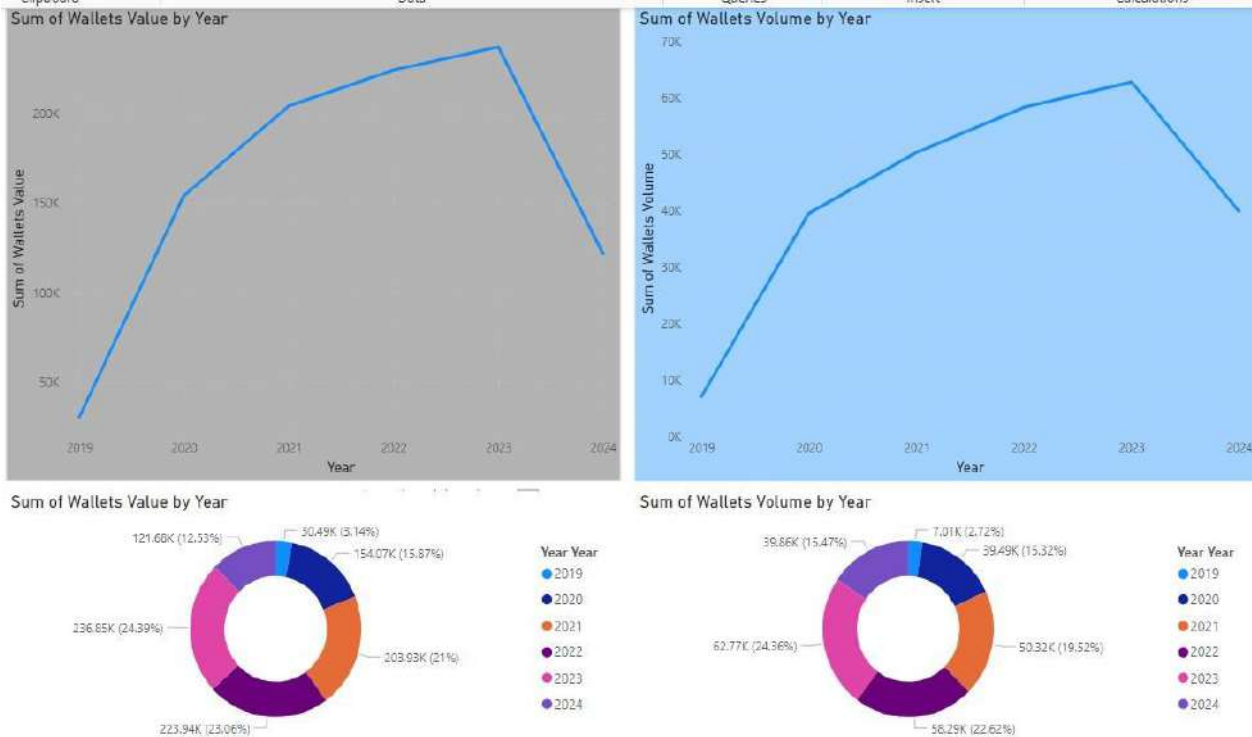


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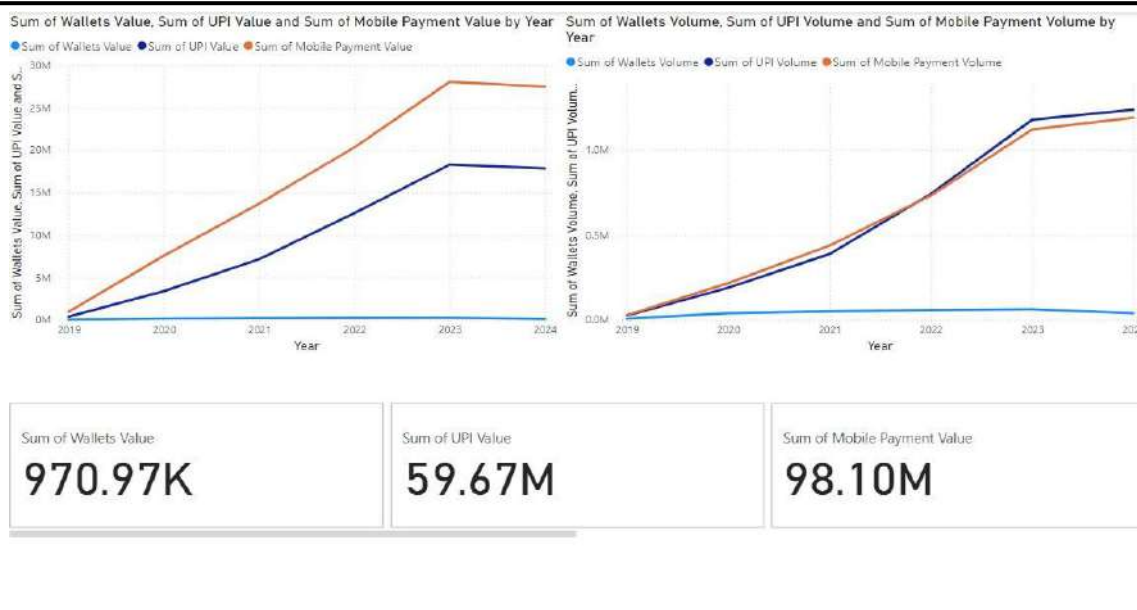


Figure: 4

UPI and mobile payments make cashless transactions accessible to a wider audience, including rural and underserved areas. This rise in digital transactions reduces dependency on cash, streamlines processes, and lowers transaction costs. The consistent growth suggests increasing consumer and merchant trust in digital payment platforms. Wallets losing prominence highlights the evolution of technology and preference for more seamless payment integrations like UPI.

CONCLUSION AND IMPLICATION

Based on the research paper's findings, it is surrounded by the impact of digitalization, particularly through cashless transactions which reveals a significant correlation between the adoption of digital payment systems and economic growth. The graphs presented in the study illustrate trends in consumer behaviour, business performance, and macroeconomic indicators for showcasing a clear upward trajectory in economic activity as cashless transactions become more prevalent. For instance, the data indicates that regions with higher adoption rates of digital payments experience increased consumer spending and improved business efficiency which in turn contributes to GDP growth. Moreover, the analysis highlights the role of business intelligence tools in visualizing these trends to allow a more nuanced understanding of the factors influencing digital payment adoption. The graphs also underscore the disparities between urban and rural areas, revealing that while urban centres benefit significantly from digitalization, rural regions face challenges such as limited internet access and lower digital literacy. This disparity calls for targeted policies to bridge the digital divide and ensure inclusive growth. In conclusion, the research underscores the transformative potential of cashless transactions in driving economic growth. The findings suggest that while digital payments can enhance efficiency and transparency for achieving their full potential requires addressing infrastructural and educational barriers, particularly in underserved areas. Policymakers must prioritize initiatives that promote digital literacy and improve access to technology to foster a more equitable digital economy. Overall, the study provides a comprehensive roadmap for leveraging digitalization as a catalyst for sustainable economic development and emphasizing the need for collaborative efforts among stakeholders to realize these benefits fully.

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A STUDY ON CUSTOMER EXPECTATION, PERCEPTION AND SATISFACTION TOWARDS HOUSEHOLD AND PERSONAL CARE PRODUCTS OF PATANJALI IN VALSAD CITY

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The purpose of this study is to know which are the factors that affect customer expectation, to study customer perception and learn about customer satisfaction towards personal care products and household products of Patanjali Ayurved Ltd in Valsad City. Literature review will be in three parts, customer expectation, customer perception and customer satisfaction. The sample size taken for the study is 100, which are randomly selected for the study. Convenient sampling method has been used to draw samples for the study. For the data analysis SPSS-21 software has been used. Various tools and techniques will be used for the study. The outcome will be useful to the company, researchers who want to explore further in this topic, and also for all the interested stakeholders.

Keywords: Patanjali Ayurved Ltd., Customer, Expectation, Perception, Satisfaction.

1. INTRODUCTION**1.1 Introduction on Fmcg Industry**

FMCG industry stands for Fast moving consumer goods. These types of products are frequently purchased, almost daily consumed and are priced relatively low. The Indian FMCG market stands as a major player on the global stage, with an estimated value of USD 110 billion in 2023. It will be substantially growing in the coming years and it will be due to factors like rising disposable incomes due to increase in income, urbanization, and changing consumer preferences, improved standard of living, easy availability, etc. are the few major factors that will lead to increase its growth tremendously. The global FMCG logistics market size was valued at USD 111.43 billion in 2023. Types of FMCG includes, Firstly, Household products such as food and beverages, detergent, soap, and all the products that are used in household and Secondly Personal Care products such as, Skin care, dental care, hair care, etc. and last but not least Health Care.

1.2 Introduction to Patanjali Ayurved Ltd

In 1988, Acharya Balakrishna and Baba Ramdev met in a gurukul in Haryana. After their formal education, Acharya Balakrishna moved around India studying about the plants and its medicinal values. In 1993 they reunited in Gangotri, in the Himalayas. In 1995, the both established Divya Yoga Mandir Trust – for Yoga teaching and practices, as well as Divya Pharmacy – for providing medicines. Both centers operated free of cost to all. After the success of the both institutions due to the followers of Baba Ramdev, Acharya Balakrishna convinced Baba Ramdev to be the co- founder of Patanjali Ayurved Limited (PAL) with 0% equity shares. Thus, Baba Ramdev established the PAL in 2006 along with Acharya Balakrishna with a thought of rural and urban development.

The product mix of PAL is divided mainly into; (1) Natural Health Care, (2) Natural Food Products, (3) Ayurvedic Medicine, (4) Herbal Home Care, (5) Natural Personal Care. The Natural Health Care deals with common selling Ayurvedic products such as digestives, health drinks, ghee, honey, fruit beverages and diet foods. The Natural Food Products caters mainly; biscuits & cookies, spices, jams, cereals, corn flakes, pulses, rice, noodles, oats, etc. The Ayurvedic Medicine product line covers a broad range of Ayurvedic medicines for various diseases. In the Herbal Home care category, it takes care of the agarbatti, dish wash bar & hawan samagri. And finally, Natural Personal Care provides a wide range of products in skin care, dental care, hair care, body care, toiletries, eye care & shishu care (baby products). For the purpose of this research, there are major divisions of PAL, namely Natural Food Products (Household) & Natural Personal Care (Personal care). These products are mainly considered as FMCG.

2. LITERATURE REVIEW**2.1 INTRODUCTION**

In this chapter literature review, it is divided in three parts. Mainly:

1) Customer Expectation, 2) Customer Perception and 3) Customer Satisfaction

2.2 CUSTOMER EXPECTATION

Sr.No.	Title	Author	Year	Sample Frame	Sample Size	Outcome
1	Customers' Expectation, Satisfaction, And Repurchase Intention Of Used Products Online: Empirical Evidence From China.	Muhammad Ashfaq; Et Al	2019	China	400	Outcomes Show That Secondhand Marketers Should Ensure The Customers That Purchasing Used Products Is A Simple, Secure, And User-Friendly Process.
2	An Investigation Of Product & Price Factors Influences On Consumer Behaviour For Selected Fmcg.	Jyoti Thakur; Et Al	2018	Bhoranj Block Of Hamirpur District	400	It Shows That There Is Significant Difference Between Price Factors That Influences Male And Female Respondents For Purchase Of Fmcg Product In Bhoranj Block Of Hamirpur District.

2.3 CUSTOMER PERCEPTION

Sr. No.	Title	Author	Year	Sample Frame	Sample Size	Outcome
25	Study of consumer perception towards online shopping of FMCG.	Joshi, P.	2021	Online	25	The paper underscores the necessity for businesses to actively address consumer concerns and provide a seamless online shopping experience to encourage greater adoption.
23	Understanding of consumers' perception toward select FMCG products.	Sirigupp i,D.	2022	Hyderabad	1150	The paper explores how consumers assess factors such as product quality, packaging, pricing, brand reputation, and product features.

2.4 CUSTOMER SATISFACTION

Sr. No.	Title	Author	Year	Sample Frame	Sample Size	Outcome
70	A Study On Customer's Satisfaction Towards Brands Of Select Fast Moving Consumer Goods	Dr Subhadeep Chakraborty; Et Al.	2020	Tinsukia Town, Assam	375	Demographic Variables Though Very Prominent In The Customer Decision-Making Process But Except Gender; Other Demographic Variables Have No Effect On Customer Satisfaction. It Is Also Disclosed From The Study That Variables Like Service Quality, Product Quality And Perceived Value Have

						High Significations To Customer Satisfaction Whereas Financial Benefit Is Found To Be Insignificant Variable To Customer Satisfaction.
71	Exploring Loyalty To Specialty Foods Among Tourists And Residents	Dwi Suhartanto; Et Al.	2018	Bandung, Indonesia	455	This Study Suggests That It Is Important For Specialty Food Retailers And Producers To Focus On Improving The Quality Of The Specialty Food As This Is The Key To Success.

3 RESEARCH METHODOLOGY

3.1 Rationale of the Proposed Research Study:

The study would give insight to all the consumers, researchers, companies, and all who require information regarding Patanjali household and personal care products. The study will give insight regarding what customers expect from Patanjali selected products, it will also help in knowing what image does customers hold in their minds and it will also analyze their satisfaction level. It will be useful for Patanjali Ayurved Ltd. to know the fall points and also it will be helpful in knowing area of improvement. Positive side of the company will also be known. Also this study will provide valuable insight to other Fmcg companies that have the same offerings.

3.2 Scope and Coverage Of The Proposed Research:

This study and evaluation will be based on available information. For this study, evaluation is based on the responses of respondents that are selected randomly from Valsad city.

3.3 Objective of the Study:

- To know the relationship between customer expectation and consumer perception towards Patanjali products.
- To understand the relation with customer satisfaction and customer expectation.
- To assess the relation with customer perception and customer satisfaction.

3.4 Hypothesis

“A research hypothesis outlines the expected outcomes of the study. It predicts whether differences or relationships exist between variables.”

Hypothesis:

H01 There is no relationship between customer expectation and customer perception.

H02 There is no relationship between the aspects of satisfaction and customer expectations.

H03 There is no relationship between the aspects of satisfaction and customer perception.

3.5 Research Design: Descriptive and Analytical in nature

3.6 Research Instrument:

The researcher would make use of Structured Non- Disguised Questionnaire for the collection of the primary data from the selected respondents. And PSPP software is used to calculate the data.

Sampling Size: 100 units **Sampling Method:** Convenience cum simple random sampling methods to draw samples from selected respondents in the Valsad area.

Sampling Media: For the collection of the primary data from the available respondents. Structured non-disguised close ended questionnaire was used.

4 DATA ANALYSIS, INTERPRETATION & FINDINGS

Data analysis: As mentioned above, the study is based on a sample of 100 respondents residing in the Valsad city.

The Demographic Data Has Been Shown in the Dashboard Below:

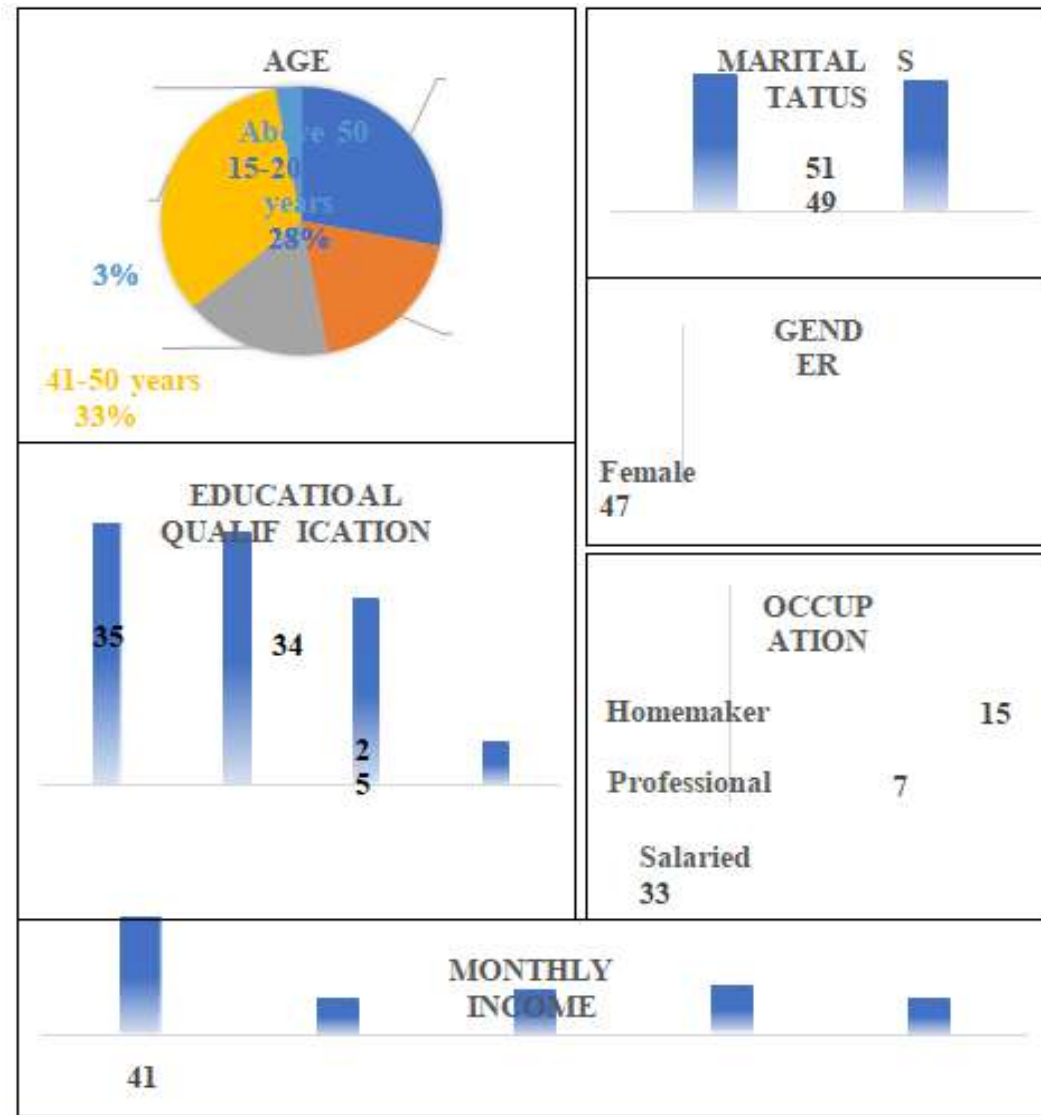


Figure 1: The Demographic dashboard of the study

Explanation: From the above figure, it is observed that the majority of the respondents fall in the 41-50 and 15-20 age group. Among the respondents 53% are male and 47% are female.

55.7% of the respondents fall under the married category and the rest are unmarried. 41.3% are school level, 30.4% are degree/diploma holders, 23% are postgraduates and 5.2% are professionals. Majority of the respondents are salaried followed by students and 43.9% of the respondents fall in the Below 10000 monthly income group followed by Rs. 20001 - 30000 and Rs. 30001-40000.

General Questions

Are you aware about the Patanjali products?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	100	100.0	100.0	100.0

Explanation: From the above table, it is observed that 100% of the respondents are aware about the Patanjali brand.

Have you ever purchased a Patanjali product?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	100	100.0	100.0	100.0

Explanation: From the above table, it is observed that 100% of the respondents have purchased Patanjali products.

Hypothesis Testing:

H01 There is no relationship between customer expectation and customer perception.

Pearson Correlation – Customer Expectation Vs Customer Perception

		Customer Perception
Customer Expectation	Pearson Correlation	-.307**
	Sig. (2-tailed)	.002
	N	100

** . Correlation is significant at the 0.01 level (2-tailed).

Interpretation: From the above table it shows that, in this case there is a negative correlation between Customer Expectation and Customer Perception. This correlation is statistically significant as p-value < 0.05 for a sample size of 100. Therefore, the null hypothesis, which states that there is no correlation between the two variables, is rejected.

H02 There is no relationship between the aspects of satisfaction and customer expectations.

Pearson Correlations - Customer Expectation Vs. Aspects of Customer Satisfaction						
		Economical	Superior Quality	Natural Ingredients	Product Usefulness	Customer Service
Customer Expectations	Pearson Correlation	-.241*	-.389**	-.361**	-.312**	-.216*
	Sig. (2-tailed)	.016	.000	.000	.002	.031
	N	100	100	100	100	100
* . Correlation is significant at the 0.05 level (2-tailed).						
** . Correlation is significant at the 0.01 level (2-tailed).						

Interpretation: From the above table it shows that, in this case there is a negative correlation between Customer Expectation and aspects of Customer Satisfaction. This correlation is statistically significant as p-value < 0.05 for a sample size of 100 for all the aspects. Therefore, the null hypothesis, which states that there is no correlation between the two variables, is rejected.

H03 There is no relationship between the aspects of satisfaction and customer perception.

Pearson Correlations - Customer Perception Vs. Aspects of Customer Satisfaction						
		Economical	Superior Quality	Natural Ingredients	Product Usefulness	Customer Service
Customer Perception	Pearson Correlation	.155	.286**	.313**	.273**	.305**
	Sig. (2-tailed)	.123	.004	.002	.006	.002
	N	100	100	100	100	100
** . Correlation is significant at the 0.01 level (2-tailed).						

Interpretation: From the above table it shows that, in this case there is a negative correlation between Customer Perception and aspects of Customer Satisfaction. This correlation is statistically significant for Superior Quality, Natural Ingredients, Product Usefulness and Customer Service as p-value < 0.05 for a sample size of 100, but it is not statistically significant for Economical aspect as p-value > 0.05. Therefore, the null hypothesis, which states that there is no correlation between the two variables, is rejected for the aspects Superior Quality, Natural Ingredients, Product Usefulness and Customer Service. For the Economical aspect the null hypothesis, which states that there is no correlation between the two variables, has failed to be rejected.

5. LIMITATIONS OF STUDY

- The study is limited to selected residents of Valsad city.
- It may be possible that there may be biasness in the responses given by respondents, which ultimately constrains the result of study.
- Topics like this need a lot of in-depth insight, and researchers have used only 100 respondents. So it may not be enough for studying.

6. FINDINGS & RECOMMENDATIONS

- Among the respondents 53%are male and 47%are female.
- It is observed that the majority of the respondents fall in the 41-50age group followed by 15-20 age group.
- 55.7% of the respondents fall under the married category and rest are unmarried. 41.3% are school level s,30.4% are degree/diploma holders, 23% are postgraduates and 5.2% are professionals.
- Majority of the respondents are salaried followed by students and 43.9% of the respondents fall in Below 10000 monthly income group followed by Rs. 20001 - 30000 and Rs.30001- 40000.
- All the respondents were aware of Patanjali Brand.
- 100% of the respondents have purchased Patanjali products.

Hypothesis testing result:

- It shows that there is relationship between customer expectation and customer perception.
- It is observed that there is relationship between customer expectation and customer satisfaction.
- It is observed that except Economical aspects all other aspects of customer satisfaction has relationship with customer perception.

7. RECOMMENDATIONS

- More awareness programs should be held so that maximum reach is possible.
- As it shows there is relationship between customer expectation and customer perception but it is negative so proper steps should be taken so that there is improvement in the relationship.
- Customer perception and customer satisfaction relationship should also be improved by taking care of promises which brand has promised.
- Company should take positive steps towards customer satisfaction levels.
- From the observation it was studied that economical aspect of satisfaction has no relationship with customer perception so proper steps should be taken and also improvement for all aspects should be done.

8. CONCLUSION

From the above study it is very clear that Patanjali brand has made awareness amongst Valsad area. From the study it can be concluded that customer expectations, customer perception and customer satisfaction have relationship with each other, But the resulting values were not obtained in positive even though it was statistically significant more efforts can be taken so that more satisfaction can be given to customers if proper care is given in all aspects.

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BEING EMOTIONALLY INTELLIGENT AT WORKPLACE: A STUDY ON EI AT WORK

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ABSTRACT

The dynamics of emotional intelligence (EI) in the contemporary workplace setting are examined in this paper. Understanding the consequences of emotional intelligence (EI) at work has become crucial for individuals and companies at a time when interpersonal skills and emotional intelligence are valued more and more. This research explores the various dimensions of emotional intelligence (EI), examining its relevance, drivers, and influence on workplace dynamics and results. It does this by synthesizing current literature and empirical evidence. The study clarifies the many elements of emotional intelligence (EI), such as self-awareness, self-regulation, social awareness, and relationship management. It looks at how these elements show up in work environments and affect productivity, work happiness, leadership effectiveness, and the business culture. The research is descriptive, and pertinent material has been gathered from primary and secondary data sources. The business employed the random sample approach to get information from respondents. A structured questionnaire was used to collect the primary and secondary data from various publications, including research reports and articles. The research findings have practical consequences for organizational management, human resource development, and theoretical development. This study provides essential ideas for developing an emotional intelligence culture, improving interpersonal connections, and advancing overall organizational success by illuminating the importance of emotional intelligence in modern work situations.

Keywords: Emotions, Emotional intelligence, Job Satisfaction.

INTRODUCTION

“The greatest ability in business is to get along with others and influence their actions.”

-John Hancock

Emotional Intelligence (EI) integrates cognitive and affective states of mind, blending intelligence with emotion. It encompasses the capacity to perceive, regulate, and appraise emotions. While some argue EI can be cultivated through learning, others contend it's an innate trait. Various assessment tools exist, each with its unique focus and methodology. High EI enables individuals to express emotions healthily and comprehend others' feelings, thereby improving workplace relationships and performance. It's not about being weak but rather about leveraging emotions to make informed decisions and exert constructive influence on oneself and others.

We may utilize our emotions to solve difficulties and think more creatively when we possess emotional intelligence. It's likely that there are some similarities between general and emotional intelligence. The four skills of emotional intelligence are emotion identification, emotion control, emotion management, and empathy for others.

It is relatively recent that the phrase "emotional intelligence" has been used. Psychologists Howard Gardner, Peter Salovey, and John Mayer's research and publications helped shape it in the 1970s and 80s. Wayne Leon Payne's PhD dissertation, "A Study of Emotion: Developing Emotional Intelligence," introduced emotional intelligence for the first time in 1985. His emotional intelligence thesis contained a framework for emotional intelligence development. According to Payne, many issues facing contemporary society result from emotional repression, and developing emotional intelligence is a skill that can be acquired.

HR specialists worldwide widely acknowledge that properly structured HR policies may significantly enhance a firm's performance. Businesses should improve workforce competencies to leverage human resources as a source of competitive advantage. Roles and positions people occupy, as well as the modifications they make to them, are the foundation of competencies. While most consider humans rational, they can demonstrate complex behaviour depending on factors, including interests, values, knowledge, skills, and other psychological categories.

SCOPE OF THE STUDY

The study aims to improve HRs' emotional intelligence at work and provide support in the future by finding reasons behind the exceptional performance of some personnel and the lack thereof. The ability to identify and comprehend organizational problems is a prerequisite for emotional intelligence. Based on the findings, businesses may then decide on a plan of action to raise employee performance.

NEED FOR THE STUDY

Employees who possess emotional intelligence are better able to express themselves emotionally, be more creative, tolerate more, have more integrity and trust, and improve relationships both inside and outside the company. As a result, both individual and organizational performance are increased. Among the essential traits that produce strategic leaders in organizations, emotional intelligence is one of the few. In a company, emotional intelligence is crucial and is evaluated as a key factor in determining if an employee is productive. It also boosts trust both inside and outside the firm.

OBJECTIVES OF THE STUDY**The Study Aims to Achieve the Following Objectives:**

- To evaluate workers' perceptions and reactions to several Emotional Intelligence elements at work.
- To assess the level of awareness among employees regarding Emotional Intelligence.

REVIEW OF LITERATURE

Goleman (1998) "Working with Emotional Intelligence," About one-third of the difference is attributable to technical skill and cognitive ability, while the remaining two-thirds are attributable to emotional competence, according to a competency study conducted in more than 200 businesses and organizations globally. (Emotional competence accounts for more than four-fifths of the variance in top leadership positions).

Robbert (2002) examined the influence of Emotional Intelligence on "burnout" and conflict resolution styles. The outcomes indicated that managers with high E.Q. displayed better stress-coping abilities. Additionally, these managers tended to utilize conflict resolution styles associated with high Emotional Intelligence when addressing stress. Interestingly, the study noted no gender disparity concerning emotional intelligence.

Carmeli and Josman's (2006) Possible links between emotional intelligence and productive performance at work are suggested by this study, "The relationship among emotional intelligence, task performance, and organizational citizenship behaviours." Researchers point out that while there may be a link between emotional intelligence and productive job performance, this relationship is usually based on self-reported assessments, which ignores that work performance is multifaceted. According to research, there may be links between emotional intelligence and productive job performance. The authors pointed out that a leader's job function may not always be fully shown by their task performance. Work performance would also be impacted by other actions like upholding polite relationships and supporting subordinates in their problems.

Hopkins & Bilimoria (2008) investigated the connection between social and emotional intelligence abilities and organizational success in their research "Social and Emotional Competencies Predicting Success for Male and Female Executives." According to the study, there aren't many distinctions between male and female leaders about how they demonstrate their emotional and social intelligence abilities. It also revealed that most successful men and women demonstrated their competencies more similarly than differently. Nonetheless, there was a correlation between success and exhibiting these qualities that were fairly accounted for by gender. Despite the fact that both male and female leaders exhibited the same degree of competency, male leaders were still seen as being more successful. Self-confidence, achievement orientation, inspirational leadership, and change catalyst were the four traits that set the most successful male and female leaders apart from their more conventional colleagues.

Afolabi O. A., Awosola R. K., and Omole S. O (2010) investigated the impact of Emotional Intelligence and Gender on the job performance and job satisfaction of Nigerian Police Officers. Their study involved 119 police officers. The findings indicated that police officers with high emotional intelligence exhibited higher job satisfaction and performed better than those with low emotional intelligence.

Sánchez-Ruiz, Jose, Carlos, Prez-Gonzlez and Petride (2010) studied the 512 students' trait emotional intelligence (also known as trait emotional self-efficacy) profiles across five university faculties: scientific research, natural arts, humanities, social sciences, and sciences. ("Trait emotional intelligence profiles of students from different university faculties") Researchers used the Trait Emotional Intelligence Questionnaire to test their hypotheses. They predicted that the social sciences would do better than technical studies in the areas of emotionality, the arts would perform better than technical studies in the same area, the arts would perform worse than technical studies in the area of self-control, and there would be an interaction between faculty and gender in the social sciences, with female students performing better than male students. Several more exploratory comparisons were also made. The findings supported (a), (b), and (d) but not (c), even though the differences went in the expected direction.

Ali, Garner, and Magadley (2011) investigated the correlation between emotional intelligence and job performance. The sample for this research consisted of 310 police officers employed by the Abu Dhabi Police. The findings of the study indicated a noteworthy relationship between emotional intelligence and job performance among police officers. Furthermore, the study demonstrated that even after considering general mental abilities and personality traits, emotional intelligence still played a significant role in predicting job performance among police officers.

RESEARCH METHODOLOGY

“No one cares how much you know until they know how much you care.”

-Theodore Roosevelt

This study is descriptive, and data has been gathered from primary and secondary sources. The researcher employed the random sample approach to get information from respondents. A structured questionnaire was used to collect the data. The first section of the questionnaire requested respondents to provide information about their age, education, marital status, and other personal characteristics. The second section measured the employee's emotional intelligence level using a scale developed by Goleman. The secondary data were gathered from various publications, including research reports and articles.

RESULTS AND DISCUSSION

The results of the study are explained below:

EMOTIONAL INTELLIGENCE AND EMPLOYEE AWARENESS

Many people lack emotional intelligence, especially when it comes to powerful emotions like joy, fear, sorrow, and wrath. It's possible that bad events throughout your early years caused you to strive to control your emotions.

We are unable to get rid of our emotions, even though we can deny, ignore, or distort them. Whether or not we are aware of them, they nonetheless exist. Unfortunately, we cannot properly comprehend our wants and motives or successfully interact with others if we lack emotional awareness. Employees are urged to be mindful of their emotions in a variety of work-related scenarios.

Table 1: Perception of Emotions

Particulars	No. of Responses	Percentage
Yes	24	48
No	17	34
Sometimes	9	18
Total	50	100

Source: Compiled from Primary Data

48% of the employees can identify and understand the cause of their emotions, and 34% don't understand their emotions, whereas 18% can understand only sometimes.

Table 2: Emotional Control

Particulars	No. of Responses	Percentage
Yes	12	24
Not Always	27	54
No	11	22
Total	50	100

Source: Compiled from Primary Data

27% of the employees do not always control their emotions, 12% of the respondents can control their emotions, whereas 11% of them lack control.

Table 3: Managing Emotions

Particulars	No. of Responses	Percentage
On Its Own Naturally	9	18
Deliberate Effort	9	18
Engaging In Some Other Activity	28	36
Advice From Others	4	8
Total	50	100

Source: Compiled from Primary Data

28% of the employees control their emotions mainly by becoming busy with some other activity, and 18% of employees control their emotions naturally on their own and by making deliberate effort. 4% of the employees control their emotions by getting advice from others.

Table 4: Empathy (Emotion of Colleagues)

Particulars	No. of Responses	Percentage
Yes	33	66
No	17	34
Total	50	100

Source: Compiled from Primary Data

34% of employees do not understand the emotions of their coworkers, compared to 66% of employees who do.

SUGGESTIONS

According to the study, most respondents only have average emotional competencies. For this reason, it is recommended that the training and development team hold regular programs at work to raise emotional intelligence levels and foster better performance.

- The management needs to make sure that HR is used effectively.
- Management should provide enough leisure facilities for staff members to enhance relationships between superiors and subordinates and, more importantly, to reduce workplace stress.
- Every week, open sessions within each department might be established as a routine to learn about and comprehend the opinions of the staff to overcome obstacles at work and provide fresh, effective ideas.
- Although people are becoming more conscious of emotional intelligence, all employees still need to raise their awareness levels.
- Emotional Competence training programs should be conducted regularly to foster emotional intelligence in managers and staff.
- To maintain their own and the serving organization's physical and mental well-being, the organization's leaders need to learn to be emotionally stable.

CONCLUSION

“Emotions can get in the way or get you on the way.”

-Mavis Mazhura

For employees within the company, emotional intelligence is crucial. This paper has improved comprehension of the many causes of emotion and improved emotional regulation. Managing emotions is a critical skill for an HR professional, both for the employees and the professionals. This will enhance organizational commitment, boost output and efficiency, assist in retaining top talent, and inspire workers to perform to the best of their abilities. This study validates that work-life balance and emotional intelligence foster organizational performance and give businesses a competitive edge. Recognizing the potential and skill inside each individual, as well as the unique contributions they offer to the workplace, is essential to the success of the firm.

The workplace should be improved to enable staff members to work in better teams, solve problems together, take on more responsibility for their work, take on challenges, complete regular tasks, and feel more confident in themselves. Improved flexibility, empathy for coworkers, leadership abilities, group rapport, participatory management, decision-making, and understanding among coworkers are all benefits of emotional intelligence. Nowadays, the majority of companies hire emotionally intelligent workers since they can handle workplace issues more readily and increase productivity for the company. Organizational strategies, leadership abilities, development programs, self-awareness, and self-management tools may all help create an emotionally intelligent organization. The researcher concludes that emotional intelligence is related to job performance throughout the entire process, and Emotional intelligence can be the most potent weapon in our armoury. It helps boost our self-awareness, self-control, motivation, empathy, and social skills, all of which help us become much better personnel.

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IMPACT OF THE NEW EDUCATION POLICY 2020 ON HIGHER EDUCATION IN INDIA

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ABSTRACT

Purpose: *This paper will examine the New Education Policy (NEP) 2020, introduced by the Government of India and evaluate its impact on higher education in India.*

This study will be undertaken to understand the policy objectives, evaluation of the challenges, reforms introduced and benefits.

NEP marks a paradigm shift in the country's educational frame, aiming to make education holistic, flexible, multidisciplinary, aligned to the requirements of the 21st century, and aimed at bringing out the unique capabilities of each pupil. The paper also explores its alignment with international education norms and its part in fostering global competitiveness.

Keywords: *New Education Policy (NEP) 2020, Education System, Development.*

INTRODUCTION

"National Education Policy 2020 envisions an India-centric education system that contributes directly to transforming our nation sustainably into an equitable and vibrant knowledge society by providing high-quality education to all."

India's advanced education system, one of the largest in the world, has been agonized with issues similar as rigid academic structures, limited multidisciplinary options, low Gross Enrolment rate (GER), and a dissociate between education and employability. The NEP 2020 seeks to address these challenges through a comprehensive frame designed to change the educational geography.

The National Education Policy 2020 (NEP 2020), was approved on July 29 2020 by the Union Cabinet. It replaces the National Policy on Education of 1986 and serves as a comprehensive framework covering elementary to higher education, including vocational training, across both rural and urban areas.

While the language policy outlined in NEP 2020 provides broad guidelines and is advisory in nature, its implementation is left to the discretion of states, institutions, and schools. Implementation of the NEP 2020 would increase the public expenditure on education from ~4% to ~6% of the GDP and it also introduces significant changes to the education sector.

OBJECTIVES OF THE STUDY

1. To study the salient features of the New Education Policy 2020.
2. To analyse the objectives, issues & challenges and impact of New Education Policy on higher education in India.

RESEARCH METHODOLOGY

This is a descriptive study and the data has been collected through secondary sources from various Research papers, Thesis, Circulars, journals and blogs.

LIMITATIONS OF THE STUDY

Due to time constraint data is collected only through secondary sources.

REVIEW OF LITERATURE

1. **Karan D. (2024)** in his research paper provided valuable insights into the impact of the NEP 2020 on stakeholders. The study further stated that the changes in the current system may have both positive and negative consequences, it is essential to focus on maximizing the positive impacts, adopting the policy effectively, and working diligently toward the nation's welfare.
2. **Verma A. (2024)** in his research paper mentioned that the NEP 2020 is a progressive strategy addressing current socioeconomic challenges and future uncertainties by focusing on skill development to adapt to increasing digitalization and automation. He also concluded that its success depends on integration with initiatives like Digital India and Skill India, effective vocational education policies, and evidence-based decision-making.

3. **Rani R. (2022)** in her research paper concluded that the NEP 2020 drafting committee has taken a comprehensive approach, incorporating diverse perspectives, global educational best practices, field experiences and stakeholder feedback. She emphasizes that while the mission is ambitious, the success of NEP 2020 hinges on its implementation roadmap and its ability to deliver inclusive education that equips learners for future industry demands.
4. **Sarta A. (2022)** in his research paper recognized the irrelevance of outdated practices, and emphasized on integrating ICT into teaching and learning, a necessity highlighted during the COVID-19 pandemic. He opined that while NEP 2020 lays out a comprehensive roadmap for making India a global education hub by 2030, its success hinges on effective implementation and coordination among stakeholders. If implemented properly, it has the potential to reshape the educational landscape and ensure that India's youth are equipped to drive future growth and innovation.
5. **Aithal P. S., Aithal S. (2020)** in their research paper explore the key features of the 1986 National Education Policy and its linkage to the current New Education Policy (NEP) 2020. They examined the innovative practices introduced in the NEP, their potential benefits, and practical approaches to their implementation. The study also analyzes the policy's impact on teacher education, professional education, and private institutions. They also provided theoretical recommendations to support the effective implementation of the new education policy.

DATA ANALYSIS AND INTERPRETATION

1. **Flexible Undergraduate Programs:** NEP 2020 introduces multidisciplinary four-year undergraduate programs with multiple entry and exit options. Students can earn a certificate after one year, a diploma after two years, a bachelor's degree after three years, and a research-oriented bachelor's degree after four years. This structure allows students to re-enter the system and upgrade their skills at any stage.
2. **Institutional Restructuring:** Higher education will be reorganized into three types:
 - i. **Research Universities:** Focused on advanced research and knowledge creation.
 - ii. **Teaching Universities:** Concentrated on delivering high-quality teaching and learning outcomes.
 - iii. **Autonomous Degree-Granting Colleges:** Institutions with the freedom to design their own curriculum and focus on undergraduate education. This restructuring aims to eliminate hierarchical distinctions and ensure that institutions focus on their core strengths.
3. **Streamlined Regulation:** The NEP 2020 replaces multiple regulatory bodies with a single apex body—the Higher Education Commission of India (HECI). HECI will have four verticals:
 - i. **National Higher Education Regulatory Council (NHERC):** For regulation of higher education.
 - i. **National Accreditation Council (NAC):** For accreditation.
 - ii. **Higher Education Grants Council (HEGC):** For funding and financing.
 - iv. **General Education Council (GEC):** For setting academic standards. This comprehensive regulatory structure seeks to reduce bureaucratic hurdles and ensure transparency, efficiency, and accountability.
4. **Integration of Technology:** NEP emphasizes digital tools like virtual labs, AI-based learning systems, and e-platforms. The National Educational Technology Forum (NETF) will guide technology deployment, aligning it with educational needs.
5. **Focus on Vocational Education:** The policy aims for at least 50% of learners to receive vocational training by 2025. Higher education institutions will offer vocational courses, skill labs, and internships in collaboration with industries, ensuring practical skills development.
6. **Merger of Affiliated Colleges:** The policy aims to phase out the uniting council system over time. Degree granting autonomy will be granted to colleges that meet specific marks, allowing them to chart their academic and functional line. This reform encourages responsibility and enhances academic norms.
7. **Research and Innovation Ecosystem:** The establishment of the National Research Foundation (NRF) is a foundation of NEP 2020. The NRF will drive research priorities and funding across disciplines. The policy promotes research-intensive universities and inter-institutional collaborations to tackle national and global challenges.

- 8. Internationalization:** The NEP promotes the internationalization of advanced education by easing the entry of top global universities into India and encouraging Indian institutions to establish premises abroad. Initiatives include joint research, faculty exchange, and student mobility, fostering global collaboration.

OBJECTIVES OF NEP 2020 FOR HIGHER EDUCATION

- 1. Multidisciplinary Education:** NEP 2020 breaks traditional academic silos by promoting multidisciplinary learning, offering flexible subject choices across arts, sciences, commerce, and vocational training. This fosters creativity, critical thinking, and innovation.
- 2. Increased Access and Equity:** The policy focuses on inclusive education, aiming to boost the Gross Enrolment Rate (GER) to 50% by 2035. It targets underrepresented groups, such as women, SC/ST, and economically disadvantaged communities, through financial aid, scholarships, and expanding quality higher education institutions in underserved regions.
- 3. Holistic Development:** Education is envisioned as a tool for holistic growth, emphasizing ethical values, emotional intelligence, physical well-being, and cognitive skills to nurture responsible and empathetic citizens.
- 4. Promotion of Research and Innovation:** NEP 2020 emphasizes research through the proposed National Research Foundation (NRF), encouraging academic-industry-government collaboration to address real-world challenges and drive innovation.
- 5. Institutional Autonomy:** The policy advocates for granting higher education institutions greater autonomy, including control over curriculum design, financial management, and academic operations, to promote accountability and excellence.
- 6. Digital and Technological Integration:** NEP 2020 highlights the integration of digital tools, virtual labs, and hybrid learning models to enhance education. It seeks to bridge the digital divide to ensure equitable access to technology.
- 7. Globalization of Education:** To position India as a global education hub, the policy encourages partnerships with foreign institutions, attracting international students, and adopting global best practices for enhanced exposure and opportunities.

ISSUES AND CHALLENGES OF NEP 2020

- 1. Complex Transition:** Adopting a multidisciplinary and flexible education system demands major structural reforms, which are time-consuming and resource-intensive.
- 2. Resource Shortages:** Many institutions, particularly in rural and underserved areas, lack the financial and infrastructural capacity to implement NEP 2020 reforms, including upgrading facilities, hiring faculty, and integrating technology.
- 3. Digital Inequity:** The digital divide continues to hinder equitable access to education, as economically disadvantaged students often lack devices and reliable internet.
- 4. Faculty Preparedness:** The shortage of skilled educators and limited professional development opportunities pose challenges to delivering multidisciplinary and research-driven education. Faculty resistance to change adds to the difficulty.
- 5. Accreditation Inequality:** Granting institutional autonomy based on accreditation status risks widening the gap between well-established universities and smaller colleges. A transparent and fair process is crucial.
- 6. Resistance to Reform:** Traditional hierarchies and practices in the education sector may lead to resistance from institutions, administrators, and other stakeholders, slowing reform adoption.
- 7. Regulatory Coordination:** Establishing the Higher Education Commission of India (HECI) requires smooth coordination among its divisions. Transitioning from existing frameworks may face bureaucratic delays.
- 8. Effective Monitoring:** Developing robust metrics for evaluating NEP 2020 implementation and ensuring consistency across diverse institutions is a complex but essential task.
- 9. Balancing Priorities:** Striking a balance between global competitiveness and preserving local cultural and indigenous knowledge is a nuanced challenge.

10. Institutional Overload: Institutions risk being overburdened with additional roles like vocational training, research, and digital integration, potentially compromising education quality.

IMPACT OF NEP 2020 ON HIGHER EDUCATION

- 1. Enhanced Education Quality:** NEP 2020 promotes multidisciplinary learning and critical thinking, producing graduates equipped to apply knowledge effectively in diverse contexts.
- 2. Global Competitiveness:** Aligning with international standards and fostering partnerships with foreign universities enhances India's standing as a global education hub and attracts international students.
- 3. Inclusivity and Accessibility:** Focused efforts to provide equitable access, such as financial aid and expanding institutions in underserved areas, aim to increase the Gross Enrolment Rate (GER) and benefit marginalized communities.
- 4. Improved Employability:** By integrating vocational training, internships, and industry collaboration, NEP 2020 bridges the skill gap, ensuring students are job-ready.
- 5. Research Advancements:** The establishment of the National Research Foundation (NRF) fosters a robust research culture, driving innovation and addressing societal and economic challenges.
- 6. Faculty Empowerment:** Continuous training, performance evaluations, and academic autonomy for faculty improve teaching quality and encourage innovative research.
- 7. Lifelong Learning Opportunities:** Flexible undergraduate programs with multiple entry and exit options enable lifelong learning and upskilling in a rapidly evolving world.
- 8. Digital Integration:** Leveraging technology democratizes access to quality education, bridging the digital divide and fostering inclusivity.
- 9. Institutional Autonomy:** Greater autonomy for institutions encourages innovation in curriculum, pedagogy, and governance, enhancing student outcomes.
- 10. Economic Growth:** A skilled and well-educated workforce contributes to a sustainable, innovation-driven economy, boosting overall development.

FINDINGS, CONCLUSION AND RECOMMENDATIONS

The New Education Policy 2020 has the potential to revolutionize higher education in India, addressing long-standing challenges while preparing students for the demands of a dynamic and interconnected world. Its focus on multidisciplinary learning, equity, research, and technology positions India to reclaim its historical legacy as a global knowledge hub.

NEP 2020 represents a transformative step in reshaping higher education in India. Its comprehensive reforms target inclusivity, quality, and relevance in education, ensuring that students are prepared for global challenges while retaining cultural values.

However, the success of NEP 2020 depends on meticulous planning, resource allocation, stakeholder collaboration, and a commitment to continuous improvement. By addressing the challenges and leveraging its strengths, India can create an education system that empowers individuals, drives innovation, and contributes to sustainable national development.

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INVESTOR BEHAVIOR PATTERNS: TRENDS IN ADOPTION OF CONVENTIONAL INVESTMENTS VS. SYSTEMATIC INVESTMENT PLANS

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ABSTRACT

The financial behavior of investors in Mumbai, a key economic center of India, reflects diverse preferences shaped by demographics, risk tolerance, and financial literacy. This study explores the adoption of conventional investments—such as fixed deposits, gold, and real estate—versus systematic investment plans (SIPs) linked to mutual funds. By analyzing secondary data from financial reports, surveys, and studies, this research identifies key trends and factors influencing investment choices. Findings reveal that younger investors predominantly prefer SIPs for their growth potential, while older demographics lean towards conventional investments for stability. Enhanced financial literacy emerges as a crucial factor in guiding informed investment decisions.

Keywords: *Investor Behavior, Financial Literacy, Systematic Investment Plans, Conventional Investments*

INTRODUCTION

Investment decisions are heavily influenced by individual behavior, preferences, and external factors such as financial literacy and market conditions. In Mumbai, a city renowned for its financial acumen, investors exhibit diverse strategies when choosing between conventional investments and systematic investment plans (SIPs). Conventional investments, including fixed deposits, gold, and real estate, offer safety and predictability, appealing to risk-averse individuals. For example, fixed deposits in Mumbai continue to hold approximately 40% of household savings, reflecting the preference for guaranteed returns. Similarly, gold investments, driven by cultural significance and perceived stability, account for nearly 15% of individual portfolios.

On the other hand, SIPs provide a disciplined, long-term approach to equity investments, attracting younger, growth-oriented investors. As of 2023, over 70% of SIP investors in Mumbai were in the 25-40 age group, with an average monthly contribution of ₹5,000. The total SIP investments in Mumbai have grown at a compounded annual growth rate (CAGR) of 18% over the past five years, reflecting rising financial awareness and aspirations for wealth creation.

This study seeks to analyze trends in investor behavior, focusing on demographic preferences, financial literacy levels, and the impact of economic awareness on investment choices. By examining existing surveys and secondary data, we aim to uncover patterns that can inform policymakers, financial institutions, and investors themselves.

LITERATURE REVIEW

Singh & Patel (2021), The study examined investment preferences among urban households in India. Findings indicated that risk-averse investors preferred fixed deposits and gold due to their stability, while younger investors, encouraged by rising financial awareness, leaned towards mutual funds and SIPs. The authors recommended targeted financial education programs to bridge knowledge gaps.

Sharma (2020), Research on financial literacy in metro cities found a direct correlation between financial awareness and the adoption of SIPs. Investors with higher literacy levels understood the benefits of rupee-cost averaging and long-term equity growth, while less literate individuals relied on conventional, tangible assets. Recommendations included integrating financial education into mainstream curricula.

Rao & Kumar (2019), A demographic analysis of investment behaviors highlighted that younger investors prioritize growth potential, often choosing SIPs. Conversely, retirees favored fixed-income securities and gold due to lower risk exposure. The study emphasized the need for age-specific financial products.

Gupta & Mehta (2018), The research explored the psychological factors influencing investment choices, identifying risk perception as a primary driver. Conventional investments were viewed as safe havens during economic uncertainty, while SIPs were linked to optimism and higher risk tolerance among investors.

OBJECTIVES OF THE STUDY

1. To analyze the demographic trends in the adoption of conventional investments and SIPs in Mumbai.
2. To evaluate the influence of financial literacy on investment preferences.
3. To understand the role of risk tolerance in shaping investor behavior.

RESEARCH METHODOLOGY

- **Data Sources:** Secondary data were gathered from surveys, financial reports, and academic studies. Notable sources include AMFI (Association of Mutual Funds in India) reports, RBI bulletins, and SEBI publications.
- **Data Collection:** Key metrics analyzed include demographic details (age, income levels, education), investment types, and financial literacy indices. Data from surveys like the National Centre for Financial Education (NCFE) and regional studies on Mumbai's investor profiles were utilized.
- **Data Analysis Techniques:**
 - Descriptive statistics to summarize investor demographics and preferences.
 - Regression analysis to evaluate the relationship between financial literacy and investment choices.
 - Comparative analysis to highlight adoption patterns across age groups and income brackets.

SCOPE OF THE STUDY

This study focuses on analyzing investor behavior in Mumbai with a specific emphasis on the choice between conventional investments and systematic investment plans (SIPs). It examines the influence of demographic factors such as age, income, and risk tolerance, as well as the role of financial literacy and economic awareness in shaping investment preferences. By leveraging secondary data from surveys, reports, and financial publications, the study provides insights into the evolving investment trends and decision-making processes among Mumbai's diverse investor base. The findings aim to inform financial institutions, policymakers, and educators about areas requiring enhanced financial literacy initiatives and product innovation.

LIMITATIONS OF THE STUDY

The study relies exclusively on secondary data, which may limit the granularity and real-time relevance of the findings. Additionally, the research is geographically confined to Mumbai, and results may not be generalizable to other regions with differing economic or cultural contexts. The study does not account for behavioral biases or qualitative factors such as investor emotions, which could influence decision-making. Furthermore, the absence of primary data collection restricts the ability to validate findings through direct surveys or interviews with investors.

ANALYSIS AND FINDINGS

1. Demographic Trends

Age Group	Preference for SIPs (%)	Preference for Conventional Investments (%)
25-40	70%	30%
41-50	50%	50%
50 and above	40%	60%

Source: Financial Behavior Survey, Mumbai (2023).

Explanation: The data reveals that younger investors (ages 25-40) predominantly prefer SIPs, with 70% of this age group allocating significant portions of their portfolios to these plans. This preference is attributed to their aspirations for long-term wealth creation and familiarity with equity markets. In contrast, older investors (ages 50 and above) demonstrate a higher allocation (60%) to conventional investments, prioritizing stability and predictable returns over growth.

2. Financial Literacy

Financial Literacy Score	Preference for SIPs (%)	Preference for Conventional Investments (%)
Above 75%	68%	32%
50%-75%	55%	45%
Below 50%	35%	65%

Source: Mumbai Financial Literacy Report (2023).

Explanation: Financial literacy emerges as a significant determinant of investment behavior. Investors scoring above 75% on financial literacy tests show a 68% preference for SIPs, utilizing their understanding of rupee-cost averaging and equity market dynamics. Conversely, individuals with scores below 50% exhibit a strong inclination (65%) toward conventional investments, often viewing them as safer and more straightforward.

3. Risk Tolerance

Risk Tolerance Level	Allocation to Equity-Oriented SIPs (%)	Allocation to Traditional Assets (%)
High	55%	45%
Moderate	40%	60%
Low	25%	75%

Source: Behavioral Risk Analysis, Mumbai Investors Study (2023).

Explanation: Risk tolerance significantly influences investment choices. Investors with high-risk tolerance allocate 55% of their portfolios to equity-oriented SIPs, leveraging market opportunities for higher returns. On the other hand, those with low-risk tolerance allocate 75% to traditional assets, particularly during economic instability, seeking security and capital preservation.

CONCLUSION

The findings underscore the interplay between demographic factors, financial literacy, and risk tolerance in shaping investment preferences. Younger investors with higher financial literacy and risk tolerance are more inclined toward SIPs, capitalizing on long-term growth potential. Conversely, older, risk-averse individuals and those with lower financial literacy prefer conventional investments for their perceived safety and stability. These insights highlight the need for tailored financial advisory services that address the diverse needs of Mumbai's investor base.

RECOMMENDATIONS

1. Targeted initiatives should focus on enhancing investor understanding of modern financial products like SIPs to promote informed decision-making.
2. Develop age-specific and risk-adjusted investment solutions to cater to diverse investor needs.
3. Further research into investor psychology and risk perception can guide the creation of strategies to address behavioral biases.
4. Financial institutions should conduct campaigns emphasizing the benefits of portfolio diversification and long-term investment strategies.

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DIGITAL REVOLUTION: LEVERAGING TECHNOLOGY FOR FINANCIAL INCLUSION IN INDIA

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ABSTRACT

This research paper explores the impact of the evolution of digital technology on accounting in India. In a country where a large portion of the population is still unbanked or underbanked, technological advancements such as mobile banking, digital payments and fintech innovations have played a significant role in improving access to financial services. This paper explores technology challenges, opportunities and initiatives, as well as the role of government policy, digital literacy and the impact of this digital revolution on business. An unprecedented achievement. As a majority of the population has historically been excluded from financial services, technological advancements such as mobile banking, digital payments and biometric systems have become essential for financial inclusion.

This paper explores how technology is changing finance in India by examining key initiatives such as the Pradhan Mantri Jan Dhan Yojana, mobile wallet mobile and government-backed platforms such as Aadhaar. It also highlights the role of fintech innovation in providing accessible and affordable financial services to the underprivileged. Despite many successes, challenges such as digital literacy, cyber security threats and controls remain. This article analyzes these issues and discusses the future potential of emerging technologies such as AI and blockchain to support the development of financial information. Finally, this article highlights the important role of collaboration between government, financial institutions and technology service providers in achieving financial inclusion in India.

Keywords: Digital revolution, financial inclusion, technology, Cyber Security, fintech, digital payments

INTRODUCTION

Financial inclusion refers to the availability and accessibility of financial services to all people, especially those in underserved and remote areas. A large section of the population in India has historically faced challenges in accessing banking services due to factors such as remoteness, lack of infrastructure, and lack of financial knowledge. The digital revolution driven by technology, internet connectivity, and government measures has brought significant changes to the financial sector. This article explores how digital tools and platforms are reshaping India's financial landscape and the opportunities they bring to market equity. Year. Despite these efforts, the majority of the population is still unbanked or underbanked, and challenges such as geographical isolation, low financial literacy, and high cost of entry to traditional banking services continue to necessitate financial inclusion. According to the World Bank, as of 2020, around 190 million adults in India are still excluded from the formal financial system. significant and poverty reduction. With the rapid increase in mobile phone usage, widespread internet connectivity and government initiatives such as the Digital India movement, technology has opened up new avenues for providing financial assistance to the poorest in India. Platforms such as mobile banking apps, digital wallets and peer-to-peer lending systems have made it easier for people in rural and remote areas to access banking services, transfer money, pay bills and even request loans without having to carry IT. every step taken to the body of the bank. The introduction of the Aadhaar biometric identification system and the Pradhan Mantri Jan Dhan Yojana (PMJDY) has further facilitated this initiative, ensuring that even individuals without registration or facilities can access legal financial services physically. This article explores the critical role that digital technology plays in improving financial literacy in India. It examines the key technology trends, government policies and measures that are driving this change. While the benefits of digital financial services are evident, challenges such as digital literacy, security issues and conflicts still hinder the full implementation of accounting. This article analyses the progress, current challenges and future prospects of digital finance in India to arrive at how technology can be a catalyst for greater economic participation, empowerment and positive development for all citizens, especially the people of India.

OBJECTIVES OF THE STUDY

- Assess the Effect of Government Initiatives.
- Examine the Function of Financial Technology (FinTech) Innovations.
- Determine the Role of Technology in Financial Inclusion.
- Evaluate the obstacles and difficulties in achieving digital financial inclusion.

- Determine potential trends and opportunities for the future.

REVIEW OF LITERATURE

- Mobile phones have become a cornerstone in the push for financial inclusion in India. According to a study by Tiwari et al. (2021), India's growing mobile subscriber base has made mobile banking one of the most accessible ways for individuals in rural and remote areas to access financial services. Mobile phones are not only used for basic financial transactions, such as transfers and payments, but also for opening accounts, applying for loans, and managing personal finances.
- For users with basic feature phones (non-smartphones), mobile financial services via USSD (Unstructured Supplementary Service Data) and SMS provide an affordable and effective means of accessing financial services. According to Bansal & Purohit (2020), initiatives like the Aadhaar-enabled Payment System (AEPS), which allows people to perform financial transactions using their Aadhaar number and biometrics, have enhanced the accessibility of digital financial services in underserved regions.
- A landmark initiative by the Government of India, PMJDY aimed at providing every Indian with access to a basic bank account. Launched in 2014, this initiative has resulted in the opening of millions of bank accounts, many of which are linked to mobile phones for easy digital access. According to Nair & Sahoo (2019), PMJDY has significantly contributed to the financial inclusion of marginalized groups, such as women, the poor and rural populations.
- The rapid adoption of digital wallets, QR code payments, and contactless cards has revolutionized payment systems in India. The UPI (Unified Payments Interface), developed by the National Payments Corporation of India (NPCI), has played a significant role in driving the digital payments revolution. Research by Sundaram & Roy (2022) underscores the role of UPI in simplifying payments across different platforms, enabling seamless transactions between banks, merchants, and consumers.

RESEARCH METHODOLOGY

A multi-method approach and quantitative tools to collect thorough data will be part of the research methodology for examining how technology is used for financial inclusion in India.

Research Design: Descriptive & exploratory research design will be used. The study will examine how much technology has helped India's financial inclusion, highlighting both the advantages and disadvantages. Additionally, the study will provide light on how FinTech advancements, government programs, and digital and mobile payments have improved access to financial services.

DATA COLLECTION METHOD

Secondary Data Collection:

- Thorough analysis of the body of research on digital banking, FinTech developments, government programs like PMJDY and Aadhaar, and financial inclusion in India, including scholarly articles, reports, and white papers. In addition to offering a theoretical framework, this will assist in identifying important research needs.
- Reports from important sources, including the World Bank, the Reserve Bank of India (RBI), the National Payments Corporation of India (NPCI), and other financial inclusion surveys, will be examined in this study. These will provide useful information about the impact and penetration of digital financial services in India.
- Case studies of effective digital financial inclusion programs in India, including PMJDY, Aadhaar-based financial services, UPI, and Bharat Net, will be included in the study. Finding best practices and lessons from successful implementation will be made easier with the aid of case studies.

KEY INITIATIVES DRIVING FINANCIAL INCLUSION

1. **Pradhan Mantri Jan Dhan Yojana (PMJDY):** PMJDY was launched in 2014 to provide international banking services. More than 500 million accounts have been opened, mostly in rural areas.
2. **Unified Payments Interface (UPI):** UPI has revolutionized digital payments by providing connectivity and instant transactions. UPI has completed over 100 billion transactions in 2023.
3. **Aadhaar and Direct Benefit Transfer (DBT):** The Aadhaar biometric system facilitates the promotion and payment of benefits, minimizes errors and increases efficiency.
4. **Microfinance and Digital Lending:** Fintech platforms use artificial intelligence and machine learning to assess creditworthiness and provide loans to people without traditional credit history.

5. **Digital Literacy Campaigns:** Government and private sector leaders are focusing on increasing digital tools and financial literacy among citizens.

THE DIGITAL REVOLUTION IN INDIA

India has witnessed a rapid digital transformation over the past decade, driven by:

1. **Mobile Penetration:** With over 1.2 billion mobile connections, smartphones have become a tool for accessing digital services.
2. **Internet Connectivity:** Initiatives like Bharat Net and cheap data have brought millions of people online, including in rural areas.
3. **Government Policies:** Projects like 'Digital India' promote digital literacy and infrastructure.
4. **Fintech Growth:** India's fintech ecosystem is one of the largest in the world, with innovations in payment systems, lending and insurance.

THE STATE OF FINANCIAL INCLUSION IN INDIA

Before delving into the role of technology, it is necessary to understand the current state of accounting in India. Despite significant progress in recent years, India still faces challenges in accessing international financial services. According to the World Bank, as of 2020, approximately 190 million elderly people in India were not paid. There are many reasons for this: low income, lack of trust in financial institutions, geographic constraints, and limited access to banking institutions. Additionally, financial services are often too expensive or inaccessible for people in rural areas.

THE ROLE OF DIGITAL TECHNOLOGY IN FINANCIAL INCLUSION

The introduction of digital technology has transformed the way financial services are delivered and accessed. Some of the key technologies that have contributed to financial inclusion in India include:

- **Mobile Banking and Payment Systems:** With a large portion of the population owning a mobile phone, mobile banking has become the primary means of accessing financial services. Platforms like BHIM (Bharat Interface for Money), Paytm and Google Pay are flexible and allow rural people to send and receive money, pay bills and access credit without having to go to the bank.
- **Aadhaar and Biometric Identification:** India's biometric system, Aadhaar, is a game changer. It provides security and authentication, making it easier for people to access government grants and open bank accounts even if they don't have traditional ID. This reduces the burden on vulnerable groups and underpins digital services.
- **FinTech Innovations:** The rise of fintech startups in India has led to the emergence of many innovative solutions targeting low-income communities. Peer-to-peer lending platforms, micro-insurance products, and digital wallets are just a few examples of how technology is shaping the financial services market.
- **Internet Banking and Branchless Banking:** With the popularity of the Internet in urban and rural areas, Internet banking allows business customers to perform banking services such as balances, transfers and loan money without having to visit any part of the body.

GOVERNMENT INITIATIVES DRIVING DIGITAL FINANCIAL INCLUSION

The Indian government has played a crucial role in promoting digital financial inclusion. Key initiatives include:

- **Pradhan Mantri Jan Dhan Yojana (PMJDY):** PMJDY was founded in 2014 with the aim of providing banking services to every family. The program helps millions of previously unbanked people gain access to digital banking services.
- **Financial Literacy Campaigns:** The government is also prioritizing improving financial literacy by announcing plans and collaborating with various organizations to educate people on digital business and financial management.
- **Digital India Initiative:** As part of the Digital India movement, the government is committed to creating a wide communication network, providing digital services and paving the way for access to information by improving digital literacy.
- **Rural Internet Connectivity:** The government's efforts to expand urban connectivity have enabled financial inclusion by promoting access to digital platforms in remote areas.

Impact of Technology on Financial Services

Financial Technology transcends geographical, social and economic barriers and provides free access to financial services.

- **Digital payment** systems like UPI, Paytm and Google Pay are easy to convert even for the illiterate or non-tech-savvy.
- **Digital platforms** for microfinance and digital lending are expanding access to credit by using other data to facilitate quick loans and credit scores.
- **Insurance and asset management** mobile apps and online platforms are offering insurance policies and investments targeting low-income groups.
- **Future Opportunities** improve fraud detection and credit risk assessment.

CHALLENGES TO DIGITAL FINANCIAL INCLUSION IN INDIA

While the digital revolution offers tremendous potential, it is not without its challenges:

- **Digital Literacy:** A large section of the Indian population, especially in rural areas, lacks the skills to use digital tools. Without proper education and training, many find it difficult to enter the digital market.
- **Cybersecurity and Privacy Concerns:** As financial transactions move online, the risk of fraud and cybercrime increases. Protecting digital platforms and user data is critical to building trust in digital financial systems.
- **Infrastructure Limitations:** Although internet penetration is increasing, internet coverage remains low in many rural areas, limiting people's ability to use online banking services.
- **Financial Exclusion of Vulnerable Groups:** Some groups, such as the elderly, the disabled, rural women, etc., may still face difficulties in accessing digital financial services due to factors such as lack of literacy or lack of digital devices.

OPPORTUNITIES AND FUTURE PROSPECTS

- **Artificial Intelligence and Blockchain:** Advanced technology can increase transparency, reduce fraud, and improve credit assessment.
- **Collaborations:** Partnerships between government, private sector, and nonprofit organizations can enable expansion and innovation.
- **Customized Solutions:** Creating user-friendly, local language-based platforms can bridge the digital literacy gap.
- **Policy Support:** Continued government support and regulatory frameworks are essential to maintain strength.

CASE STUDIES OF SUCCESSFUL DIGITAL FINANCIAL INCLUSION INITIATIVES

Several case studies highlight the successful integration of digital technologies to enhance financial inclusion:

- **PMGDISHA (Pradhan Mantri Gramin Digital Saksharta Abhiyan):** The program aims to improve digital literacy in rural areas and educates millions of people on the digital economy.
- **Jio's Contribution to Connectivity:** The launch of Reliance Jio has reduced the cost of mobile internet, making access to digital platforms and services affordable for low-income people.
- **M-Pesa in India:** Although the M-Pesa mobile money model was first launched in Kenya, it was adapted to the Indian context to provide financial services such as transfers and payments to those who do not have access to bank cash.
- **The Future of Digital Financial Inclusion in India:** The future of accounting in India lies in the use of new technologies such as artificial intelligence (AI), machine learning (ML), and blockchain. This technology can improve credit scores, fraud detection, and overall financial outcomes. Furthermore, collaboration between traditional financial institutions and fintech companies is needed to create more inclusive, affordable, and easy-to-use financial products.

POLICY RECOMMENDATIONS

1. **Enhancing Digital Infrastructure:** Improve high-speed internet access and provide reliable electricity to underserved areas.
2. **Strengthening Cybersecurity Measures:** Implement strong data protection policies and cybersecurity framework to protect users.
3. **Promoting Digital Literacy:** Expand literacy programs and integrate digital literacy into the curriculum.
4. **Regulatory Support for Innovation:** Create an enabling environment for the use of financial technology through good supervision.

FINDINGS OF THE STUDY

According to the study, digital payment systems like Paytm, UPI, and Aadhaar-enabled services, along with mobile technology, have greatly increased financial inclusion in India, especially in urban and semi-urban areas. While FinTech innovations like peer-to-peer lending have expanded credit availability for underprivileged communities, government programs like PMJDY and Aadhaar have improved access to financial services. Broader acceptance is still hampered, though, by issues including digital literacy, cybersecurity worries, and inadequate infrastructure in rural places. Notwithstanding these obstacles, the study indicates that future developments in 5G and AI technologies may improve financial inclusion even more, especially for underserved populations.

CONCLUSION

The digital revolution has immense potential to drive financial inclusion, transform lives and promote equitable growth in India. Despite the challenges, collaboration and technology can overcome these challenges and pave the way for inclusive financial markets. With effective technology, India can set the global benchmark for accounting and economic growth.

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EXPLORING THE FRONTIERS OF FINTECH: TYPES, BENEFITS, AND FUTURE DIRECTIONS

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ABSTRACT

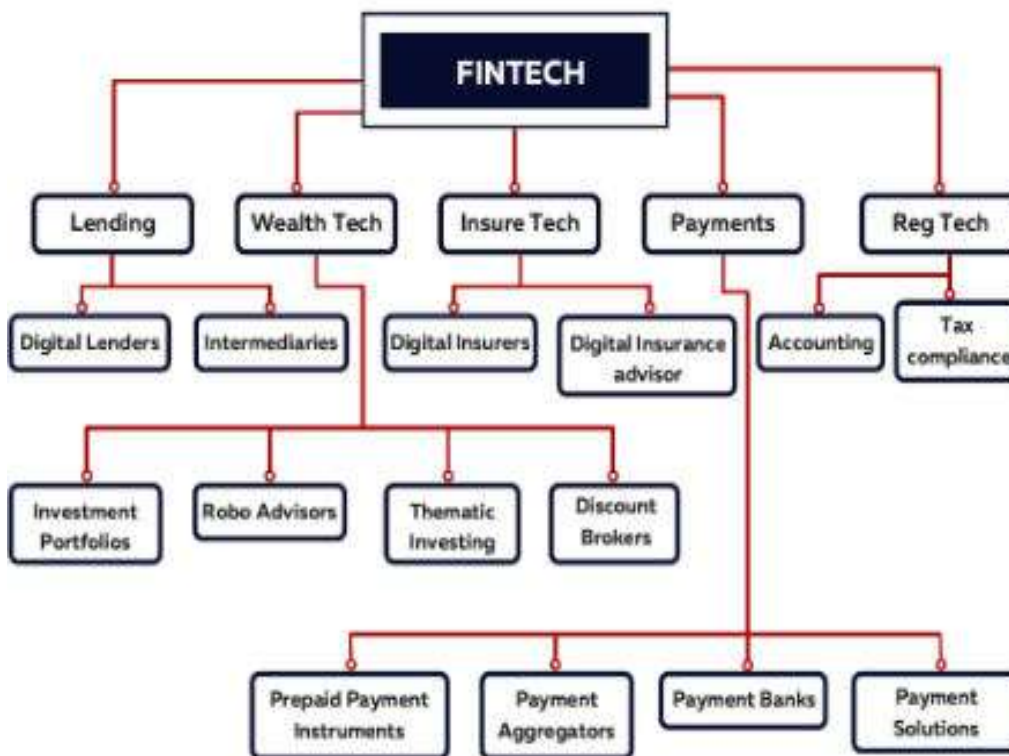
The fintech industry has undergone significant transformation in recent years, reshaping the financial services landscape. This paper explores the diverse types of fintech, including Payments Fintech, Lending Fintech, Investment Fintech, Insurance Fintech, and Blockchain Fintech. It also delves into the benefits fintech offers, such as greater efficiency, cost reduction, enhanced customer experience, and improved financial inclusion. Moreover, the paper highlights challenges and looks ahead to the future of fintech, stressing the need for better regulatory frameworks, stronger cybersecurity measures, and increased collaboration between fintech companies and traditional financial institutions.

Keywords: Fintech, Types, Benefits, Challenges, Future Directions

INTRODUCTION

The financial technology (fintech) industry has witnessed unprecedented growth in recent years, transforming the way financial services are delivered and consumed. Fintech has enabled financial institutions to provide faster, cheaper, and more convenient services, while also expanding access to financial services for underserved populations. The rapid evolution of fintech has fundamentally changed how financial services are delivered and consumed. In particular, fintech has made financial services faster, cheaper, and more accessible, especially for underserved populations. Segments like payments, lending, wealth management, insurance, neobanking, and block chain have emerged as key drivers of this transformation.

In India, as traditional banks and financial institutions struggle with legacy systems, fintech start-ups are gaining a competitive edge, offering more agile and cost-efficient solutions. While traditional providers work to catch up, fintech is playing a pivotal role in reshaping financial services. This study aims to analyze the various types of fintech, their benefits, and the industry’s future, focusing on how these advancements address structural challenges in the financial sector. This study aims to explore the different types of fintech, their benefits, and future directions. In a nutshell, the following are various kinds of fintech solutions:



Source: <https://amlegals.com/fintech-primer-the-landscape-of-fintech-in-india/#>

OBJECTIVES

1. To identify and classify the different types of fintech.
2. To examine the benefits of fintech, including increased efficiency, reduced costs, improved customer experience, and enhanced financial inclusion.
3. To discuss the future directions of the fintech industry.

REVIEW OF LITERATURE

A study by Demirguc-Kunt et al. (2018) found that fintech has the potential to increase financial inclusion, particularly in developing countries. The study noted that fintech can provide access to financial services for underserved populations, such as the poor and small businesses.

Research by Philippon (2016) found that fintech can increase efficiency in the financial services industry. The study noted that fintech can automate many tasks, reducing the need for manual processing and increasing the speed of transactions.

A study by Arner et al. (2016) found that fintech poses significant regulatory challenges. The study noted that fintech companies often operate outside of traditional regulatory frameworks, making it difficult for regulators to oversee their activities.

Research by Romanosky et al. (2019) found that fintech companies are vulnerable to cybersecurity risks. The study noted that fintech companies often rely on complex technology systems, making them vulnerable to hacking and other types of cyber-attacks.

A study by Lee and Shin (2018) found that fintech companies can benefit from collaborating with traditional financial institutions. The study noted that fintech companies can provide innovative solutions, while traditional financial institutions can provide scale and regulatory expertise.

RESEARCH METHODOLOGY

This study employed a descriptive research design, using secondary data sources to gather information on fintech types and benefits. The data sources included academic journals, industry reports, and online articles.

RESULTS AND DISCUSSIONS

The study identified six primary types of fintech:

1. PAYMENTS FINTECH

Payments fintech enables faster, secure and more convenient payment solutions. Examples include PayPal, Square, and Apple Pay, which offer users simple, mobile, and contactless payment methods. These solutions enhance customer experience by reducing friction in payments and improving transaction speed.

Benefits:

- a. **Increased Efficiency:** Instant payment processing reduces time spent on manual reconciliations.
- b. **Improved Customer Experience:** Simple mobile payments and contactless solutions make transactions convenient and secure.

2. LENDING FINTECH

Lending fintech platforms provide alternatives to traditional borrowing methods. Platforms like Lending Club, Funding Circle, and Prosper connect borrowers directly with investors, offering faster approval processes and more flexible loan terms. These platforms democratize lending, making it easier for underserved groups to access credit.

Benefits:

- a. **Reduced Costs:** Lower overhead costs lead to more competitive loan rates.
- b. **Enhanced Financial Inclusion:** By using alternative credit scoring models, individuals without traditional credit histories can access loans.

3. INVESTMENT FINTECH

Investment fintech simplifies wealth management through digital platforms like robo-advisors (e.g., Betterment, Wealthfront) and commission-free brokerage services (e.g., Robinhood). These platforms cater to individual investors, especially younger generations, by offering low-cost, user-friendly investment solutions.

Benefits:

- a. **Increased Efficiency:** Automated portfolio management saves time and money.
- b. **Improved Customer Experience:** Lower fees and easy-to-use platforms provide accessible investment opportunities.

4. INSURANCE FINTECH

Insurance fintech includes innovations like usage-based insurance and insurance aggregators. Companies like Lemonade use AI to streamline the insurance process, while Metromile offers pay-per-mile auto insurance, catering to consumers who drive less frequently.

Benefits:

- a. **Improved Customer Experience:** Personalized, flexible coverage ensures customers only pay for what they use.
- b. **Enhanced Financial Inclusion:** Lower-cost and simplified processes offer insurance to previously underserved populations.

5. BLOCKCHAIN FINTECH

Blockchain fintech enables secure, transparent, and efficient financial transactions. Cryptocurrencies like Bitcoin, platforms such as Ripple, and Ethereum-based smart contracts are revolutionizing financial transactions, especially cross-border payments.

Benefits:

- a. **Increased Efficiency:** Faster transactions due to the removal of intermediaries.
- b. **Enhanced Security:** Blockchain’s decentralized, cryptographic nature reduces the risk of fraud.
- c. **Transparency:** Immutable records ensure that transaction histories cannot be altered, providing greater accountability.

6. NEO-BANKING FINTECH

Neobanks only provide us with online banking services and no physical branches. They offer vivid range of services which include assessing the CIBIL score i.e the credit ratings, giving mobile (digital) payment access, etc. In the present age and time, Neobanks are abreast with the banking industry by ensuring its frequent utilization of fintech solutions to enhance the services offered and for smooth, efficient and impactful changes in the world. For example: RazorPay.

Benefits:

- a. **Low Cost:** The fact that there are no physical branches involved, no maintenance fees and less regulation required makes it a cost-efficient alternative.
- b. **Quick services:** The customers can go through and explore the neo banks apps very smoothly which makes it quick.
- c. **Simple account creation:** Unlike the traditional banks and their tedious processes, the steps needed to create an account on neo bank app are comparatively easier.

Fintech V/S Regtech

Fintech	Regtech
Focus	
Fintech focuses on improving and innovating the financial services.	Regtech merely helps to fulfil compliance of the regulatory requirements and risk management.
Goals	
Reducing the costs, increasing efficiency and enhancing customer experiences.	Betterment of risk management, increasing the transparency and reduce the regular compliance burdens.
Examples	
Paytm, Zerodha, Bharatpe	Amiti, Vama Ventures

CHALLENGES FACED BY FINTECH

Despite the benefits of fintech, there are several challenges that need to be addressed. Some of the key challenges include:

- 1. Regulatory uncertainty:** Fintech companies often operate in a regulatory gray area, making it difficult for them to navigate the complex regulatory landscape.
- 2. Cybersecurity risks:** Fintech companies are vulnerable to cybersecurity risks, including hacking and data breaches.
- 3. Competition from traditional financial institutions:** Traditional financial institutions are increasingly competing with fintech companies, making it difficult for fintech companies to gain traction.
- 4. Scalability:** Fintech companies often struggle to scale their businesses, particularly in terms of achieving profitability.

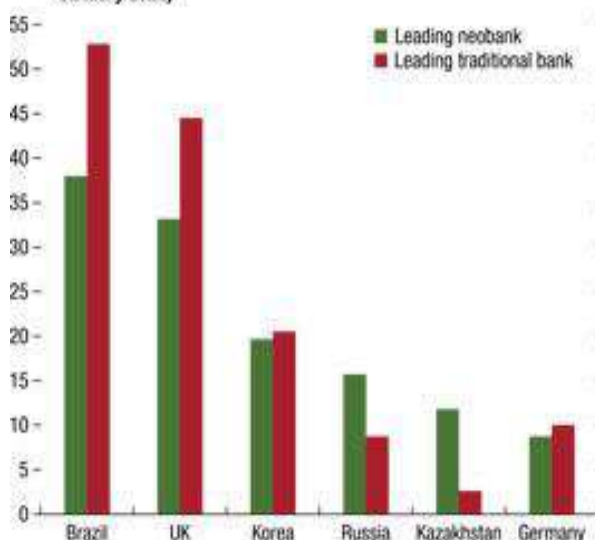
FUTURE DIRECTIONS

The fintech industry is rapidly evolving, and there are several future directions that are likely to shape the industry. Some of the key future directions include:

- 1. Increased use of artificial intelligence and machine learning:** Fintech companies are likely to increasingly use artificial intelligence and machine learning to improve their services and reduce costs.
- 2. Growing importance of cybersecurity:** As fintech companies continue to grow, cybersecurity is likely to become an increasingly important issue.
- 3. Expansion into new markets:** Fintech companies are likely to expand into new markets, including emerging markets and underserved populations.
- 4. Increased collaboration with traditional financial institutions:** Fintech companies are likely to increasingly collaborate with traditional financial institutions, leading to new business models and innovations.

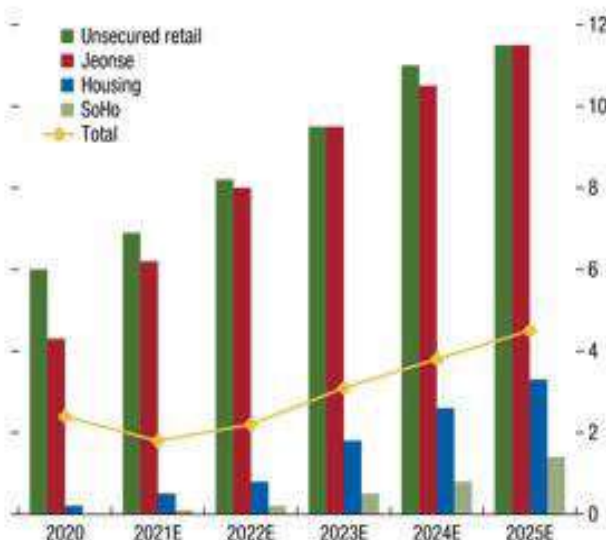
Some neobanks are among the largest players in their local markets and have large valuations ...

1. Valuation of Selected Leading Neobanks
(Billions of US dollars, as of late March 2022; for Russia: data as of January 2022)



... driven by expectations for strong loan growth, particularly in the unsecured segment.

2. Korean Digital Banks: Loan Market Share
(Percent of loans outstanding, 2021-25, expected)



DISCUSSION

The findings of this study highlight the importance of fintech in transforming the financial services industry. Fintech has enabled financial institutions to provide faster, cheaper, and more convenient services, while also expanding access to financial services for underserved populations. However, the study also notes that fintech firms face several challenges, including regulatory uncertainty, cybersecurity risks, and competition from traditional financial institutions.

CONCLUSION

In conclusion, this study has provided an overview of the different types of fintech and their benefits. The study has also highlighted the future directions of the fintech industry, including the need for regulatory clarity, cybersecurity measures, and collaboration between fintech firms and traditional financial institutions. As the fintech industry continues to evolve, it is likely to play an increasingly important role in shaping the future of financial services.

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**FINANCIAL STRATEGIES AND INVESTMENT OPPORTUNITIES IN ADVANCING
ENTREPRENEURIAL VENTURES IN BIOLOGICAL SCIENCES: A SYSTEMATIC LITERATURE
REVIEW**

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ABSTRACT

The entrepreneurial landscape in biological sciences, including biotechnology, pharmaceuticals, and sustainable agriculture, presents unique financial challenges and opportunities. Despite the sector's high capital intensity and long product development timelines, innovative financial strategies and investment opportunities play a crucial role in enabling entrepreneurial ventures to thrive. This systematic literature review critically examines the financial mechanisms supporting biological sciences ventures, focusing on venture capital, crowdfunding, government grants, and corporate partnerships. Through an exhaustive analysis of academic and industry sources, the study identifies best practices in financial management and highlights key barriers and opportunities. Findings emphasize the importance of a diversified financial strategy to enhance the sustainability and growth of biological science startups. This review provides insights into the current state of research and offers directions for future studies on the intersection of finance and entrepreneurship in biological sciences.

Keywords- *Biological Sciences, Venture Capital, Crowdfunding, Government Grants, Corporate Partnerships, Financial Management, Investment Opportunities, Entrepreneurial Ventures, Biotechnology, Pharmaceuticals*

1. INTRODUCTION

Entrepreneurship in the biological sciences sector, encompassing fields like biotechnology, pharmaceuticals, and environmental sciences, has the potential to bring forth groundbreaking innovations. However, the high capital requirements, long research and development (R&D) cycles, and intricate regulatory requirements make it especially challenging to secure funding and ensure long-term success. As a result, entrepreneurs in this field often face difficulties in accessing traditional financial resources, such as bank loans or public markets, due to the high risk associated with early-stage scientific ventures (Gage et al., 2019).

Financial strategies for biological science ventures are critical in overcoming these barriers. Various funding mechanisms, such as venture capital (VC), crowdfunding, government grants, and strategic corporate partnerships, have emerged to support the growth and commercialization of innovations in these fields. Each of these financial instruments offers distinct advantages, and the choice of strategy is often contingent upon the stage of the venture, the nature of the scientific discovery, and the venture's broader strategic goals. This paper aims to systematically review the literature on financial strategies and investment opportunities in the biological sciences sector, providing an in-depth analysis of the mechanisms available to support these ventures.

2. OBJECTIVES OF THE SYSTEMATIC REVIEW

The primary objectives of this systematic review are as follows:

1. To explore the financial strategies employed by entrepreneurial ventures in biological sciences and their relevance to the development and commercialization of innovations.
2. To analyze the investment opportunities available within the biological sciences, including venture capital, crowdfunding, government grants, and corporate partnerships.
3. To evaluate the financial management practices that contribute to the success and sustainability of biological science ventures.
4. To identify key gaps in the existing literature and propose directions for future research in the field.

3. RESEARCH METHODOLOGY**3.1 Search Strategy**

This systematic review follows the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to ensure methodological rigor and transparency in the selection and synthesis of studies (Moher et al., 2015). A comprehensive search of peer-reviewed journals, books, and conference proceedings was conducted using academic databases such as Google Scholar, Scopus, PubMed, and JSTOR. The search terms included a combination of keywords such as "financial strategies in biological sciences," "venture capital

in biotechnology," "investment in pharmaceuticals," "crowdfunding for life sciences," "government grants in biological sciences," and "corporate partnerships in biotechnology."

3.2 Inclusion and Exclusion Criteria

Studies were considered eligible for inclusion if they met the following criteria:

- Published within the last ten years to ensure relevance to current trends in biological sciences entrepreneurship.
- Focused on financial strategies, investment mechanisms, or financial management in entrepreneurial ventures within the biological sciences.
- Peer-reviewed and empirical in nature, including case studies, theoretical analyses, and empirical research articles.

The exclusion criteria were as follows:

- Publications not focused on entrepreneurship or financial mechanisms in biological sciences.
- Articles that are not peer-reviewed or do not meet academic standards.
- Non-English language publications.

3.3 Data Extraction and Synthesis

A structured data extraction form was used to capture essential information from each study, including the type of financial strategy discussed, the biological sciences sector in focus, the investment mechanism employed, and the outcomes or conclusions drawn. The synthesis was conducted thematically, categorizing the findings based on the types of financial mechanisms identified in the literature and their impact on the success of biological science ventures.

4. LITERATURE REVIEW

4.1 Venture Capital (VC) and Private Equity (PE)

Venture capital (VC) and private equity (PE) are essential for driving growth in high-risk sectors like biotechnology and pharmaceuticals. These industries rely on VC and PE funding for financial resources, strategic guidance, mentorship, and industry connections (Gage et al., 2019). VC investments, typically in the form of equity shares, demand high returns due to the risks of early-stage technologies.

In biotechnology, VC funding supports the development of treatments, therapies, and diagnostics, with firms like Sequoia Capital and Andreessen Horowitz heavily investing in gene editing, immunotherapy, and personalized medicine (Gage et al., 2019). However, startups must demonstrate scalability and market potential to secure this competitive funding (Sapp et al., 2021).

Beyond funding, VCs provide business advice, regulatory support, and partnership opportunities with pharmaceutical companies and research institutions (Sapp et al., 2021). A key criticism, however, is the pressure for rapid growth and short-term returns, which can conflict with the long-term goals of biological science ventures (Li & Chen, 2022).

4.2 Crowdfunding: Democratizing Investment

Crowdfunding has become a viable funding option for early-stage biological science ventures. Platforms like Kickstarter allow startups to raise capital from small investors, reducing dependence on institutional funding. This supports activities like prototype development, initial studies, and product marketing (Mollick, 2014).

In biological sciences, crowdfunding is particularly effective for projects with social or environmental benefits, such as sustainable agriculture, medical devices, or environmental biotech. Campaigns for clean water, renewable energy, and affordable healthcare have gained significant attention (Mollick, 2014). Additionally, crowdfunding builds a community of advocates invested in the venture's success.

However, its success depends on generating public interest, effectively communicating impact, and building trust. A key limitation is the insufficient capital to scale operations, often requiring startups to seek additional funding (Mollick, 2014).

4.3 Government Grants and Subsidies

Government grants are a vital funding source for research and development in the biological sciences. Organizations like the NIH, NSF, and global agencies provide critical seed funding and phase-one grants for early-stage ventures (Lichtenberg, 2020). Programs such as the U.S. SBIR support technological innovations in

biotechnology, pharmaceuticals, and healthcare, enhancing startups' credibility and attracting further investment (Lichtenberg, 2020).

However, government grants are highly competitive, with complex applications, strict compliance requirements, and limited support for commercialization. To bridge the gap between R&D and market readiness, startups often combine grants with other funding sources (Lichtenberg, 2020).

4.4 Corporate Partnerships and Licensing Agreements

Strategic corporate partnerships and licensing agreements are essential funding mechanisms for biological science startups. Partnerships allow startups to access resources, expertise, and distribution networks of established companies, while corporations gain innovative technologies to commercialize (Li & Chen, 2022). Licensing agreements, where startups grant rights to commercialize their IP, provide revenue through upfront payments, milestones, and royalties as products develop (Li & Chen, 2022). These arrangements also grant startups access to infrastructure like manufacturing and global distribution. However, such partnerships often require startups to cede some control over IP and decisions. Ensuring favorable terms and alignment with long-term goals is critical for success (Li & Chen, 2022).

5. DATA ANALYSIS AND INTERPRETATION

The data analysis of the reviewed literature reveals several critical insights into the financial strategies and investment opportunities that support entrepreneurial ventures in biological sciences. By synthesizing key themes across the studies, we can categorize the findings into distinct areas: the role of venture capital, the rise of alternative funding sources like crowdfunding, the importance of government support, and the value of corporate partnerships.

5.1 Venture Capital's Dominance in Biotechnology and Pharmaceuticals

Venture capital (VC) plays a crucial role in funding biotechnology and pharmaceutical startups, particularly in high-risk, long-term investment scenarios. It supports critical stages like proof-of-concept, early clinical trials, and market entry, making it indispensable for the biological sciences sector (Gage et al., 2019; Sapp et al., 2021; Li & Chen, 2022). However, there is often a disconnect between VC investors' short-term return expectations and the long timelines of biological sciences R&D. VCs push for rapid commercialization, sometimes leading to compromises in research or development (Gage et al., 2019). This tension can hinder the long-term success of scientific ventures.

5.2 Crowdfunding: Democratizing Financial Opportunities

Crowdfunding has become a popular funding strategy for early-stage biological science ventures. Platforms like Kickstarter and Indiegogo enable entrepreneurs to access capital from a broad pool of backers, democratizing financial opportunities (Mollick, 2014). It is particularly effective for socially-oriented projects, such as environmental biotech and medical devices, where public interest is strong (Lichtenberg, 2020). Crowdfunding often provides insufficient funds for full product development. Success depends on crafting a compelling narrative, especially in the biological sciences, where public understanding of technology is limited (Mollick, 2014).

5.3 Government Grants: Sustainability through Public Funding

Government grants are a key funding source for early-stage biological science ventures, particularly in fields like medical research, clean energy, and sustainable agriculture. Programs such as SBIR and NIH grants provide essential seed funding for scientific research, which can attract further investment (Lichtenberg, 2020; Sapp et al., 2021). While invaluable, government grants are highly competitive and involve complex application processes requiring proof of scientific merit and societal impact. Despite these challenges, receiving grants enhances a startup's credibility and appeal to other investors (Lichtenberg, 2020).

5.4 Corporate Partnerships and Licensing Agreements: Strategic Alliances for Growth

Corporate partnerships and licensing agreements are identified as pivotal mechanisms for scaling biological science startups. A study by Li and Chen (2022) highlights that large pharmaceutical companies, in particular, are increasingly turning to partnerships with biotech startups to access innovative technologies without the burden of in-house R&D. These strategic alliances allow startups to leverage the infrastructure and resources of established companies, such as manufacturing capabilities, clinical trial networks, and regulatory expertise, which are crucial in the complex and resource-demanding biological sciences sectors.

Licensing agreements, where startups grant established companies the rights to commercialize their intellectual property (IP), are another widely used financial strategy. These agreements can provide startups with upfront payments, milestone payments, and royalties, which can significantly reduce the financial strain of product

development (Li & Chen, 2022). However, the review also reveals that licensing agreements often require startups to relinquish some control over their intellectual property, which may impact long-term strategic decisions (Sapp et al., 2021).

5.5 Integrated Financial Strategies: A Hybrid Approach

The review points to the increasing trend toward hybrid financial strategies, wherein biological science ventures combine multiple funding mechanisms to overcome the challenges of each individual strategy. For example, a startup may secure initial funding through government grants, followed by venture capital investment once the product is de-risked, and later form corporate partnerships to scale and commercialize the product. The integration of different financial mechanisms helps to mitigate risks associated with each individual funding source and provides startups with a more robust financial foundation.

6. FINDINGS AND CONCLUSION

6.1 Key Findings

The systematic literature review highlights several key findings regarding the financial strategies and investment opportunities for entrepreneurial ventures in biological sciences:

1. **Venture Capital (VC)** remains the most significant source of funding for high-risk ventures in the biotechnology and pharmaceutical sectors. However, VC funding often comes with high expectations for rapid returns, which may not always align with the slow and methodical nature of scientific innovation.
2. **Crowdfunding** presents a promising opportunity for early-stage ventures, particularly those with a social or environmental impact. While crowdfunding can democratize funding access, it is generally insufficient for financing the full commercialization of complex biological products.
3. **Government Grants** play a crucial role in supporting R&D, especially in the early stages of technological development. However, the competitive nature of government funding means that startups must demonstrate clear scientific merit and societal value to secure grants.
4. **Corporate Partnerships and Licensing Agreements** provide startups with vital resources, expertise, and commercialization pathways. These collaborations enable biological science startups to scale rapidly, but often at the cost of IP control.
5. **Hybrid Financial Strategies**, which combine venture capital, crowdfunding, government grants, and corporate partnerships, offer the most sustainable financial approach for biological science ventures. A diversified financial strategy increases the chances of successful commercialization and long-term growth.

6.2 CONCLUSION

This systematic literature review underscores the complexity and diversity of financial strategies available to entrepreneurs in the biological sciences. While individual funding mechanisms such as venture capital, crowdfunding, and government grants provide distinct advantages, the review concludes that a hybrid approach combining multiple financial sources is essential for the success of early-stage biological science ventures.

Future research should explore the synergies between these financial mechanisms, examining how startups can effectively combine them to address the unique challenges in the biological sciences sector. Additionally, longitudinal studies that track the long-term impact of these financial strategies on the success and growth of biological science startups would provide valuable insights into the effectiveness of different funding models over time.

The findings of this review contribute to a deeper understanding of the financial landscape in the biological sciences, offering practical insights for entrepreneurs, investors, and policymakers looking to foster innovation and growth in this critical sector.

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A STUDY ON ROLE OF DATA ANALYTICS IN SOFTWARE ENGINEERING

Prof. Safura Salman Patel¹ and Prof. Sumaiya Haseeb Shaikh²¹Assistant Professor, Sailee Degree College of BCA²Assistant Professor, Pace Junior Science College, Dadar**ABSTRACT**

Data analytics collects data from various sources in raw form and converts it into conclusive data. It includes various tools, techniques, and algorithms to discover meaningful patterns and trends and draw conclusions. Data analytics aims to find valuable information to shape business, individual or organisation decision-making and improve growth. Data analytics predominantly refers to classifying applications, including business intelligence (BI), online analytical processing (OLAP), and reporting. These initiatives can help businesses increase revenue, operational efficiency, marketing campaigns, etc. Software Engineering is an organised way of using engineering principles, methods and tools to design, develop, test, and maintain software systems. This paper discusses the numerous aspects of data analytics and the advantages of data analytics in software engineering.

Keywords: Business Intelligence, Online Analytical Processing, Software Engineering.

INTRODUCTION

Data analytics play a vital role in Software Engineering in various areas, such as Development, Testing, Deployment and maintenance. Data analytics are performed using various approaches, such as descriptive analytics, diagnostics analysis, and prescriptive analysis. Many techniques are used in data analytics, including statistical analysis, machine learning, data mining, data visualisation and many more. Today, the digital world is evolving tremendously with the increasing complexity of data analytics play an important role in various fields such as finance, healthcare, marketing, retail, banking, and technology that require software engineering as a key pillar to enable industries to improve decision-making processes, optimise operations and reach to their objective more efficiently.

Data analytics plays a vital role in software engineering in various ways. Below are the roles of data analytics in improving software engineering.

- **Requirement Analysis** - Data analytics enables analysing user data, feedback, and market trends to more efficiently acknowledge user requirements. It guides the development process and meets the requirements of the target audience.
- **Software Development** - Data analytics helps decision-making during the development phase by providing insights into coding patterns, bug detection, and performance optimisation. It also identifies areas for improvement and optimises the development process.
- **Testing and Quality Assurance**- Data analytics techniques, test results, and raw data can help identify and prioritise fixing bugs. They can also aid in automating test case generation and enhancing test coverage.
- **Performance Monitoring and Optimization**- It observes the performance of software real-time systems. It analyses various metrics such as response time, throughput and resource utilisation, identifying bugs and optimising system performance.
- **User Interface Improvement**- Data analytics enables software engineers to gather insights into user behaviour and preferences. It identifies user interaction with software to note usability issues and different areas of improvement.

ADVANTAGES OF DATA ANALYTICS IN SOFTWARE ENGINEERING

The advantage of data analytics in software engineering has been demonstrated to be highly useful, offering understanding and improvements at various stages of the software development lifecycle.

- **Personalized User Experiences**-Data analytics helps software engineers personalise user experiences by observing user behaviour and prediction. It also enables engineers to understand user requirements, increase involvement, and improve appeasement.
- **Ongoing Improvement on Resources Allocation**—Analyzing data through the software development lifecycle helps engineers identify improvement opportunities and iterate on their processes. This improves software quality, performance, and user satisfaction.

- **Quality Assurance** - Data Modelling using Data analytics techniques helps engineers identify resource allocation by identifying areas where resources are underutilised or overutilised. Many factors are involved in resource allocation, such as productivity, infrastructure usage, and project dependencies, to enable effectiveness and productivity.
- **Predictive Maintenance- Business Intelligence (BI) enables engineers to** find forthcoming failures in software systems. Users can carefully address numerous issues and prevent downtime, enhancing reliability.
- **Enhanced Decision Making** - Business Intelligence using data analytics enables engineers to make more reliable decisions in all phases, such as development, testing, deployment and usability. Overall, project management leads to better resource allocation and task prioritisation.

CHALLENGES FACED IN SOFTWARE ENGINEERING WHILE USING DATA ANALYTICS

Data analytics used with software engineering can be highly beneficial but has cons and challenges. Some of the vital challenges include:

- **Data Quality**- Data are collected from various sources such as logs, raw data, repositories and user feedback. The data collected can be incomplete, inaccurate and inconsistent, leading to incorrect data collection and analytics.
- **Data Integration** - In software engineering, combining multiple company systems and integrating and analysing them effectively in visible formats is quite challenging. These challenges arise because there are different data schemas, formats and methods of accessing data.
- **Data Volume** - Large-scale projects or organisations have vast amounts of data. Organising this data is challenging as it is not scalable with real-time data. Handling and processing such information is not feasible.
- **Data Security and Privacy** - Security plays an important role in Software engineering, as sensitive information such as source code, credentials, and personal information is stored in organisations. Certaining the privacy and security of this data during storage and analysis is critical to prevent unauthorised access or data breaches.
- **Domain Expertise** - Finding individuals with technical expertise, skills, and experience in both areas can be challenging. A single data analytics expert cannot possess domain-specific knowledge of the software development process, tools, and practices.
- **Complexity of Software Systems** - Software comprises various interdependencies, complex software systems and interactions between components. This makes the system heavy, so analysing such a system using deployment, software development, and maintenance requires a deep understanding of these complexities to derive meaningful insights.
- **Change Management** - It is difficult for stakeholders to adopt a new culture, as the effectiveness of data analytics requires the implementation of new workflows. Implementing data analytics in software engineering requires organisational changes, such as changes in process, culture and workflow.
- **Tools and Infrastructure** - The selection of the right tools plays a vital role in data analytics in software engineering. However, it can be challenging as the market has rapidly evolving data analytics technologies. Setting up technologies requires heavy infrastructure to support their data analytics initiatives effectively.

RESEARCH CONTEXT

This research paper is theoretical in nature. The data has been collected through various secondary sources, including journals, research papers, books, and websites. Secondary data collected from other researchers has served as a good source for collecting the required data to analyse the objectives.

LIMITATION OF STUDY

The research study is limited to understanding the requirements of Data Analytics and Software Engineering in the recent working model and acknowledging the benefits and challenges faced while adopting the new working environment with Data Analytics.

CONCLUSIONS

In this paper, we proposed the role of Software Engineering with Data Analytics. We thoroughly studied various research papers and other articles related to data analytics and software engineering and various security

areas where the vulnerability of data protection is upheld. We have identified multiple methods of data analytics usage while designing a project. We discussed the complexity of software development, finding out domain expertise, and data integration. We have also identified the advantages and challenges of implementing data analytics with software engineering. Our ongoing work is to analyse the role of data analytics in enabling software engineers to decide based on data-driven information throughout the software development lifecycle, leading to more efficient development processes, improved software quality and user satisfaction.

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NUTRITIONAL STATUS OF MORINGA OLEIFERA LAM. LEAVES OBTAINED FROM TWO DIFFERENT ECOTYPES**Farhan Suraliwala¹ and Bindu Gopalkrishnan²**

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¹A.B.V.M. Agrawal Jatiya Kosh's Ghanshyamdas Jalan College of Science, Commerce & Arts, Malad (E), Mumbai- 97²SVKM'S Mithibai College, (Autonomous), Vile Parle (W), Mumbai – 56**ABSTRACT**

Moringa oleifera Lam. belongs to family Moringaceae. It is known as drumstick in English. The leaves, flowers and fruits are a rich source of nutrients. The Ayurveda and Unani medicines have recognized the therapeutic potential of Moringa. The leaves are a good source of nutrients such as protein, iron, vitamin C, etc. The leaves are very much in use as nutraceuticals. In order to know the nutrient content of Moringa leaves growing in two different ecotypes the current study was carried out. For the study the leaves were collected from two different ecotypes i.e. from wild and cultivated areas of Mumbai. The study included the parameters like organoleptic tests, crude fibres, moisture content, proteins, iron, calcium, magnesium and iron content. The investigation revealed that the percentage of fiber content, iron content and magnesium were more in the leaves obtained from the tree growing in wilderness area. While the moisture content, protein, Vitamin C and calcium was more in Cultivated Moringa leaves. Thus these nutraceutical parameters will help in confirming the nutritional aspects of Moringa leaf in both wild and cultivated plants.

Keywords: Moringa, leaves, ecotypes, nutraceuticals.

INTRODUCTION

Moringa oleifera Lam. is commonly known as drumstick, shevga, Sigrū Shobhanjan, etc. It belongs to family Moringaceae. It is native to India and is cultivated in most of the countries. The whole plant part is of economic and medicinal value ¹. The aboriginals of Maharashtra and the people of Kerala consume the leaf as vegetables ². Over the past 15 years intensive research has been made on *Moringa oleifera*. The new findings encouraged and revealed that *Moringa* can make a significant contribution to the promotion of health, not only in the less developed countries, but everywhere in the world. Especially important in the contribution as a food supplement for all ages ^{3, 4}. Therefore, the current work is taken up to know the nutritional value of dry leaf powders collected from wild and cultivated tree. *Moringa* is a small or medium sized tree reaching an average height of 5-7 m and a maximum height of 10m. The trunk is erect or ramified near the base, the wood is tender and spongy, and the branches are drooping bark corky; wood soft; root pungent; young parts tomentose. Leaves usually 3-pinnate, sometimes 0.5 m long; rachis slender, thickened and articulated at the base, pinnae and pinnules opposite, deciduous, their rachis very slender, articulated and with a gland at the articulations; ultimate leaflets 1-2 by 0.6-0.9 cm, the lateral elliptic, the terminal obovate and slightly larger than the lateral ones; nerves obscure; petiolules of the lateral leaflets 1-2 mm, those of the terminal 3-6 mm long. Flowers white, in large puberulous panicles. Calyx lobes linear-lanceolate reflexed, puberulous outside. Petals spatulate, veined. Stamens 5, fertile, alternating with 5-7 antherless ones; filaments villous at the base. Ovary oblong, villous; style cylindrical. Pods reaching 45cm long, 9-ribbed. Seeds 3-angled the angles winged ⁵.

MATERIALS AND METHODS**Procurement of Materials:**

For the present investigation the leaves of *Moringa oleifera* Lam. were collected from two ecotypes in order to find the difference/similarities in the nutritional values. The sample was collected from wilderness area at Bhayandar and the cultivated sample from agricultural farm, Safala. Both the sample was collected from a matured tree. These leaf materials were authenticated by the help of Flora of Maharashtra at Department of Botany, Mithibai College, Vile Parle (W).

Processing and Storage of Materials:

The samples were washed under running tap water and dried in shade. Further the samples were thoroughly dried in incubator at the temperature of 34° C. The dried leaves were finely powdered in a mixer. The leaf powders were stored in airtight containers for further use.

METHODOLOGY**Organoleptic tests:**

The dried leaf samples were analyzed for its colour, taste and odour ⁶.

Estimation of Moisture Content

Weigh 2 grams of sample in a clean preweighed petridish. Keep the petridish with the sample in oven set at 100° C. Weigh the petridish again after cooling in a desiccator. Carry out the above procedure and note three readings till constant weight is obtained ⁷.

CALCULATIONS

$$\text{Moisture content} = \frac{A-B}{B} \times 100$$

A: Initial weight before drying

B: Final weight after drying

Estimation of Crude Fibre

Weigh 5 grams of sample and transfer it to a clean dry conical flask. Add 50ml of 0.5N HCl and place the conical flask in a boiling water bath for 1 hour. Decant the acidic supernatant. Wash the residue thrice with 100ml of distilled water to remove the traces of acid. Transfer the residue now to a clean conical flask and add 50ml of 0.5N of NaOH and keep again in boiling water bath for 1 hour. Decant the alkaline supernatant. Wash the residue thrice with 100ml of distilled water to remove the traces of alkali. The litmus paper test was done to ensure that the washings are done properly (red litmus should not turn blue). Dry the residue in oven at 110° C. Note the weight of the dried sample. Incinerate the dried sample in furnace at 750° C for 3 hours. Cool the residue in desiccators and weigh the ash. The difference in the sample before and after incinerating the crude fibre content in 5grams of sample ⁷.

CALCULATIONS

$$\% \text{ Crude fibre} = A - B \times 100$$

A: Weight of the dried sample.

B: Weight of the ash.

Estimation of Iron:

Prepare three test tubes and label them as blank, reaction mixture and standard. In blank test tube add 1ml of distilled water. To the standard test tube add 1ml of standard working iron solution. To the reaction mixture test tube add 1ml of plant acid extracted sample. To each of the above test tubes add 1ml of nitric acid and 5ml of KCNS solution. Add 10ml of amyl alcohol to each test tube and mix well on vortex mixture. Keep the test tube at rest for 10 minutes. Read OD at 440nm. Using standard calculate iron content in 100 gm of material ⁸.

ESTIMATION OF PROTEIN (LOWRY'S METHOD)

Plant Extraction: Weigh 0.5 gm. of suitable plant material. Homogenize it in a mortar with pestle using 10 ml. of distilled water. Filter with muslin cloth and make the volume of the filtrate 100 ml. with distilled water.

Preparation of Standard Graph: Prepare a series of tubes containing 0 (blank), 0.1 to 1.0 ml. of standard protein solution. Make final volume in all tubes to 2 ml. with distilled water.

Procedure: Take 1 ml. of the Plant extract in a tube and add 5.0 ml. of Reagent C to all the above test tubes, mix thoroughly and allow it to stand. After 15 minutes add 0.5 ml. of Folin's reagent to all the tubes and shake vigorously. Allow it to stand for 20 minutes. Read OD at 625nm. Plot a standard graph for protein using concentration of protein on X- axis and OD on Y- axis. Calculate amount of proteins / 100 gm plant tissue ⁸.

Estimation of Calcium-Magnesium

Weigh 2grams of plant sample in a conical flask add 40ml of 0.5N HCl and keep the flask on rotary shaker for 1 hour. Filter the extract and then use for titration.

Estimation of Calcium-Magnesium

Take 5ml of liquid extract in a beaker add 5ml of distilled water add 1ml of pH buffer (NH₄Cl-NH₄OH buffer). Titrate the mixture against 0.01N EDTA in presence of EBT indicator End point is from red to blue. Note the burette reading as 'A'.

CALCIUM

Take 5ml of extract in a conical flask add 10ml of distilled water add 2.5ml of 10% NaOH. Add Patton's reeder indicator and titrate against 0.01N EDTA. End point is red to blue. Note the burette reading as 'B'.

CALCULATION

$$\text{Ca-Mg Formula (meq/L)} = \frac{A' \times 0.01 \text{NEDTAX}1000}{\text{Volume of extract}}$$

$$\text{Calcium formula (meq/L)} = \frac{B' \times 0.01 \text{NEDTAX}1000}{\text{Volume of extract}}$$

$$\text{Magnesium (meq/L)} = \text{Ca-Mg} - \text{Ca}$$

Estimation of Vitamin C

First standardize the Indophenol solution with standard Ascorbic acid. Place 2 ml of Ascorbic acid into conical flask, add 5ml TCA reagent and titrate against indophenols solution. The end point is blue to pink. Homogenize, about 5gms material in a mortar using TCA reagent. Shake the mixture thoroughly and make up the volume to 100 ml with TCA. Filter and use the filtrate for the estimation of vitamin “C”. Take 100 ml of the filtrate and titrate rapidly with Indophenol solution. Note the amount of Indophenol reagent required ⁸.

CALCULATION

$$\text{Vitamin C content mg/100g} = \frac{A \times B \times 1000}{W}$$

A = Volume in ml of the Indophenol solution used for titration.

B = Weight in mg of ascorbic acid equivalent to 1ml of the Indophenol solution

W = Weight in gm of the sample taken for the test.

RESULTS

Table 1: Organoleptic Test of Wild and Cultivated Leaves of *Moringa Oleifera*

Sr.no	Parameters	Wild leaf sample	Cultivated leaf sample
1	Colour	Dark green	Light green
2	Odour	Odourless	Odourless
3	Taste	Pungent, Tastless	Bitter

Table 2: Nutritional Parameters of Wild and Cultivated Leaves of *Moringa Oleifera*

SR.NO	PARAMETERS	WILD LEAF SAMPLE	CULTIVATED LEAF SAMPLE	UNITS
1	Moisture Content	7.736	8.083	%
2	Crude Fibre	44.5	26.1	%
3	Protein	168	222	Mg/100gm
4	Iron	20	10	Mg/100gm
5	Vitamin C	56	140	Mg/100gm
6	Calcium	42	55	Meq/L
7	Magnesium	8	5	Meq/L

DISCUSSION

Moringa oleifera Lam. grows in wild too. The leaves and fruit are consumed as vegetables by the local people and aboriginals. Knowing the nutritional value of the leaf the tree is cultivated in many parts of the world. The comparative study of wild and cultivated leaf for its nutritional value is done. The result obtained shows that the moisture content in cultivated leaf is more than the wild leaf. Thus it indicates the wild leaf grow in water stress condition compared to cultivated one. The wild variety of *Moringa oleifera* contains a relatively more amount of crude fibre than the cultivated variety, same goes with the iron content. The cultivated leaf is rich in protein and Vitamin C to certain extends then the wild variety. But both have much more protein than the other leafy vegetables. The leaves are rich in calcium too. The leaf powder is significant in magnesium content also.

Thus, *Moringa oleifera* Lam. is rightly known as the miracle tree since it is a store house of power pack nutrients. Research proves that the leaf powder can be consumed for its rich iron source and high amount of fibre. On the other hand it is also a source of protein for the vegetarians who avoid meat intake. Their protein requirements could be fulfilled if the said leaf intake is incorporated in daily diet. Vitamin C is also fairly available in leaf powder. Macro nutrient Magnesium is a good source from *Moringa* leaf powder. The high fibre contain could help in curing constipation. Hence, the dry leaf powder proves to be a natural supplement to curb malnutrition. The powder could be easily incorporated into our daily cuisine without the change in taste and at

the same time enhancing the nutritional parameters of the dish. Thus the plant if cultivated in stressful condition might encourage the synthesis of nutraceutical required for mankind.

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A STUDY ON THE IMPACT OF FIRE CRACKERS ON THE GROWTH AND CHLOROPHYLL CONTENTS OF TULSI PLANT *OCIMUM SANCTUM L*

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Mumbai – 400097**ABSTRACT**

Ocimum sanctum L., commonly known as “Tulsi” in Hindi or “Tulasi” in Sanskrit and Holy Basil in English, is an aromatic herb belonging to the Lamiaceae family. Native to the Indian subcontinent, it has been utilized in Ayurvedic medicine for over 3,000 years. Within the Ayurvedic system, “Tulsi” is frequently referred to as the “Elixir of Life” due to its reputed therapeutic properties, and it has been recognized for its efficacy in addressing a wide range of common health ailments (Puri & Singh, 2002).

To ensure the proper maintenance of a “Tulsi” plantation in the garden, it is recommended to refrain from setting off fireworks near plants and trees. The pollutants released during fireworks, including toxic gases and chemicals, can significantly impair plant growth and productivity by increasing atmospheric toxicity.

According to the National Botanical Research Institute (NBRI), the emissions from fireworks disrupt the process of gas exchange in plants, specifically reducing the rate at which carbon dioxide is absorbed and water vapor is released through the leaves. Additionally, the plant’s transport systems are affected, impairing the movement of essential minerals, water, and nutrients to the leaves and stems, leading to dehydration. This disruption also disturbs the plant's metabolic processes, further hindering its growth.

In our findings, the control Tulsi plants, which were not exposed to air polluted by firecrackers burning, showed superior growth ($\bar{x} = 26.82$) and higher chlorophyll content ($\sigma = 0.$), emphasizing the beneficial effects of unpolluted air quality (Graph 1, Table 1) (Conti and Díaz, 2013). In contrast, the test Tulsi saplings, which were exposed to the polluted air resulting from firecracker emissions, showed the lowest growth ($\bar{x} = 16.76$) and chlorophyll content ($\sigma = 0.26$), (Graph 2, Table 2).

Keywords: - Ayurveda, Chlorophyll, Environment, Fire crackers, Pollution, Tulsi.

INTRODUCTION

In countries such as India, the use of firecrackers during celebrations like Diwali has raised considerable environmental concerns, as it severely impacts air quality and leads to the accumulation of particulate matter in the atmosphere. This air pollution adversely affects various organisms, including animals, plants, and other living beings, disrupting their life cycles and other biological processes. Firecrackers contain a variety of harmful chemicals, and when ignited, they release toxic fumes that contribute to air pollution and present serious health risks.

The concentrations of air pollutants can increase as follows: sulfur dioxide (SO₂) by a factor of 5.62, nitrogen dioxide (NO₂) by a factor of 3, particulate matter with a diameter of 10 μm (PM₁₀) by a factor of 2.35, and particulate matter with a diameter of 2.5 μm (PM_{2.5}) by a factor of 1.01, compared to typical levels before Diwali (Jamal et al., 2024).

The medicinal plant Tulsi, known for its wide range of health benefits, has gained global popularity. As interest in Ayurveda, the ancient Indian system of medicine, grows, people are increasingly rediscovering the numerous uses and therapeutic qualities of the Tulsi plant.

Mishra (2009), emphasized that bursting crackers near edible plants, such as Tulsi, Curry, and Coriander, should be avoided, as the dust particles and chemicals from fireworks may pose significant health risks upon consumption of these plants.

METHODS AND METHODOLOGY

Tulsi (*Ocimum sanctum*) belongs to the Lamiaceae family. This study aimed to investigate the impact of firecracker-induced air pollution during Diwali on medicinal plants. On October 25, 2024, a total of 10 Tulsi saplings, each approximately 6.5 to 7.0 cm in height, were selected. All essential conditions for plant growth, including air, water, light, and nutrients, were maintained consistently across all samples. The saplings were divided into two groups: 25 plants served as the 'Test' group (labelled T1, T2, T3, etc.), and the other 25 as the 'Control' group (labelled C1, C2, C3, etc.).

For a period of 3 to 4 days, the Test group plants were exposed to air pollution resulting from the burning of firecrackers during Diwali, both in the morning and evening. Meanwhile, the Control group plants were shielded from exposure to firecracker-related air pollution and smoke.

The growth patterns of each plant were monitored regularly on a weekly basis, using specific parameters such as plant height, the number of buds and flowers, and overall development. Additionally, leaf growth was evaluated by counting the number of leaves and measuring their size.

Within one-week, noticeable differences were observed in the leaf colour, plant height, and other growth characteristics. After 15 days, the height of all 50 plants was measured and recorded. The same height measurements were taken again after an additional 15 days. Additionally, chlorophyll content was assessed for both the Test and Control plants. A colorimetric estimation was performed to quantify changes in chlorophyll levels between the Test and Control saplings.

One gram of finely chopped fresh leaves from both the test and control saplings was taken separately and homogenized with 20–40 mL of 80% acetone. The mixture was then centrifuged at 5,000–10,000 rpm for 5 minutes. The supernatant was carefully decanted, and the extraction process was repeated until the residue became colourless. The absorbance of the resulting solution was measured at 645 nm and 663 nm, with acetone serving as the blank solvent.



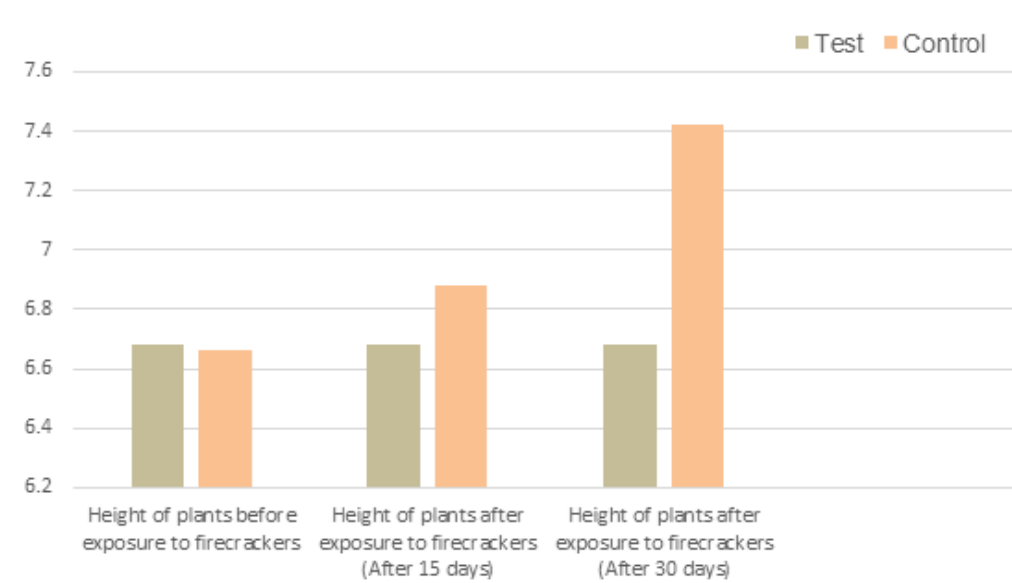
Photoplate 1: Image depicting the test saplings of *Ocimum sanctum* L.



Photoplate 1: Image depicting the control saplings of *Ocimum sanctum*

Table 1: Results of the Impact of Firecrackers on the Growth of Control Saplings (Height Changes) and Test Saplings (No Height Changes) of *Ocimum sanctum* L

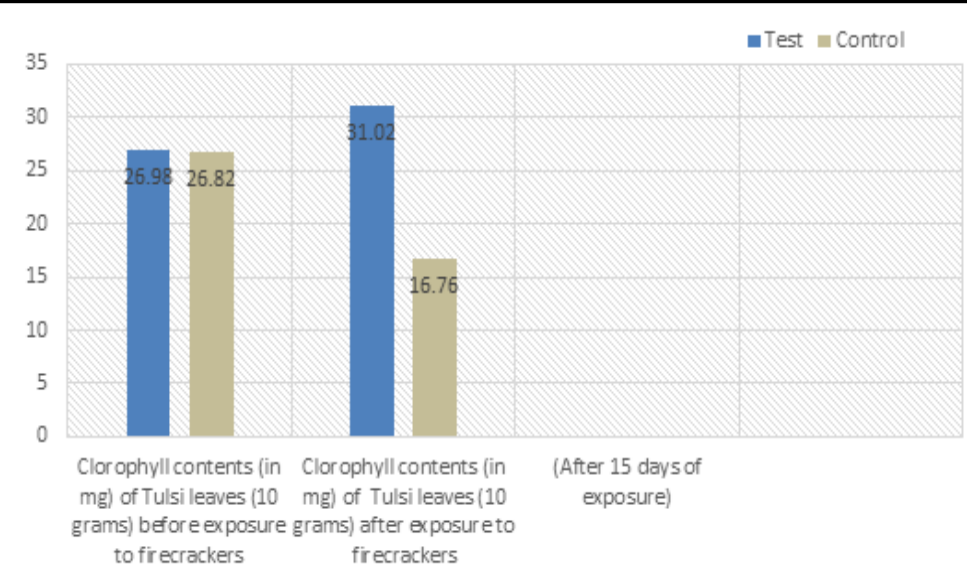
Height of plants before exposure to firecrackers		Height of plants after exposure to firecrackers (After 15 days)		Height of plants after exposure to firecrackers (After 30 days)	
Control	Test	Control	Test	Control	Test
C1 = 6.4 cm	T1 = 6.5 cm	C1 = 6.7 cm	T1 = 6.5 cm	C1 = 7.1 cm	T1 = 6.5 cm
C2 = 6.6 cm	T2 = 6.5 cm	C2 = 6.9 cm	T2 = 6.5 cm	C2 = 7.4 cm	T2 = 6.5 cm
C3 = 6.8 cm	T3 = 7.0 cm	C3 = 6.9 cm	T3 = 7.0 cm	C3 = 7.4 cm	T3 = 7.0 cm
C4 = 7.0 cm	T4 = 7.0 cm	C4 = 7.2 cm	T4 = 7.0 cm	C4 = 7.5 cm	T4 = 7.0 cm
C5 = 6.5 cm	T5 = 6.4 cm	C5 = 6.7 cm	T5 = 6.4 cm	C5 = 7.7 cm	T5 = 6.4 cm
$\sigma = 0.21$	$\sigma = 0.26$	$\sigma = 0.18$	$\sigma = 0.26$	$\sigma = 0.19$	$\sigma = 0.26$



Graph 1: Results of the Impact of Firecrackers on the Growth of Control Saplings and Test Saplings of *Ocimum sanctum* L.

Table 2:- Results of colorimetric estimation to quantify changes in chlorophyll levels between the Test and Control saplings.

Clorophyll contents (in mg) of Tulsi leaves (10 grams) before exposure to firecrackers		Clorophyll contents (in mg) of Tulsi leaves (10 grams) after exposure to firecrackers (After 15 days of exposure)	
Control (mg)	Test (mg)	Control (mg)	Test (mg)
C1 = 26.7	T1 = 26.5	C1 = 30.8	T1 = 14.4
C2 = 27.4	T2 = 26.8	C2 = 31.4	T2 = 17.6
C3 = 27.0	T3 = 27.2	C3 = 30.2	T3 = 17.8
C4 = 27.3	T4 = 27.0	C4 = 31.5	T4 = 17.2
C5 = 26.5	T5 = 26.6	C5 = 31.2	T5 = 16.8
$\bar{x} = 26.98$	$\bar{x} = 26.82$	$\bar{x} = 31.02$	$\bar{x} = 16.76$



Graph 2:- Graphical representation showing the colorimetric estimation of chlorophyll levels between the Test and Control saplings before and after exposure.

RESULTS & DISCUSSIONS

Fireworks contribute to pollution by emitting sulfur dioxide, carbon dioxide, carbon monoxide, suspended particles, aluminum, manganese, and other substances, combined in black smoke composed of potassium nitrate, charcoal, and sulfur (Sijimol and Mohan, 2014). The particulate matter released has a significant and immediate detrimental impact on air quality, though it diminishes rapidly within 24 hours (Singh et al., 2019). Following firework displays, particulate levels can be up to five times higher than background levels (Cao et al., 2018). In New Zealand, a notable increase in particulate matter has been observed after fireworks, with a substantial portion originating from small, handheld sparklers (Rindelaub et al., 2021). Dangi and Bhise (2020) documented multiple respiratory and allergic reactions in residents at a location after Diwali celebrations.

In our findings, the control Tulsi plants, which were not exposed to air polluted by firecrackers, exhibited superior growth ($\bar{x} = 26.82$) and higher chlorophyll content ($\sigma = 0.19$), highlighting the positive effects of unpolluted air quality (Graph 1, Table 1) (Conti and Díaz, 2013). In contrast, the test Tulsi saplings, exposed to the polluted air generated by firecracker emissions, displayed the lowest growth ($\bar{x} = 16.76$) rates and chlorophyll content ($\sigma = 0.26$), (Graph 2, Table 2).

Our results support the hypothesis that the burning of firecrackers significantly impacted the growth and chlorophyll content of the selected Tulsi saplings within the observed time frame. The data suggest that maintaining good air quality plays a crucial role in both the growth and chlorophyll composition of the Tulsi species studied. As studied, the pollutants generated by firecracker combustion altered the growth patterns of the Tulsi plants, likely due to physical stress and the time elapsed after exposure. Further quantitative studies on physiological responses are needed to deepen our understanding of the mechanisms involved in resprouting and their effects on biomass production.

CONCLUSION

A study was conducted to examine the growth and chlorophyll content in Tulsi plants following the Diwali festival. Diwali, one of the most significant festivals in Hindu culture, typically occurs between October and November each year. The analysis revealed that the growth and chlorophyll content of Tulsi plants were significantly reduced in the post-Diwali period (Tables 1 and 2). This study indicates that the burning of firecrackers during Diwali is a major source of air pollution, contributing substantially to the concentration of metals in the atmosphere.

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USING EPIDERMAL STUDIES (TRICHOMES AND STOMATA) OF LEAF TO SOLVE TAXONOMIC PROBLEMS IN SPECIES OF GENUS STERCVLIA, MUMBAI

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ABSTRACT

A study on six *Sterculia* species around Mumbai, including *Sterculia urens*, *Sterculia villosa*, *Sterculia foetida*, *Sterculia guttata*, *Sterculia colorata*, and *Sterculia alata*, aimed to enhance morphological character identification through leaf anatomy. Light microscopy analysis of cleared and stained leaves assessed qualitative (trichome and stomata types) and quantitative (trichome measurements, stomata size) parameters. The study identified distinct taxonomic features, such as biserriate non-glandular trichomes in *Sterculia foetida* and brachi-paracytic stomata in *Sterculia colorata*. Amphistomatic stomata positioning in *Sterculia urens* and *Sterculia villosa* was also noted. These findings aid in accurate species identification and expand our understanding of *Sterculia*.

Keywords: *Sterculia*, Trichomes, Stomata, Artificial Yoked key

INTRODUCTION

Genus *Sterculia* Linn., mainly consists of trees and rarely shrubs, distributed throughout the Asia. It is native to the tropics of both hemispheres, but especially abundant in tropical of South-East Asia. In all total 60 species are found in India [1] and total 8 species are found in Maharashtra [2] and out of which 6 are native to Mumbai [3]. The Genus *Sterculia* Linn., consists of economically important plants e.g. *S. urens*, is the source of Karaya gum or Kaday gum, which is of considerable commercial and industrial importance. Many sp. Notably *S. foetida*, yield seeds, rich in fatty oils and minor gums and blast fibers. Several species *S. guttata*, *S. villosa* and *S. colorata* are fiber yielding used in cloths, ropes and cordages respectively [4], [5]. Several species are also used as fodder and grown in gardens for their handsome foliage and attractive fruits [6].

Most of the species of the Genus *Sterculia* Linn., are tall trees and plant is mainly in its vegetative condition and bears flowers or fruits hardly form 1 or 2 month [2] and even if present they are mostly alike. The morphological characters are similar and these factors contribute to difficulties in classification and identification, Therefore further studies are required in order to enhance the knowledge on these genera. Anatomical evidences are needed in addition to leaf morphological characteristics for species identification [7], [8], [9], [10].

Anatomical studies are useful in solving various kinds of taxonomical problems in today's world. Leaf anatomy, especially epidermal analysis is an efficient tool in taxonomic determination, supplying excellent differences in characters such as trichomes, Stomata, Leaf architecture, etc. are useful, as they are highly, meaningful in vascular plant Taxonomy [11], [12].

The aim of this work is to solve the taxonomic problems regarding identification in vegetative state by using leaf anatomical characters as an alternative tool for artificial key preparation.

METHODOLOGY

Fresh leaves were collected from various locations: *Sterculia urens* Roxb. from SGNP in Borivali; *Sterculia villosa* Roxb. from Aarey Milk Colony in Goregaon; *Sterculia foetida* Linn. from Mithibai College in Vile Parle; *Sterculia guttata* Roxb. from Kalva Mountain in Kalva; *Sterculia colorata* Roxb. from SGNP in Borivali; and *Sterculia alata* Roxb. from Rani Bagh in Byculla. The plants were accurately identified with the help of the Flora of the Bombay Presidency. The leaves were cleared, stained, and prepared as permanent slides [13], [14], [15], [16]. Trichomes and stomata were analyzed under light microscopy using MIPS, with measurements taken using an ocular and stage micrometer. Studies included presence/absence, measurement, and types of trichomes and stomata, based on established methodologies [17], [18], [19], [20], [21].

OBSERVATION**Macroscopic Characters of leaves**

Sterculia foetida has digitate leaves crowned at the end of branches with 5-9 lanceolate leaflets that are dark green on the upper surface and light green on the lower surface. The leaves are 10-15 cm long and 3-5 cm wide, with a cuneate base, entire margins, uncostate reticulate venation converging, and an acute or acuminate apex. The leaf surface is glabrous on both sides.

Sterculia urens features palmately lobed leaves crowded at the ends of the branches. The leaf color is dark green on the upper surface and yellowish green on the lower surface. The leaves are 19-25 cm long and 20-26 cm

wide, with a cordate base, entire margins, multicostate reticulate venation divergent, and a caudate-acuminate apex. The leaf surface is glabrous on the upper side and velvety on the lower side.

Sterculia villosa also has palmately lobed leaves that are crowded at the ends of the branches. The leaf color is green on the upper surface and whitish green on the lower surface. The leaves are 17-22 cm long and 22-32 cm wide, with a broadly cordate base, entire margins, multicostate reticulate venation divergent, and a caudate apex. The leaf surface is velvety on the upper side and pubescent on the lower side.

Sterculia guttata has simple, ovate leaves that are light green on both surfaces. The leaves are 10-17 cm long and 7-10 cm wide, with a rounded or sub-cordate base, entire margins, unicostate reticulate venation converging, and an acute-acuminate apex. The leaf surface is glabrous on the upper side and pubescent on the lower side.

Sterculia colorata features palmately lobed leaves that are crowded at the ends of the branches. The leaf color is dark green on the upper surface and green on the lower surface. The leaves are 10-17 cm long and 12-15 cm wide, with a deeply cordate base, entire margins, multicostate reticulate venation divergent, and an acuminate apex. The leaf surface is pubescent on both sides.

Lastly, *Sterculia alata* has simple, broadly ovate leaves that are crowded at the ends of the branches. The leaf color is green on both surfaces. The leaves are 13-35 cm long and 10-17 cm wide, with a truncate or cordate base, entire margins, unicostate reticulate venation converging, and an acute or shortly acuminate apex. The leaf surface is glabrescent on both sides.

Microscopic Characters of leaves

Sterculia foetida Linn. presents three types of trichomes on its leaves. These include a single type of glandular trichome and two types of non-glandular trichomes. The glandular trichome is multicellular with a single stalk and a two-celled head, primarily located on the veined parts and lower leaf surface (Fig 15). The first type of non-glandular trichome is a macroscopic single-celled solid structure found on the margin and mid-rib region. The second type is a characteristic multicellular trichome with 25-50 cells, biseriate, ending in a long single cell, more abundant on the lower epidermis (Fig 16). The epidermal cells of *S. foetida* are polygonal and irregularly arranged. The anomocytic stomata are hypostomatic, located on the non-veined leaf parts (Fig 38).

***Sterculia urens* Roxb. has four types of trichomes on its surface:** two glandular and two non-glandular. The first glandular trichome is balloon-like, 16-30 celled, and distinctive in both *S. urens* and *S. villosa* (Fig 19). The second glandular trichome is circular and consists of 4-5 cells (Fig 20). Both types are located on the veined parts, mainly on the lower epidermis. The non-glandular trichomes include a single-celled type (Fig 21) and a cluster type with 6-8 trichomes, longer on the lower epidermis. The epidermal cells are polygonal and regularly arranged. Anomocytic stomata, amphistomatic in position, are found on non-veined areas (Fig 39).

***Sterculia villosa* Roxb. exhibits three types of trichomes:** two glandular and one non-glandular. The non-glandular trichome is unicellular, densely populating the lower surface, especially around the midrib (Fig 26). The first glandular trichome is balloon-like, 16-30 celled, found more on the upper surface (Fig 24). The second glandular trichome is circular, 3-4 celled with a single stalk cell (Fig 25). The epidermal cells are polygonal and regularly arranged. Anomocytic stomata, amphistomatic, are located on non-veined regions (Fig 40).

***Sterculia guttata* Roxb. has two types of trichomes:** one glandular and one non-glandular, both only on the lower epidermis. The non-glandular trichome is unicellular (Fig 30). The glandular trichome is tuber-shaped and multicellular (Fig 29). The epidermal cells are polygonal and regularly arranged, elongated over veined regions. Anomocytic stomata are hypostomatic, not present on veined areas (Fig 41).

***Sterculia colorata* Roxb. features two trichome types:** one glandular, which is multicellular with a three-celled head and a single stalk, circular in shape (Fig 33), and one non-glandular, multicellular branched stellate trichome (Fig 34). The glandular trichome is found on the lamina area and veined parts, while the non-glandular trichome is present in the midrib region. The epidermal cells are polygonal and regular, elongated over veined regions. Brachyparacytic stomata are hypostomatic, found on non-veined areas (Fig 42).

Sterculia alata Roxb. has glandular trichomes only, which are multicellular with a five-celled head and a single stalk cell, more abundant on the lower surface (Fig 37). The epidermal cells are polygonal, regularly arranged, and elongated over veined areas. Anomocytic stomata are hypostomatic, present on both veined and non-veined regions (Fig 43).

The table 1 & 2 shows all the measurements of trichomes and stomata in detail.

RESULTS

Artificial Key for the identification of *Sterculia* taxa based on epidermal characters,

Indented Or Yoked Key.

Trichomes are Glandular and Non-Glandular, present	
Stomata Brachyparacytic type.....	<i>S. colorata</i>
Stomata Anomocytic type.	
Inflated Glandular Trichomes, Present	
Clustered Trichomes absent.....	<i>S. villosa</i>
Clustered Trichomes present.....	<i>S. urens</i>
Inflated Glandular Trichomes, Absent	
Multicellular Biserrate Trichomes are present.....	<i>S. foetida</i>
Multicellular Biserrate Trichomes, absent.....	<i>S. guttata</i>
Trichomes Glandular only	
	<i>S. alata</i>

TRICHOMES

All *Sterculia* species, including *Sterculia urens*, *Sterculia villosa*, *Sterculia foetida*, *Sterculia guttata*, *Sterculia colorata*, and *Sterculia alata*, exhibit distinct glandular trichomes. *Sterculia foetida* features non-glandular, biserrate trichomes. *Sterculia villosa* and *Sterculia urens* have balloon-shaped glandular trichomes, differing in their epidermal distribution and the clustering of unicellular trichomes. *Sterculia guttata* is characterized by tubular glandular trichomes, while *Sterculia colorata* has stellate hairs on the mid-rib and margins. *Sterculia alata* shows a single type of glandular trichome. Each species demonstrates unique trichome morphology, highlighting the diversity within the *Sterculia* genus.

STOMATA

In *Sterculia* species, stomata are predominantly of the anomocytic type, except in *Sterculia colorata*, which features brachiparacytic stomata. Stomatal distribution varies: in *Sterculia urens*, stomata are widely spaced, whereas in *Sterculia villosa*, they are closely packed. *Sterculia urens* and *Sterculia villosa* have amphistomatic positioning, while *Sterculia foetida*, *Sterculia guttata*, *Sterculia colorata*, and *Sterculia alata* exhibit hypostomatic distribution.

CONCLUSION

The six *Sterculia* species (*Sterculia urens*, *Sterculia villosa*, *Sterculia foetida*, *Sterculia guttata*, *Sterculia alata*, *Sterculia colorata*) share similar morphological features, such as palmate-lobed leaves and multicostate reticulate venation, making vegetative identification challenging. Leaf epidermal studies aid in distinguishing them. Consistent anatomical traits include circular glandular trichomes and anomocytic stomata, while distinctive features, like brachiparacytic stomata in *Sterculia colorata* and biserrate non-glandular trichomes in *Sterculia foetida*, serve as taxonomic markers. This research enhances our understanding of *Sterculia* around Mumbai, and further studies of vegetative and reproductive organs are needed to expand knowledge on the genus.

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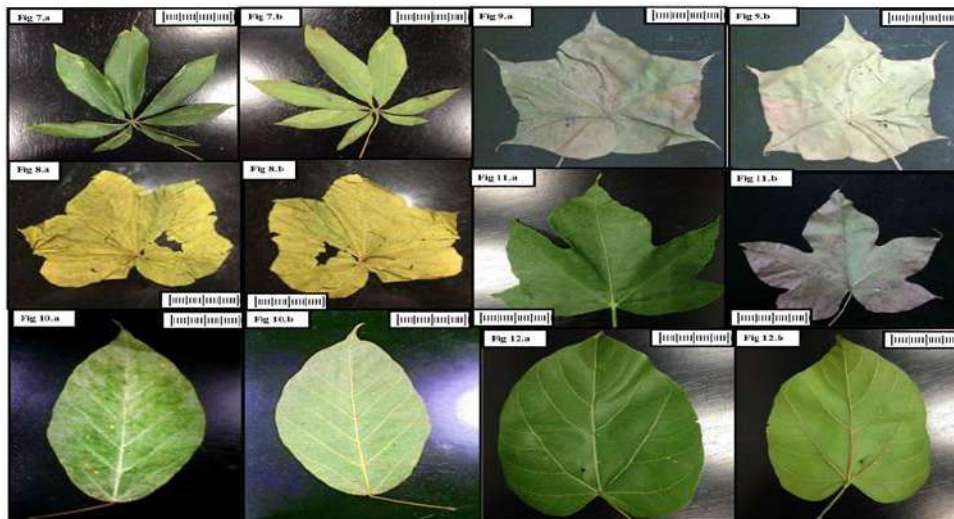
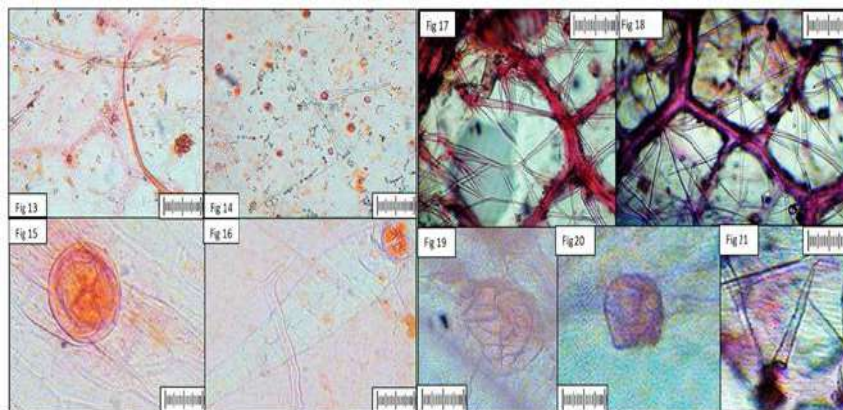
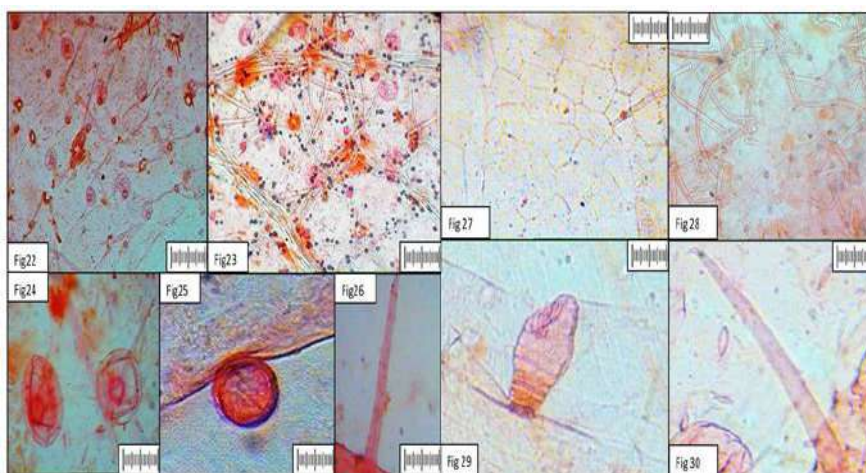


Fig 7: *Sterculia foetida* Linn, **Fig 8:** *Sterculia urens* Roxb, **Fig 9:** *Sterculia villosa* Roxb, **Fig 10:** *Sterculia guttata* Roxb, **Fig 11:** *Sterculia colorata* Roxb, **Fig 12:** *Sterculia alata* Roxb (Key: a- upper, b- lower),



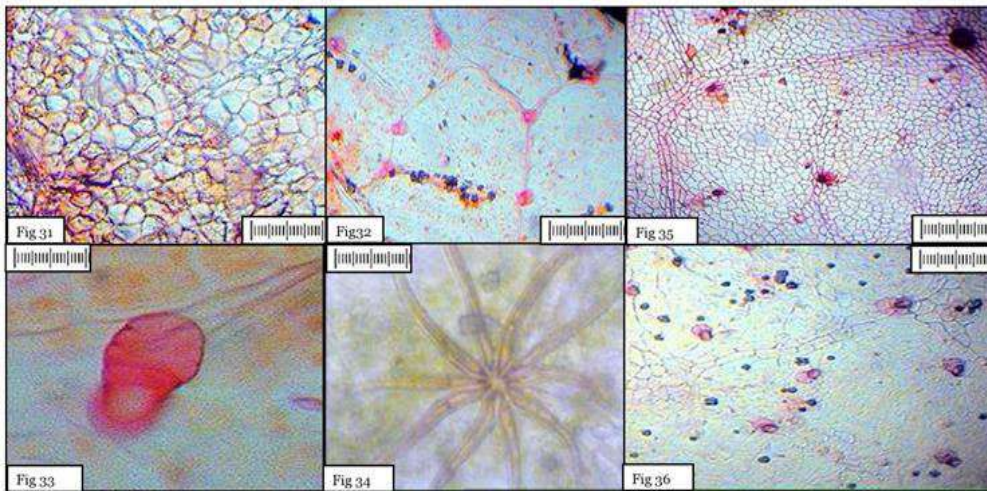
Sterculia foetida Linn- **Fig 13-** Upper epidermis (X100), **Fig 14-** Lower epidermis(X100), **Fig 15-** Glandular trichomes(X400), **Fig 16-** Non- Glandular trichomes(X400).

Sterculia urens Roxb **Fig 17-** Upper epidermis (X100), **Fig 18-** Lower epidermis(X100), **Fig 19-** Inflated glandular trichomes (X400), **Fig 20-** Small glandular trichomes(X400), **Fig 21-** Non- glandular trichomes (X400).



Sterculia villosa Roxb. **Fig 22-** Upper epidermis (X100), **Fig 23-** Lower epidermis (X100), **Fig 24-** Inflated glandular trichomes (X400), **Fig 25-** Small glandular trichomes(X400), **Fig 26-** Non- glandular trichomes (X400).

Sterculia guttata Roxb **Fig 27-** Upper epidermis (X100), **Fig 28-** Lower epidermis (X100), **Fig 29-** Glandular trichomes (X400), **Fig 30-** Non- glandular trichomes (X400).



Sterculia colorata Roxb .**Fig 31-** Upper epidermis (X100), **Fig 32-** Lower epidermis (X100), **Fig 33-** Glandular trichomes (X400), **Fig 34-** Non- glandular stellate trichomes (X400).

Sterculia alata Roxb .**Fig 35-** Upper epidermis (X100), **Fig 36 -** Lower epidermis(X100)

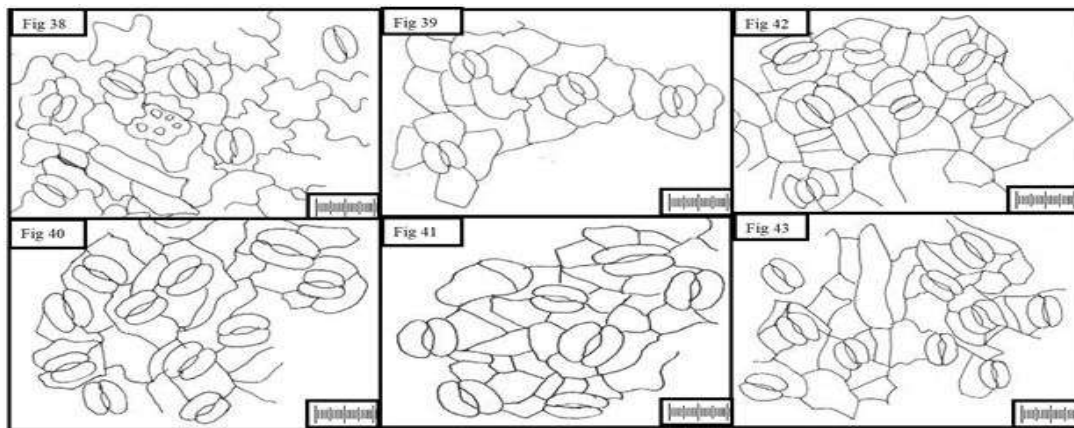


Fig 38- *Sterculia foetida* Linn. (Anomocytic type), **Fig 39-***Sterculia urens* Roxb.(Anomocytic type),**Fig 40-** *Sterculia villosa* Roxb.(Anomocytic type), **Fig 41-** *Sterculia guttata* Roxb.(Anomocytic type), **Fig 42-** *Sterculia colorata* Roxb.(Brachyparacytic type) , **Fig 43-** *Sterculia alata* Roxb.(Anomocytic type).

Table 1: Measurements of Trichomes

Sr No.	Name	Type	Magnification	Trichomes Measurements (µm)			
				Upper		Lower	
				Length	Breadth	Length	Breadth
1.	<i>S.foetida</i>	Gl	X 400	58-73	30-58	60-90	54-80
		N-Gl Uni	X 400	580-620	12-30	590-720	15-23
		N-Gl Mutli	X 100	300-580	32-46	396-516	36-50
2.	<i>S.urens</i>	Small Gl	X 400	30-50	26-48	36-60	30-58
		Large Gl	X 400	90-120	86-118	90-132	80-120
		N-Gl Uni	X 400	30-94	13-20	48-150	18-26
		N-Gl Clu	X 100	245-559	18-23	432-792	23-37
3.	<i>S.villosa</i>	Small Gl	X 400	50-68	44-50	60-72	48-60
		Large Gl	X 400	92-140	88-150	90-150	90-146
		N-Gl Uni	X 400	200-340	18-26	240-540	16-28
4.	<i>S.guttata</i>	Gl	X 400	Ab	Ab	42-144	36-60
		N-Gl Uni	X 100	Ab	Ab	240-960	20-36
5.	<i>S.colorata</i>	Gl	X 400	36-82	36-62	48-90	48-60
		Ste	X 400	Ab	Ab	12-210	25-40
6.	<i>S.alata</i>	Gl	X 400	54-80	42-58	60-96	48-60

Key: Gl- Glandular Trichomes, N-Gl- Non-Glandular Trichomes, Uni- Unicellular, Multi- Multicellular, Ste- Stellate, Clu- Clusters, Ab- Absent.

Table 2: Measurements of Stomata

Srn No.	Name	Type	Position	Magnification	Stomata Measurements (µm)			
					Lower		Upper	
					Length	Breadth	Length	Breadth
1.	<i>S. foetida</i>	Ano	Hyp	X 400	Ab	Ab	36-48	30
2.	<i>S. urens</i>	Ano	Amp	X 400	36-48	24	36-48	24
3.	<i>S. villosa</i>	Ano	Amp	X 400	42-48	30-36	40-46	24-36
4.	<i>S. guttata</i>	Ano	Hyp	X 400	Ab	Ab	30-48	24-36
5.	<i>S. colorata</i>	Brp	Hyp	X 400	Ab	Ab	42-54	30
6.	<i>S. alata</i>	Ano	Hyp	X 400	Ab	Ab	36-42	24

Key: Ano- Anomocytic, Bra- Brachiparacytic, Hyp- Hypostomatic, Amp- Amphistomatic, Ab- Absent.

ENVIRONMENT SUSTAINABILITY: REDUCING POWER CONSUMPTION & CARBON EMISSION BY CLOUD COMPUTING**Mr. Ashish Shah¹ and Mr. Raviprakash Jaiswal²**¹Assistant Professor, Kelavani Mandal's Jashbhai Maganbhai Patel College of Commerce, Goregaon West, Mumbai – 400104²Assistant Professor, A.B.V.M. Agrawal Jatiya Kosh's Ghanshyamdas Jalan College of Science, Commerce & Arts, Upper Govind Nagar, Malad (East), Mumbai 400097**ABSTRACT**

The concept of cloud computing allows for easy, on-demand network access to a shared pool of reconfigurable computing resources (such as servers, networks, storage, apps, and services) that can be quickly provisioned and released with little involvement from service providers or management staff. However, data centers' energy usage has skyrocketed due to the growing demand for cloud infrastructure, which has become a serious problem. Cloud computing makes use of numerous current technologies, including web browsers, web services, and virtualization, which helps cloud environments develop. As a result, every flaw in these technologies also impacts the cloud, and it may even have a major effect. Data-centers can use a lot of energy and produce a lot of carbon dioxide because of their numerous pieces of equipment.

There could be hundreds or thousands of networked computers in a cloud data-center, along with the associated networking and storage subsystems, power distribution and conditioning apparatus, and cooling infrastructures.

Despite widespread community concerns that cloud computing may lead to increased energy consumption by data-centers, cloud computing offers several benefits. In order to enable green cloud computing, this study focuses on the several aspects of clouds that contribute to overall energy usage, how these issues are resolved in real-world scenarios, and the implications of these solutions for future research areas. The four essential elements that allow cloud computing to reduce energy consumption and carbon emissions—dynamic provisioning, multi-tenancy, server utilization, and data center efficiency—are also covered.

1. INTRODUCTION

Data center strategies are being re-evaluated by IT professionals to see if energy efficiency should be included in the list of essential operating characteristics.

Concerning issues include:

- Cutting down on power and cooling expenses and data center energy use.
- Data access and security must be easier and more effective to handle.
- During periods of power surge or drain, critical business functions must continue to function.

More businesses are implementing green computing plans for IT budget management, energy efficiency, and business operations as a result of these problems. Green computing is increasingly seen as a key strategy for improving the IT environment for both environmental preservation and business financial success. It's

2. OBJECTIVES OF THE STUDY

- (i) To study the factors associated with carbon emission by cloud computing.
- (ii) To study the framework to implement green cloud computing in cloud computing to reduce energy consumption and carbon emissions.

3. RESEARCH METHODOLOGY

Data has been collected through secondary data. It was referred to through various journals.

DATA-CENTER

Cloud data-centers differ significantly from conventional hosting establishments. There could be hundreds or thousands of networked computers in a cloud data-center, along with the associated networking and storage subsystems, power distribution and conditioning apparatus, and cooling infrastructures. Data-centers can have enormous energy consumption and carbon emissions due to their numerous pieces of equipment.

According to Environmental Protection Agency (EPA) report, following is the Power Consumption Percentage by Data-center Device:

- a. Approximately 40% power consumption are due to Cooling device

b. 30%-32% by I.T. Equipment

c. 20%-28% by Electrical Equipment

4. FINDINGS OF THE STUDY:

4.1. Necessity of Cloud Computing Through Greening Technology:

A cloud computing system that is both scalable and efficient is desperately needed. This is caused by the growing need for more processing power, which is being offset by the ongoing increase in both economic and environmental use costs. Businesses and institutions will need to adapt to these demands in a setting that is changing quickly. We introduce a new framework for green computing that is used in the cloud to achieve the objective of lowering power usage. This framework is intended to outline effective resource management for computing, and cloud systems can benefit from the adaptation and application of green computing technology.

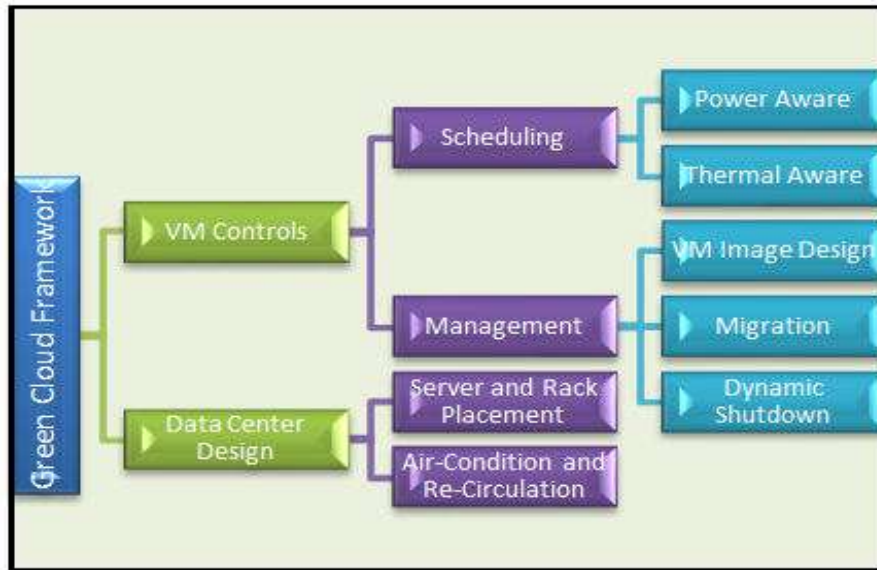


Fig 1: Green Cloud Framework

Performance per watt in a cloud is maximized via the Green Cloud framework. The main topics include sophisticated data center design, VM image management, and scheduling. It extends the framework's functionality.

The framework extends the functionality of virtual machines in a cloud setting to provide a more effective scheduling system for virtual machines. In order to minimize the Cloud's running expenses, the Scheduling section deals with the placement of virtual machines (VMs) within the Cloud infrastructure. Either the server equipment's power or the data center's general temperature was optimized to achieve this.

4.2. Cloud Architecture under Green Effect:

As previously mentioned, cloud computing platforms, as the next generation of IT infrastructure, allow businesses to simplify management, speed up reaction to business dynamics, and consolidate computer resources.

The two main obstacles to successfully running a cloud computing system are increasing resource utilization and lowering power usage. We created the Green Cloud architecture and associated Green Cloud exploratory system to address these issues. Through the use of Virtual system live migration, the exploratory system is able to dynamically adjust workload and resource utilization by monitoring a number of system parameters and performance metrics, such as application workload, resource utilization, and power consumption. Thus, in a cloud computing environment, latest architecture reduces needless power use.

Applications with variable workloads, resources, devices, virtual machines, and remote instructions on virtual machines are all included in the managed environment.

4.3. Improving In Schedule and Working of Virtual System:

New virtual systems are made to do certain tasks in a lot of service-oriented scientific cloud architectures. The concept is comparable to sandboxing in a following controlled setting.

4.3. A. APPLY SUITABLE ALGORITHM FOR VIRTUAL SYSTEM:

As suggested below, algorithm must be implemented for assigning virtual system:

```

Ctr =0
While ctr <= poolingdo
  _PEI = QTY core_system in poolingend do
ctr2=0
ctr3=0
While ctr2 <= queue_processdo
  ver_system=queue [ctr2]
  If process exists on queue [ctr3]
  Schedule_new_ver_system on queue [ctr3] end if
  ctr3=ctr3+1end do

```

4.3. B. MANAGEMENT OF VIRTUAL SYSTEMS:

Another crucial element of Green Cloud architecture is the management of Virtual system images. The usage of cloud-based virtualization technologies opens up a number of new techniques. Idle physical computers in a cloud can be dynamically shut down and restarted to conserve energy during low load times. Turning off underutilized machines won't affect power usage because all units will be running at maximum load. However, in reality, clouds rarely run at full capacity because this could result in a decline in service quality. Therefore, rapid dynamic shutdown and start-up of physical computers could have a big impact on power utilization, depending on the Cloud's load at any given time.

It is simple to monitor and implement this control as a daemon that runs on the scheduler or Cloud head node. This clearly illustrates the objective of the Green Cloud Framework, whereas any one power-saving method can be useful, a well-thought-out systems-level combination of several methods can result in large power savings above their separate implementations.

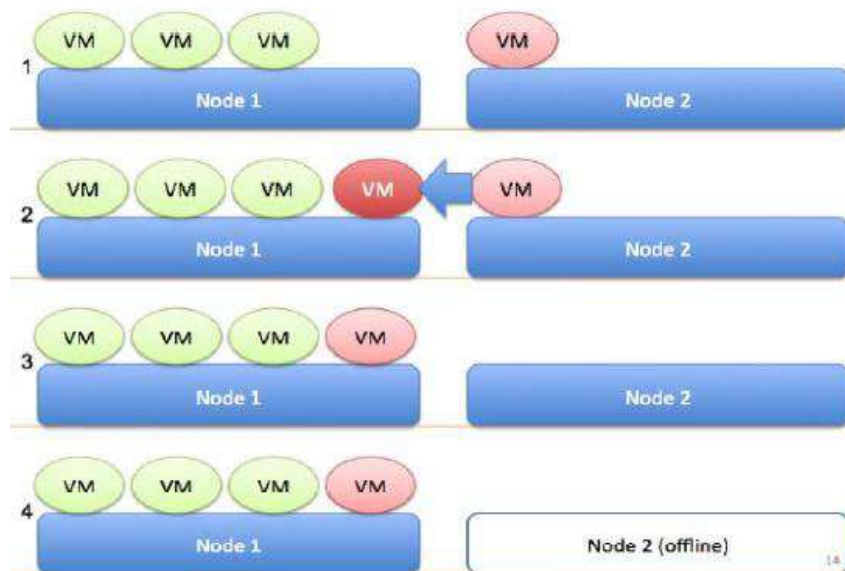


Fig 2: Virtual Machine Management Dynamic Shutdown Technique

4.3. C. UTILIZING IMAGE OF SERVICES PROVIDED BY VIRTUAL SYSTEM:

Virtual system scheduling and management are essential in a private cloud environment, but it's also critical to comprehend what is being scheduled. These Virtual system instances have significantly more than is required to support a wide variety of hardware software and various user tasks. Although this is ideal for a desktop-based environment, it wastes time and energy in a server-based system. A hypervisor assigns the same virtualized hardware to each virtual machine, which is often made for a particular task. Instead of a complete desktop/application suite, we essentially want the operating system running in the Virtual system (VM) to act as a thin wrapper that supports a small number of specialized yet complex tasks or services. Therefore, the vast majority of modern functioning

5. CONCLUSION

The question of whether cloud computing is actually environmentally beneficial has been raised by its financial potential as well as its contribution to the increase of carbon emissions associated with ICT. Data-centers already produce 7.8 billion tons of CO₂ yearly, and between 2002 and 2020, their environmental impact is predicted to triple. Some research on green IT study of clouds and data-centers claim that cloud computing is "green," whereas others forecast a surprising increase in carbon emissions. Therefore, I started by examining the fundamental definitions, benefits, end-user services, and deployment architecture of cloud computing in order to analyze its advantages. We also talked about a number of studies and technological advancements that improve the energy efficiency of different cloud components.

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COMPARATIVE STUDY OF PHYSICO- CHEMICAL PARAMETERS OF JUHU BEACH AND BANDSTAND BEACH: POLLUTION PERSPECTIVE

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ABSTRACT

In Mumbai, Maharashtra, Ganesh Chaturthi is one of the most widely celebrated festivals, during which numerous idols are immersed in water bodies. Traditionally, idols were crafted from biodegradable materials such as clay, mud, natural colors, and crystals. However, in recent years, harmful substances like Plaster of Paris (POP), oils, and chemically prepared paints have been increasingly used, contributing to bioaccumulation in aquatic organisms. This study examines various physico-chemical water parameters, including temperature, pH, total alkalinity (TAL), total acidity (TAC), biochemical oxygen demand (BOD), hardness, and the levels of nitrates and phosphates, both before and after idol immersion at two locations in Mumbai: Juhu Beach and Bandstand Beach. The research indicates significant changes in these parameters, with a marked increase in pollution levels post-immersion, negatively affecting aquatic life, habitats, and the aquatic food chain. As the number of idols immersed in water bodies continues to rise, there is an urgent need to address water pollution. Implementing appropriate measures for idol immersion could help mitigate the harmful impact on the aquatic ecosystem. In four samples (2 before and 2 after immersion of lord Ganesha), two or more parameters have been found to exceed the permissible limits of WHO for water.

Keyword: Aquatic Flora, Chemical Parameters, Physical Parameters, Pollution, Water Quality.

INTRODUCTION

Water is a vital resource that sustains all forms of life on Earth. Ganesh Chaturthi, a major and widely celebrated festival in Mumbai, is marked by the immersion of numerous idols, providing an ideal opportunity to assess the impact on water quality [1,4,5]. Similar practices occur during festivals like Durga Puja in Bengal, where idols are immersed in water at the conclusion of the celebrations. These traditions, which vary across different regions of India, carry distinct cultural and religious importance. However, human activities have contributed to the degradation of natural ecosystems, leading to a loss of biodiversity. According to the BMMC, over 62,000 idols were immersed during Ganesh Chaturthi in 2024 [7].

These pollutants can severely harm the aquatic ecosystem, causing a significant decline in water quality and disrupting the ecological balance, which negatively affects aquatic organisms. The detrimental effects of Plaster of Paris (PoP) idols on marine ecosystems are well-documented. PoP, derived from gypsum (calcium sulfate), increases both water hardness and sulfate levels, which can severely disturb aquatic environments. Moreover, the paints used on these idols often contain toxic heavy metals such as lead, mercury, and cadmium, which can leach into the water, resulting in bioaccumulation and posing serious health risks to marine life [1,8,9].

Juhu Beach and Bandstand Beach are two of the most popular beaches in Mumbai. This study was conducted to examine various physico - chemical parameters at Juhu Beach (Andheri) and Bandra Bandstand following the immersion of Ganesh idols during Ganesh Chaturthi [11]. The primary objective of the research was to assess the impact of idol immersion and its detrimental effects on the aquatic ecosystem [5, 6].

MATERIALS AND METHODS

The levels of pollution can be evaluated by conducting a comparative analysis of physico-chemical water parameters measured before and after the immersion of idols in the aquatic environment. The parameters selected for this study include pH, nitrates, phosphates, hardness, chemical oxygen demand (COD), biochemical oxygen demand (BOD), acidity, and alkalinity. Water samples were collected from Juhu Beach and Bandstand Beach before the Ganesh Chaturthi immersion on September 19th, with temperatures of 32°C and 31°C, respectively. Post-immersion samples were taken on September 30th [1,3].

Samples were collected before and after immersion from the surface of both water bodies in pre-rinsed glass bottles with rubber caps. Two sample bottles were collected during each visit, and the weather and ambient temperature were recorded to assist in the analysis of water quality. Formaldehyde was added to the first bottle from each water body to suspend biological processes, as it is toxic to microbes [3]. The second bottle from each water body was treated with Winkler's A and Winkler's B reagents to fix and measure dissolved oxygen (DO). Appropriate precautions were taken during the sample collection process to ensure accuracy.

RESULTS & DISCUSSIONS

The results for the physico-chemical parameters of the sample water were analysed for the deviation between the values before immersion and after immersion (Table 1, Graph-plate 1)

Temperature:-

The temperature of the Juhu Beach sample before immersion was 32°C, while the Bandstand Beach sample was 25.9°C. After immersion, the temperature of the Juhu Beach sample increased to 35°C, and the Bandstand Beach sample raised to 25.15°C.

Conductivity:-

The conductivity of the Juhu Beach sample was 34.3 mS before immersion, and it increased to 35.9 mS after immersion. For the Bandstand Beach sample, the conductivity was 31.6 mS before immersion, rising to 34.8 mS after immersion.

pH:-

The pH value of the Juhu Beach sample was 7.18 before immersion, and it decreased to 6.12 after immersion. For the Bandstand Beach sample, the pH was 7.10 before immersion, and it dropped to 5.72 after immersion.

Hardness:-

The hardness level in the Juhu Beach sample was 4400 mg/L before immersion, increasing to 5900 mg/L after immersion. In the Bandstand Beach sample, the hardness was 3800 mg/L before immersion, rising to 4900 mg/L after immersion.

Dissolved Oxygen (DO):-

The dissolved oxygen (DO) level in the Juhu Beach sample was 7.528 mg/L before immersion, and it decreased to 4.432 mg/L after immersion. In the Bandstand Beach sample, the DO level was 6.558 mg/L before immersion, and it dropped to 3.225 mg/L after immersion.

Alkalinity:-

The Total Alkalinity (TAL) at Juhu Beach was initially 200 mg/L, while at Bandstand Beach, it was 145 mg/L. Following the immersion activity, the TAL values increased to 271 mg/L at Juhu Beach and 203 mg/L at Bandstand Beach.

Acidity:-

The Total Acidity (TAC) at Juhu Beach was initially 200 mg/L, while at Bandstand Beach, it was 105 mg/L. Following the immersion activity, the TAC values increased to 298 mg/L at Juhu Beach and 165 mg/L at Bandstand Beach.

Biochemical Oxygen Demand (BOD):-

The value of Biochemical Oxygen Demand (BOD) of Juhu beach was 3.4 mg/L and the value of Biochemical Oxygen Demand (BOD) of Bandstand beach was 4.1 mg/L. After immersion, the BOD levels increased to 4.1 mg/L at Juhu Beach and 4.5 mg/L at Bandstand Beach.

Nitrates:-

The nitrate concentration at Juhu Beach was 0.37 mg/L, while at Bandstand Beach, it was 0.26 mg/L before immersion. After immersion, the nitrate levels increased to 0.45 mg/L at Juhu Beach and 0.31 mg/L at Bandstand Beach.

Phosphate:-

After immersion, the phosphate concentration at Juhu Beach was measured at 0.93 mg/L, while at Bandstand Beach was recorded at 0.79 mg/L. Prior to immersion, these values were 0.72 mg/L and 0.69 mg/L, respectively.

Table 1: Displays the values of physico-chemical parameters measured before and after the immersion of the Ganesha idol at Juhu and Bandra Bandstand Beaches.

Sr. No.	Parameters	Juhu Beach		Bandstand Beach	
		Before Immersion	After Immersion	Before Immersion	After Immersion
01	Temperature (°C)	32°C	35°C	25.9°C	25.15°C
02	Conductivity (mS)	34.3 mS	35.9 mS	31.6 mS	34.8 mS
03	pH	7.18	6.12	7.10	5.72
04	Hardness (mg/L)	4400	5900	3800	4900
05	Dissolved Oxygen	7.528	4.432	6.558	3.225

	(mg/L)				
06	Total Alkalinity (TAL) (mg/L)	200	271	145	203
07	Total Acidity (TAC) (mg/L)	200	298	105	165
08	Biochemical Oxygen Demand (mg/L)	3.4	4.1	4.1	4.5
09	Nitrates (mg/L)	0.37	0.45	0.26	0.31
10	Phosphates (mg/L)	0.72	0.93	0.69	0.79

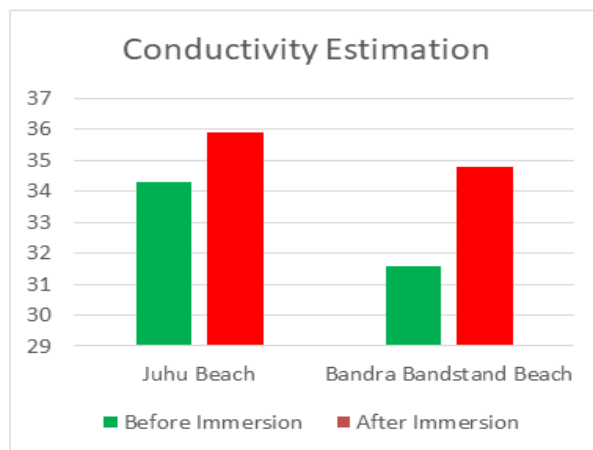
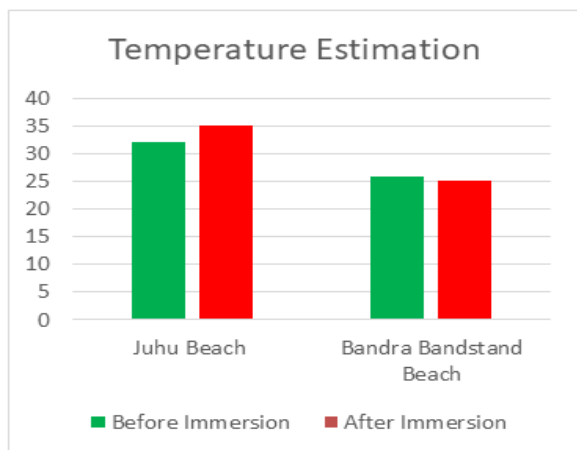
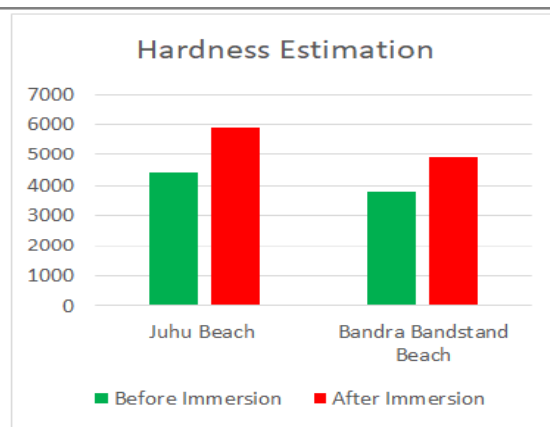
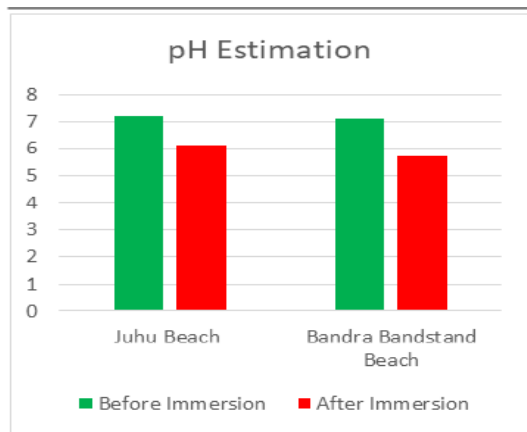
DISCUSSIONS

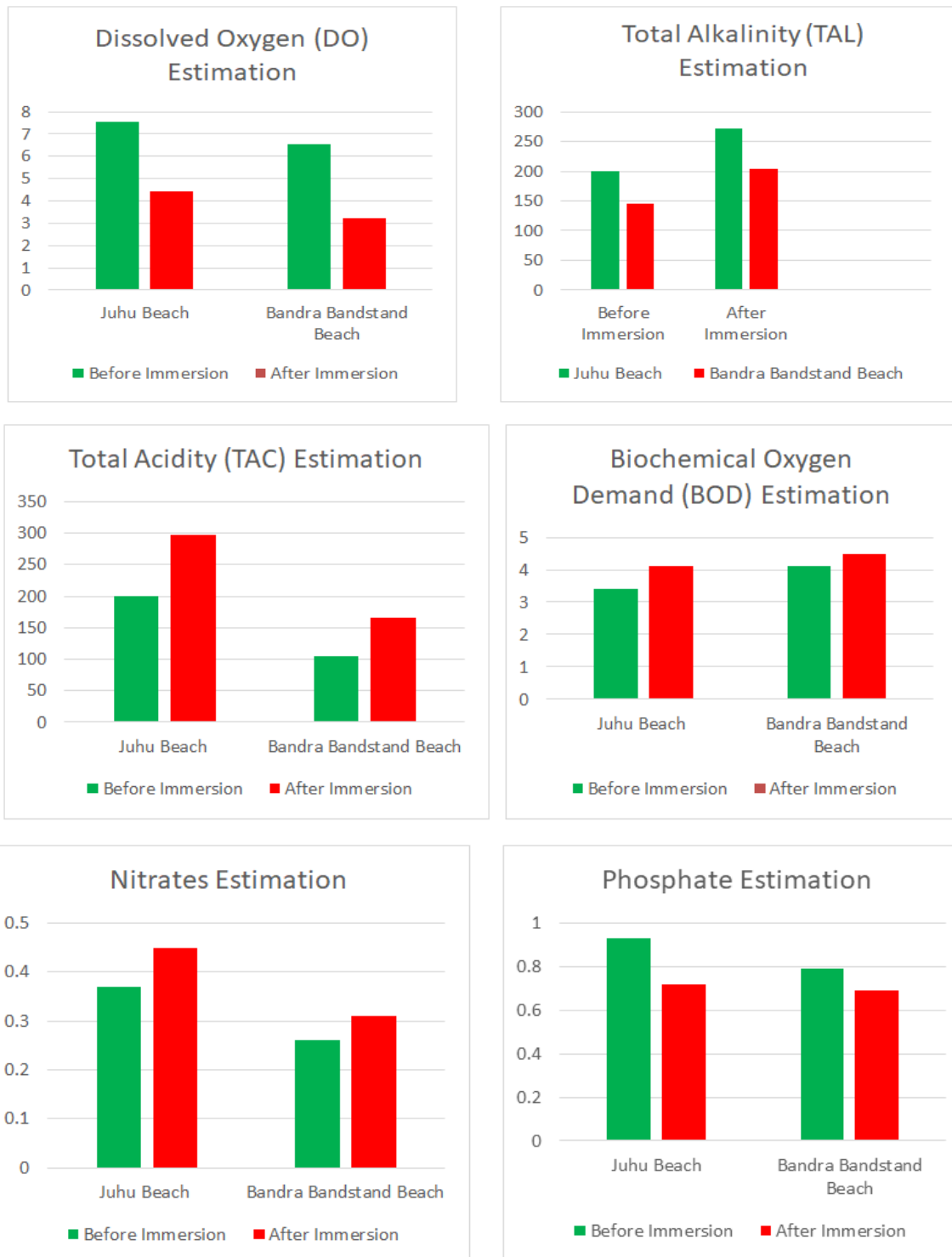
In the current study, total alkalinity revealed both maximum and minimum values, with average levels showing a decreasing trend at all immersion points, in contrast to sample No. 2, as presented in Table I and Graph-plate I. Alkalinity demonstrated a significant positive correlation with total dissolved solids (TDS), total hardness, and calcium hardness, while showing a significant negative correlation with pH [Table 1, Graph-plate 1].

In the present study, total hardness in all samples exhibited elevated levels due to the immersion of painted Ganesha idols, the dissolution of paint materials, silt deposition, and dilution. An increasing trend in total hardness was observed at all sample collection sites, with values ranging from 5900 to 4900 mg/L. The investigators noted that two samples exceeded the permissible limits set by BIS (1998) before idol immersion, compared to three samples exceeding the limits after immersion, as shown in Table II and Graph VI. Total hardness was found to have a significant positive correlation with pH, calcium, and potassium, and a negative correlation with turbidity, electrical conductivity (EC), and alkalinity [Table 1, Graph-plate 1].

CONCLUSION

The immersion of painted Ganesha idols results in an increase in the physico-chemical parameters in all the study areas mentioned above. Therefore, the present study concludes that the lake water in the study areas is polluted due to the rituals associated with the Ganesha festival, specifically the immersion of colored and painted idols along with the decorative materials used in these idols.





Graph - Plate 1: Displays the values of physico-chemical parameters measured before and after the immersion of the Ganesha idol at Juhu and Bandra Bandstand Beaches.

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A STUDY OF MENSTRUAL PRACTICES ACROSS GENERATIONS: CULTURAL AND SOCIAL BELIEFS AND INFLUENCES

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ABSTRACT

The survey aims to explore menstrual practices and attitudes across generations, focusing on cultural and social beliefs. Key findings include a predominantly female respondent base, highlighting the relevance of their insights. Most learned about menstruation between ages 10-15, underscoring the impact of early education. Family discussions on menstruation were rare, indicating a need for open dialogue. Cultural perceptions were mostly neutral, with some positive and negative views. Disposable pads were the most used product, raising sustainability concerns. The survey also noted limited workplace policies and varied social restrictions and taboos. These findings emphasize the need for better education, communication, and supportive policies to address menstrual health challenges.

INTRODUCTION

Historically, the experience of menstruation has been interwoven with an array of cultural beliefs, traditions, and societal norms that vary significantly across different communities and geographies [1]. The menstrual cycle, a natural biological process, has commonly emerged as a subject of stigma, often categorized by various taboos that seek to control, sequester, or marginalize the experiences of menstruators [2], [3]. This research proposes to explore these taboos and the myths associated with menstruation, illuminating how they have evolved and persisted across generations, influencing both personal experiences and broader societal attitudes.

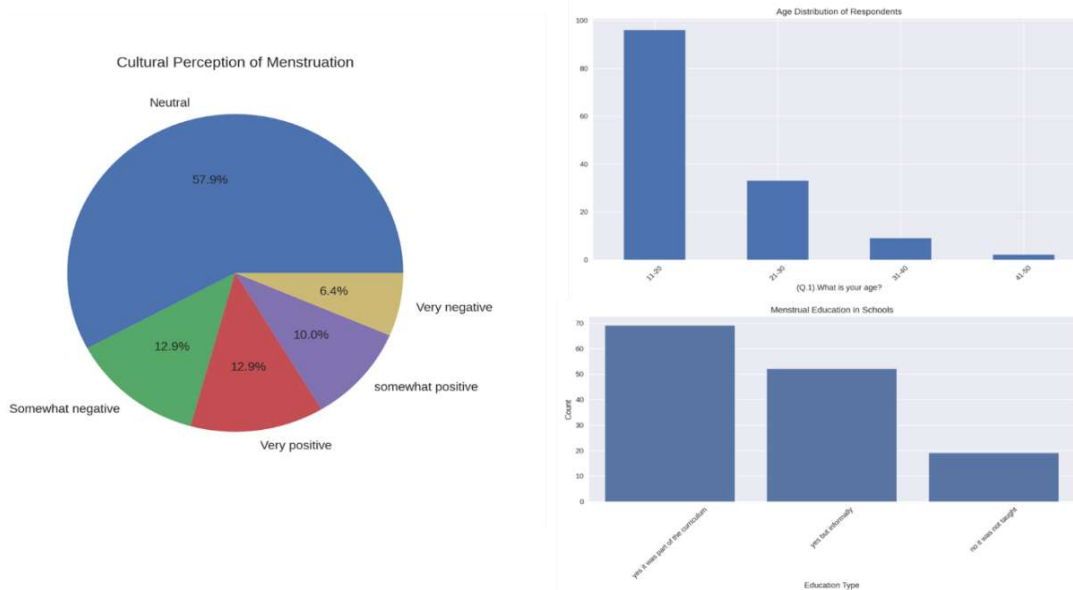
Menstrual practices are often shaped by narratives that extend beyond mere biological functions; they are enshrined in religious doctrines, cultural traditions, and even educational systems [4], [5]. Many cultures possess specific rituals or restrictions related to menstruation that can delineate expectations of behaviour for menstruators [6], [7]. In some contexts, these practices have promoted a sense of community and shared experience among women, while in others, they can perpetuate feelings of shame and isolation [8]. The discourse surrounding menstruation is often colored by historical perceptions of femininity and purity, leading to a devaluation of female's experiences [5]. For example, in certain cultures, menstruating individuals are perceived as impure or unclean, leading to exclusion from various public or sacred spaces. Such beliefs can foster environments where misinformation flourishes, creating barriers to proper menstrual health management [3], [9], [10]. In contrast to these lingering taboos, contemporary perspectives on menstruation are gradually shifting. Young menstruators today often challenge traditional myths, demanding access to information and resources that previous generations might not have had [11]. By reviewing literature and conducting a Google survey, this study aims to highlight these generational differences in attitudes and practices related to menstruation [12], [13], [14], [15].

This comprehensive examination will not only promote greater understanding and empathy but also serve as a call to action for continued advocacy, aiming to empower those affected by menstruation and inspire systemic changes within educational frameworks [10]. The goal is to prepare an atmosphere where menstruation is recognized to be a natural and vital characteristic of human experience, free from the constraints of outdated taboos and myths.

METHODOLOGY

To understand the variations in menstrual practices across different generations and identify influencing factors, we conducted a Google survey targeting female as well as male participants aged 10 and above, divided into four age groups: 11-20, 21-30, 31-40 and 41+. The survey, designed on Google Forms, with open ended, image and multiple choice question across four sections: Demographics, Menstrual Cycle Characteristics, Health and Lifestyle Factors, and Historical Changes. 35 questions were covered related to cultural practices, understanding between families, beliefs, education and use of menstrual products. We distributed the survey link through social media, email, and community groups, offering small incentives to encourage participation over a three-month period. Quantitative data was analyzed using statistical software to determine averages and prevalence. The findings were summarized in a report, highlighting significant differences and trends across generations, and provided recommendations for further research and potential interventions.

OBSERVATIONS



Gender Distribution: The survey responses indicate that a significant majority (70%) of the participants identified as female. This suggests that the perspectives and experiences shared in the survey are predominantly from those who menstruate, which is crucial for understanding menstrual practices and attitudes. The gender distribution can influence the findings, as females may have different experiences and insights compared to males regarding menstruation.

Learning About Menstruation: Most respondents learned about menstruation at the ages between 10 and 15. This is significant as it typically coincides with the onset of menstruation for many individuals. The timing of this education can impact how individuals perceive and manage their menstrual health. Early education can lead to better understanding and acceptance, while late or inadequate education may contribute to stigma or misinformation.

Family Discussions: The survey revealed that discussions about menstruation within families were mostly rare or occasional. This lack of open dialogue can perpetuate myths and taboos surrounding menstruation, leading to embarrassment for people who are menstruating. It highlights the need for more open communication in families to foster a supportive environment for discussing menstrual health.

Cultural Perception: The cultural perception of menstruation among respondents was largely neutral (58%).

- **58% Neutral Perception:** A majority of respondents view menstruation in a neutral light, indicating that it is neither overly stigmatized nor celebrated in their culture. This suggests a level of acceptance or indifference.
- **13% Negative Views:** indicate the presence of taboos or stigmas that could affect how menstruation is discussed or treated in their culture.
- **23% Positive Views:** reflect cultural practices that celebrate menstruation as a natural and important aspect of womanhood

Considering these aspects is necessary to reduce the stigma and promoting positive attitudes toward menstruation.

Menstrual Products: The most commonly used menstrual products were disposable pads. This is due to factors such as accessibility, convenience, and social norms. However, it also raises questions about environmental sustainability and the need for education on reusable pads or menstrual cups which are an alternative menstrual product.

Religious Guidelines: 58% which is more than half of the respondents indicate that their religion has specific teachings or rules regarding menstruation. 21% have no guidelines while 21% are not Unsure.

SUPPORT FOR MENSTRUAL EDUCATION

- **49% Formal Curriculum:** Nearly half of the respondents received formal education about menstruation in school, which is crucial for understanding and normalizing the topic.
- **37% Informal Education:** A significant number learned about menstruation through informal means, such as family discussions or community practices, which may vary in quality and comprehensiveness.
- **14% No Education:** A smaller group did not receive any education about menstruation, which could lead to misconceptions and stigma. There was strong support among respondents for including menstrual education in school curricula.

This reflects a recognition of the importance of educating young people about menstruation to dispel myths, reduce stigma, and promote healthy practices. Comprehensive menstrual education can empower individuals to manage their menstrual health confidently and knowledgeably.

Workplace Policies: The survey revealed a shortage of formal workplace policies on menstruation. This absence of policies can create obstacles for menstruating employees, including insufficient support for managing menstrual symptoms and a lack of employer awareness. Establishing supportive policies in the workplace can foster a more inclusive atmosphere for all employees.

Social Restrictions and Taboos: The survey responses revealed different levels of social restrictions and taboos related to menstruation in various cultures. These cultural beliefs and practices significantly impact how menstruation is viewed and managed. While some cultures see menstruation as a natural process, others impose stigma and restrictions. Recognizing these cultural differences is essential for creating effective educational and support programs.

SIGNIFICANT PROGRESS IN MENSTRUAL ATTITUDES ACROSS GENERATIONS

- **Challenges Still Exist:** The majority of respondents feel that societal attitudes towards menstruation have improved over time. This could mean that discussions about menstruation are becoming more normalized, and there is less stigma associated with it compared to previous generations. But still 36% report religious guidelines are affecting menstrual practices. This suggests that while attitudes may be changing, traditional beliefs still play a remarkable role.
- **Disposable Pads Dominate Product Usage (81%):** According to the statistic shows that the primary menstrual product use are disposable pads. This could reflect accessibility, convenience, or cultural preferences. However, it also raises questions about sustainability and the environmental impact of such products.
- **Only 29% Have Workplace Menstrual Policies:** This finding highlights a gap in workplace support for menstruating individuals. A low percentage of respondents indicated that their workplaces have specific policies or considerations for menstruation, which could affect comfort and productivity during menstruation.
- **Education is Improving but Informal:** 49% Formal Curriculum, 37% Informal: This suggests that while there is some level of education about menstruation being provided in schools (49% reported formal education), a significant portion (37%) of education occurs informally, perhaps through family or community discussions. This indicates a need for more structured and comprehensive menstrual education in formal settings.
- **Physical Activity During Menstruation Remains Mostly Neutral (49%):** This point reflects that opinions on whether physical activity should be encouraged or discouraged during menstruation are mixed, with a significant number of respondents feeling neutral about it. This could indicate a lack of consensus or clear guidance on the topic, which may affect how individuals approach physical activity during their menstrual cycles.

RESULTS

The dataset reveals diverse cultural perceptions and attitudes towards menstruation. Many respondents reported that menstruation is viewed neutrally or somewhat negatively in their cultures, with some taboos and restrictions associated with it. However, there is a trend towards more open and positive attitudes, especially among younger generations. Regarding religious guidelines, the dataset shows that some cultures have specific rules around menstruation, while others do not. Many respondents indicated that their religion has guidelines or restrictions related to menstruation. In terms of education, the data suggests that menstrual education is often

provided in schools, though the quality and comprehensiveness of this education varies. Some respondents reported that menstrual education was part of the curriculum, while others received it informally or not at all. Finally, the dataset highlights the importance of family discussions about menstruation. While some respondents reported that their families rarely or never discussed the topic, others indicated that it was discussed openly and regularly. The frequency of these discussions appears to be correlated with more positive attitudes towards menstruation. Overall, the dataset reveals a complex and nuanced landscape of cultural, religious, and educational factors that shape perceptions and experiences of menstruation.

CONCLUSION

The dataset reveals a diverse range of cultural and religious perspectives on menstruation. While some cultures view it as a natural process, others associate it with negative stigma and taboos. Many respondents reported that menstruation is not openly discussed within their families or communities, which can limit access to education and perpetuate misconceptions. Notably, several respondents indicated that their cultures have specific religious guidelines around menstruation, which can restrict women's participation in social and religious activities. This suggests that addressing menstrual stigma requires engaging with religious institutions and leaders. The data also highlights the importance of comprehensive menstrual education in schools. Respondents who received formal menstrual education tended to have more positive attitudes, compared to those who learned about it informally or not at all. Integrating menstrual health into school curricula could help normalize discussions and challenge harmful myths. The datasets also reveal the lack of work policies for menstruating women's, in India. Overall, the findings underscore the need for a multifaceted approach to destigmatizing menstruation. This includes fostering open family dialogues, reforming religious and cultural practices, and improving access to menstrual education and resources—all of which can empower individuals and transform societal perceptions.

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EFFECT OF LOCKDOWN ON PHARMACEUTICAL INDUSTRY**Ms. Dipika Shrinath Gupta**Ghanshyamdas Jalan College of Commerce & Science & Arts, Upper Govind Nagar, (Malad East)
Mumbai-400097**ABSTRACT**

As we already know the world is suffering from COVID 19. WHO declared the outbreak (COVID-19) in December 2019 and as a global pandemic in March, 2020. This pandemic had a huge influence on the health market, the pharmaceutical business. In this study we have considered the effect of Covid 19 on the pharmaceutical industry. Which includes the overall operations & Development Operations in them. As the pharmaceutical sector has their center outside the industries, they can act as transmittance. Although they take care for necessary precaution. Important impacts that can occur within a short to long-term time period that need to be defined and prepared accordingly. Decreasing burdens on their socio-economic life.

Keywords: COVID-19, Pharmaceutical industry, health care, impact on pharmacy, development

INTRODUCTION

The novel coronavirus (COVID-19), first identified in December 2019 in Wuhan, China, was officially declared a global pandemic by the World Health Organization (WHO) on March 11, 2020. By April 23, 2020, the virus had rapidly spread across the globe, infecting approximately 2.5 million individuals. The pandemic has disrupted global economies, significantly affecting the pharmaceutical industry. Despite extensive efforts, no definitive cure for COVID-19 currently exists.

The pharmaceutical sector has played a pivotal role in addressing the unprecedented demands brought by the pandemic. Governments have relied on this sector for research and development (R&D), therapeutic interventions, and maintaining the supply chain of essential medications during the crisis. Pharmaceutical companies strive to sustain operational continuity and ensure access to affordable essential medicines, a core objective of the industry.

At the global level, this study examines the challenges faced by the pharmaceutical sector, with a particular focus on developed countries. For instance, the Indian pharmaceutical industry, the world's third-largest by volume, contributes significantly to global health by producing 60% of vaccines and fulfilling 40–70% of WHO's requirements for Diphtheria, Tetanus, and BCG vaccines. India's leadership in generic drug manufacturing highlights its critical role in the global pharmaceutical supply chain.

The pandemic has also underscored vulnerabilities in pharmaceutical systems in middle-income nations such as Iran. Governed by its National Drug Policy (NDP), last updated in 2014, Iran's pharmaceutical strategy emphasizes local manufacturing, price regulation, and enhanced access to essential medicines. While over 95% of pharmaceuticals marketed in Iran are domestically produced, the industry remains reliant on imported raw materials, particularly active pharmaceutical ingredients (APIs) sourced primarily from India and China, as well as some European suppliers. This dependency has posed significant challenges during the pandemic, given disruptions in global supply chains.

As of April 28, 2020, Iran reported 0.9 million COVID-19 cases with a mortality rate of 1.38%, aligning with global trends. Hospitalization rates varied significantly across age groups, highlighting the pandemic's differential impact. This study evaluates the immediate and long-term implications of the COVID-19 crisis on the pharmaceutical industry, both globally and in Iran. These findings are crucial for guiding evidence-based policy decisions and preparing for similar challenges in the future.

OBJECTIVES OF THE STUDY:

- **Analyze the Impact on Production and Supply Chain**
 - To evaluate how lockdown measures disrupted the production and distribution of pharmaceutical products.
- **Assess Changes in Demand for Pharmaceutical Products**
 - To study the variations in demand for essential and non-essential medicines during the lockdown period.
- **Study the Influence on Research and Development (R&D)**
 - To investigate how the lockdown affected ongoing research projects and clinical trials in the pharmaceutical sector.

○ Evaluate Economic Implications

- To assess the financial performance of pharmaceutical companies during the lockdown, including changes in revenue and profit margins.

○ Examine Regulatory and Policy Changes

- To analyze the impact of emergency regulations and government interventions on the pharmaceutical industry.

○ Identify Adaptations and Innovations

- To explore how pharmaceutical companies adapted to challenges, such as implementing digital strategies or innovating supply chain solutions.

○ Study Workforce and Operational Changes

- To examine the effects of the lockdown on workforce management and operational processes in the industry.

○ Understand Global Trade and Export Dynamics

- To evaluate the lockdown's impact on international trade, including the export and import of pharmaceutical goods.

○ Assess Public Health Responses

- To analyze how pharmaceutical companies contributed to public health measures during the pandemic, such as the production of vaccines, sanitizers, and PPE.

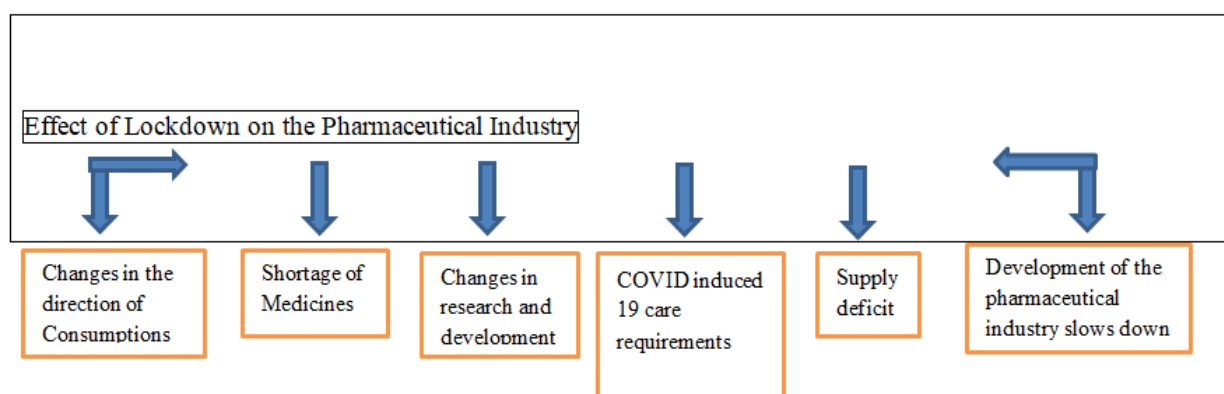
○ Forecast Long-term Implications

- To predict the potential long-term effects of lockdowns on the pharmaceutical industry's structure, growth, and innovation.

RESEARCH METHODOLOGY

Secondary Data:

- Analysis of industry reports, journal articles, government publications, and References during the lockdown period.



The COVID-19 pandemic has had significant short-term effects on the healthcare market, including shifts in demand patterns, stock limitations, panic-driven purchasing behaviors, and adjustments to legislative and marketing approaches. Changes in technical operations and research and development (R&D) processes have also been prominent. A key challenge during the pandemic has been the shortage of medicines, particularly oral medications for chronic diseases, driven by increased demand and disruptions in supply chains.

A medicine shortage, often referred to as a "supply issue," arises when the preparation or dispensing of a drug is hindered, necessitating the use of alternative treatments. Globally, regulatory agencies have highlighted shortages of drugs, particularly those associated with COVID-19 treatments and complications such as pneumonia. The United States Food and Drug Administration (FDA), for example, identified critical shortages, including hydroxychloroquine (HQC) and chloroquine (QC), alongside essential medications for hospitalized COVID-19 patients with respiratory distress. These included azithromycin, dopamine, dobutamine, opioids, heparin, midazolam, propofol, and dexmedetomidine.

The American Society of Health-System Pharmacists (ASHP) also published a list of 11 critical medications experiencing shortages, primarily hospital-level antibiotics (e.g., meropenem, ceftazidime, ampicillin, doxycycline) and anesthetics (e.g., vecuronium, rocuronium). Additionally, the list included albuterol and

fluticasone, both vital for airway clearance in respiratory conditions. These shortages underscore the strain on pharmaceutical supply chains during the pandemic and highlight the need for robust strategies to mitigate such challenges in the future.

Findings of the Study

1. Impact on Production and Supply Chain

- Significant disruptions in raw material supply, especially for Active Pharmaceutical Ingredients (APIs) imported from countries like China.
- Reduced production capacity due to workforce shortages and lockdown restrictions.
- Delays in distribution and transportation of medicines to various regions.

2. Changes in Demand

- Surge in demand for essential medicines, including antivirals, antibiotics, and over-the-counter drugs like paracetamol and vitamins.
- Decline in demand for elective and non-critical medications due to reduced hospital visits and postponed surgeries.

3. Financial Performance

- Increased revenue for companies producing essential drugs, vaccines, and personal protective equipment (PPE).
- Financial strain on companies reliant on non-essential drugs or international markets due to export restrictions.

4. Impact on Research and Development (R&D)

- Delays in clinical trials and R&D activities due to lockdown measures.
- Shift in focus towards COVID-19 treatments and vaccines, leading to a temporary halt in other R&D projects.

5. Regulatory and Policy Interventions

- Accelerated approval processes for COVID-related drugs and vaccines.
- Implementation of price controls on essential medicines in some regions to ensure affordability.

6. Adoption of Technology and Digital Transformation

- Increased adoption of telemedicine and e-pharmacy platforms to meet patient needs.
- Digital tools used for supply chain management and remote workforce operations.

7. Global Trade and Export Dynamics

- Export restrictions on essential medicines imposed by some countries.
- Diversification of API sourcing to reduce dependency on specific countries like China.

8. Workforce Challenges

- Difficulty in maintaining workforce morale and safety during the pandemic.
- Implementation of strict safety protocols in manufacturing facilities.

9. Public Health Contributions

- Rapid scaling up of production for sanitizers, masks, and vaccines.
- Partnerships between pharmaceutical companies and governments to combat the pandemic.

10. Long-term Implications

- Increased investment in R&D for pandemic preparedness.
- Greater focus on localizing supply chains to reduce dependency on global trade.
- Emphasis on digital transformation across the pharmaceutical industry.

Induced Demand and Panic Purchasing

The pandemic-induced surge in medication stocking by the public, often referred to as "panic buying," has significantly contributed to periodic shortages in the pharmaceutical market, particularly for drugs treating

chronic conditions. By March 2020, the global pharmaceutical industry reported an induced demand increase of approximately 8.9%. A U.S.-based study noted substantial spikes in medication claims between March 13 and 21, 2020, including a 65% rise in asthma medications and a 25% increase in type 2 diabetes drugs. Medications for high cholesterol, migraines, and hypothyroidism also experienced notable demand growth. However, in some countries with "stay-at-home" mandates, overall demand for certain drugs decreased. Conversely, in Iran, where such policies were absent, demand persisted, driven by retail pharmacy purchases.

Supply Shortages of APIs and Finished Products

China and India, as leading global suppliers of active pharmaceutical ingredients (APIs), key starting materials (KSMs), and finished pharmaceutical products, experienced production slowdowns during the pandemic. These disruptions resulted in shortages and price increases for critical prescription drugs, including antibiotics such as amoxicillin, potassium clavulanate, ceftriaxone, meropenem, vancomycin, gentamicin, and ciprofloxacin. The Indian Pharmaceutical Alliance (IPA) urged the government to restrict the export of pharmaceutical products, APIs, and formulations to prioritize domestic needs. Consequently, API prices increased by an average of 10–15%, with some instances reaching up to 50%.

Regulatory Interventions

To mitigate shortages, the FDA and the European Commission implemented policies emphasizing market optimization and rational supply. These measures included fast-track approvals for COVID-19 treatments. However, with approximately 50% of APIs and 5% of finished pharmaceutical products being imported, local pharmaceutical industries in many countries faced heightened vulnerability during the pandemic.

Shifts in Communication and R&D

Social distancing measures necessitated a transition from in-person interactions to remote communications in healthcare product promotion and patient support. This shift significantly impacted healthcare services, with patient visits to medical offices in the U.S. dropping by 70–80%.

The pandemic also spurred intensive R&D efforts, with at least 113 medications or regimens and 53 vaccines undergoing clinical trials for COVID-19 treatment. However, these rapid developments raised ethical concerns regarding decision-making based on limited evidence.

LONG-TERM IMPACTS

The pandemic's long-term effects on the health and pharmaceutical industries include:

- Approval Delays:** Regulatory focus on COVID-19 treatments has delayed the approval of non-COVID-related medications.
- Self-Sufficiency in Supply Chains:** Export bans by key suppliers like India and China have prompted many countries to adopt policies promoting self-sufficiency.
- Sector Growth Deceleration:** Economic slowdowns have impacted the growth of the pharmaceutical sector, which is closely tied to overall economic conditions.
- Consumer Behavior Shifts:** The pandemic has likely altered long-term consumer demand and purchasing habits for pharmaceuticals.

Understanding these dynamics is crucial for policymakers and industry stakeholders to adapt strategies, ensure supply chain resilience, and sustain the global healthcare ecosystem.

R&D

To effectively manage clinical trials during the disruptions caused by the COVID-19 pandemic, the following steps are essential:

1. Classification of Disrupted Trials:

Identify clinical trials likely to be affected by potential shutdowns or logistical interruptions. Categorize these trials based on their stage, criticality, and vulnerability to delays.

2. Incorporate COVID-19 Impact Controls:

Integrate strategies to address COVID-19-related risks into trial management plans. This includes protocols for managing site closures, patient enrollment disruptions, and data collection challenges.

3. Collaboration with Inspectors:

Engage with inspectors to identify site-specific issues caused by COVID-19. These may include constraints in local laboratory testing, patient retention challenges, and increased risks of serious adverse events. Based on this

assessment, adjust trial timelines or locations and prioritize new investigator sites in regions with lower risk levels.

4. Patient Engagement Strategies:

Develop and implement effective strategies to maintain patient involvement in trials. This could involve virtual visits, telemedicine consultations, and providing clear communication about safety measures and trial adjustments.

5. Regulatory Perspective for Communication:

Establish an internal regulatory framework for addressing COVID-19-related challenges. Use this framework to guide communications with institutional oversight boards, investigators, and ethics committees, ensuring compliance with evolving guidelines.

6. Regulatory Guidance for Incident Management:

Collaborate with regulators to understand best practices for managing the increased likelihood of trial-related incidents during the pandemic. This includes adapting protocols to ensure patient safety and data integrity while accommodating emergency measures.

By adopting these approaches, clinical trial stakeholders can mitigate disruptions, safeguard patient safety, and ensure continuity in generating reliable data during the pandemic.

CONCLUSION

The COVID-19 pandemic has had profound short- and long-term effects on the healthcare market, particularly within the pharmaceutical industry, observable at both global and local levels. Understanding and identifying these impacts are essential for policymakers to engage in evidence-based planning and decision-making to address the challenges effectively.

To mitigate long-term risks, it is critical to first analyze and assess the immediate short-term effects through comprehensive data collection. This process enables a systematic approach to identifying vulnerabilities and developing targeted interventions. Evidence-based strategies are particularly crucial for addressing the unique challenges faced by developed countries, where the healthcare sector may experience heightened pressures and complexities. By adopting this approach, policymakers can strengthen preparedness and resilience within the pharmaceutical and broader health industries.

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COMPARATIVE ANALYSIS OF HEAVY METALS FROM THE VARIOUS PARTS OF RASTRELLIGER KANAGURTA COLLECTED FROM THREE DIFFERENT FISH LANDING CENTERS

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ABSTRACT

This study presents a comparative analysis of heavy metal contamination in fish from three distinct fish landing sites, offering valuable insights into environmental pollution and its potential risks to public health. The research focuses on the concentration of heavy metals, including lead (Pb), cadmium (Cd), mercury (Hg), and arsenic (As), in fish samples collected from Marvae Beach (Malavani), Bhayandar Fish Landing Centre and Mazgoan (Bhaucha Dhakka). Using advanced analytical techniques such as Atomic Absorption Spectroscopy (AAS), the heavy metal levels were quantified and compared across the different locations.

*The bioaccumulation and biomagnification of toxic metals along trophic levels represent a significant global threat to human health. This study evaluated the concentrations of heavy metals in *Rastrelliger kanagurta*, a commercially important fish species, sourced from three distinct landing centers. The findings indicate that the concentrations of these heavy metals in the sampled fish surpassed the established safety limits for human consumption.*

Mercury and Arsenic concentrations were found to be higher than limits set by WHO, and BIS. Concentrations were however within limits of EC. For Lead concentration levels in both water samples from all three sampling stations and fish, they were found to be below-set limits (0.025mg/L) [11,12]. Lead and Cadmium concentration levels were also found to be below-set limits (0.05mg/L) [11,12] but exceeding set limits for WHO [13].

Notably, high levels of Mercury and Arsenic were found in the gill, liver, and muscle tissues of the fish, with both metals surpassing the recommended limits set by the World Health Organization (WHO) and the Food and Agriculture Organization of the United Nations (FAO) for heavy metals in seafood.

Keywords: Aquatic organisms, Bioaccumulation, Biomagnification, Heavy Metals, Pollution

INTRODUCTION

The Indian mackerel, scientifically known as *Rastrelliger kanagurta*, is a rich source of Omega-3 fatty acids and other essential nutrients [1,8]. Recognized as the national fish of India, it plays a crucial role in the country's marine fish landings. Approximately 75% of Indian mackerel is consumed fresh within the country. Fish, including Indian mackerel, serves as an essential and cost-effective source of vital nutrients for humans, offering high-quality protein, phospholipids, polyunsaturated fatty acids, key minerals, vitamins, and Omega-3 fatty acids [4,5].

These nutrients play a crucial role in supporting various physiological processes. The nutritional composition of fish is largely influenced by their diet. As the global population continues to expand, the demand for fish valued for its exceptional nutritional properties has grown significantly [8,12]. Regular fish consumption has been scientifically associated with a lower risk of cardiovascular diseases, faster wound healing, reduced incidence of breast and colon cancers, a potential delay in the progression of Alzheimer's disease, and enhanced immune function [4,10,14]. Scientific studies have highlighted that the pollution of aquatic ecosystems with a diverse range of contaminants has become an increasingly serious environmental issue in recent decades. [4,5,11].

Heavy metals, which include both essential and non-essential elements, are of considerable significance in ecotoxicology due to their environmental persistence and potential toxicity to living organisms [6,7]. Trace metals are minerals present in trace amounts within living organisms. These metals are persistent in the environment and are not subject to biological degradation. They can be categorized into two groups: (1) essential trace metals, which are crucial for various biological functions, and (2) non-essential metals, which do not serve any known biological purpose [3,6,10].

The release of heavy metals into marine environments can severely impact biodiversity and ecosystems due to their toxic nature and ability to accumulate in aquatic organisms. This accumulation poses significant risks to fish consumers, including humans and other wildlife [7].

METHODS AND METHODOLOGY

Sampling Site Description:

Sampling Site 1: Mazagon Dock Shipbuilders Limited (MDL)

Formerly known as Mazagon Dock Limited, Mazagon Dock Shipbuilders Limited (MDL) is located [Coordinates: 18.96713°N, 72.84993°E] in Mazagaon, Mumbai, India. The company operates shipyards that are integral to India's maritime industry.

Sampling Site 2: Marve Beach

Marve Beach is situated [Coordinates: 19.1973°N, 72.7968°E] in the Western Suburb of Malad in Mumbai, India. It is notably associated with the East Indian community.

Sampling Site 3: Bhayandar

Bhayandar, also spelled as Bhaindar or Bhayander, is a suburb located [Coordinates: 19.31°N, 72.85°E] in the western part of Mumbai, near Vasai Creek. It is the northernmost suburb on the island and falls under the North Central ward of the Municipal Corporation. The area comes under the jurisdiction of the Mira-Bhayandar Police Commissionerate.

Field Sampling:

In December 2024, three fish samples of *Rastrelliger kanagartha*, each measuring approximately 15–20 cm, were collected from three distinct locations by professional fishermen using multifilament nylon gill nets and trawls. The sampling sites included Mazgaon (Bhaucha Dhakka), Marve Beach, and Bhayandar (Khadi). In light of the increasing concern regarding metallic contamination in seafood, particularly fish, the samples were washed with clean water at the collection site, categorized according to their respective sampling locations, and stored on ice. They were transported to the laboratory on the same day and subsequently frozen at -20°C until dissection.

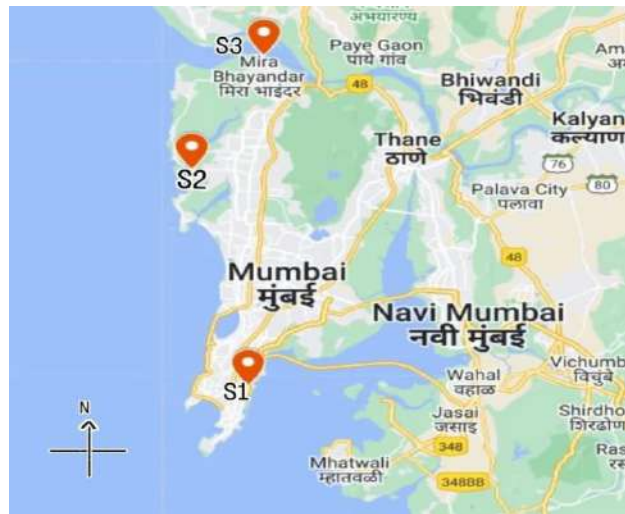


Fig 1: Map showing three different sampling stations (fish landing centers) in Mumbai.

(S1 – Mazgaon (Bhaucha Dakka), S2 – Marve, S3 – Bhayandar Fish Landing Center)



Photoplate 1: Showing samples collection (*Rastrelliger kanagartha*) three different sampling stations (fish landing centers) in Mumbai, (Mazgaon (Bhaucha Dakka), Marve, Bhayandar Fish Landing Center)

Biota [Gills, Gut & Muscles] Collection:

The frozen fish samples were thawed at room temperature before being dissected with stainless steel scalpels. A 10-gram sample of muscle tissue from the lateral side, along with the entire liver and two gill rakers, were carefully removed for analysis. The dissected tissue samples were then transferred into beakers for processing. To prepare the samples, those from each collection site were first sun-dried for two days, then dried further in a hot air oven at 70°C for 7-8 hours to eliminate moisture. After the drying process, the samples were re-weighed to assess the moisture loss. The levels of heavy metals in the samples were quantified using an Atomic Absorption Spectrophotometer (AAS) [12,13].

Table 1: Estimation of weight, Size/length and Heavy metals from different body parts of *Rastrelliger kanagurta* from 3 different landing centers.

Name of the Sampling Station	Body Weight (gm)		Size / Length (cm)	
	S1	S2	S1	S2
Mazgoan (Bhaucha Dhakka)	110.0	114.3	10.8	10.5
Bhayandar (Khadi)	113.3	112.7	10.5	10.6
Marvae Beach (Malvani)	117.5	114.4	10.7	10.5

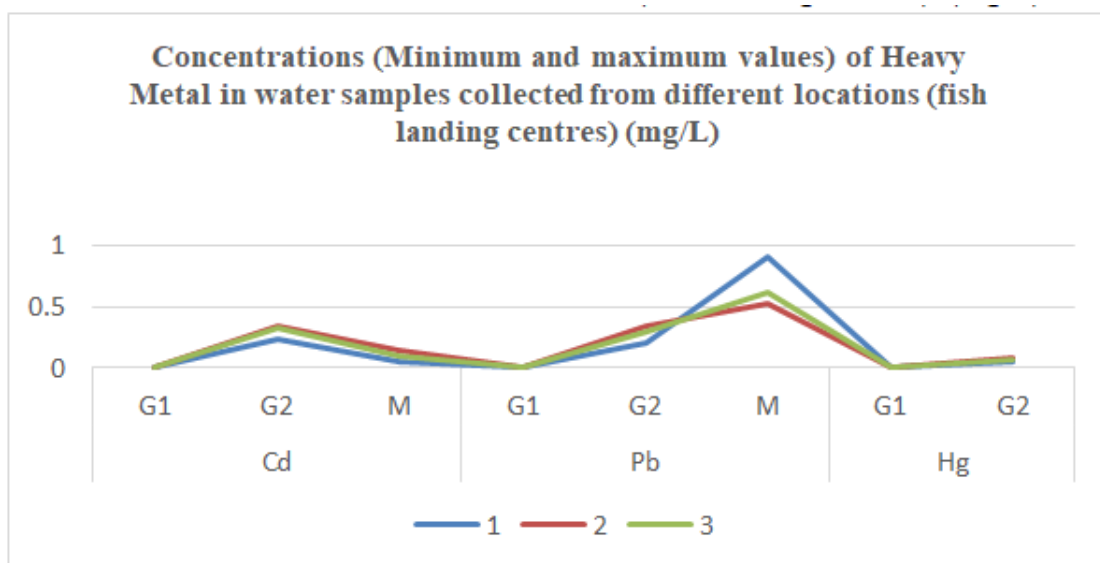
Table 2: Concentrations (Minimum and maximum values) of Heavy Metal in water samples collected from different locations (fish landing centres) (mg/L)

Sr. No.	Sampling Stations	Cd		Pb		Hg		As	
		Min	Max	Min	Max	Min	Max	Min	Max
1	Mazgaon Dockyard	0.003	0.014	0.004	0.012	0.006	0.017	0.018	0.018
2	Marve	0.010	0.020	0.013	0.019	0.015	0.023	0.026	0.029
3	Bhayandar	0.005	0.016	0.007	0.016	0.008	0.019	0.022	0.024

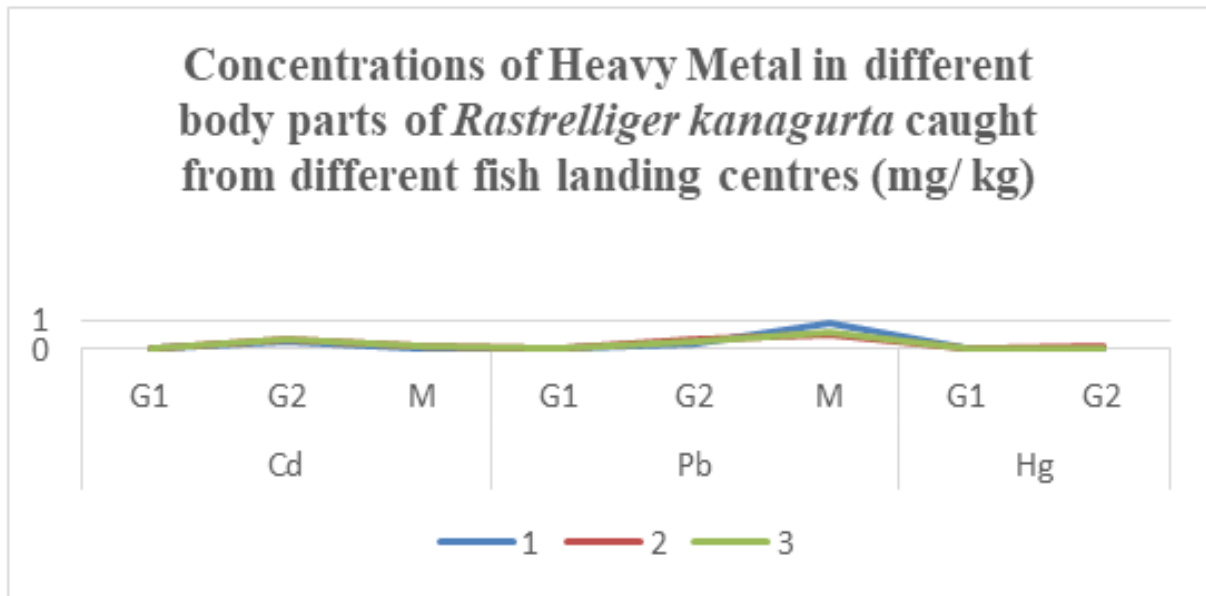
Table 3: Concentrations of Heavy Metal in different body parts of *Rastrelliger kanagurta* caught from different fish landing centres (mg/ kg)

Sr. No.	Sampling Stations	Cd			Pb			Hg			As		
		G1	G2	M	G1	G2	M	G1	G2	M	G1	G2	M
1	Mazgaon Dockyard	0.001	0.24	0.06	0.004	0.201	0.91	0.002	0.055	0.019	0.011	0.021	0.010
2	Marve	0.004	0.34	0.14	0.008	0.341	0.52	0.006	0.085	0.041	0.029	0.031	0.021
3	Bhayandar	0.002	0.32	0.10	0.003	0.302	0.62	0.003	0.062	0.027	0.013	0.023	0.013

G1: Gills, G2: Gut and M: Muscles



Graph1. Concentrations (Minimum and maximum values) of Heavy Metal in water samples collected from different locations (fish landing centres) (mg/L)



Graph2. Concentrations of Heavy Metal in different body parts of *Rastrelliger kanagurta* caught from different fish landing centres (mg/ kg)

G1: Gills, G2: Gut and M: Muscles

Statistical Analysis:

In the present study, correlation analysis was performed separately for fish samples of *Rastrelliger kanagurta* collected from three different sites. The correlations between various elements were calculated using statistical values ($p < 0.05$) for different tissues of the fish samples from each collection site. All statistical analyses were conducted using SPSS software (version 20).

RESULTS AND DISCUSSIONS

Heavy Metals in Water:

The concentrations of toxic heavy metals in the water samples generally fell within the acceptable range, except for mercury (Hg) and arsenic (As), which slightly exceeded the safe limits established by FAO/WHO. For Cadmium and Lead, there was no significant difference ($p > 0.05$) observed in their concentrations. Toxic metals concentrations in the water samples of three different sampling stations are decreased in the order of $As > Hg > Cd > Pb$ are as follows (Table 3).

Mazgaon Dockyard: $As > Hg > Cd > Pb$, $0.018 > 0.017 > 0.014 > 0.012$

Marve: $As > Hg > Cd > Pb$, $0.029 > 0.023 > 0.020 > 0.019$

Bhayandar: $As > Hg > Cd > Pb$, $0.024 > 0.019 > 0.016 > 0.016$

Heavy Metals in different body parts (Gills, Guts and Muscles) of *Rastrelliger kanagurta*

The concentration of heavy metals in the gills, guts, and muscles of *Rastrelliger kanagurta* collected from Mazgaon Dockyard, Marve, and Bhayandar follows a decreasing order: $Hg > As > Cd > Pb$. In the case of *Rastrelliger kanagurta* collected from Marve, the heavy metal concentrations were observed to increase in the order: muscles $>$ gills $>$ guts, with the following concentrations recorded: $Hg > As > Pb > Cd$, at 0.041, 0.021, 0.008, and 0.004, respectively (Table 3).

Mercury and Arsenic concentrations were found to be higher than limits set by WHO, and BIS. Concentrations were however within limits of EC. For Lead concentration levels in both water samples from all three sampling stations and fish, they were found to be below-set limits (0.025mg/L) [11,12]. Lead and Cadmium concentration levels were also found to be below-set limits (0.05mg/L) [11,12] but exceeding set limits for WHO [13].

All water and fish samples analyzed in the study were found to be within the limits established by the FAO. However, the concentrations of mercury (Hg) exceeded the safe limits set by the WHO. This necessitates a human health risk assessment regarding heavy metal exposure through fish consumption.

Metallic contamination in seafood, particularly fish, is an increasing concern for human health. As the reliance on farmed fish as a primary source of seafood grows, the levels of metallic pollutants in these farmed species

raise substantial concerns. Fish, like other aquatic organisms, have the capacity to bioaccumulate toxic metals in various tissues, which can subsequently enter the human body and pose significant health risks [14].

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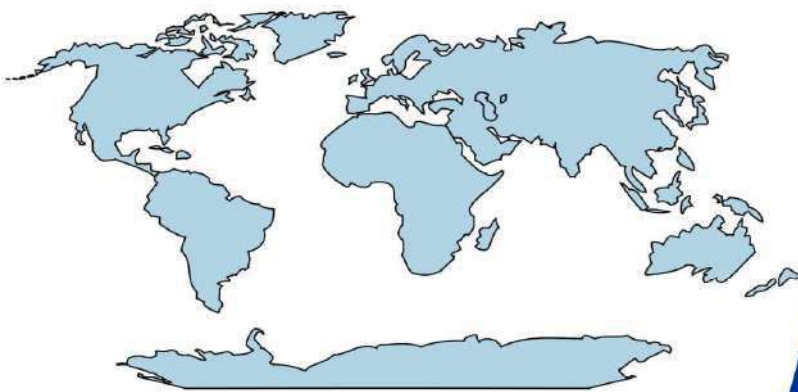
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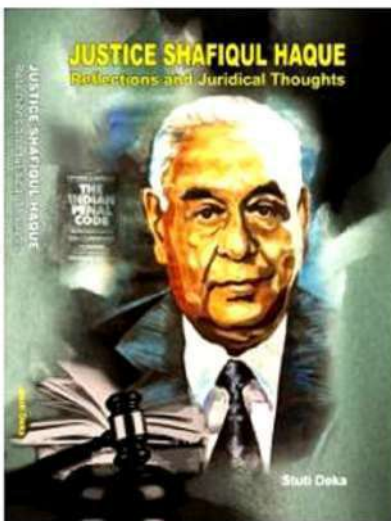


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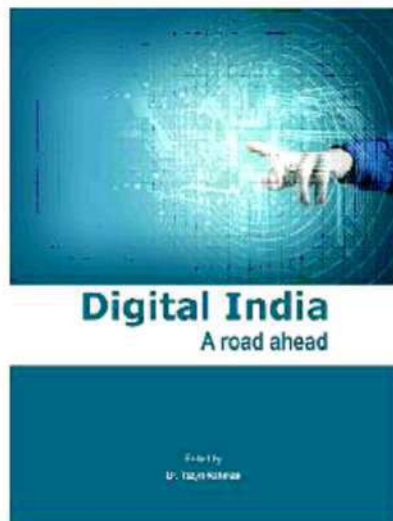
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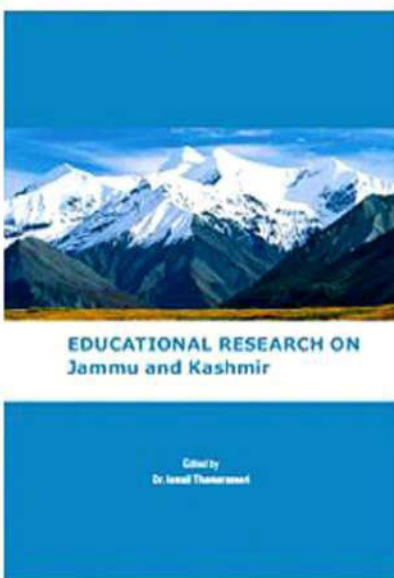
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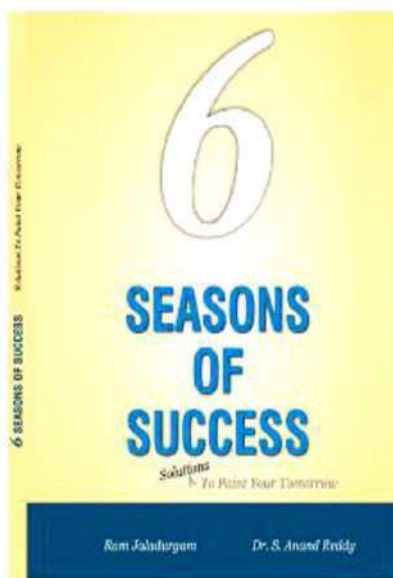
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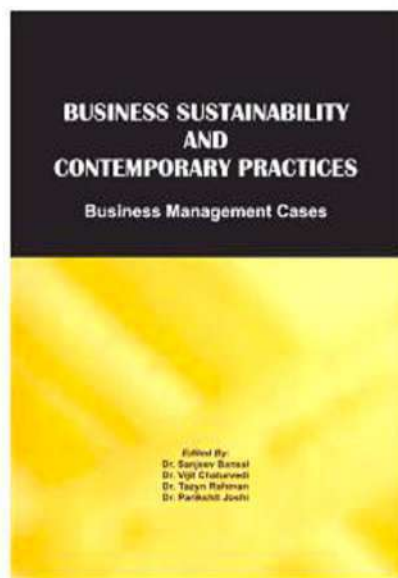
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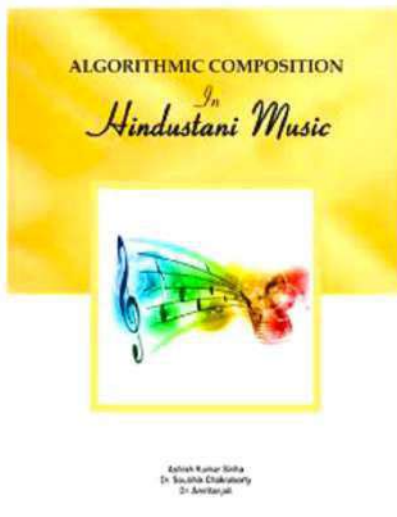
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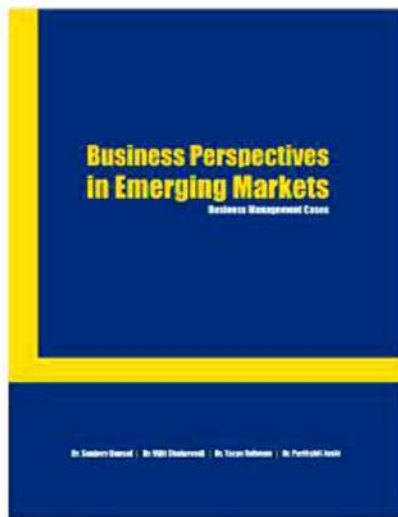
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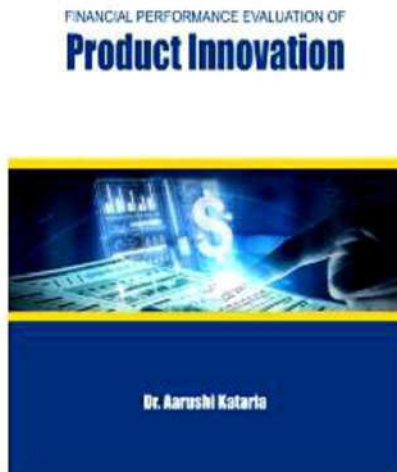
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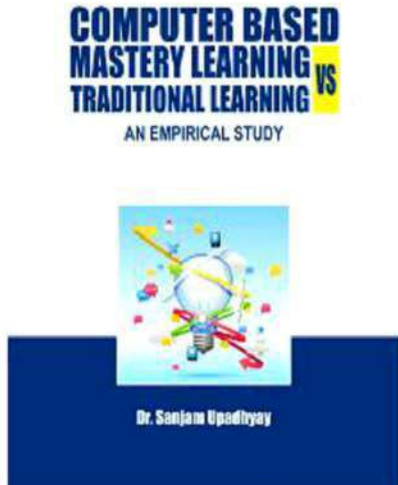
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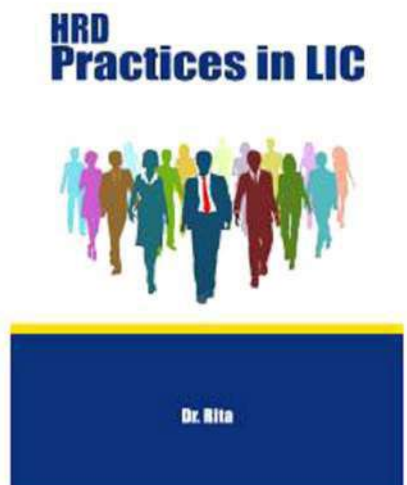
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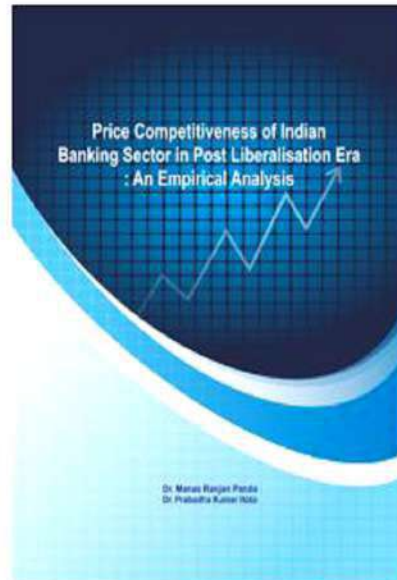
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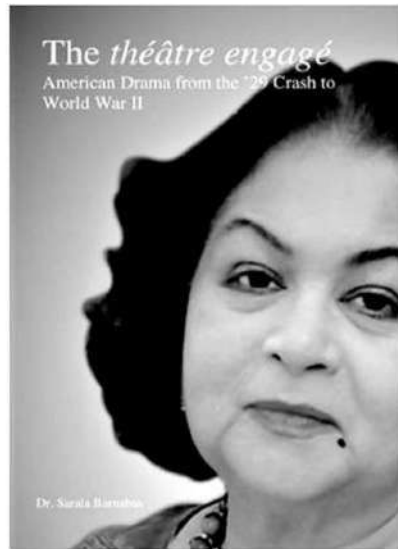
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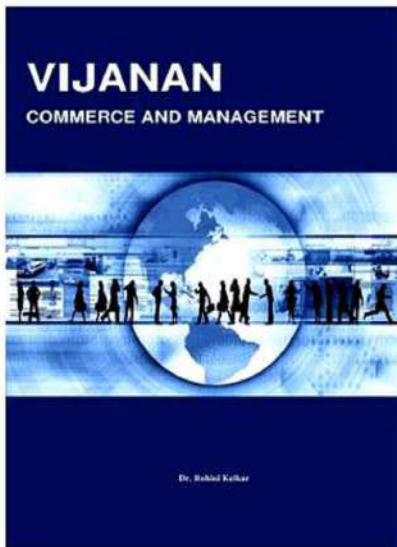
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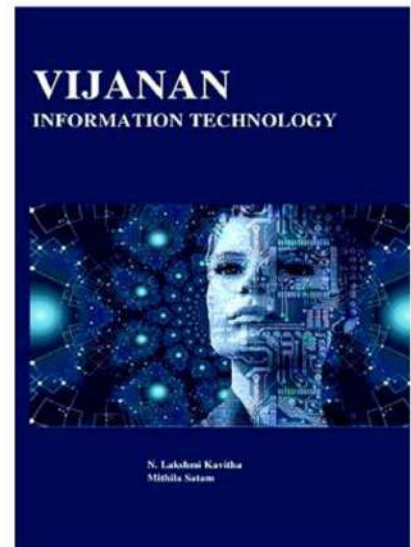
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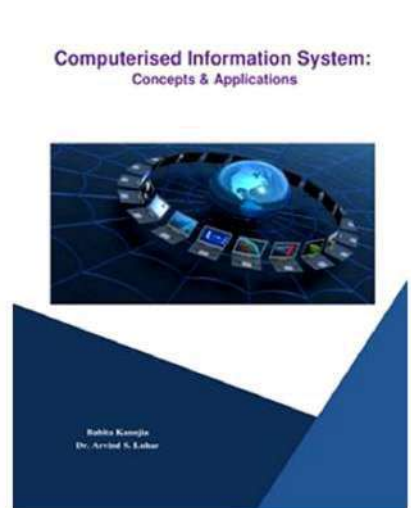
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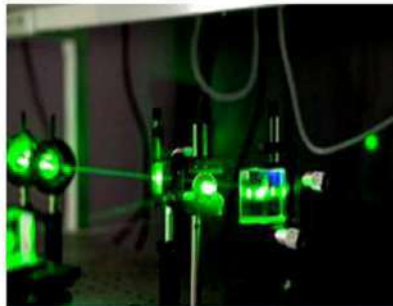
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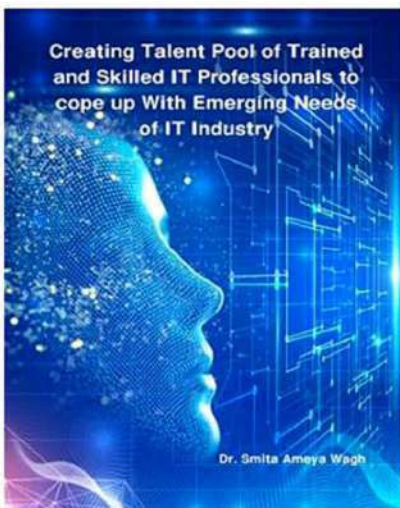


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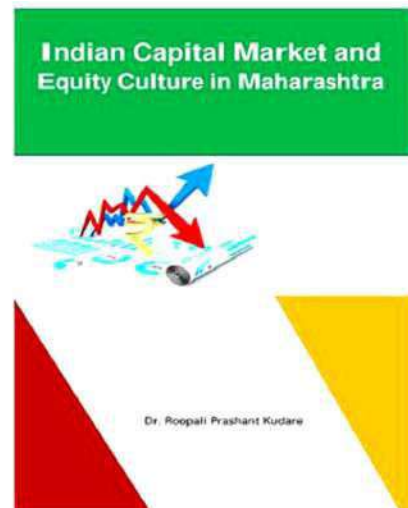
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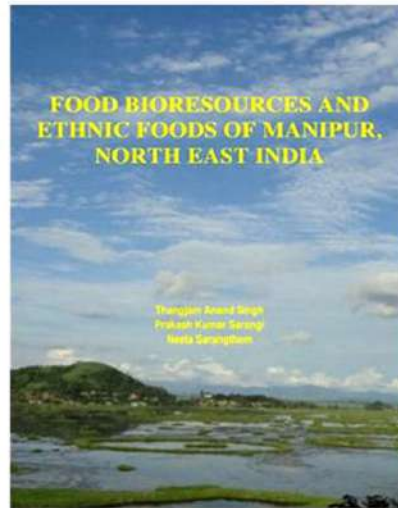
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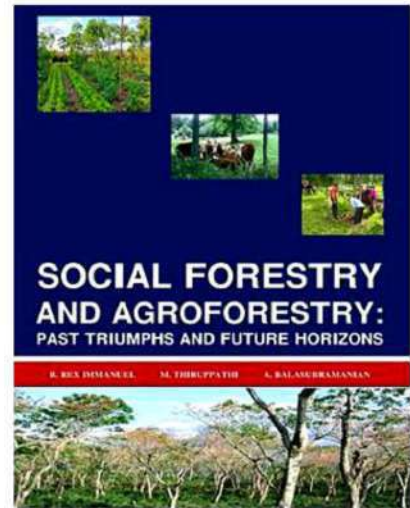




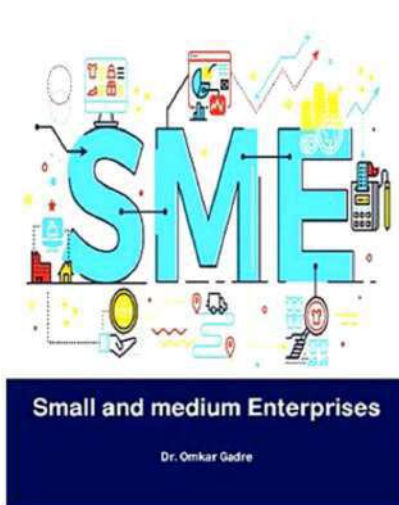
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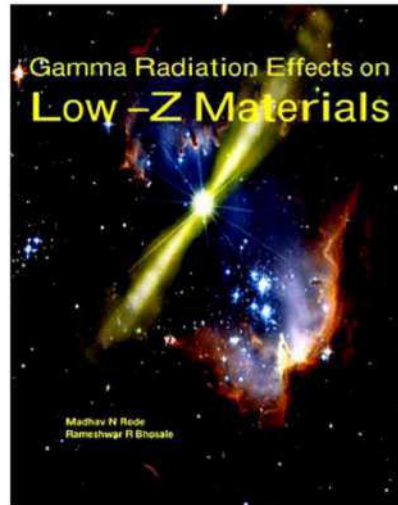
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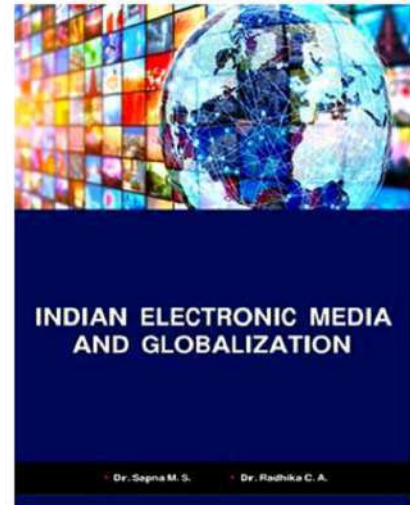
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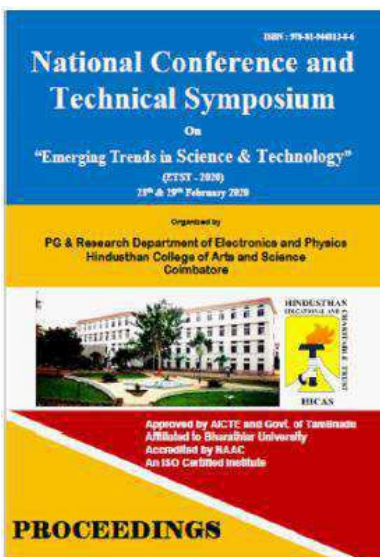
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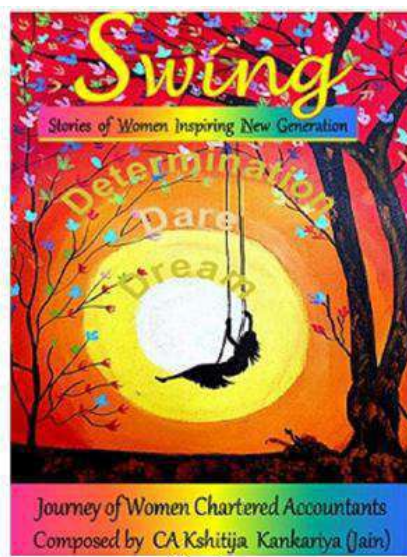
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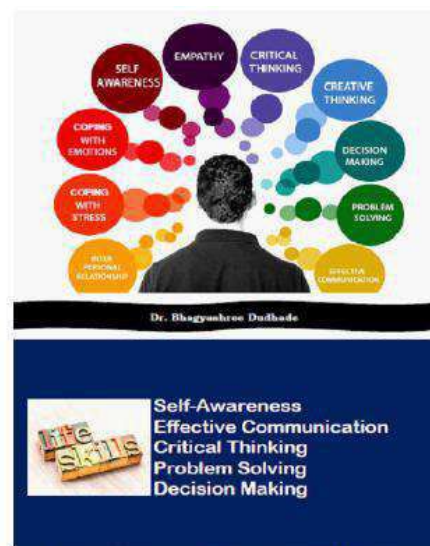
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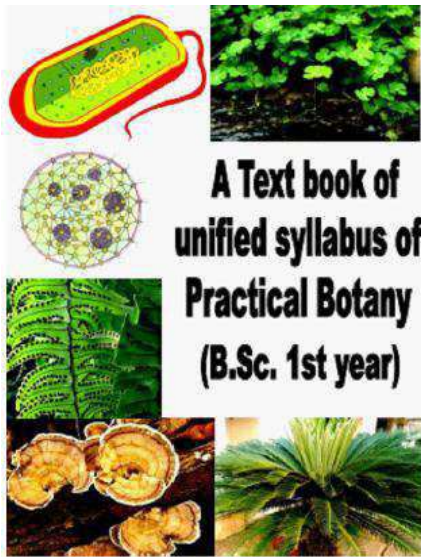
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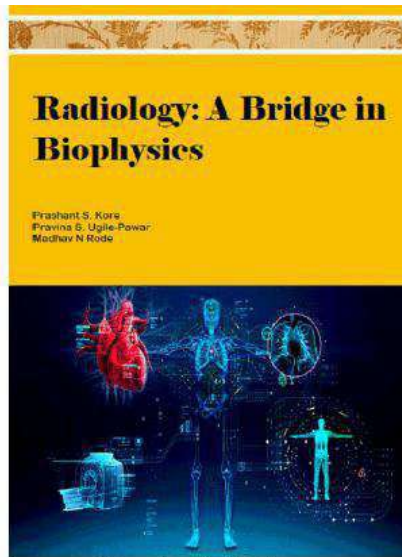


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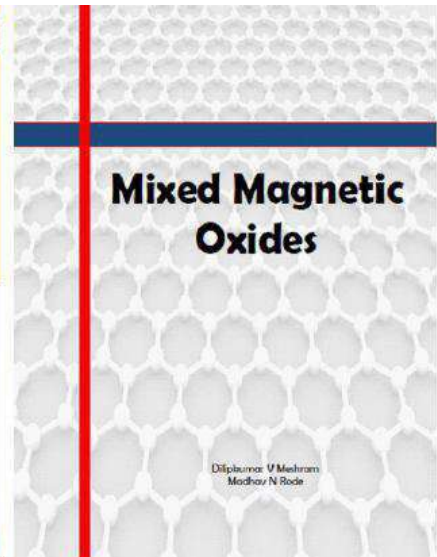
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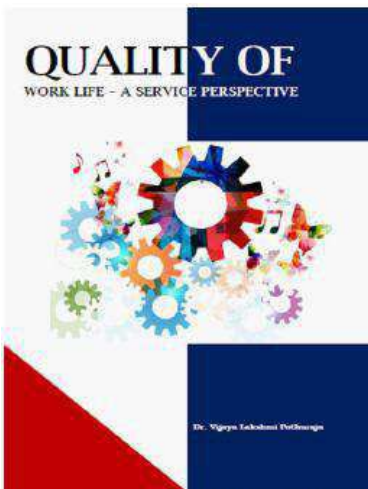
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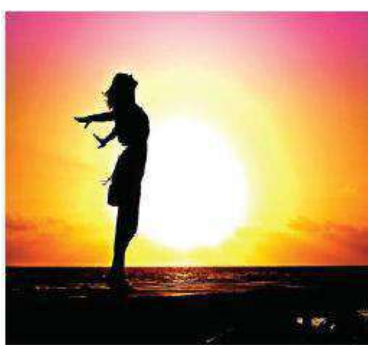
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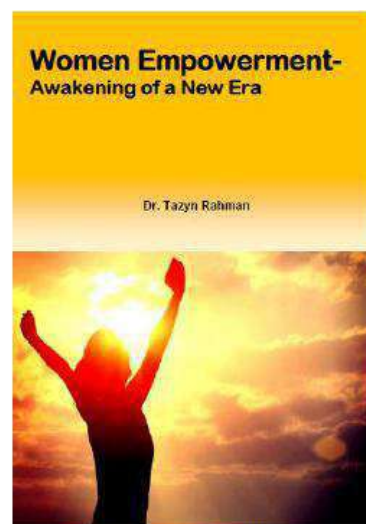


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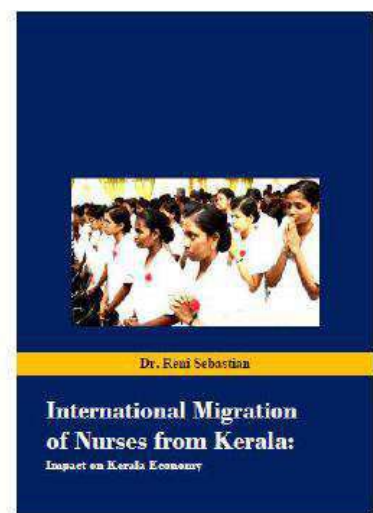
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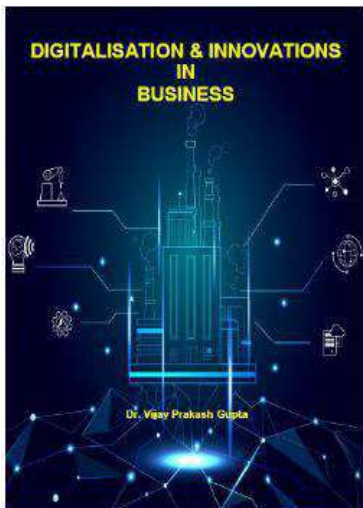
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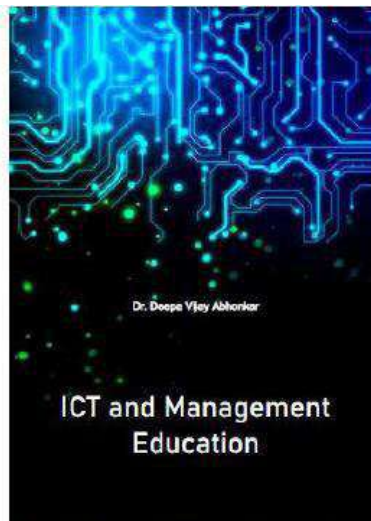


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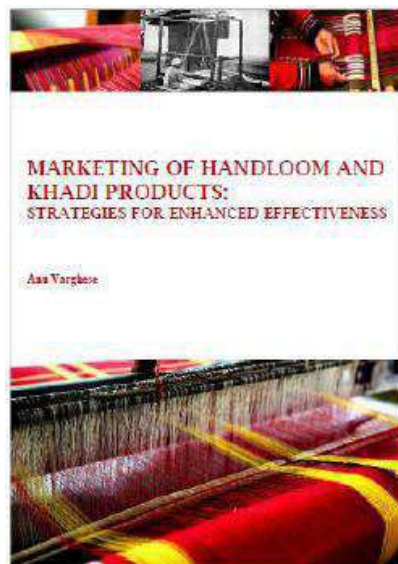
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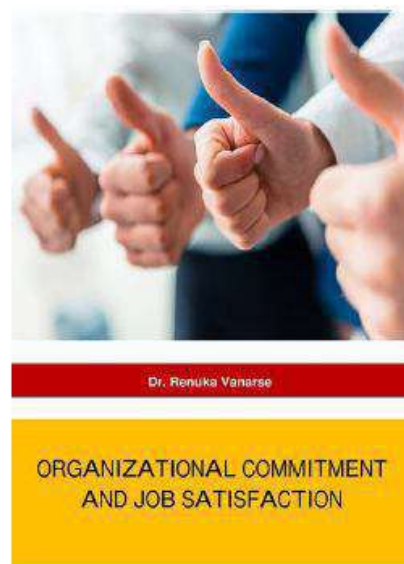
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