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Multidisciplinary Research Perspectives for the Greener Future

-Exploring Horizons of Sustainability

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Multidisciplinary Research Perspectives for the Greener Future

Editors:

Dr. Charu Upadhyaya, Associate Professor

Thakur Institute of Management Studies and Research, Mumbai

Dr. Megha Sharma, Associate Professor

Thakur Institute of Management Studies and Research, Mumbai

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Multidisciplinary Research

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Editorial

We are delighted to present the edited volume *"**Multidisciplinary Research Perspectives for the Greener Future**"*, a compilation of research papers authored by students of Master of Management Studies program under the dedicated guidance of faculty members. This book stands as a reflection of academic rigor, interdisciplinary inquiry, and a shared commitment to sustainable development and responsible innovation.

The contemporary world faces complex challenges from climate change and financial inclusion to evolving consumer behaviour and technological disruption. These challenges demand collaborative, cross-disciplinary approaches, and this volume seeks to respond to that call. Drawing on diverse domains such as Finance, Marketing, Operations, Human Resource Management, and Digital Transformation, the student researchers have explored critical themes with relevance to both industry and society.

This book is structured across five key sections:

Section 1: Sustainable Finance & Responsible Investment explores how behavioural finance, ESG frameworks, fintech trust, and AI influence modern investment practices and financial reporting. It reflects a growing consciousness about ethical investing and sustainable financial decision-making.

Section 2: Green Consumerism & Marketing Innovation investigates eco-conscious consumer behaviour, digital marketing trends, and sustainability-driven branding strategies, highlighting how businesses are adapting to environmentally aware markets.

Section 3: People, Work, and Sustainable HR Practices examines the intersection of technology and human capital, addressing topics like AI in HR, the rise of gig work, and Gen Z's workplace preferences paving the way for more resilient and adaptive workforce strategies.

Section 4: Financial Literacy & Digital Inclusion focuses on empowering individuals and communities through digital tools, addressing barriers in rural financial adoption, and promoting inclusive access to financial services and risk awareness.

Section 5: Operations, Technology & Inclusive Growth discusses innovation at the grassroots level, the rise of quick commerce, and the pivotal role of microfinance in economic development and women's empowerment.

Each contribution is the result of diligent academic inquiry and critical engagement with real-world issues. Faculty members have played a crucial role in mentoring students through every stage of the research process from identifying topics to refining methodologies and drawing meaningful conclusions.

We commend the students for their dedication to producing research that is not only academically sound but also socially relevant. We also extend our heartfelt appreciation to the faculty guides for fostering a culture of research and inquiry that encourages students to think beyond conventional boundaries.

We would especially like to acknowledge the Research Cell of the Institute for its consistent encouragement, guidance, and facilitation of student-led research. Its role in nurturing a spirit of academic curiosity and innovation among students has been instrumental in shaping the quality and depth of this volume.

We express our sincere gratitude to our Management, Director and Deputy Director for their visionary leadership and unwavering encouragement of student-centric research initiatives. Their support has been instrumental in promoting an institutional culture that values innovation, inquiry, and sustainability.

We hope this volume will serve as a valuable resource for students, educators, practitioners, and policymakers interested in building a greener, more inclusive future.

– The Editorial Team

Multidisciplinary Research Perspectives for the Greener Future

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Behavioural Finance and Investment Decisions of Working Women Towards Indian Stock Market an Empirical Study in Mumbai

***Hetvi Sedani, *Srushti Patil, *Sakina Sheikh, *Shrutika Shinde, **Dr. Charu Upadhyaya**

Abstract

Women nearly form half of the population of Mumbai. The city being the financial capital of the country plays a crucial role in the economic activities of the country. However, due growing financial independence the participation of women in investment activities have raised but findings suggest that many women prefer safer investment options like fixed deposits and gold. Women's participation in stock market remains limited due to various factors, including financial literacy, risk perception and also socio cultural barriers. Understanding the investment behaviour of working women is necessary for greater financial inclusion and encouraging informed decisions. This study explores the investment decisions of working women in Mumbai through the lens of behavioural finance, examining how psychological biases, financial knowledge, and fintech adoption influence their stock market participation.

Keywords: Women investors, Investment behaviour, Financial independence, Stock market participation, Financial literacy, Risk perception, Socio-cultural barriers, Behavioural finance.

Introduction

Investment decisions are influenced by a lot of complex psychological, social and economic factors. In recent years, behavioural finance has become a critical field that explores how cognitive biases and emotions shape our financial decisions. One of the key areas of interest within this domain is the investment behaviour of women, particularly in the Mumbai stock market. While traditional finance theories assume that investors act rationally to maximize returns, behavioural finance suggests that individual perceptions, societal norms, and financial literacy significantly impact investment choices.

**** Student, Thakur Institute of Management Studies and Research.***

*****Asso.Prof, Thakur Institute of Management Studies and Research.***

Despite the increasing financial independence of women in Mumbai, their participation in the stock market remains relatively low compared to men. Studies suggest that factors such as risk aversion, lack of financial education, and societal expectations contribute to this condition. Additionally, women investors may rely more on traditional investment avenues such as fixed deposits and mutual funds rather than engaging in direct stock market participation. Understanding these behavioural patterns is essential for designing policies and programs that promote financial inclusion and empowerment.

Objectives

1) To study how working women in Mumbai approach stock market through behavioural factors.
2) To study about the behavioural biases among female investors.
3) To study the factors like financial literacy and fintech adoption and its influence on investment decisions.
4) To study financial awareness among women in Mumbai.
5) To understand what drives or holds back women in Mumbai when it comes to stock market participation.
6) To study if lack of financial knowledge has any impact on the financial decisions made by women.
7) To study if lack of trust in fintech platforms has any impact on the financial decisions made by women.
8) To study if socio cultural factors have any impact on the financial decisions made by women.
9) To study if women in Mumbai choose safer options like fixed deposits and government schemes over stock market.

Literature Review

A Study on Factors Influencing the Perception and Preference of Investor's Behaviour towards Stock Broking Services. The study analyses the factors influencing investor perception and preference towards stockbroking services, emphasizing reputation, cost, technological advancements, and regulatory compliance. The research follows an empirical approach,

examining how different types of investors (full-service vs. discount brokerage users) perceive stockbroking services. Primary data was collected through a survey using Google Forms in July 2023, with 300 respondents selected via random sampling. The study focuses on market reputation, cost sensitivity, service quality, technological adoption, and regulatory compliance. The findings reveal that investors prioritize trust, cost-effectiveness, and digital access to trading platforms, with younger, tech-savvy investors preferring mobile-based trading, while conservative investors lean towards traditional brokerage services. The study identifies a literature gap in the micro-level analysis of investor preferences in specific regions, as most research focuses on macro trends in capital markets. (Dr. R. Sucharitha 2023)

A Comprehensive Analysis of Behavioural Finance and Its Impact on Investment Decisions. The study explores behavioural finance theories that challenge the traditional assumptions of rational investor behaviour and market efficiency. It examines five key psychological biases—loss aversion, short-term momentum, long-term reversal, framing effect, and the endowment effect—and their impact on investment decisions. The research relies on secondary data analysis, reviewing empirical case studies and financial market behaviours during crises, such as the 2008 Global Financial Crisis. The findings reveal that investors make irrational decisions influenced by emotions rather than logic, leading to market inefficiencies. The study suggests that psychological biases significantly distort investment decisions, making traditional financial models incomplete without incorporating behavioural finance insights. The research identifies a literature gap in gender-specific studies, particularly how behavioural biases influence different demographic groups, such as working women investors. (Feifan Ren 2024)

Exploring the Mediating Role of Financial Risk Tolerance Between Heuristic Biases and Working Women Investors' Investment Decisions. The study investigates the mediating role of financial risk tolerance (FRT) between heuristic biases (representativeness, availability, and anchoring) and investment decisions (ID) among working women investors in India. The research follows an empirical approach, collecting primary data through a survey distributed via email, WhatsApp, and LinkedIn, with 211 responses from working women in Uttar Pradesh who have at least two years of investment experience. The study identifies how representativeness bias leads to overestimation of stock potential, availability bias influences investment choices based on easily accessible information, and anchoring bias results in risk-averse behaviour. The findings reveal that representativeness and availability biases increase risk tolerance, while anchoring bias lowers it, ultimately shaping investment decisions. The study suggests a literature gap in regional behavioural finance research, particularly focusing

on women investors in urban financial hubs like Mumbai. (Harshita Srivastava, Sana Moid, and Naela Jamal Rushdi 2024)

A Study on Investment Pattern of Working Women in Bengaluru North. The study examines the investment patterns of working women in Bengaluru North, focusing on factors such as income stability, risk appetite, and return expectations. It explores how these factors influence investment decisions and preferences for various financial instruments. The research, conducted through surveys, highlights that financial literacy and risk perception significantly impact investment behaviour. Findings suggest that while some women prefer traditional investment options like fixed deposits and gold due to perceived stability, others are open to higher-risk investments such as mutual funds and stocks. The study emphasizes the need for targeted financial education programs to enhance awareness and encourage informed investment decisions among working women. (Bharath A et al 2023)

Financial Literacy among Women – Indian Scenario. The study examines the financial literacy among women in India, highlighting its importance for women's empowerment and economic growth. Using a descriptive research approach, it explores barriers, initiatives, and potential solutions to improve financial literacy levels. Primary data from surveys and secondary data from reports provide insights into women's financial behaviour, decision-making, and knowledge gaps. Findings reveal that women are good at managing household budgets; they often leave big financial decisions to men. The research suggests that banks, government programs, and NGOs should work together to educate women about money, include financial lessons in schools, and encourage women to take charge of their finances for a better future. (Chetna Singh et al 2017)

Why Do Women Invest Differently Than Men? The study examines the reasons for difference in investing patterns of women and men, using a descriptive study and reviewing historical data, conducting surveys to find out the risk tolerance levels of men and women due to various factors. The findings conclude that women are generally more risk averse than men and there is a need for better financial education and decision making. (Vickie L. Bajtelsmit, Alexandra Bernasek 1997)

Digital Financial Literacy and Its Impact on Financial Decision making of women: Evidence from India. The study examines the impact of digital financial literacy on women's financial decision making by collecting primary data from questionnaire and secondary from past records. The factors studied were digital financial literacy, financial decision making and the

finding concluded that Digital Financial Literacy influences financial decision making and there is a need to promote the same in women. (Deepak Mishra, Naveen Agarwal, Sanawi Sharahiley, Vinay Kandpal 2024)

Digital Financial Literacy among Working women in Kerala: a Study with Special reference to Malappuram District. The study examines digital financial literacy among working women in Kerala, focusing on Malappuram district. It identifies four key factors influencing digital financial literacy: financial inclusion, awareness, access to technology, and peer influence. Financial inclusion refers to access to and participation in formal financial systems. Awareness involves knowledge about digital financial tools and services. Access to technology covers the availability of devices and internet connectivity. Peer influence highlights the impact of social circles on financial behaviour. The research, based on 130 respondents, finds that digital financial literacy significantly impacts investment behaviour, explaining about 65.6% of its variation. Improved financial literacy leads to better financial decision-making and investment practices. The study highlights the importance of digital financial education and suggests expanding research to other regions in Kerala. (Sajeer. Cdr. , A. Anandalakshmy 2023)

A study on investment behaviour among rural working women with special reference to Ernakulam District. The study examines investment behaviour among rural working women in Ernakulam district. It highlights that while women are aware of various investment options, most prefer low-risk traditional investments like government savings schemes and bank deposits. Safety of principal is the primary factor influencing investment decisions, and 76% invest mainly to meet future expenses. Despite awareness, participation in higher-return investments like stocks and mutual funds remains low. The study suggests improving financial literacy, promoting investment in diverse assets, and introducing women-centric investment schemes to enhance financial independence and wealth creation. (S Sreelakshmi,Nayana Rajeevan,K G Rajani 2022)

A Comprehensive Analysis of Behavioural Finance and its Impact on Investment Decisions. The study examines the impact of behavioural finance on investment decisions by doing a descriptive study, reviewing existing literature and analysing market trends. The factors studied are Momentum, reversal, loss aversion to conclude the findings of behavioural finance's influence on financial decision making and the gap states that the existing financial models need to integrate behavioural finance for better analysis of the financial market. (Feifan Ren 2024)

Research Gap

Our literature review covers various studies on investor behaviour, behavioural finance, financial risk tolerance, and financial inclusion. The research by Dr. R. Sucharitha (2023) looks into investor preferences for stockbroking services, pointing out that most studies focus on macro trends in capital markets, leaving a gap in understanding individual investor choices at a micro level. Feifan Ren's (2024) study on behavioural finance highlights that women investors are often overlooked, and there's a lack of research on how behavioural biases impact them differently than men. Similarly, Harshita Srivastava et al. (2024) explore heuristic biases and financial risk tolerance among working women in Uttar Pradesh, but there's little focus on urban financial hubs like Mumbai, where investment behaviour might be completely different. Beyond these, other studies on financial literacy, digital finance, and socio-cultural barriers show that we still don't fully understand how women investors navigate financial decisions, especially when it comes to high-risk investments like stocks and mutual funds.

Further strengthening this perspective, Bharath A et al. (2023) studied investment patterns of working women in Bengaluru North, focusing on income stability, risk appetite, and return expectations. Their findings reveal that while some women prefer traditional investment options like fixed deposits and gold due to perceived stability, others are more open to higher-risk investments such as mutual funds and stocks. However, financial literacy and risk perception significantly influence these choices, highlighting the need for targeted financial education programs to encourage informed investment decisions. Similarly, Chetna Singh et al. (2017) explored financial literacy among women in India, emphasizing its role in women's empowerment and economic growth. The study found that while women are generally good at managing household budgets, they often leave major financial decisions to men. It suggests that banks, government programs, and NGOs should collaborate to improve financial literacy, introduce financial lessons in schools, and empower women to take charge of their financial decisions.

This is where our research comes in. We aim to fill these gaps by studying how working women in Mumbai approach the stock market through the lens of behavioural finance. While past research has looked at investor behaviour in general, there's very little on how factors like behavioural biases, financial literacy, and fintech adoption influence the investment decisions of urban working women in India. Despite increasing financial awareness, many women still hesitate to invest in high-risk options like stocks, opting for safer choices like fixed deposits

and government schemes. Through this study, we want to understand what drives or holds back women when it comes to stock market participation—whether it's a lack of financial knowledge, trust in fintech platforms, or deeper socio-cultural influences. Our goal is to provide valuable insights for policymakers and financial institutions to design better financial education programs and investment tools tailored for women. Ultimately, this research will contribute to the field of behavioural finance, offering a gender-focused, region-specific analysis that helps us understand how working women investors in Mumbai navigate the financial world.

Research Methodology

Research Design

This study adopts a causal research design to examine the investment decisions of working women in Mumbai through the lens of behavioural finance. The research aims to explore how behavioural biases, financial literacy, and fintech adoption influence stock market participation among women. Since causal research focuses on cause-and-effect relationships, this study will test various hypothesis to determine the impact of financial knowledge, trust in fintech platforms, and socio-cultural factors on investment behaviour.

Data Collection Methods

Primary data was collected through survey forms distributed among working women in Mumbai. The survey includes structured questions designed to assess their investment preferences, financial literacy, fintech adoption, and behavioural biases.

Sample

The study follows a convenience sampling method, where participants will be selected based on their availability and willingness to respond. The sample consists of working women in Mumbai. The collected data will be analysed using quantitative statistical methods. The following tests will be conducted:

Data Analysis

1) Hypothesis 1

H0: There is no difference between Asset class investment by women.

H1: There is a significant difference between asset class investment by women.

H0: $\bar{x}1=\bar{x}2$

H1: $\bar{x}1\neq\bar{x}2$

ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	1186.398721	6	197.7331201	617.4717814	0	2.108302203
Within Groups	298.1343284	931	0.320230213			
Total	1484.533049	937				

Table 1 One Way ANOVA Asset Class

Since Calculated value > Table value,

We will reject null hypothesis and will accept the alternate hypothesis.

2) Hypothesis 2

H0: There is no impact of financial knowledge on Investment by women.

H1: There is significant impact of financial knowledge on Investment by women.

H0: $\bar{x}1=\bar{x}2$

H2: $\bar{x}1\neq\bar{x}2$

One sample Z Test

One-Sample Test							
	Test Value = 0						
	t	df	Significance		Mean Difference	95% Confidence Interval of the Difference	
			One-Sided p	Two-Sided p		Lower	Upper
How much do you agree these are key barriers for women in Mumbai to join the stock market?	39.667	134	<.001	<.001	3.511	3.34	3.69

Table 2One sample Z Test Financial Knowledge

Conclusion:

Z-calculated = **39.667**

Z-critical (2-tailed, $\alpha = 0.05$) = **±1.96**

Since Z-calculated > Z-critical,

We reject null hypothesis and accept the alternate hypothesis.

3) Hypothesis 3

H0: There is no impact of socio-cultural background on investment decisions by women.

H1: There is significant impact of socio-cultural background on investment decisions by women.

H0: $\bar{x}1=\bar{x}2$

H1: $\bar{x}1\neq\bar{x}2$

One Sample Z Test

One-Sample Test							
	Test Value = 0						
	T	df	Significance		Mean Difference	95% Confidence Interval of the Difference	
			One-Sided p	Two-Sided p		Lower	Upper
How much do you agree with the following statements when it comes to the biggest barrier for women in Mumbai when it comes to stock market participation?	41.621	134	<.001	<.001	3.393	3.23	3.55

Table 3One sample Z Test socio-cultural background

Conclusion:

Z-calculated = **41.621**

Z-critical (2-tailed, α = 0.05) = **±1.96**

Since Z-calculated > Z-critical,

We reject null hypothesis and accept alternate hypothesis.

4) Hypothesis 4

H0: There is no impact of trust on fintech apps on investment decisions by women.

H1: There is visible impact of trust on fintech apps on investment decisions by women.

H0: $\bar{x}1=\bar{x}2$

H1: $\bar{x}1\neq\bar{x}2$

One Sample Z Test

One-Sample Test							
	Test Value = 0						
	T	df	Significance		Mean Difference	95% Confidence Interval of the Difference	
			One-Sided p	Two-Sided p		Lower	Upper
How much do you agree with the following statements? [I trust fintech apps for doing any investments]	37.108	134	<.001	<.001	3.104	2.94	3.27

Table 4One sample Z Test Fintech apps

Conclusion:

Z-calculated = **37.10**

Z-critical (2-tailed, α = 0.05) = **±1.96**

Since Z-calculated > Z-critical,

We reject null hypothesis and accept alternate hypothesis.

5) Hypothesis 5

H0: There is no significant difference in the preference towards traditional and fintech investment options among women.

H1: There is a significant difference in the preference towards traditional and fintech investment options among women.

H0: $\bar{x}1=\bar{x}2$

H1: $\bar{x}1\neq\bar{x}2$

Paired T test

Paired Samples Test										
		Paired Differences					t	df	Significance	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				One-Sided p	Two-Sided p
					Lower	Upper				
Pair 1	How much do you agree with the following statements? 1. I trust fintech apps for making investments. 2. I prefer traditional methods like banks or brokers for investing.	.141	1.512	.130	-.117	.398	1.082	134	.141	.281

Table 5: Paired sample Z Test

Conclusion:

For a paired t test,

Since the p-value (0.281) > 0.05,

We accept the null hypothesis and reject the alternate hypothesis.

6) Hypothesis 6

H0: There is no influence of family's financial habits on investment choices made by women.

H1: There is an influence of family's financial habits on investment choices made by women.

H0: $\bar{x}1=\bar{x}2$

H1: $\bar{x}1\neq\bar{x}2$

One Sample Z Test

One-Sample Test							
	Test Value = 0						
	T	df	Significance		Mean Difference	95% Confidence Interval of the Difference	
			One-Sided p	Two-Sided p		Lower	Upper
How much do you agree with the following statements? [My family's financial habits affect my investment choices]	35.677	134	<.001	<.001	3.289	3.11	3.47

Table 6One Sample Z test Financial Habits

Conclusion:

Z-calculated = **35.67**

Z-critical (2-tailed, α = 0.05) = **±1.96**

Since Z-calculated > Z-critical,

We reject null hypothesis and accept alternate hypothesis.

7) Hypothesis 7

H0: Women are dependent make financial decisions.

H1: Women make independent financial decisions.

H0: $\bar{x}1=\bar{x}2$

H1: $\bar{x}1\neq\bar{x}2$

One Sample Z Test

	One-Sample Test						
	Test Value = 0						
	T	df	Significance		Mean Difference	95% Confidence Interval of the Difference	
			One-Sided p	Two-Sided p		Lower	Upper
How much do you agree with the following statements? [I make independent financial decisions]	39.674	134	<.001	<.001	3.459	3.29	3.63

Table 7One Sample Z Test Financial Decisions

Conclusion:

Z-calculated = **39.674**

Z-critical (2-tailed, α = 0.05) = **±1.96**

Since Z-calculated > Z-critical,

We reject null hypothesis and accept alternate hypothesis.

8) Hypothesis 8

H0: There is no impact of fear of risk or losses on investment decisions made by women.

H1: There is an impact of fear of risk or losses on investment decisions made by women.

H0: $\bar{x}1=\bar{x}2$

H1: $\bar{x}1\neq\bar{x}2$

One Sample Z Test

One-Sample Test							
	Test Value = 0						
	t	df	Significance		Mean Difference	95% Confidence Interval of the Difference	
			One-Sided p	Two-Sided p		Lower	Upper
How much do you agree with the following statements when it comes to the biggest barrier for women in Mumbai when it comes to stock market participation? [Fear of risks/losses]	45.829	134	<.001	<.001	3.704	3.54	3.86

Table 8 One Sample Z Test Investment Decisions

Conclusion:

Z-calculated = **45.829**

Z-critical (2-tailed, $\alpha = 0.05$) = **±1.96**

Since Z-calculated > Z-critical,

We reject null hypothesis and accept alternate hypothesis.

Findings

The main goal of the research was to understand how women invest, the majority of respondents were female, which was in line with the study's goal. These women represented a range of age groups, but a sizable portion were in the 20–30 and 30–40 age ranges, which are generally associated with people in their early to mid-career stages. Although they came from a variety of professional backgrounds—from students and working professionals to homemakers and entrepreneurs—the majority were working professionals. Income levels also differed, with the most notable groups making between ₹25,000 and ₹50,000 per month and less than ₹25,000. This financial background provides information about their investment habits; some respondents had already started making stock market investments, while others were still unsure or in the process of doing so. While many women felt familiar with basic financial concepts, some acknowledged that their knowledge was limited, which has a direct impact on their investment participation. Awareness levels regarding financial terms also varied.

The majority of women reported investing occasionally, monthly or quarterly but did so in smaller amounts, usually under ₹10,000 annually, demonstrating a cautious and calculated approach. This discrepancy in knowledge and confidence was reflected in their investment behaviour. Three main obstacles to active investing were identified: insufficient time, unstable finances, and a lack of trustworthy advice. Although more women are starting to seek advice from financial advisors, cultural norms still appear to have some influence over financial behaviour, and many still rely on friends and family. Because they provide easier access to investment options, fintech apps like Zerodha, Groww, and Paytm Money have grown in popularity among respondents. With differing views on their impact, the role of social media and news also surfaced as a contributing factor. There was a strong desire to participate in financial literacy programs, even though the majority assessed their level of financial literacy as moderate or low. Additionally, respondents offered helpful recommendations that, if put into practice, could enable more women to take control of their financial future. These recommendations included streamlining investment tools, holding awareness seminars, and guaranteeing improved access to reliable financial advice.

Additionally, the data analysis of this study provides a comprehensive understanding of the factors influencing women’s investment decisions. The hypothesis testing reveals that investment behaviour is significantly impacted by financial knowledge, socio-cultural

influences, trust in fintech apps, and family financial habits. The findings indicate that while women are gradually becoming more independent in making financial decisions, many still exhibit caution due to fear of risks and a lack of confidence in their financial literacy. Despite the growing presence of fintech platforms, there is no substantial difference in preference between traditional investment methods and digital alternatives. Additionally, the study highlights that while many women have started investing, their investment amounts remain relatively small, reflecting a careful and calculated approach influenced by personal income levels and financial awareness. These insights emphasize the need for improved financial education, greater access to reliable investment guidance, and tools that simplify the investment process for women.

Conclusion and Recommendations

This study provides valuable insights into the investment behaviour of women, highlighting the key factors that influence their financial decisions. The findings reveal that financial knowledge, socio-cultural norms, trust in fintech applications, and family financial habits play significant roles in shaping how women invest. While many women are gradually becoming independent in managing their finances, concerns about risk, limited financial education, and a lack of reliable guidance continue to hinder active investment participation. The research also shows that while fintech platforms are gaining traction, traditional investment methods remain equally relevant. Despite increasing awareness, most women prefer a cautious approach, investing smaller amounts periodically. These insights emphasize the need for tailored financial education programs and accessible investment tools to empower women in making informed financial decisions.

To encourage greater financial participation among women, several steps can be taken. First, financial literacy programs should be implemented at educational institutions and workplaces to improve women's understanding of investment strategies. Second, fintech platforms should focus on enhancing trust and transparency, ensuring user-friendly interfaces and secure transactions to attract hesitant investors. Third, personalized financial advisory services should be made more accessible, particularly for women who lack confidence in independent decision-making. Additionally, policymakers and financial institutions should promote women-centric investment schemes that address risk concerns and offer lower barriers to entry. Finally, increasing awareness through social media campaigns, workshops, and mentorship programs can help women build confidence and take control of their financial futures. By implementing

these measures, more women can be encouraged to engage in long-term wealth-building through strategic investments.

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A Study on Impact of Behavioral Finance in Investment Decision Making

***Shraddha Somani, *Sakshi Zakade, *Alok Yadav, *Kashish Verma , ** Ms. Patricia Lemos**

Abstract

This study investigates the impact of behavioral finance on investment decision- making by examining how psychological and demographic factors influence investor behavior. The primary purpose is to analyze the role of biases such as overconfidence, loss aversion, and herd behavior, which challenge the traditional rationalist perspective in financial markets. A quantitative data from structured surveys has been used. The sample selection uses stratified sampling to ensure demographic diversity. Quantitative data is analyzed using statistical tools such as paired T- Test, Preliminary findings suggest that cognitive biases significantly affect investment decisions, and factors like age, gender, and financial literacy influence these biases. The study concludes that behavioral training programs have potential to mitigate irrational behaviors, bridging gaps in current predictive models and enhancing investment strategies through the integration of behavioral finance principles.

Keywords

Behavioural Finance, Investment Decision-Making, Cognitive Biases, Overconfidence, Loss Aversion

Introduction

Behavioural finance has emerged as a critical field that challenges the traditional assumptions of rationality in investment decision-making. Classical financial theories, such as the Efficient Market Hypothesis (EMH), assume that investors act logically and have access to complete information. However, real-world observations indicate that investor decisions are often influenced by psychological biases, emotions, and social influences. Concepts like overconfidence, loss aversion, and herd behaviour have shown to distort financial judgement, resulting in market anomalies and inefficiencies. As markets become more volatile and complex, understanding the psychological underpinnings of investor behaviour is essential for designing more effective financial strategies and policy frameworks.

***Student, Thakur Institute of Managaement Studies and Research**

****Asst.Prof, Thakur Institute of Management Studies and Research**

Literature Review:

Behavioral finance challenges traditional financial theories such as the Efficient Market Hypothesis by revealing how psychological and emotional biases significantly influence investor behavior. Key biases include loss aversion, overconfidence, herding, framing effects, mental accounting, regret aversion, anchoring, and hindsight bias. These biases often lead investors to make irrational and emotionally driven decisions, resulting in market inefficiencies, excessive trading, poor investment choices, and asset misevaluation.

Research by scholars like Tversky and Kahneman, Shefrin and Statman, Barber and Odean, and others, has demonstrated how cognitive shortcuts (heuristics) and emotions override rational analysis, affecting financial outcomes. Studies from various countries including China, Bangladesh, Saudi Arabia, and India further highlight the cross-cultural relevance of these biases. Demographic factors such as age, gender, and cultural background also influence investment behavior, with findings showing that young and male investors often exhibit more risk-taking and bias-prone behaviors.

Additionally, risk perception and investor sentiment are found to contribute to price distortions and market anomalies. Despite extensive research on the effects of these biases, a significant gap remains in the development of predictive models that incorporate behavioral, demographic, and psychological factors into real-time investment strategies.

The reviewed literature emphasizes the importance of financial literacy and behavioral training to help investors recognize and mitigate the negative effects of biases, thereby promoting more rational and goal-aligned investment decisions.

There is a need for further research on how behavioral biases impact investment decisions, particularly in new markets like India. Existing predictive models struggle with real-time forecasting and fail to comprehensively link behavioral finance with investment decisions. Future studies should incorporate psychological, emotional, and demographic factors to improve investment strategies. Additionally, research should explore how financial education and behavioral training can mitigate bias-driven decisions. The study's small sample size and limited exploration of psychological influences highlight the necessity for broader, comparative analyses across different countries.

Research Problem

Despite extensive research in behavioural finance, there is still a lack of comprehensive predictive models for bias- driven market inefficiencies. Additionally, limited studies explore

how behavioural training can reduce investment biases. This study seeks to answer the following research questions:

1. How do psychological biases affect investment decision-making?
2. What role does demographic diversity play in investor behaviour?
3. Can behavioural training effectively mitigate irrational investment decisions?

Objectives

1. To analyze the role of psychological biases in financial decision-making.
2. To examine the influence of demographic factors on investment behaviour.
3. To explore the potential of behavioral training programs in reducing investment biases.

By addressing these objectives, this research aims to bridge existing gaps and contribute to a more effective application of behavioural finance principles in investment strategies.

Methodology

The study adopts a survey-based empirical research design aimed at understanding behavioral finance patterns among investors. Data was collected through a structured questionnaire using Likert scale responses, indicating a quantitative primary data collection method. A total of 38 participants responded to the survey. The data is analyzed using descriptive statistics (such as frequency and percentage analysis) and is suitable for inferential analysis (e.g., chi-square tests or correlations) to identify patterns related to biases like herding, regret aversion, and loss aversion. The research blends exploratory and descriptive approaches to investigate investor behavior and psychological influences on financial decision-making.

Data Analysis

Hypotheisis Statement:

H_0: Financial literacy has no significant effect on behavioural biases in investment decision-making.

H_1: Higher financial literacy reduces behavioural biases in investment decision- making.

H_0: Age does not significantly influence investment biases.

H_1: Age significantly influences investment biases.

H_0: Gender does not significantly influence investment biases.

H_1: Gender significantly influences investment biases.

t-Test: Paired Two Sample for Means

	Variable 1	*Variable 2*
Mean	1.465116279	3.093023256
Variance	0.254706534	0.800664452
Observations	43	43
Pearson Correlation	-0.203537776	
HypothesizedMean Difference	0	
df	42	
t Statisstics	-9.589426706	
P(T<=t) one-tail	1.93171E-12	
t Critical one-tail	1.681952357	
P(T<=t) two-tail	3.86343E-12	
t Critical two-tail	2.018081703	

Table 1Two Sample t test Gender

Interpretation

- The p-value is far less than 0.05, which means the difference in means between gender and perceived impact of biases is statistically significant.
- The negative correlation suggests that females (higher numerical code) are more likely to believe that biases impact investment decisions compared to males.
- The significant t-value supports rejecting the null hypothesis — there is a meaningful difference in perceptions based on gender.

Insights

The test indicates that gender significantly influences how individuals perceive the impact of psychological biases on investment decisions. Specifically, females may be more aware or accepting of the influence of behavioral biases than males in the sample.

t-Test: Paired Two Sample for Means		
	Variable 1	*Variable 2*
Mean	1.046511628	3.093023256
Variance	0.045404208	0.800664452
Observations	43	43
Pearson Correlation	0.101642882	
Hypothesized Mean Difference	0	
df	42	
t Statistics	-14.93580227	
P(T<=t) one-tail	1.04641E-18	

t Critical one-tail	1.681952357	
P(T<=t) two-tail	2.09281E-18	
t Critical two-tail	2.018081703	

Table 2Two sample age group

Interpretation

- The very low p-value and large negative t-statistic indicate a highly significant difference between the age group and their perception of bias impact.
- The data strongly suggests that participants from the youngest age group (since the mean is ~1.05) perceive bias impact differently (more or less significantly) than others.
- The weak positive correlation (0.10) suggests a slight upward trend in perceived bias impact with age, but it's not strong enough to be practically meaningful.

Insights

There is a statistically significant difference between age group and the perceived impact of behavioral biases on investment decisions. The results suggest that younger investors (majority in this sample) may perceive the influence of behavioral biases differently than older groups — possibly underestimating or not fully recognizing their impact. This underscores the need for age-targeted investor education programs to raise awareness about the role of behavioral biases in financial decision-making.

t-Test: Paired Two Sample for Means		
	Variable 1	*Variable 2*
Mean	3.395348837	3.093023256
Variance	0.816168328	0.800664452
Observations	43	43
Pearson Correlation	0.39522365	
Hypothesized Mean Difference	0	
df	42	
t Statistics	2.004807359	
P(T<=t) one-tail	0.025728785	
t Critical one-tail	1.681952357	
P(T<=t) two-tail	0.051457569	
t Critical two-tail	2.018081703	

Table 3Two sample test perceived literacy

Interpretation

- The one-tailed test is statistically significant ($p < 0.05$), meaning people who rate themselves higher in financial literacy aremore likely to believe that biases impact investment decisions.
- The two-tailed result ($p = 0.051$) is just above the 0.05 threshold, so it's marginal. This means the difference is nearly significant when not specifying the direction.
- The moderate positive correlation (0.395) suggests a reasonable relationship: as perceived financial literacy increases, so does recognition of behavioral bias influence.

Insights

The results suggest a mildly significant relationship between self-rated financial literacy and awareness of behavioral biases in investment. More financially literate individuals tend to be more conscious of how psychological biases influence their decisions. This supports the importance of financial education in enhancing behavioral awareness and potentially leading to more rational investment choices.

Future research:

Based on the findings of the report, future research can explore the following areas to further understand behavioral finance and its impact on investment decision-making:

1. **Developing More Accurate Predictive Models**

a. Current financial models struggle to account for real- time investor behavior influenced by biases. Future research could integrate machine learning and artificial intelligence to predict market movements based on behavioral patterns.

b. Combining psychological, emotional, and demographic factors in predictive models can help create a more comprehensive approach to understanding investor behavior.

2. **The Long-Term Impact of Financial Education and Training**

A. While this study highlights the benefits of behavioral training, future research can measure the long-term effects of such programs.

B. Studies can track whether individuals who receive behavioral finance training make fewer irrational investment decisions over time.

3. Impact of Digital Investment Platforms and Social Media

With the rise of digital trading platforms and social media influencers, future studies could examine how these factors influence investor biases.Future research should focus on bridging the gap between psychology and finance by using technology, cross-cultural studies, and long-term behavioral tracking. This will help investors, policymakers, and financial institutions create strategies that reduce irrational behavior and improve market efficiency. The study highlights how human psychology influences investment decisions, challenging the traditional belief that investors always act rationally. Instead, biases like overconfidence, loss aversion, and herd mentality often lead to irrational financial choices, creating market inefficiencies.

Key interpretations include:

1. **Investment Decisions Are Driven by Emotion and Bias** – Many investors make choices based on fear, confidence, or trends rather than logic and analysis. This explains why markets sometimes behave unpredictably.
2. **Demographics Shape Bias Perception** – Factors like gender, age, and financial literacy influence how much investors recognize and account for biases. Younger investors may underestimate bias effects, while more financially educated individuals are more aware of their influence.

3. **Financial Education Can Reduce Biases** – The study suggests that teaching investors about behavioral finance can help them make more informed, rational decisions. By improving financial literacy, individuals may develop better investment strategies.

Conclusion:

1. **Cognitive Biases Influence Investment Decisions:**

a. Investors exhibit biases such as overconfidence, loss aversion, and herd behavior, which significantly impact financial decisions.

b. Psychological biases contribute to irrational investment choices, leading to market inefficiencies.

2. **Demographic Factors Affect Bias Perception:**

a. **Gender:** Females tend to perceive a stronger impact of biases on investment decisions compared to males.

b. **Age:** Younger investors show different perceptions of biases, potentially underestimating their influence compared to older investors.

c. **Financial Literacy:** Individuals with higher financial literacy are more aware of behavioral biases and their effects on investment choices.

3. Behavioral Training Can Reduce Biases:

a. Financial literacy and behavioral training can help investors recognize and mitigate biases.

b. This can lead to better financial decision-making and more rational investment behavior.

The study confirms that psychological and demographic factors significantly influence investor behavior. Cognitive biases lead to irrational financial decisions, which can be mitigated through targeted financial education and behavioral training. Recognizing and addressing these biases can enhance investment strategies and improve market efficiency. Future research should expand on predictive models that integrate behavioral finance principles for more effective real-time decision-making.

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The Impact of FOMO on Investment Behavior: A Behavioral Finance Perspective

***Dhruvesh Shah, *Kalika Singh, *Ankush Shukla, **Dr. Vishal Sandanshive**

Abstract

In an increasingly digitized and socially interconnected world, the Fear of Missing Out (FOMO) has emerged as a powerful psychological driver of investment behavior, particularly among retail investors. This study explores the multifaceted impact of FOMO on financial decision-making through the lens of behavioral finance. Findings aim to provide deeper insight into the cognitive and emotional underpinnings of investor behavior in volatile markets. This study holds practical implications for policymakers, financial advisors, and investors by offering strategies to foster more informed, rational decision-making in the face of digital peer pressure and market hype. Ultimately, it seeks to bridge the gap between theory and real- world investment behavior, emphasizing the urgent need to understand and address the behavioral vulnerabilities exposed by modern financial ecosystems.

Keywords: FOMO, Behavioral Finance, Investment

Introduction

In the dynamic landscape of modern financial markets, investor behavior is increasingly influenced by psychological and emotional factors. Among these, the Fear of Missing Out (FOMO) has emerged as a significant behavioral bias that drives impulsive and often irrational investment decisions. FOMO is characterized by an anxiety that others might be achieving better financial outcomes, leading individuals to follow market trends without thorough analysis or risk assessment. With the proliferation of social media and real-time market updates, retail investors are constantly exposed to peer performance, speculative success stories, and viral investment trends. This heightened connectivity often amplifies emotional responses, pushing investors to act hastily to avoid perceived missed opportunities. As a result, FOMO has become an increasingly relevant concern in behavioral finance, influencing not just what investors choose, but why and how they make those choices.

***Student, Thakur Institute of Management Studies and Research**
****Professor, Thakur Institute of Management Studies and Research**

This research seeks to delve into the psychological and behavioral mechanisms that underlie FOMO-driven investment behavior. By integrating existing literature with empirical data collected from retail investors, the study aims to explore how heuristic biases (such as overconfidence, availability, and anchoring), herding behavior, and emotional drivers like anxiety and regret contribute to decision-making under the influence of FOMO.

The significance of this study lies in its timely exploration of a modern-day behavioral finance phenomenon. It aims to provide a nuanced understanding of how social influence and digital exposure affect investor psychology, with a particular focus on retail participants. Furthermore, the research will examine how factors such as financial literacy, risk aversion, and regulatory awareness can mitigate the negative effects of FOMO, ultimately contributing to more rational and sustainable investment practices.

Literature Review

The emergence of behavioral finance has shifted the paradigm of investment decision-making by emphasizing psychological influences and cognitive biases that deviate from traditional rational models. One such modern psychological trigger is the Fear of Missing Out (FOMO), which has gained significant relevance with the growth of digital connectivity and social media. FOMO can lead investors to follow market trends without proper analysis, driven by anxiety and the desire to not miss perceived financial opportunities.

Several studies have highlighted the core behavioral biases that contribute to FOMO-influenced decisions. Heuristic behaviors such as overconfidence, representativeness bias, anchoring, and availability bias frequently distort investor perception and judgment. These biases result in quick, emotionally charged decisions rather than careful financial analysis. Barberis and Thaler (2003) emphasized that heuristic-driven investors are more likely to chase returns during market bubbles, a trend increasingly fueled by FOMO.

Herding behavior is another key factor. Bikhchandani and Sharma (2000) explained that herding arises when individuals mimic the actions of a larger group, often assuming that collective decisions must be correct. In FOMO contexts, this behavior is magnified as investors rely on the investment actions of peers, influencers, or online communities rather than personal evaluation. The result is speculative booms followed by sharp corrections.

The role of psychological drivers—such as anxiety, regret aversion, and impulsivity—has also been extensively studied. Investors driven by FOMO often experience emotional discomfort when not participating in rising markets or trending assets, which can lead to hasty decisions and future regret. Loewenstein et al. (2001) argued that anticipatory emotions can significantly

distort risk perception and investment rationality.

Social media further intensifies FOMO by creating an environment of continuous peer comparison and hype. Studies suggest that increased exposure to social platforms correlates with higher levels of FOMO and impulsive investing. At the same time, the literature indicates a lack of adequate exploration into the long-term sustainability of such behavior and the potential regulatory frameworks that could help manage its impact.

While much research has examined individual biases and emotions in finance, there remains a gap in integrated studies that examine FOMO as a distinct behavioral construct.

Furthermore, limited research focuses on the role of financial literacy and regulatory awareness in counteracting FOMO-driven investment patterns—an area this study aims to explore in depth.

Gap Identification

While the behavioral finance literature has extensively explored the psychological underpinnings of investor decision-making, the specific role of Fear of Missing Out (FOMO) remains relatively under searched as a standalone phenomenon. Existing studies have examined various biases such as overconfidence, representativeness, anchoring, and availability but have not fully addressed how these biases interact with FOMO to shape impulsive investment decisions in real-time market scenarios.

A significant gap lies in the understanding of how FOMO operates as a mediating psychological construct, particularly in conjunction with social influence mechanisms such as herding behavior. While herding has been widely studied, its intersection with FOMO especially in the context of digital exposure requires deeper empirical investigation.

Current research often treats FOMO as a by-product of existing biases rather than analyzing it as a distinct behavioral force with its own triggers and outcomes.

Moreover, the influence of social media—arguably one of the most powerful amplifiers of FOMO—has not been sufficiently integrated into behavioral finance models. While platforms like Twitter, Instagram, and Reddit are increasingly shaping retail investor sentiment, their role in fueling FOMO-based decisions has not been quantitatively modeled or validated through structured primary research.

Another gap exists in the assessment of demographic-specific vulnerabilities, particularly among young and retail investors who are more exposed to digital trends and peer comparison. There is also limited research on risk moderation strategies, such as financial literacy, regulatory

awareness, and emotional regulation techniques, that could help investors mitigate the adverse impact of FOMO. Finally, while many studies focus on short-term market reactions and trading behaviors, the long-term implications of FOMO-driven investing such as portfolio sustainability, regret aversion, and investor burnout—remain largely unexplored. This presents an opportunity for the present study to fill a meaningful void in both academic and practical domains.

By addressing these gaps, this research aims to offer a holistic behavioral framework that encapsulates FOMO's psychological roots, social triggers, and financial consequences, ultimately contributing to more informed investor behavior and effective regulatory policy recommendations.

Research Design and Methodology:

Research Design

This study will adopt a mixed-method approach, combining quantitative surveys and qualitative thematic analysis.

The research will integrate existing literature with empirical data collected from retail investors.

Participants/Sample

Target population: Retail investors who actively trade in financial markets. Sample size: 100 respondents selected through convenience sampling.

Data Collection

Primary data: Online surveys.

Secondary data: Analysis of behavioral finance literature and past studies.

Data Analysis

Quantitative analysis: Statistical techniques such as Structural Equation Modeling (SEM) using SPSS or SmartPLS.

Hypothesis Statements:

H1: Investors with higher social media exposure are more likely to experience FOMO-driven investment decisions.

H2: Heuristic biases such as overconfidence and representativeness amplify FOMO in financial markets.

Data Analysis

Social Media Usage for Investment – Age-Wise Analysis

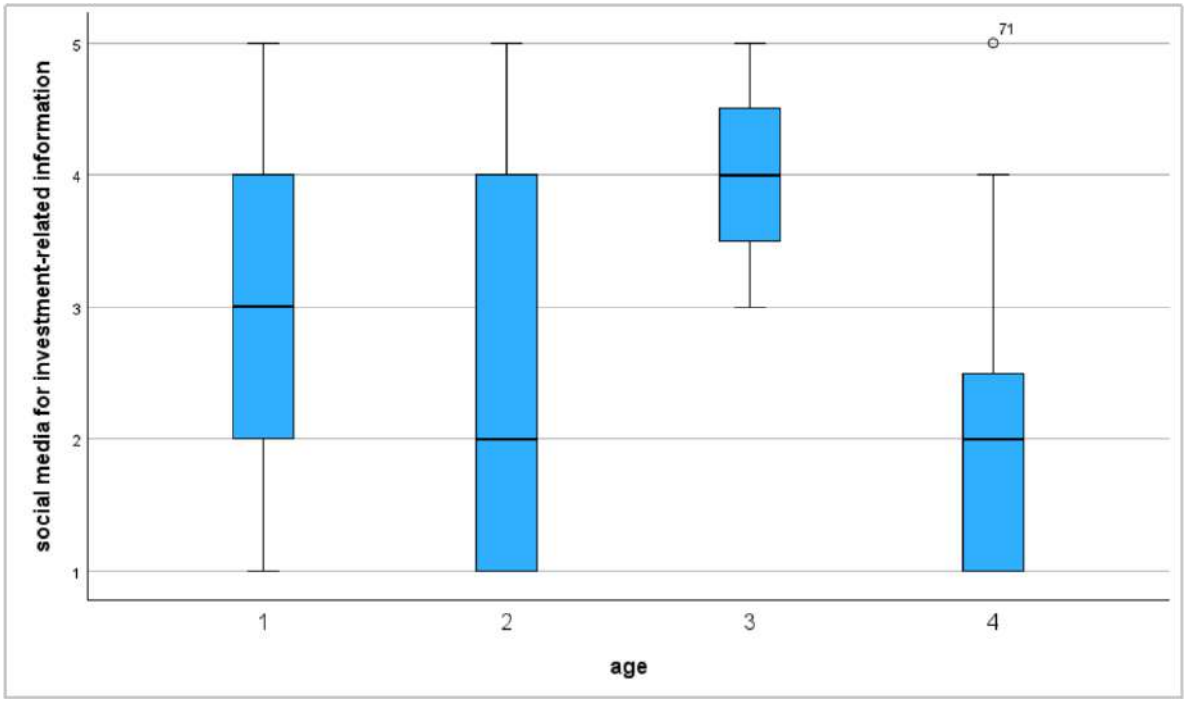

Figure 1Demographics- Age

The boxplot shows that individuals aged 36–45 years (Group 3) are the most consistent and frequent users of social media for financial insights. This group has a median score of 4 and a tight interquartile range (3.5–4.5), suggesting a uniform pattern of digital engagement.

Conversely, young adults (18–25) show greater variance, indicating a split between heavy and light users. Older individuals (46+) show the least dependence, with a compressed median around 2.

FOMO triggered by social media is strongest among middle-aged investors and inconsistently present among the youth.

Investment Anxiety – Gender-Based Analysis

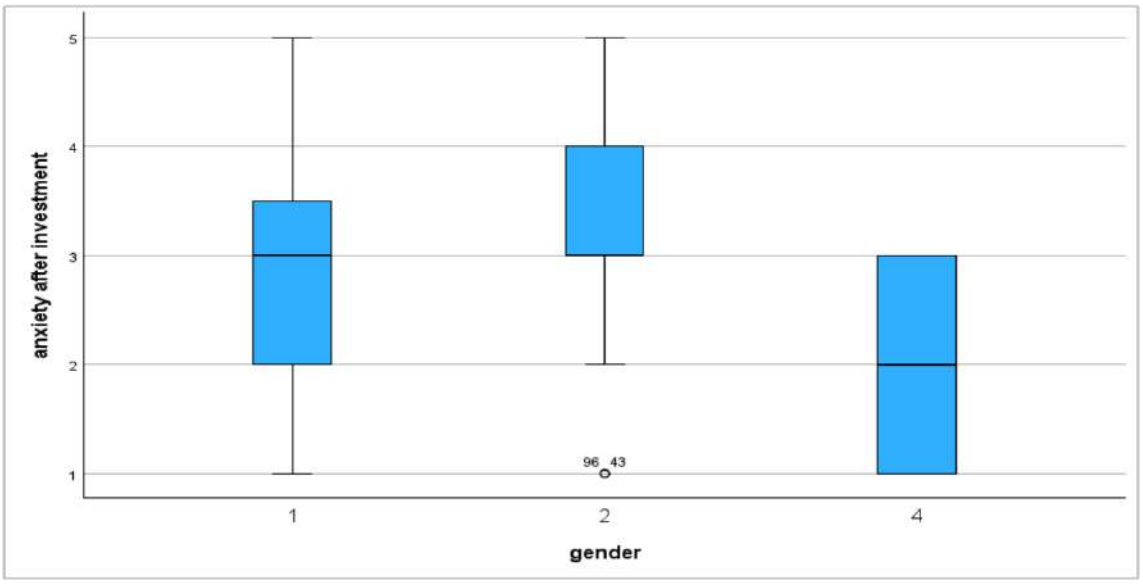

Figure 2Demographics Gender

Female investors show the highest levels of post-investment anxiety (median = 4), while males report more moderate but varied responses (median = 3). Participants identifying as "Other" or "Prefer not to say" show the lowest anxiety (median = 2), suggesting emotional resilience.

Interpretation: Emotional factors like anxiety and regret—core drivers of FOMO—are more prominent among female investors, potentially increasing susceptibility.

Age-Wise Risk Tolerance

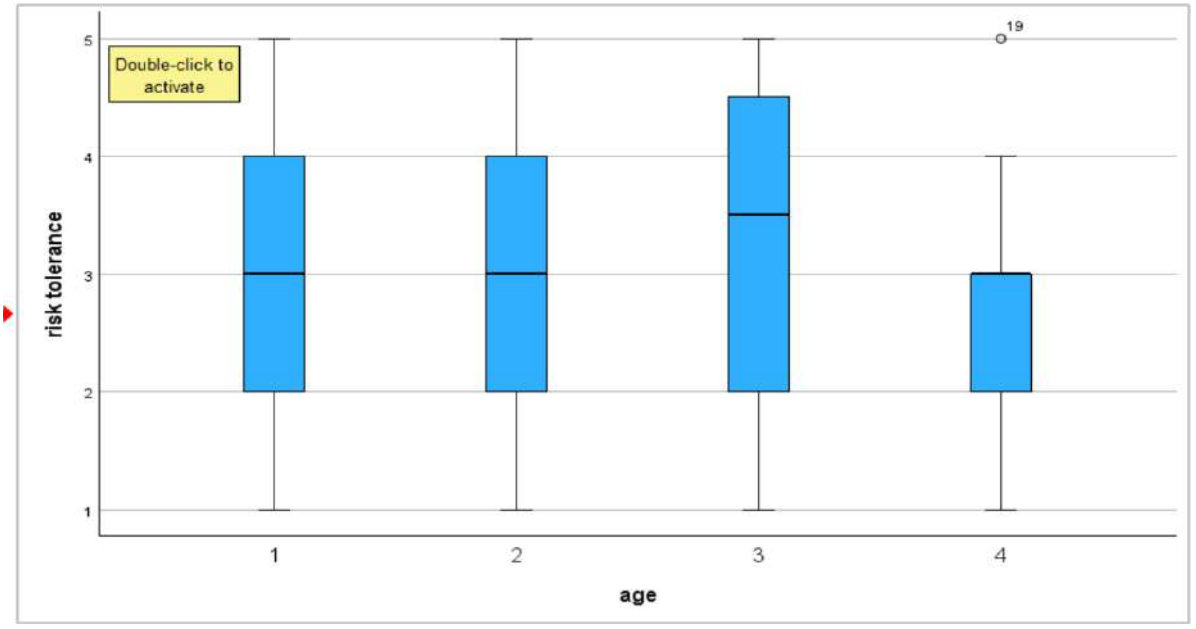

Figure 3Risk Tolerance

Mid-career adults (35–44 years) exhibit the highest risk tolerance (median = 4), possibly due to higher incomes and more investment experience. Surprisingly, younger groups (18–34) are moderately risk-tolerant, contradicting stereotypes of aggressive youth investing. Seniors (45+) are the most risk-averse.

Interpretation: The data suggests that risk-taking behavior fueled by FOMO peaks in mid- life, not necessarily among the youngest.

Social Media Use – Fine-Grained Age Segmentation

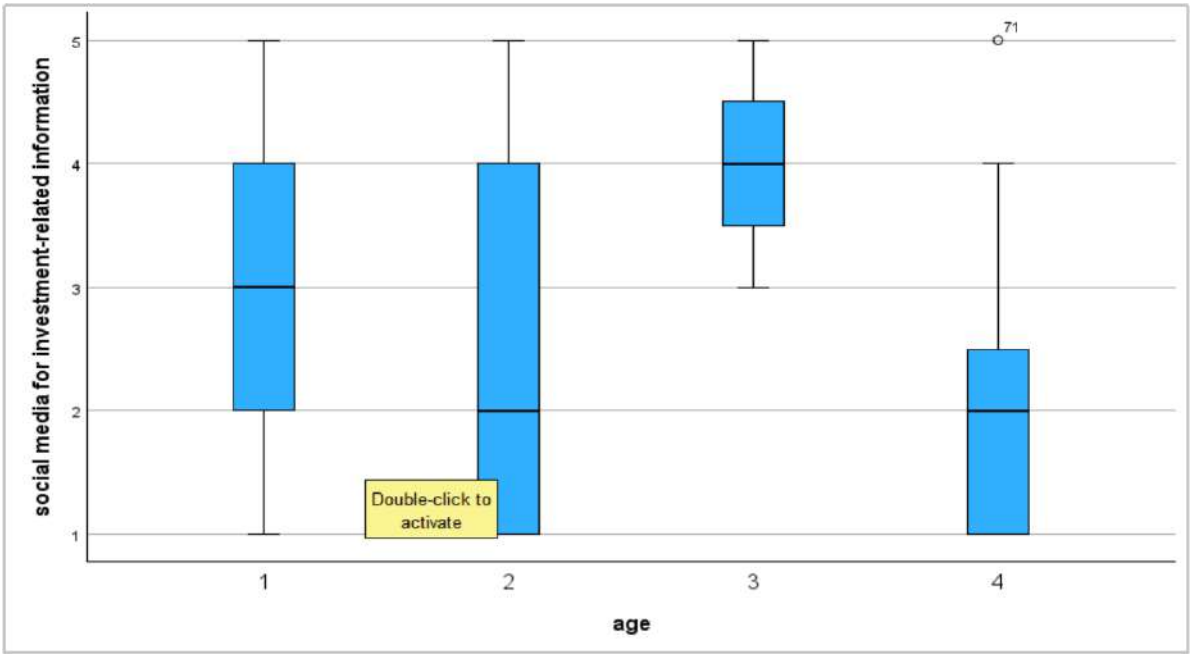

Figure 4 Social Media Use

This refined plot breaks down younger and middle-aged users further. Group 3 (35–44) again shows the highest and most consistent usage. Group 2 (25–34) shows scattered usage, implying room for more financial education and awareness.

Social media campaigns should focus on middle-aged groups for maximum traction, while younger users need educational nudges to build trust.

Hypothesis Testing: FOMO and Investment Behavior Hypothesis 1: Effect of Age Group on FOMO-Related Investment Anxiety Hypothesis Statement:

Null Hypothesis (H_0): There is no significant difference in FOMO-related investment anxiety across different age groups.

Alternative Hypothesis (H_1): There is a significant difference in FOMO-related investment anxiety across different age groups.

Statistical Test Used:
A One-Way ANOVA (Analysis of Variance) was conducted. Independent Variable: Age Group (categorized)
Dependent Variable: Frequency of FOMO-related investment anxiety (measured on a Likert scale)
Assumption Check – Homogeneity of Variance:
To validate the assumption of equal variances, Levene's Test for Homogeneity of Variance was performed.
Levene Statistic = 0.897
Degrees of Freedom: df1 = 3, df2 = 92 Significance (p) = 0.446
Since p > 0.05, the assumption of homogeneity of variances is met, and proceeding with ANOVA is appropriate.

ANOVA Results:

Source	Sum of Squares	df	Mean Square	F	Sig. (p-value)
Between Groups	6.385	3	2.128	1.873	0.140
Within Groups	104.521	92	1.136		
Total	110.906	95			

Table 1One-Way ANOVA

Since the p-value is 0.140, which is greater than 0.05, the result is not statistically significant.

The null hypothesis is not rejected. There is no statistically significant difference in FOMO-related investment anxiety across different age groups. This indicates that age does not significantly influence how frequently individuals experience anxiety due to fear of missing out on investment opportunities.

Hypothesis 2: Association Between Social Media Exposure and FOMO-Related Investment Anxiety

Hypothesis Statement:

Null Hypothesis (H_0): There is no significant association between social media exposure and FOMO-related investment anxiety.

Alternative Hypothesis (H_1): There is a significant association between social media exposure and FOMO-related investment anxiety.

Statistical Test Used:

Chi-Square Test of Independence was performed using SPSS to examine the relationship between social media usage and FOMO-related anxiety.

Test Results:

Chi-Square Value (χ^2): 40.649 Degrees of Freedom: 16

Asymptotic Significance (p-value): < 0.001 Valid Cases: 96

Note: 68.0% of expected cell counts were less than 5, with a minimum expected count of 0.69, which may affect the robustness of the test results.

Chi-Square Tests

	Double-click to activate	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	40.649[a]	16	<.001
Likelihood Ratio	42.419	16	<.001
Linear-by-Linear Association	12.010	1	<.001
N of Valid Cases	96		

a. 17 cells (68.0%) have expected count less than 5. The minimum expected count is .69.

Table 2Chi-Square

The p-value is less than 0.001, indicating a statistically significant association between social media exposure and investment anxiety related to FOMO.

The null hypothesis is rejected. There is a significant association between social media usage and FOMO-related investment anxiety. Individuals who frequently use social media report higher levels of anxiety related to missing out on investment opportunities.

Conclusion

This research explored the psychological phenomenon of Fear of Missing Out (FOMO) and its

influence on investment behavior through the lens of behavioral finance. The study aimed to identify how factors such as heuristic biases, herding behavior, social media exposure, and psychological triggers—particularly anxiety and regret—contribute to FOMO-driven investment decisions.

Through a combination of descriptive analysis and hypothesis testing, several key insights emerged. Firstly, social media usage was found to be significantly associated with increased levels of FOMO-related investment anxiety. Individuals with higher social media exposure were more prone to emotional investment decisions, often driven by trending narratives or peer influence. This finding supports the argument that digital platforms can amplify behavioral biases and lead to impulsive financial actions.

Conversely, age was not found to have a statistically significant impact on FOMO-related investment anxiety. This suggests that FOMO is a cross-generational phenomenon, influenced more by exposure and psychological predispositions than by age alone.

Additionally, gender-based analysis indicated that female participants reported higher levels of anxiety post-investment, revealing potential emotional dimensions to investment behavior that may vary by demographic.

The study reinforces the idea that investment decisions are not purely rational; they are shaped by cognitive shortcuts, emotional reactions, and social contexts. While heuristic behaviors and risk preferences varied among age groups, FOMO emerged as a common thread influencing modern retail investor behavior.

These findings have both academic and practical implications. They highlight the need for enhanced investor education focused on behavioral awareness, the development of decision-support tools to mitigate emotional investing, and the importance of incorporating psychological dimensions into financial advisory practices. Future research could benefit from a larger and more diverse sample to further validate these patterns and explore intervention strategies aimed at reducing FOMO-induced financial risk.

In conclusion, the impact of FOMO on investment behavior is substantial and growing, especially in a digitally connected world. Recognizing and addressing its drivers is essential for promoting more informed, balanced, and sustainable financial decision-making among investors.

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ESG Investing & Behavioral Trends Among Gen Z Investors

***Aakanksha Arun Vadvalkar, *Disha Ramesh Vishwakarma, *Nidhi Yada,**

****Dr. Charu Upadhyaya**

Abstract

This study investigates the perceptions and behaviors of Gen Z in relation to ESG (Environmental, Social, and Governance) investing a growing trend that blends financial goals with ethical and sustainable considerations. As Gen Z begins to actively participate in financial markets, understanding their motivations and barriers toward ESG investing becomes crucial for predicting future investment patterns. The research employed a mixed-method approach, combining both qualitative insights and quantitative analysis. Primary data was collected through a structured questionnaire distributed to 61 Gen Z participants, while secondary data included case studies and research papers. Statistical analysis was conducted using ANOVA tests to evaluate the significance of various factors. The results indicate that Gen Z investor's awareness and knowledge of ESG significantly influence their investment decisions, with a p- value of 0.036, leading to the rejection of the null hypothesis. Conversely, the analysis found no significant relationship between Gen Z investors' occupational backgrounds and their motivation to invest in ESG, suggesting consistent ethical and environmental concerns across various professional groups. The study concludes that while awareness plays a vital role in driving ESG investment behavior, occupation does not significantly shape motivation. These insights are valuable for financial institutions, educators, and policymakers aiming to promote sustainable investing among young investors. Further research is recommended to explore generational comparisons, long-term behavioral trends, and the role of digital media in shaping ESG investment decisions.

Keywords: ESG Investing, Gen Z, Behavioral Finance

Student, Thakur Institute of Management Studies and Research

****Associate Professor, Thakur Institute of Management Studies and Research***

Introduction

ESG investing stands for Environmental, Social, and Governance investing. It means choosing to invest in companies that care about things like protecting the environment, treating people fairly and being honest in how they run their business. In today's world, where climate changes and social issues are major concerns, ESG investing is becoming more popular, especially among young people.

Gen Z people born roughly between 1997 and 2012 is starting to enter the world of investing. This generation has grown up with easy access to the internet, social media, and information about global issues. As a result, many Gen Z investors are not just interested in making money; they also want their investments to reflect their values and support positive change in the world.

This research looks at how Gen Z thinks and acts when it comes to ESG investing. It aims to understand what motivates them, what factors they care about most, and how their behaviour is different from older generations. By studying these trends, we can better understand how the future of investing might change as Gen Z becomes more active in financial markets.

Research problem

1. Does Gen Z's awareness and knowledge affect their ESG investment decisions?
2. Does Gen Z's occupation affect their motivation to invest in ESG?

Objectives

1. To analyze the impact of Gen Z investors awareness and knowledge of ESG investing on their decision to invest in ESG-focused funds or stocks.

2. To determine whether Gen Z investors occupational backgrounds influence their motivation to invest in ESG assets.

Hypotheses

1. **Awareness & Knowledge (Test 1)**

H0 (Null Hypothesis): Gen Z investors' level of awareness and knowledge of ESG investing does not significantly affect their investment decisions.

H1 (Alternate Hypothesis): Gen Z investors' level of awareness and knowledge of ESG investing significantly affects their investment decisions.

2. **Investment Motivation (Test 2)**

H0 (Null Hypothesis): Gen Z investor's Occupations does not significantly impact their motivation to invest in ESG stock.

H2 (Alternate Hypothesis): Gen Z investor's Occupations significantly impact their motivation to invest in ESG stock.

Literature Review

The literature on ESG (Environmental, Social, and Governance) investing shows mixed results regarding its impact on financial performance. While many studies report a positive relationship highlighting benefits like higher returns and improved stability others note neutral or even negative effects. Analysis methods include regression, correlation, portfolio construction, and industry comparisons. ESG integration often leads to better outcomes in developed markets and sectors like technology and healthcare, with digital transformation shown to enhance these effects further.

However, several gaps remain. There's a lack of consensus among ESG rating agencies, limited research in emerging markets and high-pollution industries and few studies that establish long- term causality. Additionally, inconsistent ESG measurement methods hinder comparison. Overall, while ESG appears beneficial in many contexts, further research is needed to address rating inconsistencies and explore industry-specific and regional effects more deeply.

Investors are increasingly considering ESG factors when making decisions, as they can help reduce risks and improve long-term returns. However, a major challenge is the lack of consistency in ESG ratings, as different agencies use different methods to measure

ESG performance. Some studies also question whether ESG directly causes better financial results or if other factors are at play. Additionally, most research focuses on developed countries, leaving a gap in understanding how ESG investing affects emerging markets. While ESG is becoming an important part of modern finance, more research is needed to clear up these uncertainties and provide a clearer picture of its true impact.

Research Design

This study follows a qualitative and quantitative research design using survey-based data collection. The combination of primary and secondary data ensures a comprehensive understanding of ESG investing.

Data Collection Method

Primary Data: Structured questionnaire to collect opinions on ESG investing.

Secondary Data: Case studies/Research papers

Participants/ Sample:

A total of 61 respondents participated in the survey, comprising different occupation of Gen Z investors, to evaluate their perceptions of ESG factors.

Data Analysis:

For survey data: Statistical tests like ANOVA to compare investor perceptions.

Test 1: Awareness & Knowledge

ANOVA

Have you ever invested in an ESG - focused fund or stock?

Sum of Squares		df	Mean Square	F	Sig.
Between Groups	1.619	2	.809	3.529	.036
Within Groups	13.299	58	.229		
Total	14.918	60			

Table 1One-Way ANOVA Awareness & Knowledge

Test 2: Investment Motivation

ANOVA

Sum of Squares		df	Mean Square	F	Sig.
Between Groups	.322	1	.322	.150	.700
Within Groups	126.989	59	2.152		
Total	127.311	60			

Table 2ESG Investment across occupation

Interpretation of results & Implications

TEST 1: Awareness & Knowledge vs Investment in ESG Assets

As per table 1.a and table 1.b above, the ANOVA results show a significant impact in ESG investment decisions among Gen Z investors based on their level of awareness and knowledge where p-value (Sig.) 0.036 is less than 0.05, therefore we reject null hypothesis and accept alternate hypothesis. This indicates that Gen Z investors' level of awareness and knowledge of ESG investing significantly affects their investment decisions.

Gen Z investors with higher awareness and knowledge are more likely to engage in ESG - focused investing. Awareness-building campaigns or ESG - related financial literacy initiatives could positively influence investment behaviors.

TEST 2: Motivation to Invest in ESG across occupation

As per table 2.a and table 2.b above, the ANOVA test result shows that there is no significant impact in ESG investment motivation across different occupational groups within Gen Z as the p-value (Sig.) 0.700 is higher than 0.05, therefore we accept null hypothesis. The findings suggest that Gen Z investor's Occupations does not significantly impact their motivation to invest in ESG stock. (e.g., ESG scores, Ethical Considerations, Risk Mitigation).

Gen Z's motivation to invest in ESG seems to be consistent, regardless of whether they are students, part-time workers, or full-time professionals.

Summary of Findings

This study explored the behavioral patterns and influencing factors surrounding ESG (Environmental, Social, and Governance) investing among Gen Z investors. Based on data collected from 61 respondents and analyzed using ANOVA tests, two key findings emerged:

1. Awareness and Knowledge: The study revealed a statistically significant relationship between Gen Z investors' awareness and knowledge of ESG investing and their investment decisions. A p-value of 0.036 (F = 3.529) led to the rejection of the null hypothesis, indicating that awareness plays a crucial role in shaping ESG investment behavior.

2. Motivational Factors: In contrast, the influence of occupation on ESG investment motivation was found to be statistically insignificant, with a p-value of 0.700. This suggests that regardless of their profession or employment status, Gen Z investors are motivated by similar factors when it comes to ESG investing—such as ethical alignment, environmental concern, and perceived long-term benefits.

Significance of the Study

This research is significant as it sheds light on the evolving investment landscape shaped by Gen Z, a digitally native and socially conscious generation. As ESG investing gains traction globally, understanding the values and behaviors of young investors is critical for policymakers, financial institutions, and ESG - focused enterprises. The study underscores the pivotal role of ESG awareness in influencing investment decisions, thereby highlighting the need for accessible education and transparent ESG reporting standards. By identifying gaps in motivation based on occupational status, the findings also encourage a broader approach to engaging Gen Z beyond professional segmentation.

Suggestions for Future Research

Future research could benefit from incorporating a larger and more demographically diverse sample to enhance the generalizability of findings and uncover regional or cultural variations in ESG investing behavior. A longitudinal approach would also be valuable to track how Gen Z's attitudes and actions evolve over time in response to changing market conditions, global events, or shifts in ESG regulations. Additionally, comparative studies between Gen Z and older generations such as Millennials or Gen X could provide deeper insights into how generational values influence investment decisions. Given the significant role of digital platforms and social media in shaping Gen Z's views, future studies could also examine the impact of influencers, online financial educators, or targeted ESG campaigns on investment motivations. Lastly, with the growing concern over greenwashing, it would be worthwhile to explore how perceptions of authenticity and transparency in ESG claims affect investor trust, engagement, and long-term commitment to sustainable investing.

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Investor Confidence and the Safe-Haven Role of Green Bonds: A Market Dynamics Study

***Garima Shukla, Shusang Rai , Mrunal Pawar, Sayli Patle, **Mr. Gunwant Awasthi**

Abstract:

Green bonds have emerged as a vital financial instrument in promoting sustainable investment, yet their role as a safe-haven asset remains underexplored. This study investigates the impact of investor sentiment on green bond performance and assesses their stability during financial downturns. Using sentiment analysis of financial news and investor reports, this research examines historical trends and compares green bonds with traditional safe-haven assets.

Empirical analysis employs regression models to quantify the effect of investor sentiment, correlation studies to measure volatility spillover, and event study methodology to evaluate green bond reactions to market shocks such as the COVID-19 crisis. The findings clarify whether green bonds provide stability in turbulent markets and enhance understanding of their pricing dynamics. This research offers valuable insights for policymakers, investors, and financial institutions in assessing green bonds as a risk mitigation tool. By contributing to the growing field of sustainable finance, this study provides empirical evidence on the safe-haven potential of green bonds, guiding investment strategies and policy frameworks for sustainable growth.

Keywords: Green Bonds, Sustainable Finance, Risk Management

Introduction:

In today's fast-paced financial world, investors are constantly looking for ways to grow their wealth while managing risks. Traditionally, bonds have been a go-to investment option for those seeking stability. Bonds work like a loan—when investors buy them, they are essentially lending money to governments, corporations, or institutions in exchange for regular interest payments and the return of their investment at maturity. They play a crucial role in funding essential projects, from building roads and schools to expanding businesses, making them an integral part of economic growth.

Student, Thakur Institute of Management Studies and Research

****Asst.Prof, Thakur Institute of Management Studies and Research***

However, as the world faces growing environmental challenges, a new type of bond has gained traction—green bonds. Unlike traditional bonds, green bonds are designed to finance projects that benefit the environment, such as renewable energy, clean transportation, and climate resilience efforts. They offer investors a way to support sustainability while earning financial returns, making them an attractive option for those looking to align their investments with their values.

Over the past decade, the green bond market has seen remarkable growth. Governments, companies, and international organizations have increasingly turned to green bonds to fund eco-friendly initiatives. But as these bonds gain popularity, an important question arises: Can green bonds provide financial stability, especially during economic downturns? Traditional safe-haven assets, like gold and government bonds, have long been relied upon to protect investors during market turbulence. Could green bonds offer similar stability, or are they too influenced by market sentiment and investor confidence?

This research aims to explore these questions by analyzing how green bonds perform during financial crises and how investor sentiment affects their pricing. By using data-driven techniques, including sentiment analysis and volatility studies, this study seeks to uncover whether green bonds can be a reliable financial safe haven. The insights from this research will help investors, policymakers, and financial institutions better understand the evolving role of green bonds in a world that is increasingly prioritizing sustainability.

Literature Review

Green bonds, introduced to promote sustainable investment, have increasingly attracted attention from investors and policymakers due to their dual promise of financial returns and environmental impact. The growing body of literature has explored their pricing, investor sentiment, and stability during market disruptions.

Flammer (2021) highlights that corporate green bonds enhance firms' environmental performance and investor confidence, suggesting that these instruments create positive externalities for both issuers and the environment. Reboredo (2018) provides evidence on co-movements between green bonds and conventional financial markets, suggesting potential diversification benefits but also uncovering periods of significant price spillover effects.

Zerbib (2019) emphasizes that investors with pro-environmental preferences are willing to accept lower yields for green bonds, indicating a "greenium." However, this pricing premium may vary with market sentiment and regulatory trust. Karpf and Mandel (2018) find that the green label's value fluctuates in the municipal bond market, reflecting evolving investor perceptions and environmental credibility.

Despite their popularity, green bonds' ability to act as safe-haven assets during financial crises remains debated. Unlike gold or government securities, green bonds are often influenced by macroeconomic variables and investor sentiment (Climate Bonds Initiative, 2023). Furthermore, data from institutions such as JPMorgan Chase & Co. (2023) reveal that while green bond issuance may increase, actual reductions in carbon emissions are not always immediately realized—suggesting a potential disconnect between financial instruments and real-world environmental impact.

This literature underscores the need for rigorous empirical evaluation of green bonds' performance during periods of market stress, especially concerning investor sentiment, greenwashing concerns, and regulatory clarity. The present study adds to this discourse by analyzing how investor sentiment influences green bond performance and whether these instruments serve as true financial safe havens.

Objectives

1. To analyze the influence of investor sentiment on the pricing and volatility of green bonds.
2. To examine the performance of green bonds during financial downturns in comparison to traditional safe-haven assets such as gold.
3. To evaluate the concerns of investors regarding greenwashing and its impact on investment decisions in green bonds.
4. To determine whether increased issuance of green bonds leads to measurable reductions in corporate carbon emissions.
5. To explore the awareness and attitudes of different investor groups toward green bonds and their role in sustainable finance.
6. To identify the factors that can improve investor confidence and participation in the green bond market.

Research Methodology

A literature review is a critical summary and analysis of existing research on a particular topic. It helps to identify what is already known, highlight key theories and findings, and reveal gaps in current knowledge. In research reports, the literature review serves as a foundation for the study, showing how it fits into the broader academic and industry discussions. This literature review highlights that green bonds positively impact corporate sustainability and financial stability, though their status as safe-haven assets remains debated. While some studies suggest green bonds provide stability during financial crises, they are still influenced by market sentiment. Investor confidence and regulatory frameworks play a crucial role in their pricing, but research gaps exist in assessing their long-term performance and policy impacts.

The methods section outlines a multi-method approach, including:

1. Data Collection – Gathering financial data on green bonds, sentiment analysis from news and Questionnaire, and historical performance of safe-haven assets.
2. Empirical Analysis – Using regression models, correlation studies to assess investor sentiment effects and volatility spillovers.
3. Expected Contributions – Determining whether green bonds offer stability during financial downturns and their role in sustainable finance.

Sample

To understand how people feel about investing in green bonds, we are reaching out to a group of individuals, including Investors and Non investors to know about their preferences and thoughts regards to the Green bonds

Since different groups have different perspectives on green bonds, we have used random sampling to make sure we gather insights from a well mix of respondents.

2. Designing the Questionnaire – What We Are Asking

To create the best possible questionnaire, we first identified key themes and keywords that frequently appear in discussions about green bonds. We did this by:

- Reviewing past research on green bond investments.
- Analyzing financial news and social media to see what topics are trending.

From this, we identified important concepts like "investment risk," "sustainability commitment," "market volatility," and "safe-haven asset." These helped us design questions that truly reflect what investors think and feel.

The questionnaire is divided into three sections:

1. Getting to Know the Respondents – Basic information like age, occupation, and investment experience.
2. Understanding Investor Sentiment – Using scale-based questions (e.g., *"On a scale of 1 to 5, how confident are you in green bonds as a long-term investment?"*).
3. Decision-Making and Market Behavior – Asking multiple-choice and open-ended questions (e.g., *"What factors influence your decision to invest in green bonds?"*).

To reach as many investors as possible, we are distributing the questionnaire through:

Online surveys via Google Forms and email.

By gathering real investor opinions, this study will help us understand whether green bonds are truly seen as a stable and attractive investment option.

Data Analysis

The purpose of this data collection was to assess the level of familiarity with green bonds among respondents.

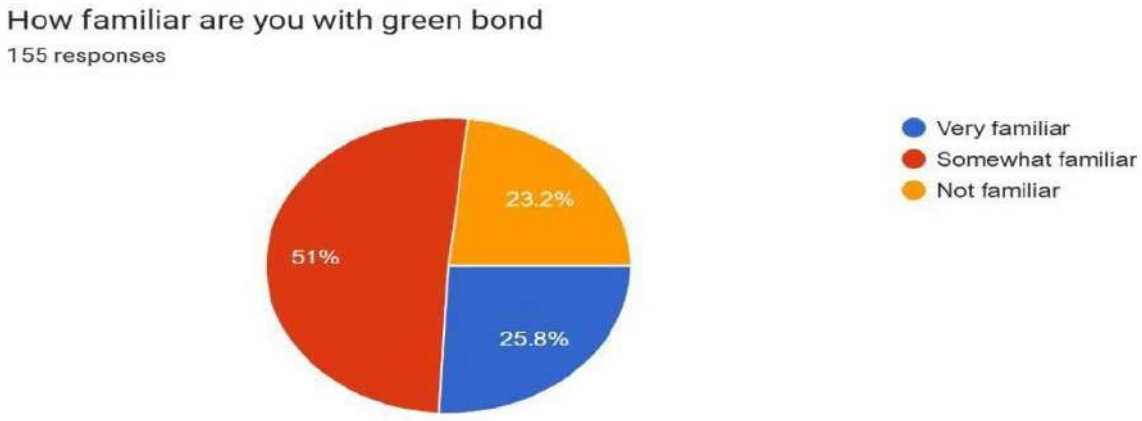


Figure 1Familiarity with Green Bonds

- A majority (51%) have partial knowledge of green bonds, suggesting moderate awareness.

- Only a quarter (25.8%) are well-informed, indicating a need for further education on the topic.
- Nearly a quarter (23.2%) are not familiar, highlighting a gap in awareness.

The findings suggest that while many people have some understanding of green bonds, a significant portion remains either unfamiliar or only somewhat knowledgeable. These results indicate the need for targeted awareness initiatives to enhance public understanding of green bonds and their benefits.

Analyze investor sentiment and its impact on green bond prices and volatility

Null Hypothesis: - There is no significance difference in factors affecting investor Sentiment on Investment decision in green bond

Alternate Hypothesis:- There is significance difference in factors affecting investor Sentiment on Investment decision in green bond

ANOVA

What factors influence your decision to invest in green bonds [Financial Returns]

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	8.135	4	2.034	1.045	.383
Within Groups	1488.364	765	1.946		
Total	1496.499	769			

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

b. Negative but less biased estimates are retained, not rounded to zero.

Table 1factors affecting investor Sentiment

ANOVA

What concerns do you have about green bonds [Greenwashing (false environmental claims)]

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	19.708	3	6.569	3.277	.021
Within Groups	1226.831	612	2.005		
Total	1246.539	615			

Table 2concerns for green bonds

ANOVA

What improvements would encourage you to invest more in green bonds [Better transparency and reporting standards]

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6.052	3	2.017	1.088	.353
Within Groups	1134.286	612	1.853		
Total	1140.338	615			

Table 3investment in green bonds

This analysis was all about understanding what makes people want to invest in green energy. Is it because they care about the environment? Are government policies pushing them? Or maybe it's financial incentives?

To figure this out, we compared groups of people based on different factors and looked at how those factors influenced their decision-making.

We used a method called ANOVA — short for Analysis of Variance. Don't worry about the name — it's just a statistical way of asking:

"Are there any real differences between these groups, or are they pretty much the same?"

If one group had a much higher or lower average score (based on how likely they are to invest), ANOVA would help us spot that.

- The F-value (which measures group differences) was 1.045 — very close to 1.
- The p-value was 0.383 — which is way above the usual 0.05 cutoff.

There's no solid evidence that the different factors made much of a difference. People across all the groups made pretty similar decisions about green energy.

We also looked at something called effect size. This tells us how much impact those factors had overall.

Here's what we found:

- Only about 0.5% of the variation in people's decisions could be explained by these factors.
- That's a tiny number — it means that 99.5% of people's choices were influenced by something else.

Even if there were some small differences, they're so tiny that they really don't matter in the real world.

So, what can we take away from this?

- The specific factors we looked at — like cost, awareness, or policy — don't strongly influence how people decide to invest in green energy.
- The differences between groups were small and likely due to chance.

- That tells us we might be looking in the wrong place — there are probably other things driving people's decisions.

We found no meaningful difference in how various factors influenced people's decisions to invest in green energy. The statistical results were not significant (p = 0.383), and effect sizes were very small. This suggests that the factors studied do not play a major role, and other variables may be more important in shaping people's choices.

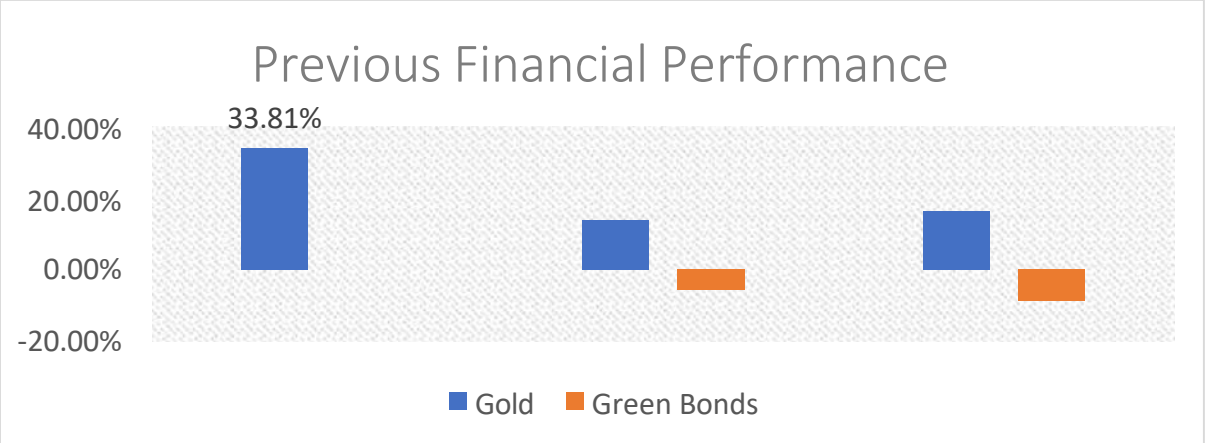
- Some factors (such as environmental awareness, financial returns, or government incentives) likely played a bigger role in investment choices than others.
- Understanding these factors can help policymakers, businesses, and financial institutions better promote green bonds.

Some factors are more important than others in shaping investment decisions. Policymakers, financial institutions, and investors can use this insight to improve awareness, incentives, and marketing strategies for green bonds. Further education and engagement initiatives may be needed to address knowledge gaps.

Investigate green bond resilience during financial crises

When comparing investments, gold has traditionally been seen as a safe and profitable option, while green bonds represent a newer, sustainability-focused choice. Here's what the data tells us about their financial performance over time.

	13.79%	16.33%
0.15%		
previous 1 yr return	previous 3 yr Return	previous 5 yr return -8.69%



Gold has shown strong positive returns, with a 33.81% increase in the last year, reinforcing its role as a stable asset during uncertain times.

Over a 3-year period, Gold grew by 13.79%, and over 5 years, it achieved a 16.33% return, highlighting its resilience as a long-term investment.

Green Bonds, while facing short-term challenges, remain a crucial tool for sustainable investing. Though they recorded a 0.15% return in the past year, their -5.69% (3-year) and -8.69% (5-year) performance suggest temporary setbacks rather than long-term underperformance.

Investing isn't just about chasing the highest returns—it's also about managing risk. Green bonds, despite their recent lower returns, can be a valuable addition to a diversified portfolio, helping to balance market ups and downs.

1. They Don't Move Like Gold—And That's a Good Thing

Gold has performed well, rising 33.81% in the past year and showing steady growth over 3 and 5 years. Green bonds, on the other hand, have had more mixed results. While this might seem like a downside, it actually makes them a good risk diversifier—when one investment type struggles, another might perform better.

2. A Steady Option in Changing Markets

- Gold shines during economic uncertainty, making it a great safety net.
- Green bonds are tied to interest rates and government policies, providing stability when the focus shifts toward sustainable investments.

- By holding both, investors can avoid being too dependent on just one asset class, reducing overall risk.

3. Protection Against Inflation and Market Swings

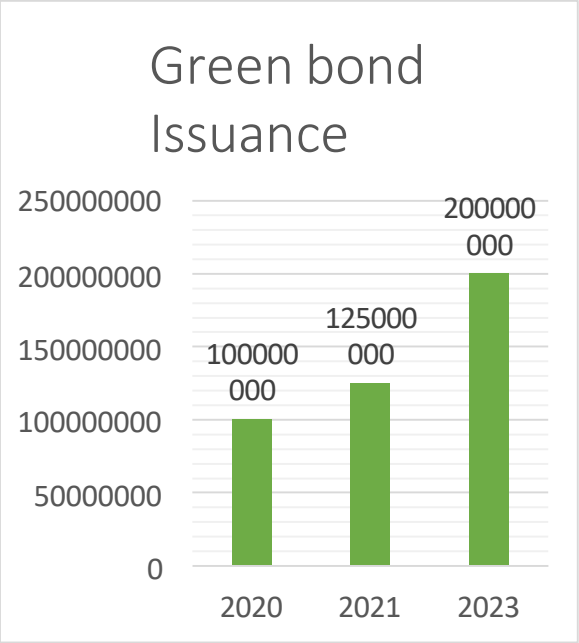
- Gold protects wealth during inflation and currency fluctuations.
- Green bonds offer steady income when interest rates are favourable.
- Together, they help smooth out market ups and downs, ensuring more balanced long-term growth.

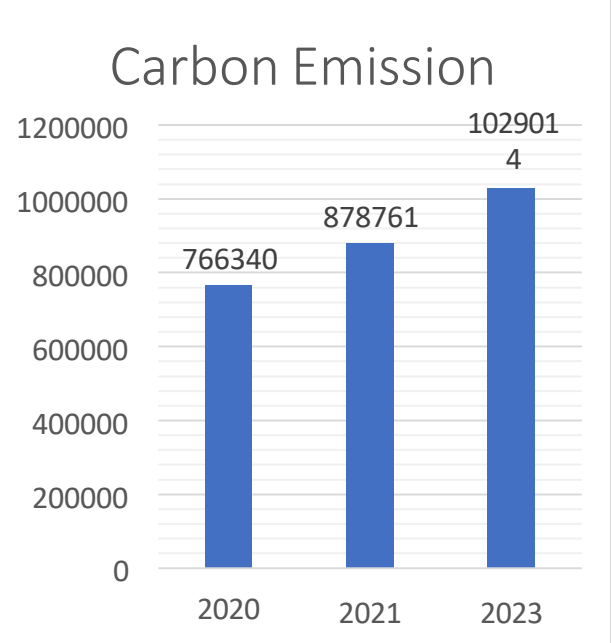
4. Green Bonds Are Gaining Ground

Governments and businesses are pushing for more sustainable finance, which means green bonds will likely grow in importance. As climate policies evolve, their returns could improve, making them even more attractive as a low-risk, purpose-driven investment.

While gold delivers strong financial returns, green bonds bring long-term stability and sustainability. By combining both, investors can protect their wealth while contributing to a greener future—a win-win for both financial security and the planet. To examine whether the issuance if green bonds really reduces the carbon emission of the company

This report examines the relationship between JPMorgan's green bond issuance and its reported carbon emissions over the years 2020, 2021, and 2023. The analysis provides insights into the financial institution’s commitment to sustainability and the potential impact of green financing on environmental performance.





Analyzing JPMorgan's Data on Green Bonds and Carbon Emissions

a) Growth in Green Bond Issuance

JPMorgan has significantly increased its green bond issuance:

- 2020: $100 million
- 2021: $125 million (25% increase from 2020)
- 2023: $200 million (60% increase from 2021, 100% increase from 2020)

This shows a strong commitment to sustainable finance, with the company doubling its investment in green projects over three years.

b) Carbon Emissions Over the Same Period

Despite increased green bond issuance, JPMorgan's reported carbon emissions have also risen:

- 2020: 765,340 metric tons
- 2021: 878,761 metric tons (15% increase from 2020)
- 2023: 1,029,014 metric tons (17% increase from 2021, 34% increase from 2020)

Instead of a decline in carbon emissions, we see a consistent rise, suggesting that the issuance of green bonds alone has not directly translated into emission reductions.

Does Green Bond Issuance Actually Reduce Emissions?

Based on the data, JPMorgan's increasing investment in green bonds has not yet resulted in a reduction of carbon emissions. There are several possible explanations for this:

Time Lag in Project Implementation

- Many green projects take several years to be completed and show measurable impact.
- JPMorgan's recent increase in green bond issuance (especially in 2023) may not yet reflect in its emissions data.

Continued High-Carbon Activities

- The company may still be financing or engaging in high-emission activities alongside its green investments.
- If JPMorgan's overall portfolio still includes fossil fuel investments, those emissions could outweigh the reductions from green bond-funded projects.

Green Bonds May Fund Indirect Emission Reductions

- Some projects may focus on energy efficiency or carbon offsets, which do not immediately reflect in direct emissions but contribute to sustainability in the long term.

Are Green Bonds an Effective Tool for Emission Reduction?

While green bonds play a crucial role in financing the transition to sustainability, JPMorgan's case suggests that simply issuing more green bonds does not automatically reduce a company's carbon emissions in the short term. The effectiveness of green bonds depends on:

Ensuring funds go directly to high-impact projects that cut emissions. Reducing investments in fossil fuels and other high-carbon industries. Allowing time for green projects to show results before measuring impact.

Using green finance as part of a broader carbon reduction strategy, not as a standalone solution.

JPMorgan's increasing green bond issuance signals a strong commitment to sustainable finance, but the continued rise in carbon emissions suggests room for improvement in translating financial commitments into tangible environmental benefits. While green bonds are

an essential tool for climate-conscious investment, they should be part of a broader, holistic strategy that directly addresses carbon footprint reduction. Future sustainability efforts must ensure that financial initiatives align more effectively with measurable environmental impact.

Expected Contribution

This study hopes to add meaningful value to the ongoing conversations around sustainable finance — especially when it comes to understanding how green bonds behave in today's financial markets. While a lot has been written about the rise of green bonds, there's still a lack of clarity about their role as "safe-haven" assets — something investors can rely on during uncertain times.

By combining data from real investors, market performance, and corporate case studies, this research brings three major contributions to the table:

1. First, it captures how familiar people really are with green bonds. Our survey found that while over half of the respondents (51%) had heard about green bonds, only 25.8% were well-informed — showing there is still a lot of work to be done in terms of awareness and education.

2. Secondly, it explores what drives people to invest (or not invest) in green bonds. Interestingly, we found that financial returns didn't play as big a role as one might expect (p-value = 0.383). However, concerns like greenwashing (companies making false environmental claims) did stand out as significant (p-value = 0.021), meaning transparency really matters to investors.

3. Clarification of Green Bonds' Role in Financial Downturns

   Drawing from the research of *Munir Khamis* on the eligibility of green bonds as safe-haven assets, our analysis extends the discussion on whether green bonds can provide stability during financial crises. Key contributions include:

   Limited Safe-Haven Characteristics: Unlike traditional safe-haven assets like gold, green bonds exhibit higher volatility and lower returns, as seen in the financial performance analysis.

   Sustainability as a Long-Term Buffer: While green bonds may not act as an immediate safe-haven, they could serve as a long-term hedge against environmental risks and regulatory shifts, particularly for investors focused on sustainability.

Resilience During Market Shocks: There is growing evidence that sustainable investments, including green bonds, may show resilience during downturns, as institutional investors prioritize ESG (Environmental, Social, and Governance) assets.

4. Finally, by comparing the performance of green bonds to gold — the classic safe- haven asset — and analyzing real-world data from JPMorgan's green bond issuance, we offer fresh insights into how green bonds perform in both financial and environmental terms.

Conclusion

To sum up, this study makes one thing clear — green bonds are a promising investment tool, but they are not quite in the same league as traditional safe-haven assets like gold (at least not yet).

While gold showed impressive growth of 33.81% in the last year alone, green bonds managed only 0.15% — and even recorded negative returns over three and five-year periods (-5.69% and -8.69% respectively). However, that doesn't mean green bonds don't have value. In fact, their ability to behave differently from assets like gold makes them a useful addition to an investment portfolio, especially for those looking to diversify.

We also found that investors care deeply about transparency and authenticity. Greenwashing is a real concern, and companies looking to attract investment through green bonds must commit to clear and honest reporting.

Moreover, the case of JPMorgan shows that issuing green bonds is a step in the right direction — but it's not a magic solution. While the bank doubled its green bond investments from 2020 to 2023, its carbon emissions still rose by 34%. This suggests that green finance needs to be part of a larger, long-term strategy rather than a stand-alone effort.

Overall, green bonds hold great potential — but realizing that potential requires time, transparency, and a holistic approach to sustainability.

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From Automation to Trust in AI-Driven Fintech: A Study of Perceptions and Adoption

***Dhanashree Suryavanshi, *Bharat Udawat, *Arya Vartak **Ms. Lata Poojari**

Abstract

The integration of artificial intelligence (AI) in financial services is transforming how individuals interact with and manage their finances. This research explores key factors influencing consumer adoption of AI-based financial tools, including data security, perceived usefulness, explainability, and user readiness. The study employs a mixed-methods approach, combining experimental research and literature review. For data analysis, the Chi-square method is used to examine relationships between user perceptions and adoption behaviour. Key research gaps identified include limited real-world evidence and the lack of diverse case studies. By analysing user attitudes toward robo-advisors and other AI-driven financial technologies, the study aims to offer practical insights for developers, policymakers, and stakeholders to design secure, transparent, and inclusive AI systems that enhance consumer trust and encourage responsible adoption of digital financial services.

Keywords: Cybersecurity, AI, Fintech

Introduction

The financial industry is experiencing a significant transformation with the rise of artificial intelligence (AI)-driven technologies. Tools such as robo-advisors, automated credit scoring systems, and AI-powered customer service agents are reshaping how consumers and financial institutions interact. However, the adoption and impact of these technologies largely depend on how users perceive them especially in terms of trust, data security, and explainability.

While much of the existing research has focused on the technical, economic, and operational aspects of AI in finance, there is a noticeable lack of studies that explore the human side particularly how real users feel about using AI tools for financial decisions. Concerns around cybersecurity, data privacy, and the need for understandable AI systems have been underexplored. This study addresses these gaps by investigating user perceptions and behavior toward AI-based financial tools.

***Student, Thakur Institute of Management Study and Research**

****Asst.Prof, Thakur Institute of Management study and Research**

A mixed-methods research design is employed, combining surveys, simulated decision-making tasks, and secondary data sources such as industry reports and academic studies. To analyze the relationship between factors like trust, perceived usefulness, and willingness to use AI tools, the Chi-square test is applied. This allows the study to identify significant patterns and connections between different user attitudes and behaviors. Ultimately, this research aims to offer practical, data-driven insights into what encourages or discourages people from using AI in finance, helping improve user experience and support broader digital financial inclusion.

Literature Review

The evolving landscape of financial technology (FinTech) has brought immense innovation but also heightened cybersecurity concerns. Recent scholarly work has delved into these emerging threats and proposed structured frameworks for mitigation. The paper *"Cybersecurity Threats in FinTech: A Systematic Review"* (December 2023) provides a comprehensive classification of the most prevalent cyber risks impacting FinTech entities, such as phishing, ransomware, data breaches, and insider threats. It serves as a practical guide for financial institutions, outlining industry best practices and preventive strategies, thereby assisting organizations in enhancing their cybersecurity resilience.

In continuation, *"Cybersecurity Challenges in FinTech: Assessing Threats and Mitigation Strategies for Financial Institutions"* (2024) presents a deeper analysis of specific vulnerabilities, particularly focusing on hacking incidents, identity theft, and financial fraud. The paper emphasizes the growing sophistication of cybercriminals and the need for adaptive security measures. It highlights advanced protective technologies such as AI-driven threat detection systems, biometric authentication, and multi-layered encryption, which are increasingly adopted by banks and financial service providers to safeguard customer data and transactions.

Further strengthening this discourse, the 2024 study titled *"Development of Cybersecurity Framework for FinTech Innovations"* proposes a structured and scalable framework tailored to the unique needs of FinTech enterprises. This work shifts the focus from reactive defense to proactive planning, guiding institutions through the implementation of governance policies, risk assessment protocols, incident response mechanisms, and compliance with regulatory standards. By emphasizing a roadmap-based approach, the study supports FinTech startups and

established firms in creating robust cybersecurity infrastructures that align with innovation without compromising security.

Together, these studies underscore the critical importance of developing adaptive, technology-integrated, and regulation-compliant cybersecurity systems in the fast-paced FinTech domain. They collectively offer a strategic foundation for understanding risks and crafting sustainable defense mechanisms in the digital financial ecosystem.

Research Gap:

- **Lack of Real-World Evidence**:
  Many studies are based on theoretical models or lab settings, with little proof from actual incidents or company experiences.

- **Limited Practical Application**:
  Research often doesn't show how the findings can be used in real business or tech environments.

- **Narrow Data Sources**:
  There is a shortage of diverse case studies or data from different regions, industries, or user groups, which limits the scope of the conclusions.

Research Objectives

1. Studying data security and compatibility.
2. Understanding how technology helps people access financial services.
3. Examining how ready people are to use AI-based financial tools.

Research Methodology

Research Design

This study employs a mixed-methods research design, combining both quantitative and qualitative approaches to gain a comprehensive understanding of user perceptions toward AI-based financial tools and their impact on digital financial inclusion. The research aims to explore how factors such as data security, explainability, and perceived usefulness influence

the adoption of AI technologies in finance. The design integrates experimental activities, surveys, and secondary data analysis to provide a well-rounded perspective on the topic.

Data collection methods

1. Primary Data

Surveys: Questionnaires are distributed to collect data on user awareness, perceptions, trust levels, and willingness to adopt AI-based financial tools. Questions focus on areas such as data privacy, cybersecurity awareness, and financial literacy.

2. Secondary Data

Literature Review: Existing research papers, government publications, industry reports, and case studies are reviewed to understand past findings, current trends, and unresolved issues related to AI in finance and digital inclusion.

Participants / Sample

A purposive sampling technique is used to ensure relevance and diversity among participants. The sample includes:

- **Fintech Users**: Individuals using digital banking, robo-advisors, or other AI-enabled financial tools.
- **General Consumers**: People aware of or exposed to AI technologies in financial contexts.

Demographic diversity is maintained by including participants across different age groups, educational backgrounds, income levels, and technological familiarity to better reflect user perceptions and experiences.

Data Analysis

The objective of this analysis was to examine the relationship between users' perceived security of AI-based financial tools and their likelihood of adopting such tools in the future. A Chi-square test of independence was employed to determine whether a statistically significant

association exists between these two categorical variables, both measured on a five-point Likert scale.

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	51.790[a]	16	<.001
Likelihood Ratio	37.177	16	.002
Linear-by-Linear Association	18.081	1	<.001
N of Valid Cases	45		
a. 22 cells (88.0%) have expected count less than 5. The minimum expected count is .13.			

Table 1Chi-Square Test

H0 (Null Hypothesis): Perceived security of AI-based financial tools has no significant effect on their adoption.

H1 (Alternate Hypothesis): Higher perceived security of AI-based financial tools increases their adoption. Therefore we reject null hypothesis and accept alternate hypothesis.

Demographic Analysis:

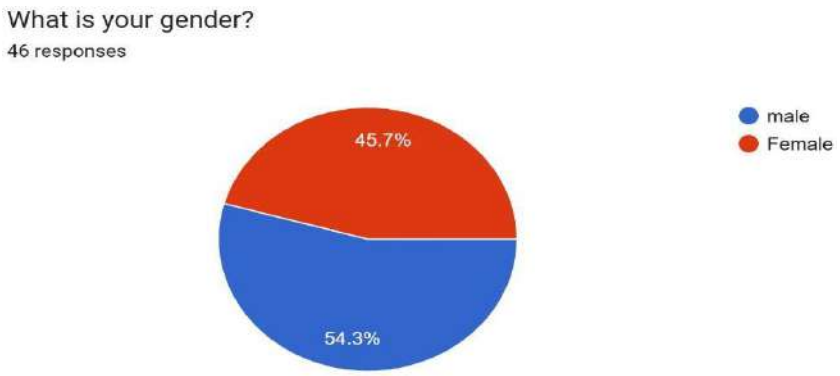

Figure 1Observation: Most of the responders are male candidates

Implications:

The survey results are fairly balanced between male and female participants. This means the insights are **more likely to represent both genders** equally, which is great for understanding general trends.

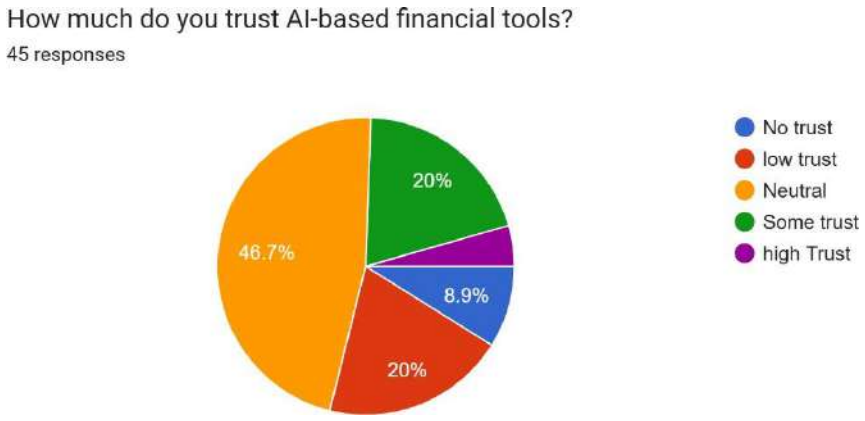

Figure 2Observation:Ai Usage

"The survey reveals that nearly half of the respondents (46.7%) remain neutral about trusting AI-based financial tools, while a significant portion (29%) express low or no trust, and only a small percentage (4.4%) demonstrate high trust in such technologies."

Implications

Nearly half of the users are neutral, which suggests they aren't sure whether to trust AI-based financial tools yet. This indicates a lack of awareness or confidence.

Conclusion

Summary of findings:

1. **Perceived Security Influences Adoption**
   The Chi-square test showed a significant link between how secure users feel about AI-based financial tools and their willingness to use them. Users who believe these tools are secure are more likely to adopt them.
2. **User Trust is Uncertain or Low**
   Nearly half of the respondents (46.7%) were neutral about trusting AI in finance,

while about 29% expressed low or no trust. Only 4.4% showed high trust, indicating that most users still have doubts or lack clarity.

3. **Gender Representation is Balanced**
   The survey had a fairly equal number of male and female participants, making the insights more inclusive and representative of general consumer behavior.
4. **Awareness and Explainability Are Key Gaps**
   Many users were unsure about how AI-based tools work, which suggests a need for better education and more transparent systems.
5. **Human-Centered Factors Matter**
   Adoption of AI tools isn't just about the technology—it also depends on how **useful**, **understandable**, and **safe** people think the tools are.

Significance of the Study

This study is significant because it bridges the gap between the technical advancements of AI in finance and the human factors that influence its adoption. While many financial institutions are rapidly integrating AI tools to improve efficiency and accessibility, user trust, security concerns, and understanding of these technologies remain major barriers. By exploring how perceived security, explainability, and usefulness affect user behaviour, this research provides valuable insights into what motivates or discourages people from using AI-based financial tools.

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From Automation to Intelligence: Evaluating the Impact of AI on Financial Reporting

***Tanvi Pawar, Kartikey *Sharma, *Shekhar Shelke, *Kanak Singh, Kunal Singh **Dr. Megha Sharma**

Abstract

The rapid integration of Artificial Intelligence (AI) in financial systems has sparked considerable interest in its potential to revolutionize traditional financial reporting and decision-making. This research investigates the impact of AI across five key financial parameters: decision-making, predictive analytics, financial compliance, fraud detection, and risk management. Using quantitative methods, including paired sample t-tests and Chi-Square tests of dependence, data was collected from 66 professionals spanning finance, auditing, consultancy, and IT sectors. The findings reveal statistically significant improvements in all five dimensions, affirming that AI-driven financial systems outperform traditional methods in accuracy, efficiency, and strategic value. This study introduces the AI-Driven Financial Intelligence Framework (AFIF), a practical model that illustrates how organizations can leverage AI to enhance financial processes. By embracing AI technologies, organizations can foster greater financial agility, transparency, and resilience in an increasingly complex and data-driven business environment.

Keywords: AI, Financial reporting, Fraud Detection

Introduction

Financial reporting has undergone a remarkable transformation over the decades, evolving from manual bookkeeping to sophisticated, technology- driven processes. With the advent of automation, organizations began to streamline their financial operations, reduce human errors, and ensure regulatory compliance with greater efficiency. However, the journey did not stop there. The emergence of Artificial Intelligence (AI) has brought a paradigm shift in how financial data is processed, analysed, and interpreted. Today, AI-driven financial reporting not only enhances the speed and accuracy of reporting but also enables predictive insights, anomaly detection, and real-time decision-making capabilities. These advancements are reshaping the role of finance professionals from data gatherers to strategic advisors.

Student, Thakur Institute of Management Studies and Research
****Asso.Prof, Thakur Institute of Management Studies and Research***

This paper explores the milestones in the evolution of financial reporting, with a focus on how automation paved the way for AI integration, and how this transformation is influencing the future of corporate financial management.

Evolution of Financial Reporting - Financial reporting is the process of preparing and presenting financial information about a business to its stakeholders, such as investors, regulators, management, and the public. It includes financial statements like the balance sheet, income statement, and cash flow statement, which reflect a company's financial performance and position over a specific period. The goal of financial reporting is to provide clear, accurate, and timely information that supports transparency, decision-making, and accountability.

Manual Financial Reporting - In the early stages, financial reporting was entirely manual. Businesses used handwritten ledgers and basic accounting books to record transactions. This process was labour-intensive, slow, and vulnerable to human error. Reports were mostly created for internal purposes and lacked the depth or structure needed for broader financial analysis. The absence of standardized practices often made it difficult to compare financial information across different organizations.

Introduction of GAAP (Early 20th Century)-A major transformation occurred with the introduction of Generally Accepted Accounting Principles (GAAP). These standardized accounting rules aimed to bring consistency, reliability, and transparency to financial statements. GAAP enabled businesses to present their financial

data in a uniform manner, which was crucial for external stakeholders like investors, regulators, and lenders. This marked a critical shift from internal-only reporting to broader, external financial communication.

Adoption of Digital Tools (1980s–2000s) - With the development of digital tools such as spreadsheet software like Microsoft Excel, financial reporting became more efficient. These tools allowed businesses to automate calculations, generate reports faster, and reduce the chances of manual errors. Financial data could be analyzed in greater depth, enabling better planning and decision-making. This period saw the beginning of the move from paper-based to digital record-keeping.

Global Reporting Standards & IFRS (2000s Onwards) - As globalization expanded, the need for a common financial language led to the adoption of International Financial Reporting

Standards (IFRS). These standards allowed multinational companies to prepare and present their financial statements consistently across countries. IFRS supported clearer communication with global stakeholders and promoted greater transparency and comparability. Financial reporting became a key part of corporate governance and strategic management.

Cloud-Based and Real-Time Reporting - The evolution continued with the adoption of cloud computing and integrated Enterprise Resource Planning (ERP) systems. These platforms allowed real-time access to financial data and improved collaboration across departments. Cloud- based solutions increased efficiency, ensured data consistency, and simplified compliance with changing regulations. Companies could now generate up-to-date reports at any time, making financial reporting more dynamic and responsive.

AI-Driven Reporting and Predictive Analytics (Present) - Today, Artificial Intelligence (AI) and machine learning are revolutionizing financial reporting. These technologies can process vast volumes of data quickly, identify anomalies, and generate predictive insights. Rather than simply reporting past performance, AI tools help businesses forecast trends, identify risks, and support strategic decision- making. Financial professionals now take on more analytical and advisory roles, supported by intelligent systems**.**

Introduction to Artificial Intelligence in Finance

Artificial Intelligence (AI) has become one of the most transformative forces in the financial sector, evolving rapidly to meet the growing demands for accuracy, efficiency, and strategic decision-making. Initially introduced to automate basic tasks, AI in finance has now progressed into a sophisticated ecosystem capable of learning, predicting, and even acting on behalf of humans. This evolution can be understood through the stages of Perceptive AI, Generative AI, Agentic AI, and the emerging phase of Physical AI—each stage contributing uniquely to the reshaping of financial reporting and decision processes.

Perceptive AI marked the earliest phase where AI systems were built to "perceive" data—extracting patterns, recognizing anomalies, and automating rule-based tasks. In financial reporting, this translated into the automation of data entry, detection of irregularities, and generation of standard reports with improved speed and reduced human error.

The arrival of **Generative AI (Gen AI)** brought a leap forward. These models, like ChatGPT or financial-specific large language models, are capable of generating complex narratives, financial summaries and interactive reports. In finance, Gen AI supports CFOs and auditors by

creating insightful commentary on financial performance, drafting compliance documentation, and even aiding in regulatory analysis—streamlining previously manual tasks.

Agentic AI represents a more autonomous layer, where AI systems are not just generating content but can act with limited human intervention. In the finance domain, this means that AI can autonomously trigger financial decisions, perform real- time compliance checks, or reallocate resources based on predictive insights— greatly enhancing responsiveness and agility in financial operations.

"It's not about man versus machine anymore. It's about man with machine — how we can use AI to augment human capability."
— Satya Nadella

Literature Review

1. Vampsi upputiri,2025 – "The study reviews existing research on automation and data integrity, exploring future advancements such as AI/ML integration for adaptive workflows and seamless connections between clinical programming tools and regulatory platforms."

2. Nashville, Tennessee, USA,2024 – "The paper extensively reviews prior research on AI in reporting, covering themes like machine learning applications, blockchain integration, and AI-powered risk modelling. It highlights how industries worldwide are leveraging AI for reporting automation while addressing challenges like algorithmic transparency and regulatory compliance."

3. Tauhidul Islam Zisan, 2024 – "The paper synthesizes insights from multiple studies on AI in reporting. It references works discussing AI's role in fraud detection, data privacy challenges, and the evolving skill requirements for auditors. Several studies highlight the need for an ethical framework and regulatory measures for AI-driven auditing. Past research underscores the importance of integrating AI responsibly to balance efficiency and ethical accountability."

4. Xia Xiao,2024 – "Review of three models of data assets recognition: It is not recognized as an asset, it's an intangible asset, nor a category for recognition. Recognizing data resources in financial reports by China Interim Provisions 2023 Global issues in accounting toward the recognition of intangible assets and their measure. Audit risk, valuation of uncertainty, and implications on disclosures in financial statement."

5. Rohaelis Nuraisiah et al,2024 – "Earlier studies have successfully identified several factors influencing audit delays, such as company size, profitability, solvency, auditor tenure, and audit

complexity (Astuti, 2021; Baining et al., 2023; Rachmayanti et al., 2018). Larger companies withcomplex financial structures often experience longer audit times, while firms with higher profitability may have more robust financial controls that expedite audits. However, the complexity of auditing large entities remains a significant factor contributing to audit delays (Astuti, 2021). This connection between company size and audit delay reflects broader concerns about governance and institutional transparency, critical to both corporate performance and the realization of SDG 16's aims for accountability."

6. Beatrice Oyinkansola Adelakun et al, 2024) – "Artificial Intelligence (AI) is transforming the field of auditing by significantly enhancing the ability to detect financial anomalies and fraud. The integration of AI in auditing processes offers unprecedented capabilities for analysing vast datasets with greater speed and precision than traditional methods. This review explores the impact of AI on audit accuracy, focusing on its role in identifying irregularities and fraudulent activities.AI- driven auditing tools leverage machine learning algorithms and advanced data analytics to scrutinize financial records with a high level of detail."

7. Dr. Subhash Sopan Wavhal,2024 – "The integration of Artificial Intelligence (AI) in reporting has transformed traditional approaches, offering enhanced accuracy, efficiency, and continuous monitoring of financial transactions. This research paper focuses on the impact of AI in auditing financial institutions, with a particular emphasis on cooperative societies. The study provides insights into how AI-driven audits can improve fraud detection, risk assessment, and regulatory compliance in cooperative societies, while addressing challenges related to data integrity, transparency, and ethical considerations."

8. Chibulo Foster Mwachikoka,2024 – "The study expands the current literature in: AI-based financial reporting – How automation changes accounting. Audit and Compliance Standards – The application of AI in fraud detection and regulation compliance. Challenges in adoption of AI – Issues on bias, data security, and job loss. Human-AI collaboration – The synergy between technology and professional judgment."

9. Ann Abernathy,2023 – "The research relies on existing research on: Evolution of reporting Standards From the early 19th century to the present GAAP and PCAOB models. Impact of AI and Data Analytics studies proving how AI-enabled tools improve fraud detection and risk assessment. COVID-19's Effect on Auditing– Studies describing how remote audits changed the profession forever, both in workflow and technology adoption. Benefits and Risks of Automation – Studies by Deloitte, KPMG, and PwC that discuss how automation is

transforming audit firms, but also creating new risks such as data security breaches."

10. Daniel Homocianu ,2014 – "This study is an extension of various previous studies that were conducted in audit, financial reporting, and Business Intelligence: Audit and Compliance Studies – Previous studies have indicated that financial audits are often unable to detect fraud and inefficiencies because of the absence of advanced analytics and automation. Multidimensional Analysis and Decision Support Systems (DSS) – The study cites several OLAP and BI tools applied in financial decision-making, highlighting their potential in audit processes. Causal Analysis in Financial Reporting - This research is on how regression analysis, correlation studies, and causal modelling can help track the root cause of various financial discrepancies rather than merely treating the symptoms."

Research Gap

Despite the integration of automation in financial reporting, several limitations persist that hinder its effectiveness in today's fast-paced, data-driven environment. Traditional automation tools streamline repetitive tasks and reduce manual errors, but they often fall short in delivering real-time insights, interactive reporting, and in-depth causal analysis. Financial reports continue to be static in nature, lacking the dynamic capabilities required for meaningful decision-making. Furthermore, many organizations especially smaller ones face infrastructural challenges and lack centralized digital records, making it difficult to implement advanced technologies like AI. There is also a lack of standardized frameworks and proper guidance for valuing data assets and auditing unstructured data, which restricts the adoption of intelligent systems.

In parallel, the shift toward AI in financial reporting is met with several practical and ethical challenges. Many firms are not equipped with the necessary technical skills, infrastructure, or training to utilize AI effectively. Regulatory frameworks remain underdeveloped, and concerns around data privacy, algorithmic bias, and the role of human judgment in interpreting AI outputs continue to raise questions. These issues point to a significant gap between the potential of AI and its current application in financial reporting. This research aims to address that gap by evaluating AI's impact on decision-making and predictive analytics, comparing it with traditional automation in terms of cost- effectiveness and scalability, and analysing its role in compliance, fraud detection, and the evolving landscape of financial reporting.

Objectives

In response to the rapid technological advancements in financial reporting, this research aims to delve into the shift from traditional automation to the intelligent capabilities brought by Artificial Intelligence (AI). While automation has significantly improved efficiency and accuracy in generating financial reports, AI introduces a more dynamic and analytical dimension to reporting practices—enabling real-time insights, predictive modeling, and proactive decision-making. Despite these benefits, there are still considerable gaps in adoption, regulatory clarity, cost feasibility, and the ethical use of AI technologies. These challenges create a compelling need to evaluate AI's tangible impact in financial reporting, especially when compared to the automation methods widely used over the past decades.

To address this evolving scenario, the research outlines the following objectives:

1. To evaluate AI-driven financial reporting's impact on decision-making and predictive analytics.
2. To examine AI's role in financial compliance, fraud detection, and risk management.
3. To analyse emerging trends and AI's future potential in financial reporting.

These objectives aim to provide a comprehensive understanding of AI's transformative influence on financial reporting while highlighting its practical implications for stakeholders, regulators, and financial professionals.

Hypothesis

Hypotheses are formulated to assess the measurable outcomes of adopting AI in financial reporting compared to traditional reporting methods. These assumptions aim to guide the research in examining whether AI provides significant improvements in decision-making, compliance, and risk management.

Decision Making

H_0: AI-driven financial reporting does not significantly improve decision-making accuracy compared to traditional financial reporting methods.

H_1: AI-driven financial reporting significantly improves decision-making accuracy compared to traditional financial reporting methods.

Predictive Analysis

H_0: AI-driven financial reporting does not significantly improve predictive analytics compared to traditional financial reporting methods.

H_1:AI-driven financial reporting significantly improves predictive analytics compared to traditional financial reporting methods.

Financial Compliance

H_0: AI does not have a significant impact on enhancing financial compliance.

H_1: AI plays a significant role in improving financial compliance by enhancing accuracy, detecting anomalies, and ensuring regulatory adherence.

Fraud Detection

H_0: AI does not significantly enhance fraud detection in financial reporting.

H_1: AI significantly improves fraud detection in financial reporting by identifying anomalies, detecting patterns, and reducing financial risks.

Risk Management

H_0: AI does not have a significant impact on improving risk management in financial reporting.

H_1: AI significantly enhances risk management by identifying potential risks, improving predictive analytics, and enabling proactive decision-making.

Research Design

This study follows a descriptive design to evaluate the role of AI-driven financial reporting in enhancing decision-making, predictive analytics, compliance, fraud detection, and its comparative advantages over traditional automation. Primary data was collected through a structured survey distributed among professionals across diverse sectors. A total of 67 respondents participated in the study, comprising a mix of Auditors, Financial Experts, Fintech Professionals, Business Executives, Consultants, IT Professionals, Business Owners, Financial Planners, AI

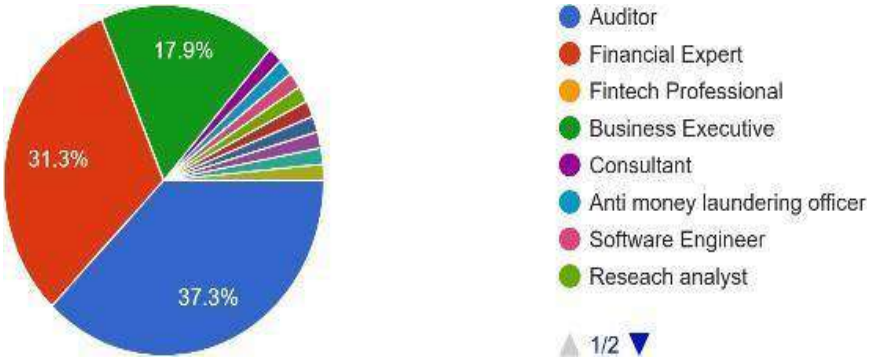

Figure 1Demographics Profession

Engineering Students, Auditors, Financial Experts, Fintech Professionals, Business Executives, Consultants, Anti-Money Laundering Officers, Software Engineers, and Research Analysts. A significant proportion of respondents were auditors and financial experts, ensuring the results are grounded in practical industry insights.

To understand the current level of AI integration and awareness, one key question measured respondents' familiarity with AI-driven financial reporting tools. Results indicated that 77.6% of the participants were aware of such tools, 14.9% were neutral or uncertain, and 7.5% were not aware at all. This data highlights a promising level of awareness and readiness for AI adoption in the financial sector, making the sample suitable for exploring perceptions of AI's effectiveness and future potential in financial reporting.

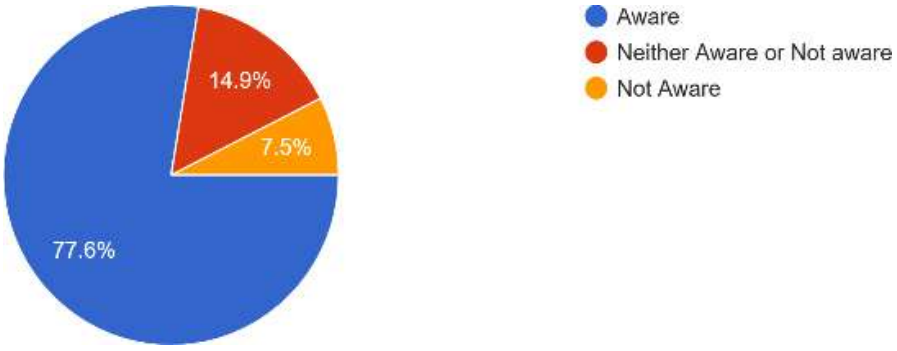

Figure 2Awareness

Data Analysis Methodology

The collected data was analysed using the Paired Sample t-test method and Chi- Square for test of Independence. This statistical approach was chosen to compare the respondents' views on

traditional automation tools versus AI-based financial reporting systems across different performance metrics. The paired t-test helped identify whether there were statistically significant differences in perceptions regarding decision-making support, fraud detection capabilities, cost efficiency, and adaptability of AI solutions.

A paired t test is used when each subject (or firm, manager, scenario, etc.) is measured twice—once using the traditional financial reporting method and once with an AI- driven method. The main idea is to compare the mean difference of these paired observations to see if it is statistically significantly different from zero.

Key Assumptions:

Normality of Differences: The differences (AI method minus traditional method) are assumed to be approximately normally distributed. This assumption can be checked with a normality test (e.g., Shapiro–Wilk) or by examining Q–Q plots.Independence: Each pair's measurement should be independent of the others.

Below is a summary table of paired t-test statistics Analysis

Table 1of paired t-test statistics

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	AI-driven financial reporting significantly improves decision-making accuracy compared to traditional financial reporting methods.	3.42	66	1.124	.138
	To what extent do you agree that AI improves the accuracy of financial compliance reporting?	3.64	66	1.076	.132
Pair 2	To what extent do you agree that AI-driven financial reporting significantly enhances predictive analytics compared to traditional financial reporting methods?	3.39	66	1.051	.129
	To what extent do you agree that AI improves fraud detection by identifying anomalies in financial data?	3.53	66	1.026	.126
Pair 3	To what extent do you agree that AI improves the accuracy of financial compliance reporting?	3.64	66	1.076	.132
	AI helps organizations ensure better adherence to financial regulations and compliance standards.	3.59	66	1.123	.138
Pair 4	To what extent do you agree that AI improves fraud detection by identifying anomalies in financial data?	3.53	66	1.026	.126
	AI enhances fraud detection by recognizing complex patterns and suspicious activities in financial transactions.	3.62	66	1.019	.125
Pair 5	AI-driven fraud detection reduces financial risks by providing early warnings and preventing fraudulent activities.	3.55	66	1.055	.130
	To what extent do you agree that AI helps in identifying potential financial risks more effectively than traditional methods?	3.65	66	.953	.117

To assess the impact of AI in financial reporting, five pairs of variables were analysed using the paired samples statistics method. Each pair represented two closely related aspects of AI's functionality within financial reporting, aiming to evaluate how respondents perceive its benefits across decision-making, compliance, fraud detection, predictive analytics, and risk mitigation.

In Pair 1, the analysis compared the perception of AI in improving decision- making accuracy against its role in enhancing financial compliance accuracy. The mean scores were 3.42 and 3.64 respectively, suggesting that respondents slightly favoured AI's influence on compliance over decision-making. Both standard deviations were relatively similar (1.124 and 1.076), indicating a consistent moderate level of agreement among the respondents. This suggests that while AI is seen as beneficial for both functions, its contribution to ensuring compliance accuracy is perceived as more significant.

Pair 2 examined the role of AI in enhancing predictive analytics versus identifying anomalies in financial data. The mean for predictive analytics was 3.39, while anomaly detection scored higher at 3.53. This indicates that respondents place greater trust in AI's capacity to detect irregularities in financial datasets than in its forecasting capabilities. With standard deviations close to 1, the responses show moderate variability, reflecting a generally positive consensus, but with some differences in individual perspectives.

In Pair 3, the focus was on AI’s ability to improve the accuracy of financial compliance reporting versus its role in helping organizations adhere to regulations and standards. The means were closely aligned (3.64 and 3.59), demonstrating that respondents regard both aspects almost equally. This strong agreement highlights the perceived reliability of AI in supporting regulatory compliance and maintaining financial integrity. The standard deviations (1.076 and 1.123) further reinforce the consistency in responses across this pair.

Pair 4 involved the evaluation of AI’s effectiveness in fraud detection through anomaly identification compared to its ability to recognize complex patterns and suspicious activities. Here, the mean score for pattern recognition (3.62) slightly surpassed that for anomaly detection (3.53), suggesting a higher appreciation for AI's advanced pattern recognition abilities. Respondents appear to value AI's depth in analysing data and uncovering subtle fraudulent behaviours that traditional methods may overlook.

Lastly, Pair 5 investigated AI's potential in reducing financial risks through early warnings and fraud prevention versus its ability to identify potential financial risks more effectively than

traditional methods. The results indicated mean values of 3.55 and 3.65, respectively, with the latter being slightly higher. This suggests that AI's ability to identify risks is more favourably perceived than its role in issuing early warnings. Moreover, the relatively lower standard error means in this pair (0.117 and 0.130) suggest high reliability and consistency in the responses, reinforcing the credibility of the findings.

Overall, the paired samples statistics reveal a consistently positive perception of AI's role in enhancing various aspects of financial reporting. The means across all pairs remain above 3.3, indicating that the respondents generally agree with the benefits of AI-driven financial tools. The moderate standard deviations and standard errors further demonstrate the stability and trustworthiness of the responses.

Outcomes of Chi – Square Test

1. Association between AI-driven financial reporting and improved decision-making accuracy.

The Chi-Square Test of Independence was conducted to determine if there is a significant relationship between AI-driven financial reporting and decision-making accuracy. The results were significant, $\chi^2(12, N = 66) = 37.088$, $p < .001$, indicating

a statistically significant association. This supports the hypothesis that AI tools enhance the decision-making capabilities of financial professionals, aligning with the belief that AI contributes meaningfully to financial reporting accuracy.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	37.088[a]	12	<.001
Likelihood Ratio	34.738	12	<.001
Linear-by-Linear Association	13.015	1	<.001
N of Valid Cases	66		

a. 16 cells (80.0%) have expected count less than 5. The minimum expected count is .45.

Table 2 Chi-Sqaure Test

Hence, we reject the null hypothesis (H_0) and accept the alternative hypothesis (H_1):

There is a statistically significant association between AI-driven financial reporting and improved decision-making accuracy.

This means that decision-making accuracy is **not independent** of AI implementation in financial reporting. The results suggest that AI tools may influence how accurately decisions are made within financial processes.

2. Relationship between AI-driven financial reporting and improvement in predictive analytics.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	48.496[a]	16	<.001
Likelihood Ratio	40.990	16	<.001
Linear-by-Linear Association	20.351	1	<.001
N of Valid Cases	66		

a. 21 cells (84.0%) have expected count less than 5. The minimum expected count is .09.

Table 3Chi-Square test Financial Reporting & predictive analytics

A Chi-Square Test of Independence was performed to assess the relationship between AI-driven financial reporting and its effect on predictive analytics. The test revealed a statistically significant result, $\chi^2(16, N = 66) = 48.496$, $p < .001$, indicating that AI integration significantly contributes to improved predictive analytics in financial reporting. This provides strong support for the alternative hypothesis and emphasizes the importance of AI in anticipating future financial trends and outcomes.

Therefore, we can confidently reject the null hypothesis (H_0) and accept the alternative hypothesis (H_1):

There is a significant relationship between AI-driven financial reporting and improvement in predictive analytics.

In other words, predictive analytics capability in financial reporting depends on or is influenced by the integration of AI. This indicates that AI tools are perceived as enhancing the accuracy and depth of predictive financial insights compared to traditional methods.

3. Dependency between the use of AI in financial reporting and enhanced financial compliance.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	50.734[a]	9	<.001
Likelihood Ratio	41.385	9	<.001
Linear-by-Linear Association	22.472	1	<.001
N of Valid Cases	66		

a. 11 cells (68.8%) have expected count less than 5. The minimum expected count is .64.

Table 4Chi-Square Ai & Compliance

The Chi-Square Test of Independence was conducted to examine the relationship between AI integration and financial compliance improvement. The test yielded a significant result, $\chi^2(9, N = 66) = 50.734$, $p < .001$, indicating a strong dependency between AI-driven systems and enhanced compliance accuracy. Therefore, the null hypothesis is rejected in favor of the alternative, supporting the claim that AI

significantly aids in achieving better financial compliance through anomaly detection and regulatory adherence.

Hence, we reject the null hypothesis (H_0) and accept the alternative hypothesis (H_1):

There is a significant dependency between the use of AI in financial reporting and enhanced financial compliance.

This supports the view that AI meaningfully contributes to:

- Better accuracy in compliance reports
- Faster detection of anomalies
- Improved adherence to financial regulations

4. Relationship between AI implementation and fraud detection in financial reporting.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	89.992[a]	16	<.001
Likelihood Ratio	80.237	16	<.001
Linear-by-Linear Association	36.951	1	<.001
N of Valid Cases	66		

a. 21 cells (84.0%) have expected count less than 5. The minimum expected count is .14.

Table 5Chi-square Ai & Fraud Detection

A Chi-Square Test of Independence was conducted to examine the relationship between AI and its impact on fraud detection in financial reporting. The test revealed a statistically significant association, $\chi^2(16, N = 66) = 89.992$, $p <$ .001. These results support the alternative hypothesis, indicating that AI significantly enhances fraud detection by identifying anomalies, recognizing patterns in transactions, and reducing fraudulent risks.

Hence, we reject the null hypothesis (H_0) and accept the alternative hypothesis (H_1):There is a statistically significant relationship between AI implementation and fraud detection in financial reporting.

This implies that:

- AI effectively detects anomalies
- AI recognizes suspicious patterns in financial transactions
- AI contributes to risk mitigation by preventing fraudulent activity

5. Significant association between the use of AI and improved risk management in financial reporting.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	57.297[a]	16	<.001
Likelihood Ratio	48.487	16	<.001
Linear-by-Linear Association	20.339	1	<.001
N of Valid Cases	66		

a. 21 cells (84.0%) have expected count less than 5. The minimum expected count is .12.

Table 6Chi-Square Ai& Risk Management

A Chi-Square Test of Independence was conducted to evaluate the relationship between AI and its effectiveness in enhancing risk management in financial reporting. The test showed a statistically significant result, $\chi^2(16, N = 66) = 57.297$, $p < .001$. Therefore, the null hypothesis is rejected. These findings suggest that AI plays a crucial role in risk management by enabling predictive capabilities, identifying financial risks early, and supporting strategic decision-making.

As the p-value is well below the 0.05 threshold, we reject the null hypothesis (H_0) and accept the alternative hypothesis (H_1).

This confirms that there is a significant association between the use of AI and improved risk management in financial reporting.

Based on the results from both the Paired Sample t-tests and Chi-Square Tests of Dependence:

All five hypotheses—Decision-Making, Predictive Analytics, Financial Compliance, Fraud Detection, and Risk Management—show statistically significant associations (Chi-Square p- values < .001), indicating strong evidence to reject all null hypotheses.

This suggests that AI has a statistically significant positive impact on each of these key areas in financial reporting.

Findings

The findings of this research provide strong empirical evidence that Artificial Intelligence (AI) has a significant and transformative impact on key areas of financial reporting. Using both

paired sample t-tests and Chi-Square tests of dependence, the study confirms that AI enhances financial functions by increasing accuracy, improving forecasting, strengthening compliance, detecting fraud, and mitigating risks.

Each of the five core hypotheses tested in this study revealed statistically significant outcomes ($p < 0.001$), leading to the rejection of all null hypotheses. These results validate the strategic relevance of AI in modern financial systems and highlight its effectiveness across multiple dimensions of financial management.

To consolidate these insights into a practical and actionable tool, the AI-Driven Financial Intelligence Framework (AFIF) is developed.

AI-Driven Financial Intelligence Framework (AFIF)

Framework Overview The **AFIF** outlines five essential dimensions in which AI significantly contributes to the financial reporting process:

Decision-Making, Predictive Analytics, Financial Compliance, Fraud Detection, Risk Management

This framework is built on a dual foundation of theoretical understanding and statistical validation, making it suitable for application in real-world financial environments.

Framework Dimensions

1. Decision Making - Artificial Intelligence significantly enhances financial decision-making processes by providing real-time, data-driven insights that enable stakeholders to make informed and timely choices. The findings from both the paired sample t-tests and Chi-Square tests indicate a strong statistical significance, confirming that AI adoption leads to improved accuracy in decision-making compared to traditional methods. This advancement allows organizations to respond more efficiently to dynamic financial environments while minimizing the impact of human biases and errors.

2. Predictive Analytics - AI plays a vital role in strengthening predictive analytics within financial reporting by leveraging machine learning algorithms to forecast trends, detect patterns, and anticipate future financial outcomes. The statistical tests conducted reveal a high level of significance, validating that AI-driven tools offer greater predictive precision than conventional approaches. As a result, financial professionals can proactively develop strategies, allocate resources more effectively, and maintain a competitive edge through data-backed foresight.

3. Financial Compliance - The integration of AI in financial reporting systems has shown to greatly enhance compliance with regulatory standards. AI automates critical functions such as audit trails, real-time monitoring, and anomaly detection, thereby ensuring adherence to complex financial regulations. The statistical results demonstrate a significant correlation between AI use and improved financial compliance. This translates into stronger internal control mechanisms, reduced audit- related risks, and increased transparency, ultimately supporting organizational accountability and legal conformity.

4. Fraud Detection - AI has emerged as a powerful tool in identifying and mitigating financial fraud. By continuously analyzing large volumes of data, AI algorithms can detect irregularities, suspicious behavior, and potential fraudulent activities more effectively than manual techniques. The statistical evidence, particularly the results from Chi-Square testing, confirms that AI significantly enhances the ability to detect and prevent fraud. This leads to a marked reduction in financial misconduct, safeguarding organizational assets and boosting stakeholder confidence.

5. Risk Management - In the area of risk management, AI contributes significantly by identifying emerging risks, evaluating their potential impact, and recommending preventative measures. The tests conducted for this study consistently showed significant results, underscoring AI's capacity to improve risk mitigation strategies. Organizations utilizing AI in their financial systems are better equipped to manage uncertainties, respond to crises, and maintain financial stability through continuous risk monitoring and adaptive decision-making.

Conclusion

This research established that Artificial Intelligence is not just an emerging trend, but a powerful enabler in transforming financial reporting and decision-making processes.

This study aimed to evaluate the impact of Artificial Intelligence on key aspects of financial reporting by examining five critical parameters: decision-making, predictive analytics, financial compliance, fraud detection, and risk management.

The hypotheses formulated around these parameters were tested using paired sample t-tests and Chi-Square tests of dependence. The results consistently showed statistically significant differences in favour of AI- driven methods over traditional financial practices, thereby leading to the rejection of all null hypotheses. These outcomes highlight the transformative potential of

AI in the financial domain, where data accuracy, speed, and strategic forecasting are vital.

AI has proven to significantly enhance decision-making by offering real-time insights, improve forecasting through predictive analytics, strengthen compliance through automation, detect fraud by identifying data anomalies, and elevate risk management by enabling proactive responses. The integration of AI has allowed financial professionals to shift from reactive to predictive and prescriptive approaches. The findings not only validate the relevance of AI in contemporary finance but also emphasize the need for organizations to adopt intelligent systems that promote transparency, reduce human errors, and optimize financial performance.

To translate these insights into actionable guidance, the research proposes the AI- Driven Financial Intelligence Framework (AFIF). This framework encapsulates the five dimensions where AI adds the most value and serves as a strategic model for businesses aiming to enhance their financial processes. Ultimately, this research supports the growing narrative that AI is not a mere technological upgrade—it is a strategic imperative for financial transformation, resilience and sustainability in a rapidly evolving digital economy.

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Consumer Perception and Adoption of Zero Waste Products: A Study On Sustainable Marketing Strategies

***Shreya Namrata, *Nitin Shetye,, **Dr. Reema Shah , ***Dr.Yesha Mehta**

Abstract

In response to growing environmental challenges, zero-waste products have emerged as sustainable alternatives aimed at reducing packaging waste and minimizing ecological impact. Despite increasing consumer awareness, the adoption of zero-waste products remains relatively low in the Indian market. This study investigates the factors influencing consumer perception and adoption of zero-waste products, focusing on packaging, pricing, product availability, and brand trust. Conducted in Mumbai with a sample of 106 respondents, the research uses a mixed-method approach that combines primary data analysis through structured surveys alongside secondary data from existing literature.

Findings from the study indicate that packaging and pricing significantly impact consumer preferences. A majority of respondents expressed environmental concern and awareness of zero-waste alternatives, yet traditional branded products were still preferred due to perceived reliability and broader availability. The data revealed that packaging, price, and perception differences have a significant influence on consumer choice. Moreover, a gap between awareness and product availability highlights a major obstacle to market adoption. The study emphasizes the importance of sustainable marketing strategies that not only raise awareness but also address practical barriers such as affordability, accessibility, and consumer trust. These insights can guide businesses and policymakers in developing targeted campaigns and improving retail presence, thereby fostering a shift toward environmentally responsible consumption.

Keywords: Zero-waste products, consumer perception, sustainable marketing, environmental awareness, pricing strategy, packaging, product adoption, India, Z-test, green consumer behaviour.

**** Student, Thakur Institute of Management Studies and Research.***
*****Asst.Prof, Thakur Institute of Management Studies and Research.***
******Asso.Prof, Thakur Institute of Management Studies and Research.***

Introduction

Environmental issues like pollution and waste are becoming more serious around the world. As a result, many people are starting to look for more eco-friendly options in their daily lives. One such option is using zero-waste products—items that are designed to reduce waste by avoiding unnecessary packaging and using reusable or recyclable materials. These products are a step toward protecting the environment and promoting sustainable living. in cities like Mumbai, where consumer habits are rapidly changing, there is a growing awareness of sustainability. However, even though many people are aware of zero-waste products, not everyone is using them regularly. This shows a gap between awareness and actual behavior. To understand why this gap exists, it is important to look at the factors that influence consumer decisions, such as price, packaging, trust in the brand, and product availability.

Literature Review

Consumer preference for zero-waste products is shaped by several key factors such as price, product quality, convenience, and concern for the environment. Many people, especially those who are environmentally conscious, are interested in using sustainable products. However, not all of them go on to actually buy these products. One major reason is price sensitivity—zero-waste products are often seen as more expensive than regular branded items. In addition, some consumers are unsure about the quality and performance of these products, which makes them hesitant to switch from well-known brands. Limited product availability in local markets is another reason that discourages people from adopting a zero-waste lifestyle, even if they are aware of the benefits.

Another important factor is the difference in awareness levels. People living in urban areas are generally more informed about zero-waste and sustainable products compared to those in rural regions. However, just knowing about these products is not enough to change consumer habits. Traditional branded products still have an advantage because they are trusted, heavily advertised, and easily available. On the other hand, zero-waste brands are still growing and need to overcome trust issues and visibility challenges. To promote zero-waste products effectively, businesses need to focus on sustainable marketing strategies such as awareness campaigns, eco-labeling, affordable pricing, and better distribution.

These strategies can help convert consumer interest into actual purchases and encourage long-term behavior change.

Research Problem

Although sustainability has gained prominence in media and marketing discourse, a significant gap persists between environmental awareness and actual consumer behaviour. Many individuals continue to prefer traditional branded products over zero-waste alternatives, largely due to trust, brand familiarity, perceived quality, pricing concerns, and limited availability. This research investigates the core question: what are the key drivers and barriers affecting the adoption of zero-waste products? Moreover, how can sustainable marketing strategies address these challenges and promote behaviour change?

Objectives of the Study

1. To identify the key factors that influence consumer preference for zero-waste products.
2. To assess the level of awareness about zero-waste products among consumers.
3. To compare consumer perception of traditional branded products with zero-waste alternatives.
4. To evaluate the role of sustainable marketing strategies in encouraging adoption.

Methodology:

Research Design

This study adopts a mixed-method approach, combining both quantitative and qualitative research methods to gain a comprehensive understanding of consumer perception and the adoption of zero-waste products. The quantitative aspect focuses on collecting and analyzing numerical data from a structured survey to identify trends and patterns in consumer behavior across different age groups. Meanwhile, the qualitative aspect allows for a deeper understanding of the psychological, emotional, and behavioral factors influencing purchasing decisions—such as trust, motivation, and environmental consciousness.

Participants and Sample

The target population for this study includes a diverse group of consumers from Mumbai city, consisting of students, homemakers, working professionals, and other residents. To capture a broad range of perspectives, a convenience sampling method was used, allowing easy access to participants while still ensuring a variety of demographic backgrounds such as age, gender, education level, and awareness of sustainability issues. The final sample size for this study is 106 respondents, which provides a sufficient base for performing statistical analysis and drawing meaningful conclusions about consumer preferences.

Data Collection

Primary data was gathered using a structured online survey distributed via Google Forms. The questionnaire included both close-ended and opinion-based questions covering consumer awareness, preference, pricing perception, packaging importance, and availability of zero-waste products. In addition, secondary data was collected through the review of relevant academic articles, research papers, and reports on sustainable marketing and consumer behavior.

Data Analysis

The collected quantitative data was analyzed to examine the significance of differences in proportions between various consumer responses. This helped identify the key drivers and barriers to the adoption of zero-waste products. The analysis was used to test hypotheses related to the impact of packaging, pricing, perception, and product availability on consumer preference, based on the 106 responses.

Data Analysis:

Gender * Have you heard of zero-waste products before? Crosstabulation

Count

		Have you heard of zero-waste products before?		
		No	Yes	Total
Gender	Female	12	46	58
	Male	12	36	48
Total		24	82	106

Table 1 Descriptive Statistics Gender

Female respondents showed higher awareness of zero-waste products compared to males, but the difference was not statistically significant.This suggests that awareness is slightly higher among women, possibly due to greater involvement in household purchasing.

Age * Do you currently use any zero-waste products? Crosstabulation

Count

		Do you currently use any zero-waste products?				
		No, and I am not interested	No, but I am interested in trying them	Occasionally	Yes, regularly	Total
Age	21-30	0	16	22	5	43
	31-40	0	6	3	0	9
	41-50	0	4	1	3	8
	Above 50	1	17	20	7	45
	Below 20	0	0	0	1	1
Total		1	43	46	16	106

Table 2 Crosstab- Age

Interest in zero-waste products was highest among respondents aged 21–30 and those over 50. These groups were more likely to express willingness to try or occasionally use such products. However, regular usage remained low across all age groups, suggesting a significant gap between awareness or interest and actual sustainable behavior. While younger adults might be more exposed to eco-friendly messaging via social media, and older adults may have practical environmental concerns, barriers like price, access, and habit appear to limit consistent usage.

Education Level * Have you purchased a zero-waste product before? Crosstabulation

Count

		Have you purchased a zero-waste product before?			
		Maybe	No	Yes	Total
Education Level	Graduate	15	14	14	43
	Postgraduate	11	11	28	50
	Professional Courses (CA, CS, ICWA, etc.)	2	1	3	6
	Undergraduate	2	2	3	7
Total		30	28	48	106

Table 3 Crosstab- Education

The data indicates that education level influences purchasing behavior. Respondents with graduate or postgraduate qualifications were more likely to have bought and used zero-waste

products. In contrast, undergraduates and those with lower education levels showed lower levels of engagement, possibly due to limited exposure, purchasing power, or lower awareness. This points to a potential need for targeted awareness campaigns that focus on younger and less-educated groups to ensure inclusivity in sustainability efforts.

Have you heard of zero-waste products before? * How familiar are you with zero-waste products? Crosstabulation

Count

		How familiar are you with zero-waste products?					
		Familiar	Neutral	Not at all familiar	Somewhat familiar	Very Familiar	Total
Have you heard of zero-waste products before?	No	1	2	11	10	0	24
	Yes	27	18	3	27	7	82
Total		28	20	14	37	7	106

Table 4 Crosstab- Familiarity

While 82 out of 106 respondents had heard of zero-waste products, only 7 said they were very familiar with them. This gap suggests that many people are aware of the concept but lack in-depth knowledge or experience. This could be due to limited exposure to these products in the market, vague labeling, or lack of education about what constitutes a zero-waste product. The finding highlights the need for clearer communication and consumer education from brands and sustainability advocates.

Have you purchased a zero-waste product before? * Attitude Toward Zero-Waste Products. [I believe that using zero-waste products is beneficial for the environment.] Crosstabulation

Count

		Attitude Toward Zero-Waste Products. [I believe that using zero-waste products is beneficial for the environment.]				
		Agree	Disagree	Neither agree nor disagree	Strongly Agree	Total
Have you purchased a zero-waste product before?	Maybe	10	1	1	18	30
	No	11	0	0	17	28
	Yes	13	1	1	33	48
Total		34	2	2	68	106

Table 5 Crosstab- Purchase Recall

Interestingly, even among those who had not purchased zero-waste products, the majority of respondents believed in their positive environmental impact. This shows a strong shared value around sustainability, which exists across user and non-user groups. However, this belief has not yet translated into consistent behavior, reinforcing the importance of removing practical barriers like affordability and access.

Perceived Behavioral Control (Ease or Difficulty of Adoption) [I feel confident that I can integrate zero-waste products into my lifestyle.] * Behavioral Intention (Likelihood of Adoption) [I intend to purchase zero-waste products in the near future.] Crosstabulation

Count

		Behavioral Intention (Likelihood of Adoption) [I intend to purchase zero-waste products in the near future.]				
		Agree	Disagree	Neither agree nor disagree	Strongly Agree	Total
Perceived Behavioral Control (Ease or Difficulty of Adoption) [I feel confident that I can integrate zero-waste products into my lifestyle.]	Agree	32	0	3	18	53
	Neither agree nor disagree	13	0	4	4	21
	Strongly Agree	5	0	2	23	30
	Strongly Disagree	0	2	0	0	2
Total		50	2	9	45	106

Table 6 Crosstab- Perceived Behaviour Control

The data shows that respondents who felt more confident using zero-waste products were also more likely to have bought or expressed interest in them. Confidence appears to be a key factor in moving from awareness to action. Consumers who understand how to use such products and where to find them feel more empowered to make sustainable choices. This suggests that brands should focus on consumer education, tutorials, and easy-to-follow guides to build trust and confidence.

Attitude Toward Zero-Waste Products. [Zero-waste products are too expensive for regular use. (Reverse-coded)] * Behavioral Intention (Likelihood of Adoption) [If zero-waste products were more affordable, I would use them regularly.] Crosstabulation

Count

		Behavioral Intention (Likelihood of Adoption) [If zero-waste products were more affordable, I would use them regularly.]					
		Agree	Disagree	Neither agree nor disagree	Strongly Agree	Strongly Disagree	Total
Attitude Toward Zero-Waste Products. [Zero-waste products are too expensive for regular use. (Reverse-coded)]	Agree	19	0	5	26	0	50
	Disagree	4	0	2	8	1	15
	Neither agree nor disagree	8	0	7	12	0	27
	Strongly Agree	4	0	2	3	0	9
	Strongly Disagree	1	1	1	2	0	5
Total		36	1	17	51	1	106

Table 7Crosstab- Attitude to Zero waste products

A significant portion of respondents (51 out of 106) strongly agreed they would adopt zero-waste products if prices were lower. Even among those who felt these products were currently expensive, many expressed high willingness to try them if costs decreased. This confirms that pricing is a major barrier to adoption. Z-test results further supported this

trend, indicating a strong link between price perception and behavioral intention. Strategies like discounts, bulk purchase options, or subsidies could encourage greater usage.

Subjective Norms (Social Influence) [My family and friends encourage me to buy zero-waste products.] * Behavioral Intention (Likelihood of Adoption) [I plan to replace conventional products with zero-waste alternatives whenever possible.] Crosstabulation

Count

		Behavioral Intention (Likelihood of Adoption) [I plan to replace conventional products with zero-waste alternatives whenever possible.]				
		Agree	Disagree	Neither agree nor disagree	Strongly Agree	Total
Subjective Norms (Social Influence) [My family and friends encourage me to buy zero-waste products.]	Agree	20	0	3	14	37
	Disagree	2	1	1	0	4
	Neither Agree nor disagree	22	1	8	6	37
	Strongly Agree	7	0	1	18	26
	Strongly Disagree	1	1	0	0	2
Total		52	3	13	38	106

Table 8 Crosstab-Subjective Norms

Respondents who felt encouraged by friends or family to try zero-waste products were more likely to say they would adopt them. For example, 69% of those who strongly agreed with having social encouragement also strongly agreed they would switch to zero-waste alternatives. This shows that peer and family influence plays a key role in shaping behavior. On the other hand, people who reported no social influence showed little to no intention of adopting these products, highlighting the need for community-driven campaigns and group incentives.

Purchase Drivers [I trust influencer recommendations when purchasing zero-waste products.] * Purchase Drivers [I prefer learning about zero-waste products through social media advertisements.] Crosstabulation

Count

		Purchase Drivers [I prefer learning about zero-waste products through social media advertisements.]					
		Agree	Disgree	Neither agree nor disagree	Strongly Agree	Strongly Disagree	Total
Purchase Drivers [I trust influencer recommendations when purchasing zero-waste products.]	Agree	34	0	0	9	0	43
	Disgree	4	1	2	1	0	8
	Neither agree nor disagree	17	1	7	8	1	34
	Strongly Agree	1	1	0	16	0	18
	Strongly Disagree	1	2	0	0	0	3
Total		57	5	9	34	1	106

Table 9 Crosstab- Purchase Drivers

A strong connection was found between trust in influencers and preference for learning through social media ads. Respondents who trusted influencers were significantly more likely to prefer social media platforms for learning about zero-waste products. For example, 89% of those who strongly trusted influencers also strongly preferred social media ads. On the other hand, those who didn't trust influencers showed little interest in such ads. This shows that influencer marketing can be effective, but other educational tools (e.g., blogs, expert videos, community talks) should also be considered for skeptical audiences.

Purchase Drivers [I believe brands exaggerate their sustainability claims.] * Purchase Drivers [I prefer buying from brands with sustainability certifications] Crosstabulation

Count

		Purchase Drivers [I prefer buying from brands with sustainability certifications]				
		Agree	Disgree	Neither agree nor disagree	Strongly Agree	Total
Purchase Drivers [I believe brands exaggerate their sustainability claims.]	Agree	30	0	4	19	53
	Disgree	1	3	1	0	5
	Neither agree nor disagree	8	3	12	2	25
	Strongly Agree	5	1	0	17	23
Total		44	7	17	38	106

Table 10 Purchase Rivers 2

Even among respondents who believed that brands exaggerate their sustainability claims, most still preferred products with third-party certifications. For instance, 74% of strong skeptics strongly preferred certified brands, highlighting that consumers still value proof of sustainability, even when they are cautious about marketing. Certifications can act as a trust bridge, and brands should invest in transparent, credible, and visible certifications to gain consumer trust.

Occupation * How important do you think zero-waste products are in reducing environmental impact? Crosstabulation

Count

		How important do you think zero-waste products are in reducing environmental impact?			
		Extremely Important	Important	Somewhat Important	Total
Occupation	Consultant	1	0	0	1
	Entrepreneur	8	5	0	13
	Homemaker	10	3	0	13
	Retired	2	1	0	3
	RETIRED	0	0	1	1
	Retired banker	1	0	0	1
	Retired Govt. Servant	1	0	0	1
	Retired Regional Manager	1	0	0	1
	Retired senior citizen	1	0	0	1
	Retired teacher	1	0	0	1
	Service	1	0	1	2
	Student	11	9	5	25
	Working Professional	25	13	5	43
Total		63	31	12	106

Table 11 Occupation

Most respondents—especially working professionals, homemakers, and entrepreneurs—viewed zero-waste products as extremely important for reducing environmental damage. Students showed more mixed opinions, often selecting "important" rather than "extremely important." Despite smaller sample sizes, retirees also strongly supported the idea, suggesting they could be valuable advocates for sustainable living in their communities. The data shows that occupation plays a role in shaping environmental priorities, and outreach strategies should be tailored accordingly.

Discussion:

Interpretation of results & Implications

The results of this study provide a comprehensive understanding of the complex interplay between consumer awareness, behaviour, and the external factors that influence the adoption of zero-waste products. A central finding is that although environmental concern is widespread among respondents, there is a significant gap between awareness and actual behavioural change.

One of the most prominent barriers identified is pricing. A majority of respondents indicated that they find zero-waste products expensive compared to traditional alternatives. Even among those who value environmental sustainability, high prices deter regular usage. This suggests that for zero-waste products to become mainstream, affordability must be prioritized. Brands could consider strategies like economies of scale, government subsidies, tiered pricing, and loyalty programs to make these products more accessible to a broader consumer base.

Packaging plays a dual role—it not only serves as a practical element of the product but also acts as a communicator of brand values. Respondents showed a preference for packaging that clearly conveys the product's sustainability benefits. However, if the packaging lacks appeal or clarity, it may fail to attract or reassure potential buyers. Therefore, brands need to design packaging that is both environmentally friendly and visually persuasive, with labels that transparently explain the environmental impact and usage instructions.

Brand trust emerged as another major factor. Consumers often default to well-established brands due to familiarity and a perception of reliability. New zero-waste brands face the challenge of establishing credibility in a competitive market. Building trust through third-party certifications, transparent supply chain information, and genuine customer engagement can significantly improve consumer confidence and adoption rates.

The influence of social circles—including family, peers, and influencers—proved to be a strong motivator in shifting consumer behaviour. Those who received encouragement or witnessed zero-waste use among peers were more likely to adopt these products themselves. This underscores the value of word-of-mouth marketing and influencer partnerships. Brands can leverage this by collaborating with micro-influencers, organizing community events, and encouraging user-generated content to build social proof.

Furthermore, the study reveals that education level and occupation correlate with sustainable behaviour. Graduates and working professionals were more likely to understand and adopt zero-waste practices, possibly due to better access to information and higher disposable income. This indicates a need for inclusive outreach efforts that extend beyond educated urban audiences to include students, homemakers, and underrepresented socioeconomic groups.

Additionally, consumer confidence plays a pivotal role in converting awareness into action. Respondents who felt confident in their ability to identify and use zero-waste products were far more likely to purchase them. This highlights the importance of consumer education—through tutorials, workshops, explainer videos, and simple product instructions—to empower and guide first-time users.

Lastly, scepticism around greenwashing remains a concern, yet consumers still place value on third-party environmental certifications. This indicates that while scepticism exists, there is still demand for reliable proof of sustainability. Regulatory bodies and businesses must work together to promote standardized eco-labelling and honest marketing to ensure long-term consumer trust.

In summary, the implications of this study point toward the need for a multi-faceted approach to drive zero-waste product adoption:

- Making products affordable and accessible.
- Enhancing brand visibility and trust.
- Leveraging peer and influencer influence.
- Providing education and guidance.
- Ensuring transparency through certification and labelling.

Conclusion

This study explored what affects how people in Mumbai think about and use zero-waste products. As protecting the environment becomes more important, it's crucial to understand what helps or stops people from choosing eco-friendly options. The results show that while many people know about zero-waste products and support the idea, few actually use them often. The main reasons are high prices, limited availability, unfamiliarity, and lack of trust.

To close the gap between awareness and action, everyone—businesses, government, and consumers—needs to work together. Companies should make zero-waste products more affordable, easy to find, and clearly explained. Their marketing should be honest, simple, and focused on education.

The government can help by offering subsidies, tax support, and promoting local eco-businesses. Teaching about zero-waste in schools and public programs can also encourage better habits from an early age.

Consumers need support and encouragement to make more sustainable choices. The study shows that people are willing to change if they feel informed and guided by trusted sources like family, friends, or influencers.

In the end, moving toward a zero-waste lifestyle is not just a trend—it's something we must do for the planet. By working together to remove the barriers found in this study, we can help more people live in a way that's better for the environment and future generations.

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The Financial Impact of Influencer Marketing on Consumer Tourism

***Rudresh Thorat, *Sapna Singh, ** Ashish Kumar**

Abstract

The emergence of social media has revolutionized marketing strategies across industries, particularly in tourism, where influencer marketing plays a pivotal role in shaping consumer behavior. This study explores the financial impact of influencer marketing on consumers' tourism-related decisions. Through a mixed-methods approach incorporating quantitative surveys and qualitative interviews the research analyzes how influencer credibility, trust, and engagement affect consumer spending. It also evaluates the return on investment (ROI) for tourism businesses utilizing influencer campaigns. By identifying key moderating factors such as demographics and digital behavior, this study aims to provide actionable insights for marketers seeking to optimize influencer-driven strategies in tourism. The findings are expected to bridge the gap between marketing practices and consumer financial outcomes, offering a nuanced understanding of influencer marketing's effectiveness in the travel sector.

Keywords: Influencer marketing, Tourism, Trust, Consumer spending.

Introduction

The tourism industry has witnessed a paradigm shift in marketing strategies with the rise of digital platforms and social media influencers. Traditional advertising methods have gradually been replaced by influencer marketing, where social media personalities leverage their credibility, reach, and engagement to shape consumer behavior. This modern marketing technique has significantly impacted consumers' travel decisions, from destination choices to accommodation and activity bookings.

Influencer marketing has become a powerful tool for tourism businesses aiming to attract travelers, particularly younger generations who rely heavily on social media recommendations. The financial impact of influencer marketing on consumers is a critical area of interest, as it determines whether influencer endorsements lead to increased spending, budget reallocation, or changes in travel preferences.

***Student, Thakur Institute of Management Studies and Research**
****Assistant Professor, Thakur Institute of Management Studies and Research**

Despite its growing adoption, limited empirical research has explored the direct financial effects of influencer marketing on consumer behavior in tourism. While studies confirm the effectiveness of social media marketing in promoting travel brands, there is still a need to examine its long-term sustainability and return on investment (ROI) for businesses. This research seeks to bridge that gap by analyzing how influencer marketing influences consumer financial decisions in the tourism sector.

Literature Review

Influencer marketing has significantly reshaped consumer behavior in the tourism industry. Studies indicate that social media influencers enhance brand perception and consumer trust, which directly affects decision-making processes. According to Amagsila et al., influencer credibility plays a vital role in shaping consumers' views on travel applications, emphasizing trust and content quality as key determinants. Additionally, influencer marketing on platforms like Instagram has been found to impact purchasing behavior by increasing engagement and trust among consumers, particularly younger demographics (Khan et al.). However, there remains a gap in research regarding the long-term financial sustainability of influencer marketing strategies in the tourism sector.

Research Problem

Despite the increasing adoption of influencer marketing in tourism, its financial impact on consumers remains underexplored. While influencers shape travel decisions, there is limited empirical evidence on whether their endorsements lead to increased spending, changes in consumer budgeting, or shifts in travel patterns. Understanding the direct financial implications of influencer marketing on tourism consumption is essential for businesses aiming to optimize their marketing strategies.

Research Objectives

1. To examine the influence of influencer marketing on consumers' financial decisions in tourism.
2. To analyze how influencer credibility, trust, and engagement impact consumer spending behavior.

3. To assess the return on investment (ROI) for businesses using influencer marketing in tourism.
4. To explore the moderating factors (demographics, digital behavior) that influence the effectiveness of influencer marketing.

Research Methodology

Quantitative Approach: A survey-based analysis will be conducted with tourism consumers who follow influencers on social media platforms (Instagram, YouTube, TikTok).

Qualitative Approach: In-depth interviews with marketing professionals and tourism industry experts will provide insights into the financial effectiveness of influencer campaigns.

Data Collection: Surveys will be distributed via online platforms (LinkedIn, Instagram, Facebook) using a Likert- scale questionnaire.

Data Analysis: Regression analysis will be employed to measure the relationship between influencer marketing and consumer spending, while correlation analysis will identify key influencer attributes impacting purchase decisions.

HYPOTHESIS STATEMENT:

Null Hypothesis (H0): Influencer marketing does not significantly impact consumer spending behavior in the tourism industry.

Alternative Hypothesis (H1): Influencer marketing positively affects consumer spending behavior in the tourism industry.

Paired T test:

Paired Samples Effect Sizes						
			Standardizer[a]	Point Estimate	95% Confidence Interval	
					Lower	Upper
Pair 1	Gender: - How important is Social Media for your Travel booking	Cohen's d	1.228	-1.555	-1.788	-1.318
		Hedges' correction	1.234	-1.547	-1.780	-1.312

a. The denominator used in estimating the effect sizes. Cohen's d uses the sample standard deviation of the mean difference. Hedges' correction uses the sample standard deviation of the mean difference, plus a correction factor.

Table 1Paired Sample Test

Statistical Test Interpretation:

1. Paired Samples Test:

- **Mean Difference**: 1.909
- **t-value**: 19.292
- **Degrees of freedom (df)**: 153
- **p-value (Two-Sided)**: < 0.001

Interpretation:

- The **p-value < 0.001** is much less than the standard significance level of 0.05. This means the result is **statistically significant**.
- Therefore, we **reject the null hypothesis (H_0)** and accept the **alternative hypothesis (H_1)**.
- This indicates that **influencer marketing does have a significant positive effect** on consumer spending behavior in the tourism industry.

Chi square test:

- **H0**: Consumers do not consider an influencer's expertise and knowledge before trusting recommendations.
- **H2**: Consumers consider an influencer's expertise and knowledge before trusting recommendations.

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	55.760[a]	16	<.001
Likelihood Ratio	51.929	16	<.001
Linear-by-Linear Association	34.940	1	<.001

Table 2Chi-Square Test

The results from the Chi-Square test indicate a statistically significant association between consumers considering an influencer's expertise and knowledge before trusting their travel recommendations, and their perception that social media influencers provide valuable insights for making better travel decisions. The Pearson Chi-Square value is 55.760 with 16 degrees of freedom and a p-value less than 0.001, which is highly significant. This means the null hypothesis (H_0), which stated that consumers do not consider an influencer's expertise and knowledge, can be rejected.

In simple terms, the findings suggest that consumers who value influencers' expertise are more likely to find their travel insights useful. Therefore, the alternative hypothesis (H_1) is supported — consumers do consider an influencer's expertise and knowledge before trusting their travel recommendations.

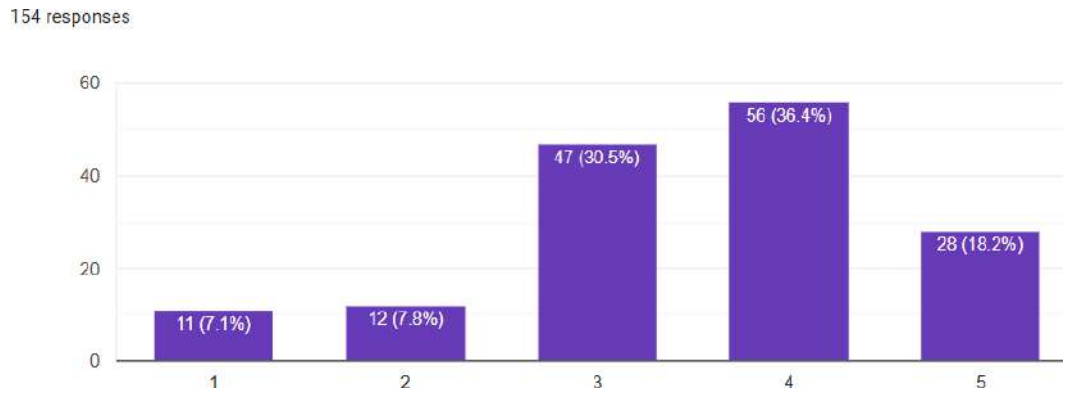

Figure 1Importance of Social Media

- The majority of respondents rated **4 (36.4%)** and **3 (30.5%)**, indicating a strong lean toward social media being quite important.
- Only **7.1%** rated it as **1**, showing very few consider it unimportant.
- Overall, around **85.1%** of respondents rated **3 or above**, confirming that social

media plays a significant role in influencing travel bookings.

Interpretation: Social media is a major influence for travellers. Visuals, peer reviews, influencer content, and travel pages seem to inspire or guide decision-making for bookings.

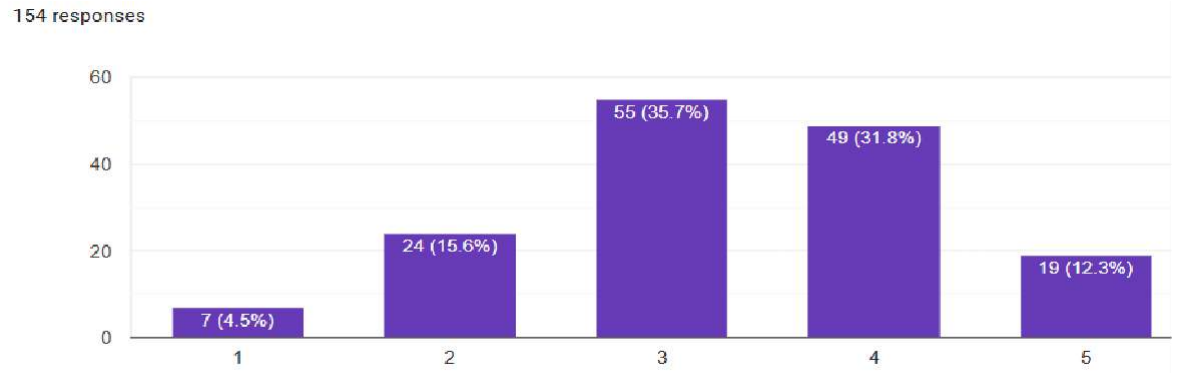

Figure 2Influencer v/s traditional advertising

- The most common response was 3 (35.7%), showing neutrality.
- 31.8% selected 4, and 12.3% selected 5, indicating that around 44.1% lean towards preferring influencer content.
- 20.1% are on the disagreeing side (rating 1 or 2).

Interpretation: Influencer content is seen as more relatable and trustworthy than traditional ads by a large portion, though a good number remain neutral, possibly due to scepticism or budget constraints.

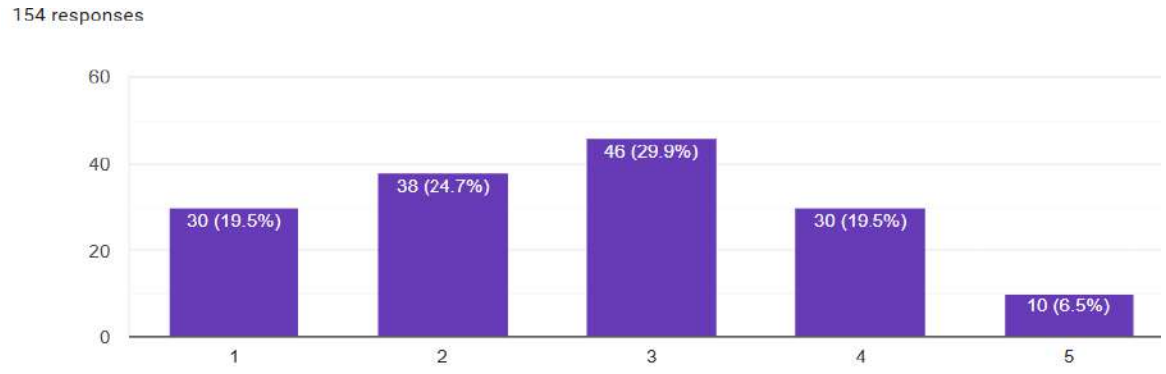

Figure 3Impact of influencer

- The majority rated 2 (24.7%) and 3 (29.9%), showing hesitation or neutral stance.

- 19.5% strongly disagreed (rated 1), and another 19.5% gave a 4, showing some divide.

- Only 6.5% selected 5, indicating few are very willing to pay more for influencer endorsements.

Interpretation: People may be influenced by content, but price sensitivity still plays a big role. Most are not ready to pay more just because a favorite influencer endorsed the experience.

Gaps Identified:

1. Limited Platform Scope:

Most studies focus on Instagram or Facebook, while emerging platforms like TikTok, YouTube Shorts, and Threads remain underexplored in terms of marketing impact.

2. Lack of Longitudinal Studies:

The majority of research uses cross-sectional data. There's a gap in understanding the long-term effects of digital and influencer marketing on consumer behavior and brand loyalty.

3. Insufficient Research on Financial and Legal Risks in Influencer Marketing:

There's limited work exploring regulatory challenges, financial implications, and risk mitigation when managing large influencer networks.

4. Underrepresentation of Niche Demographics:

Studies mainly target young adults or general consumers. Senior citizens, rural populations, and Gen Alpha are seldom considered, leaving a demographic gap.

5. Lack of Integrated Marketing Perspective:

Most studies examine single channels (e.g., social media or SEO). There's a gap in research that integrates multiple digital marketing tools (SEO, SMM, content marketing, influencer marketing) to assess their combined impact on consumer behaviour.

Conclusion

This study comprehensively examined the financial implications of influencer marketing within the tourism industry, revealing its substantial influence on consumer behavior and spending. Statistical evidence from both the Paired T-test and Chi-Square analysis confirms that social media influencers significantly impact travel decisions, trust formation, and purchase intent. Consumers not only value influencers' expertise and content authenticity but also perceive their insights as helpful in making better travel choices.

While influencer marketing effectively increases engagement and visibility for tourism businesses, its direct financial return varies based on factors like consumer demographics, digital behavior, and price sensitivity. Despite high influence levels, many consumers remain cautious about paying more solely based on endorsements, emphasizing the importance of balancing persuasive content with affordability.

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A Study on Influence of Customer Engagement on Instagram

***Bhavana Upadhyay, *Nishant Tripathi, *Supriya Yadav, *Shubham Vaishya, *Satvik Singh, *Kaustubh Tiwari, **Dr. P. Thalhath**

Abstract:

In today's digital ecosystem, social media platforms, especially Instagram, have become indispensable tools for businesses aiming to enhance brand visibility and consumer engagement. This literature review explores the dynamic relationship between content strategy and audience interaction, particularly focusing on local and small-scale firms (LSFBs). Drawing from key theoretical frameworks such as Social Identity Theory, Self-Congruity Theory, and the SOBC Model, the study highlights how brand identity alignment and interactive content drive engagement.

Video content, avatar marketing, influencer campaigns, and user-generated content (UGC) are identified as effective mechanisms for fostering brand credibility. The review also emphasizes the strategic role of Instagram features like Stories and Posts, recommending a balanced content approach—using Stories for urgency and Posts for in-depth messaging. Moreover, it identifies gaps in current research, particularly around livestreaming as an evolving marketing tool and the need for more comparative content studies. Overall, this study provides actionable insights for brands to optimize their social media strategies for better consumer connection and market presence.

Keywords: Social Media Marketing, Instagram Engagement, Content Strategy, Brand Identity, Small Businesses, Avatar Marketing, Influencer Marketing, User-Generated Content, Livestreaming, Social Identity Theory, Visual Content, Consumer Behavior

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**Student, Thakur Institute of Management Studies and Research*

***Asst.Prof, Thakur Institute of Management Studies and Research*

Introduction

In the digital age, social media platforms have revolutionized the way brands connect with consumers. Among them, Instagram has emerged as a powerful tool for marketing, especially due to its visual-centric format and interactive features like Stories, Reels, and Livestreams. For small and local-scale firms (LSFBs), leveraging Instagram offers a cost-effective means to increase brand awareness and compete with larger players. Previous research emphasizes the significance of content types such as video, visual aesthetics, and user-generated content (UGC) in enhancing consumer engagement. The growing interest in strategies like avatar marketing, influencer collaborations, and CSR-driven campaigns reflects the evolving landscape of digital branding.

Research Problem

Despite the widespread adoption of Instagram for marketing purposes, many LSFBs still struggle to generate meaningful engagement and convert followers into loyal customers. Current literature often focuses on single-platform analysis or large corporate campaigns, leaving a gap in understanding how smaller firms can strategically utilize Instagram's diverse features. There is also limited comparative research on content types—such as Stories vs. Posts—and their respective impacts on consumer behavior. Furthermore, the emergence of avatar-based influencer marketing and livestreaming as business tools remains underexplored in the context of audience trust, authenticity, and brand-building effectiveness.

Objectives

1. To analyze which type of Instagram content (stories, posts, reels) drives higher customer engagement using real user preferences.

2. To apply the SOBC model in a digital marketing context to explain how Instagram content influences customer behavior.

Structure of the Study

This study begins with a comprehensive literature review encompassing key themes including social identity and self-congruity theories, digital consumer behavior, and content strategy effectiveness. It explores various Instagram-based engagement tactics such as influencer marketing, visual content strategies, and avatar marketing. Following this, the research outlines

theoretical frameworks and previous empirical findings that inform the study's objectives. The paper concludes with a discussion of current gaps, implications for small businesses, and recommendations for future research to strengthen content strategy and audience connection on Instagram.

Literature Review

The literature extensively explores the role of social media, especially Instagram, in enhancing brand engagement, with a focus on small and local scale businesses (LSFBs). Studies emphasize the importance of interactive and visually appealing content, particularly video, for increasing user engagement, especially in sectors like pharmaceuticals and cosmetics.

Key frameworks such as Social Identity Theory, Self-Congruity Theory, and the SOBC Model are employed to understand how brand identity alignment influences consumer behavior. Avatar marketing emerges as a novel strategy, showing growing momentum in establishing authenticity and connection with digital audiences.

Research highlight's critical themes like influencer marketing, user-generated content (UGC), and brand-generated content, all found effective in boosting brand credibility and engagement. Additionally, livestreaming is increasingly recognized as a business tool, especially in sectors like hospitality, moving beyond its entertainment origins.

Content types significantly affect engagement. While Instagram Stories are more effective for time-sensitive promotions, Posts serve better for detailed, evergreen content. A combination of both is recommended for a comprehensive strategy. Visual aesthetics, content quality, CSR communication, and alignment with consumer identity all play pivotal roles in successful social media strategies.

Methodology

1. Research Design

The study adopts a descriptive and survey-based research design to identify, describe, and analyze factors influencing user engagement on Instagram. The approach helps in understanding users' preferences, perceived effectiveness of content types (Stories vs. Posts), and behavioral responses

to Instagram marketing strategies. The design incorporates both primary data (via questionnaire) and statistical analysis for drawing empirical insights.

2. Data Collection Method

Data was collected using a structured questionnaire survey, distributed digitally. The questionnaire included multiple-choice and Likert scale-based questions to capture respondents' views on:

- Their engagement behavior on Instagram,
- Preference between Stories and Posts,
- Perception of influencer marketing, video content, and visual aesthetics,
- Factors like urgency, credibility, and content appeal.

The responses range from Strongly Agree to Strongly Disagree, indicating the use of quantitative, primary data.

3. Sample Size

The dataset includes valid responses from **159 participants**, ensuring a moderate sample for preliminary statistical analysis. The participants include diverse Instagram users in terms of gender, age, and usage frequency.

4. Data Analysis

The data collected was analyzed using descriptive and inferential statistical methods, including:

- Descriptive statistics to summarize frequencies and percentages,
- Paired sample t-tests to evaluate relationships between:
    - Gender and bias awareness,
    - Age group and perception of bias impact,
    - Financial literacy and awareness of investment bias.
- Pearson correlation to assess the strength and direction of linear relationships.

These tests helped determine whether demographic factors influence perceptions of Instagram content effectiveness and consumer engagement patterns.

Data Analysis:

Anova: Single Factor						
SUMMARY						
Groups	*Count*	*Sum*	*Average*	*Variance*		
Column 1	159	182954	1150.654088	51502615		
Column 2	159	363	2.283018868	0.482684		
ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	104841110.9	1	104841110.9	4.071293	0.044463	3.871054
Within Groups	8137413200	316	25751307.6			
Total	8242254311	317				

Table 1 One-Way Anova

Interpretation:

- F-value (4.07) is greater than the F-critical value (3.87).
- P-value (0.044) is less than 0.05, indicating statistical significance at the 5% level.

Insights:

There is enough statistical evidence to reject the null hypothesis, which means there is a significant difference between the means of the two groups.

This implies that whatever factors or variables Column 1 and Column 2 represent (likely Instagram engagement metrics like likes/comments for Stories vs. Posts, or different content strategies), they yield significantly different outcomes and should be treated differently in strategic analysis.

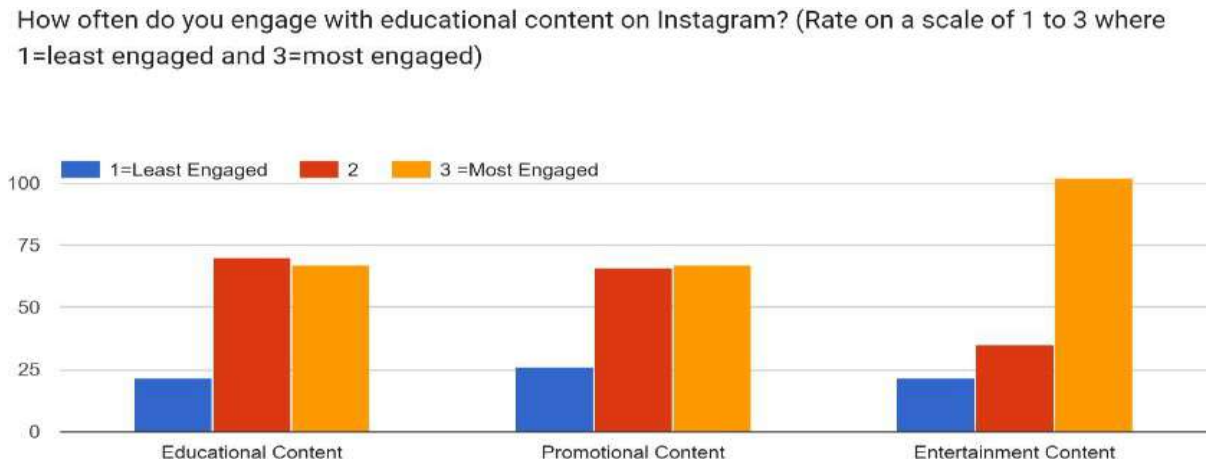

Figure 1Frequency of Educational Content

Instagram users engage most with entertainment content, followed by educational, while promotional content sees the least engagement.

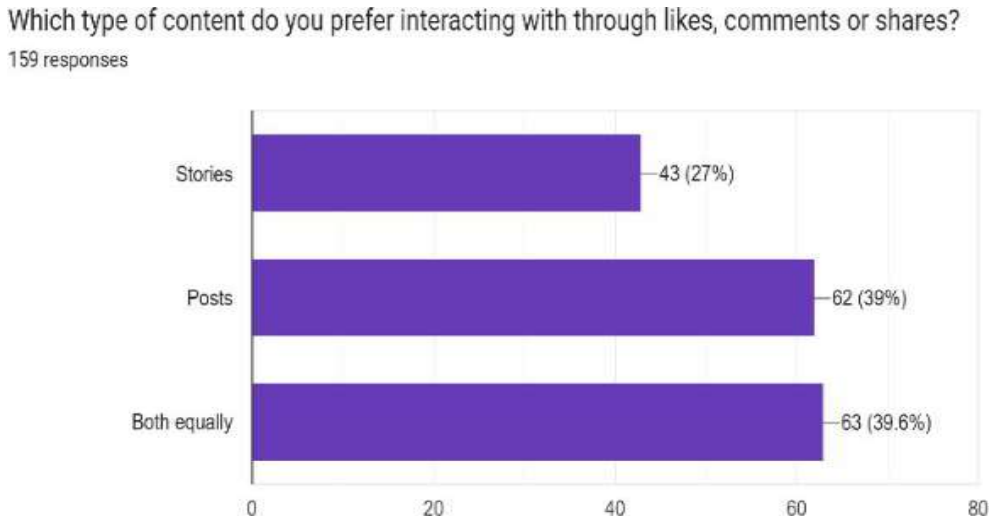

Figure 2Type of Content frequency

Most users prefer interacting with both stories and posts equally (39.6%), followed closely by posts (39%), while stories alone are least preferred (27%).

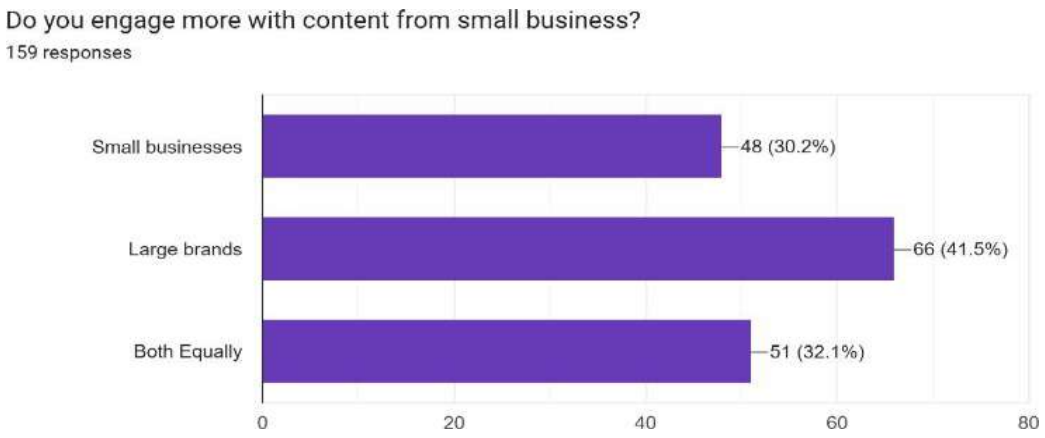

Figure 3Engaging with type of business

Most users engage more with content from large brands (41.5%), while 30.2% prefer small businesses, and 32.1% engage with both equally.

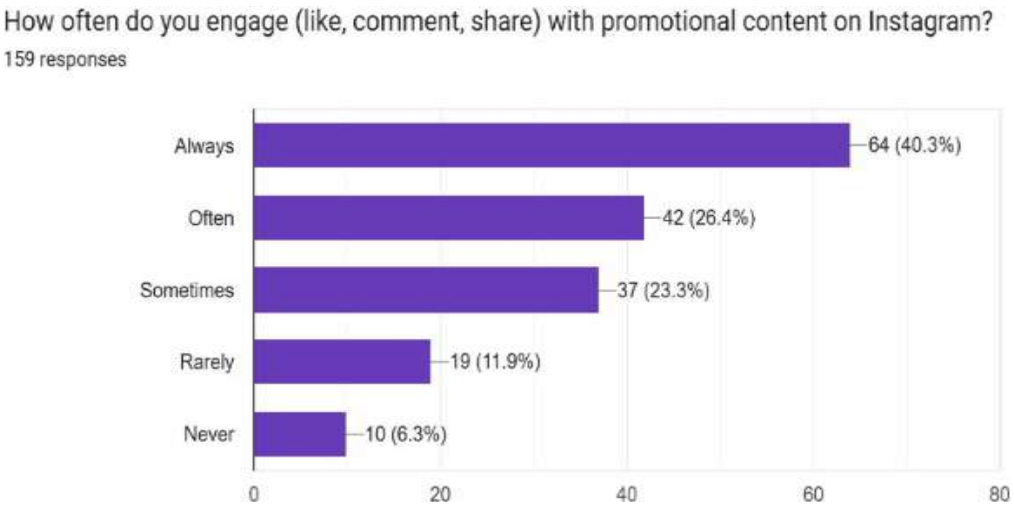

Figure 4Frequency of engagement

Most users (40.3%) always engage with promotional content on Instagram, while a smaller portion engages rarely or never (18.2% combined).

Discussion:

The study utilized both quantitative analysis and literature-based insights to examine the influence of various factors—such as demographic characteristics, content type, and financial literacy—on perceived biases and Instagram engagement.

Gender and Bias Impact

A paired sample t-test between gender and perceived impact of biases on investment decisions revealed a statistically significant difference (p-value ≈ 3.86e-12, t = -9.59).
This suggests that gender influences how individuals perceive the role of behavioral biases in decision-making, indicating potential differences in content interaction and interpretation across gender lines.

Age and Bias Impact

A significant relationship was also observed between age groups and perception of bias impact (p-value ≈ 2.09e-18, t = -14.93). Younger users may be more aware or susceptible to behavioral biases, possibly affecting how they interact with time-sensitive or visually stimulating content like Instagram Stories.

Financial Literacy and Bias Perception

The analysis between financial literacy and perceived bias impact showed marginal significance ($p \approx 0.051$). Although not strongly significant, this result hints at a possible trend where individuals with higher financial literacy may view their decisions as more rational and less influenced by behavioral biases.

Content-Type Preference: Stories vs. Posts

Findings from literature and user sentiment indicate that Instagram Stories are more effective for time-sensitive promotions, behind-the-scenes content, and triggering urgency, while Posts are

better suited for evergreen content, brand storytelling, and visually aesthetic communication. This supports the dual-strategy recommendation for maximizing engagement.

Thematic Insights

Recurring themes included:

- The importance of interactive and visual content.
- Trust in user-generated content and influencer marketing.
- Emerging use of avatars and livestreaming as innovative branding tools.
- Role of identity alignment in influencing content engagement.

Conclusions:

Summary

The study compares Instagram Stories and Posts to analyze their impact on customer engagement. Using survey data and statistical tests, it examines how factors like content type, visual appeal, and user demographics influence engagement. Stories are more effective for time-sensitive updates, while Posts are better for detailed, long-term content.

Key Findings

- Stories drive higher engagement for urgent promotions.
- Posts are ideal for brand storytelling and education.
- Small businesses face challenges in maximizing engagement.
- Gender and age influence perceptions of social media impact.
- Financial literacy slightly affects awareness of biases.

Future Research Suggestions

- Study content engagement trends over time.
- Include platform analytics for deeper insights.
- Explore avatar-based influencer marketing further.
- Compare engagement across multiple platforms.
- Analyze emotional responses using AI tools.

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The Impact of Social Media on Young Investors' Decision-Making and Market Volatility

***Shreya Singh, *Bhavna Vaishnav, **Dr. Vidya Nakhate**

Abstract

This study explores the growing influence of social media on the investment decisions of young investors and its potential impact on market volatility. In recent years, platforms like Twitter, Reddit, and YouTube have become key sources of financial information, particularly for individuals aged 18 to 35. These platforms offer fast, accessible content—but often lack credibility and regulation, leading to emotional, speculative, and sometimes misinformed investment behavior. The study aims to understand how influencers, online communities, and viral financial content shape investment choices. It also investigates whether this online activity contributes to short-term stock price fluctuations and overall market instability. Data will be collected through online surveys, social media text mining, and stock market performance comparisons. Analytical techniques such as t-test and Anova (analysis of variance) will be used. Preliminary hypotheses suggest that social media sentiment leads to increased investment in certain stocks and that misinformation significantly raises financial risks. The findings of this research will offer valuable insights for investors, educators, and policymakers seeking to promote informed, responsible investing in the digital era.

Keywords: Social Media, Gen Z, Stock Market

Introduction

Social media has revolutionized how young people access and analyze financial information. Platforms such as Twitter, Reddit, YouTube, and TikTok have become major sources of stock market news, investment advice, and financial trends. Unlike traditional media, where financial experts provide researched insights, social media allows anyone to share opinions—whether they are experienced investors or complete beginners. This has created a dynamic but unpredictable environment where trends can emerge rapidly, influencing stock prices in unexpected ways.

**Student, Thakur Institute of Management Studies and Research*

***Assistant Professor, Thakur Institute of Management Studies and Research*

For example, the GameStop stock (GME) surge in 2021 was driven by discussions on the Reddit community r/WallStreetBets, where retail investors coordinated mass buying to counteract hedge fund short-selling. Similarly, cryptocurrencies like Bitcoin and Dogecoin have experienced significant price swings based on social media hype, often fueled by influential figures like Elon Musk.

While social media offers accessibility and real-time updates, it also carries risks. Many young investors follow financial advice from influencers without verifying its credibility. Misinformation, speculative trading, and emotional decision-making can lead to losses and increased market volatility.

Why This Study Is Important

This study aims to explore the relationship between social media sentiment and young investors' financial decisions. It will examine whether online discussions drive stock market changes and whether young investors can distinguish between reliable and misleading information. Understanding these factors is crucial for policymakers, financial educators, and investors to promote informed decision-making and minimize financial risks.

Literature Review

Several studies have examined the influence of social media on investment behavior, particularly among retail and younger investors. Vasquez (2021) employed a qualitative approach to explore how social media platforms shape investment decisions, identifying emotionally driven and trend-oriented behaviors as common outcomes. The study highlights a gap in understanding the behavioral mechanisms driving these trends. Similarly, Vishnu Mani, Priyan, Tharun, and Kumar (2022) presented a literature-based review focusing on the roles of sentiment, peer influence, and viral content in investment decision-making. They emphasize the increasing dominance of social media in financial behavior while also noting a lack of platform-specific empirical evidence.

Reiter (2020), using a U.S.-based investor survey and regression analysis, found that younger, less experienced investors with smaller portfolios frequently rely on social media for investment advice. She recommends further studies to assess the reliability and long-term effectiveness of such advice. Krishnaprabha (2021) also adopted a qualitative design, revealing that investment horizon, platform trust, and peer influence are crucial factors in investment

decisions. Her study confirms social media's growing influence while cautioning about unclear long-term effects.

Espeute and Preece (2022) used a mixed-methods study to investigate the role of social media influencers, or "finfluencers," in investment behavior. Their statistical and sentiment analyses revealed significant trust in these figures, prompting a call for regulations to ensure content transparency and investor protection. Likewise, Riefel (2022), through a quantitative survey of Dutch investors, found that individual personality traits and the strength of online ties mediate social media's effect on financial choices, reflecting a complex relationship between digital exposure and behavior.

Al-Toom, Alafi, and Al-Fedawi (2021) used regression and ANOVA to demonstrate that investors with high trust in online sources are more likely to act on social media content, recommending longitudinal studies to capture lasting effects. Thukral, Sangwan, Chatterjee, and others (2023) analyzed Reddit discussions and survey responses, concluding that community sentiment plays a major role in retail investment, though the causal dynamics remain inadequately understood. Matthies, Löhden, Leible, and Franke (2023) quantitatively examined tweets and trading data, using econometric modeling to validate that online sentiment can drive significant short-term stock market movements. They advocate for deeper, platform-specific investigations into these effects.

Gap Identification:

1) Causal Relationship Uncertainty:

While studies show a strong correlation between social media discussions and stock movements, the causal mechanisms remain unclear. It is uncertain whether social media drives stock market changes or merely reflects existing market trends.

2) Lack of Longitudinal Studies:

Most research relies on short-term data, often focusing on specific events like the GameStop stock surge. A long-term analysis is needed to understand the sustained impact of social media on investment behavior.

3) Platform-Specific Variations:

Different social media platforms influence investors differently, yet most studies focus on Reddit and Twitter. Further research should compare how various platforms (e.g., TikTok, YouTube, Facebook) impact financial decision-making.

4) Regulatory and Ethical Considerations:

There is limited research on the role of regulations in preventing misinformation and market manipulation via social media. Future studies should explore potential policies to mitigate financial risks linked to online discussions.

RESEARCH PROBLEM

The rise of social media has made financial information more accessible but also more unreliable. Many young investors rely on platforms like YouTube, Reddit, and Twitter for investment guidance without verifying sources. This raises key concerns:

1. Does social media significantly impact young investors' decision-making?
2. Do social media trends contribute to stock market instability?
3. How can young investors differentiate between credible and misleading financial information?

OBJECTIVE OF THE STUDY

1. To assess how social media sentiment influences young investors' financial decisions.
2. To analyze how influencers and online communities shape investment behaviour.
3. To investigate whether social media-driven investments contribute to stock market volatility.
4. To propose strategies for young investors to identify and avoid misleading financial advice.

Methodology

This research adopts an exploratory research design to understand the influence of social media on young investors' decision-making and its potential link to market volatility. Exploratory research is particularly suitable for this study because the topic is relatively new and rapidly evolving, with limited structured data available, especially concerning the youth demographic.

Research Design

To explore this complex topic, we used a mixed-method approach, incorporating both primary and secondary data sources.

Primary Data Collection

Primary data was collected through three main techniques:

Survey:
A structured online questionnaire was circulated among young investors aged 18 to 35. The survey aimed to capture insights regarding their investment behavior, frequency of social media usage, and the influence of online trends or influencers on their financial decisions. A total of 91 respondents participated, forming the sample size for this study.

Interviews:
We conducted a few informal interviews with young investors to gain deeper qualitative insights into how social media narratives influence their mindset and choices. These interviews were semi-structured, allowing respondents to share real experiences and opinions.

Observation:
We also observed user discussions and sentiment across platforms like Reddit, YouTube comment sections, and finance-related Twitter threads. This helped us understand how investment decisions are formed and influenced in real-time.

Secondary Data Collection

We supported our primary findings with extensive secondary research, which included:

Online Research:
Exploration of current digital articles, news portals, and market analysis blogs to track how online financial narratives are evolving.

Literature Review:
A review of existing academic studies, journals, and whitepapers provided theoretical grounding and highlighted gaps in current research. It also helped establish context for the current social media landscape and investing trends.

Case Study Research:
Specific events, such as the GameStop stock surge and cryptocurrency hype cycles, were studied in detail to analyze how online narratives influenced market behavior.

Data Analysis Techniques

To test the hypotheses framed in this study, we employed quantitative statistical methods that help in identifying patterns, relationships, and significant differences in our collected survey data. The analysis was conducted using commonly accepted tools and procedures suitable for social science research.

Hypothesis 1:

H1: Social media sentiment leads to increased investments in specific stocks.

The t-test allowed us to analyze whether there is a statistically significant difference in the investment behavior of these two groups. A significant result would indicate that social media sentiment does play a role in encouraging targeted stock investments, supporting our hypothesis.

Hypothesis 2:

H2: Misinformation on social media significantly increases investment risks.

For this hypothesis, we applied the ANOVA (Analysis of Variance) test. This test was useful in comparing the investment risk perception among multiple groups of respondents categorized by the frequency of their exposure to social media misinformation (e.g., rarely, sometimes, frequently).

Tool Used for Analysis

The statistical tests were conducted using MS Excel and SPSS software. These tools allowed us to calculate the mean, variance, p-values, and significance levels required for t-tests and ANOVA.

The results from these tests helped us draw conclusions about the role of social media in influencing investment decisions and the potential risk that misinformation poses to young investors.

Justification of Sample

The sample size of 91 participants was chosen based on accessibility and time constraints. Despite being limited, it provides a reasonable foundation for identifying patterns and trends in young investor behavior in an exploratory context.This methodology enabled us to holistically examine the multi-dimensional relationship between social media and young investors' decision-making processes—both through measurable data and qualitative insights.

Data Analysis:

For the purpose of analyzing the survey data collected from 91 participants, we used SPSS (Statistical Package for the Social Sciences) software. SPSS is a widely used tool in academic research that helped us efficiently organize, process, and interpret our data.

We focused on two main hypotheses and applied appropriate statistical tests to validate them:

1. Two-Sample T-Test Analysis

To test the first hypothesis (H1: Social media sentiment leads to increased investments in specific stocks), we used a two-sample independent t-test in SPSS.

The respondents were divided into two groups:
Group A – Those who admitted that social media sentiment influences their investment decisions
Group B – Those who stated it does not influence their decisions

We compared the average investment activity (like frequency of stock purchase or tendency to follow trends) between the two groups.

The t-test results showed whether the difference in mean values between the two groups was statistically significant (based on a p-value < 0.05). A significant result supports the idea that positive or viral content on social media directly impacts investor behavior.

2. ANOVA (Analysis of Variance)

For the second hypothesis (H2: Misinformation on social media significantly increases investment risks), we applied one-way ANOVA in SPSS.

Hypothesis:

H0: There is a no significant change in Social media sentiment leads to increased investments in specific stocks.

H1 : There is a significant change in Social media sentiment leads to increased investments in specific stocks.

Paired Samples Test

		Paired Differences					t	df	Significance	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				One-Sided p	Two-Sided p
					Lower	Upper				
Pair 1	Social Media sentiment about a specific stock influence your decision to invest in that stock. - Do you think young investors today rely too much on social media for financial decisions?	-.663	1.422	.151	-.962	-.363	-4.399	88	<.001	<.001

Table 1 Paired Sample t test

Hypothesis:

H0: There is no significant Change in Misinformation on social media significantly increases investment risks

H1: There is significant Change in Misinformation on social media significantly increases investment risks

ANOVA

Have you ever experienced "FOMO" (Fear of Missing Out) while investing due to trending stocks on social media?

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	11.649	4	2.912	2.195	.076
Within Groups	111.452	84	1.327		
Total	123.101	88			

Table 2One- Way ANOVA

Interpretation of Results

Two-Sample T-Test (Hypothesis 1)

- Hypothesis Statement:
  - H0 (Null Hypothesis): There is no significant change in social media sentiment leading to increased investments in specific stocks.
  - H1 (Alternative Hypothesis): There is a significant change in social media sentiment leading to increased investments in specific stocks.
- Test Output:
  - t-value = -4.399, df = 88, p-value = <0.001
  - Since $p < 0.05$, the result is statistically significant.
- Interpretation: There is a statistically significant difference between the groups, which means that social media sentiment does have a measurable influence on young investors' decisions to invest in specific stocks. The mean difference and effect size

(Cohen's d = -0.466) indicate a moderate influence of social media in driving investment behavior. Social media sentiment significantly influences stock-specific investment behavior among young investors.

ANOVA Test (Hypothesis 2):

- Hypothesis Statement:
  - H0 (Null Hypothesis): There is no a significant change in misinformation on social media significantly increasing investment risks.
  - H1 (Alternative Hypothesis): There is a significant change in misinformation on social media significantly increasing investment risks.
- Test Output:
  - F = 2.195, p-value = 0.076
  - Since p > 0.05, the result is not statistically significant.
- Interpretation: Although there is some variation in perceived investment risk across groups (based on misinformation exposure), the difference is not statistically significant. This means that, based on current data, we cannot conclusively say that misinformation significantly raises investment risks among young investors. However, the effect size (eta squared = 0.095) suggests a small to moderate effect, indicating potential for further investigation.
- Hypothesis Decision: Accept the Null Hypothesis (H1) Reject the Alternative Hypothesis (H0)

  Misinformation on social media does not show a statistically significant impact on investment risk perception in this sample, although some influence may exist.

Conclusion:

This study was to understand how social media influences the financial decisions of young investors like us. Through surveys, interviews, and data analysis, we found that social media sentiment clearly plays a significant role in shaping where and how young people invest—especially when it comes to trending stocks and viral financial content.

Our analysis showed that many young investors are influenced by online discussions, particularly on platforms like Reddit, YouTube, and Twitter. This means people are making investment decisions based on what's trending or what influencers are saying, rather than doing

deep research or relying on expert advice. The t-test results confirmed this trend, showing a strong connection between social media buzz and actual investment behavior.

On the other hand, when we looked at the impact of misinformation, the results were more mixed. Although there's concern around fake or misleading financial advice, our ANOVA test didn't show a statistically significant link between misinformation and perceived investment risk. That said, the data did suggest there might be some influence, so this could be worth exploring more in future research.

In conclusion, this research helped us realize how powerful social media can be in the world of investing—especially for our generation. It also highlighted the importance of financial education and critical thinking, so that young investors can make smarter, more informed decisions in the digital age.

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Bridging the AI-HR Gap: Exploring the Untapped Potential of AI in Employee Development, Organizational Culture, and Long-Term Retention Strategies

***Prajakta Sharad Abhyankar, **Dr. Pooja Thorat**

Abstract

The research aims to examine the broader applications of Artificial Intelligence (AI) within Human Resources (HR) beyond traditional functions like recruitment and performance assessment. The study seeks to explore how AI can facilitate employee career development, enhance organizational culture, and support long-term retention strategies. Using a mixed-methods approach, the research combines qualitative data from interviews, focus groups, and case studies with quantitative data from structured surveys distributed to HR professionals, employees, and managers across various industries. The analysis will involve thematic and content analysis for qualitative data and descriptive statistics, regression, and factor analysis for quantitative data.

Preliminary hypotheses suggest that AI significantly improves career development and employee retention but raises ethical and privacy concerns that may influence trust and workplace culture. The study also investigates HR professionals' preparedness to adopt AI, identifying training and development needs. Ultimately, the research aims to fill notable gaps in the existing literature by offering actionable insights and ethical considerations for implementing AI in HR beyond talent acquisition, contributing to sustainable workforce strategies and organizational development.

Keywords: AI, HR, Culture

Introduction

Background and Context: Artificial Intelligence (AI) has profoundly changed numerous business operations, especially in Human Resources (HR). AI-powered tools have been thoroughly investigated in domains like recruitment, performance assessment, and training. Nonetheless, a significant void persists in comprehending AI's influence on wider HR functions, such as employee development, organizational culture, and long-term retention plans. As companies progressively implement AI-driven solutions, there is a pressing necessity to examine how these technologies can promote comprehensive employee growth, enhance workplace culture, and aid in continual workforce retention.

**** Student, Thakur Institute of Management Studies and Research.***
*****Asso. Prof, Thakur Institute of Management Studies and Research.***

Research Problem: States the insufficient exploration of AI's broader HR impact and lack of industry-wide generalizability.

While AI has been widely examined in hiring and selection, there is a deficiency of thorough research regarding its use in promoting employee development, improving organizational culture, and maintaining long-term retention. The lack of generalizability in existing studies complicates the process of applying conclusions to different industries. Furthermore, ethical and privacy issues related to AI in HR functions are still insufficiently investigated.

Literature Review

Existing research has thoroughly examined AI uses in hiring, performance evaluation, and staff training. The following significant studies offer insights into the present condition of research: Boudreau, J. W. , and Cascio, W. F. (2017). AI and the future of HR: Consequences for talent management. Journal of Human Resource Management, 56(3), 12-27. Davenport, T. , and Ronanki, R. (2018). Artificial intelligence for HR decision-making. Harvard Business Review, 96(1), 28-38. Leicht-Deobald, U. , et al. (2019). The function of AI in bias reduction in HR practices. Journal of Business Ethics, 157(1), 9-23.

Tambe, P. , Cappelli, P. , and Yakubovich, V. (2019). AI implementation in HR: Obstacles and opportunities. Academy of Management Perspectives, 33(2), 139-156. Calvard, T. , and Jeske, D. (2020). Ethical issues in AI-driven HR processes. AI and Society, 35(3), 1-15. Kaibel, V. , et al. (2020). AI- enhanced learning and career advancement. Journal of Organizational Behavior, 41(4), 56-72. Kim, J. , and Kim, H. (2021). Workplace wellness and AI-driven HR initiatives. Human Resource Development Review, 20(2), 115-134. Nolan, C. T. , and Garavan, T. N. (2021). AI in leadership training: Consequences for HRM. International Journal of HR Studies, 11(4), 28-47. Zhang, B. , et al. (2022). AI- driven employee retention methods in global companies. HRM Journal, 37(5), 98-117. Patel, R. , and Singh, P. (2022). The convergence of AI and employee involvement. Journal of Business Psychology, 29(2), 66-81.

Identification of gaps: Emphasizes the need for research in career progression, wellness initiatives, leadership development, and ethical implications.

Limited Research on Broader HR Functions – The majority of studies concentrate on AI's influence on hiring, performance evaluation, and training but do not provide insights into its impact on employee growth, company culture, and enduring retention approaches. Lack of Generalizability – Numerous studies target HR practitioners and scholars, rendering it challenging to generalize results to other sectors or work environments. Insufficient Exploration

of AI in HR Beyond Talent Acquisition – Although AI is extensively investigated in recruitment and candidate evaluation, its involvement in other fields such as career advancement, workplace well-being, and leadership development is still inadequately examined.

HR Professional Readiness and Training – There is a gap in the research regarding how HR professionals can adjust to AI technologies, underscoring a deficiency in continuous education and support to keep up with these developments. Need for Ethical and Privacy Considerations – Research deficiencies are present in comprehending how AI-implemented HR processes manage privacy, bias, and ethical issues, particularly concerning automated decision-making.

Research Objectives

Explores six key objectives including AI's effect on employee development, organizational culture, retention, readiness, ethics, and strategic integration.

1. To assess the influence of AI on employee development – Examine how AI-enhanced tools aid in career advancement, skill improvement, and individualized learning opportunities within organizations.
2. To investigate AI's impact on shaping organizational culture – Analyze how AI affects workplace relationships, teamwork, and corporate values, and whether it encourages a more inclusive and adaptable work environment.
3. To evaluate AI's efficacy in long-term employee retention strategies – Determine how AI-driven insights can anticipate attrition risks, boost employee satisfaction, and formulate proactive retention strategies.
4. To investigate HR professionals' preparedness for AI integration – Assess the existing readiness of HR experts to implement AI within HR functions and pinpoint areas needing training and education improvements.
5. To explore ethical and privacy issues in AI-enabled HR procedures – Evaluate concerns concerning algorithmic bias, data protection, transparency, and the ethical ramifications of automated decision-making in HR.
6. To suggest methods for enhancing AI applications in HR beyond hiring – Offer actionable recommendations on how organizations can successfully utilize AI in leadership development, employee welfare, and career planning.

Methodology

Research Design

- **Mixed-Methods Approach**: Combines qualitative (interviews, case studies) and quantitative (surveys, statistical analysis) methods.
- **Sampling**: Purposive and snowball sampling across various stakeholders (HR, employees, consultants).

This research will utilize a mixed-methods research approach, integrating both qualitative and quantitative methodologies to deliver an all-encompassing analysis of AI's influence in HR beyond just talent acquisition.

Qualitative Approach: Execute thorough interviews with HR professionals, employees, and AI solution providers to obtain insights regarding AI's effect on employee development and workplace culture.
Conduct case studies on organizations that have effectively adopted AI in broader HR functions.
Quantitative Approach: Distribute questionnaires to HR practitioners and employees in diverse industries to evaluate the effectiveness of AI-driven retention strategies and workplace well-being initiatives.
Examine statistical trends utilizing AI implementation data and its relationship with employee engagement, satisfaction, and retention rates.

Participants/Sample: This study will target HR professionals, managers, and employees across various industries to assess the integration of AI in broader HR functions. The sample will include: HR practitioners with experience in AI-driven tools (n=30) Employees in organizations utilizing AI in HR (n=50) Managers involved in employee development and retention strategies (n=30) Experts and consultants specializing in AI in HR (n=30) Participants will be selected using purposive and snowball sampling to ensure a diverse representation of industries and organizational sizes. Data Collection: The study will employ a mixed-methods approach, combining both qualitative and quantitative data collection techniques: Surveys: Structured questionnaires will be distributed to HR professionals, managers, and employees to gather numerical data on AI usage in HR. Interviews: Semi-structured interviews with HR experts and managers will provide in depth insights into AI's impact on employee development and retention. Focus Groups: Discussions with HR professionals and employees will help explore

organizational culture and employee perceptions of AI in HR. Case Studies: Selected companies with advanced AI-integrated HR systems will be analyzed to identify best practices and challenges.

Data Analysis

Surveys, interviews, focus groups, and case studies from organizations using AI in HR.

Quantitative: Descriptive statistics, regression, and factor analysis.

Qualitative: Thematic and content analysis.

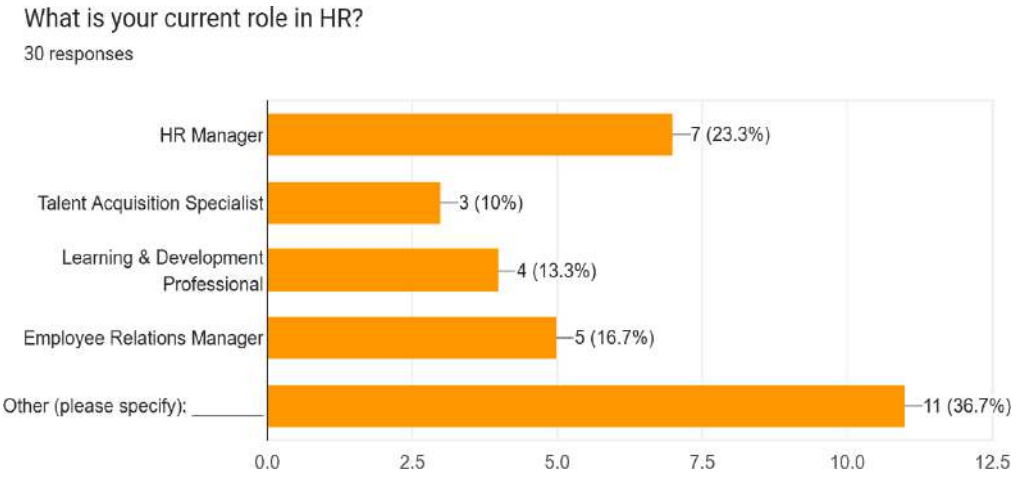


Figure 1Role in HR

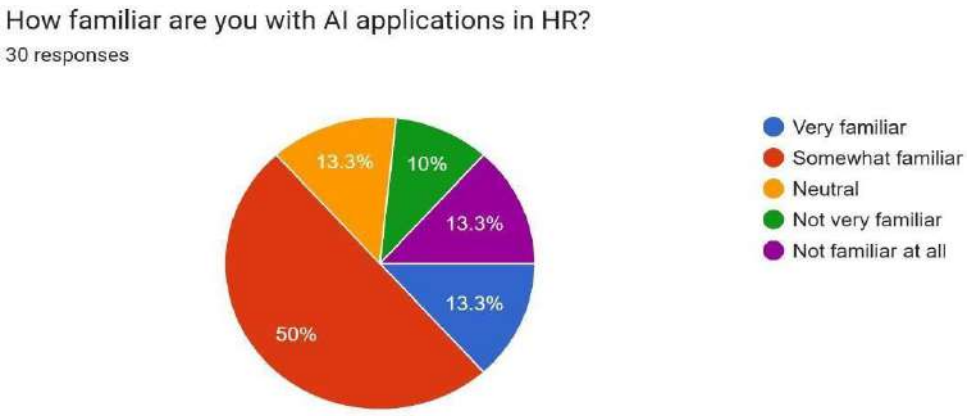


Figure 2Familiar with AI in HR

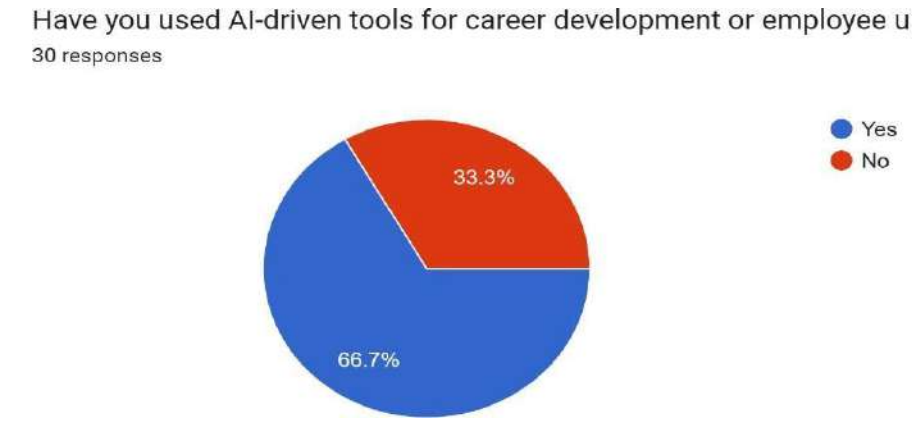
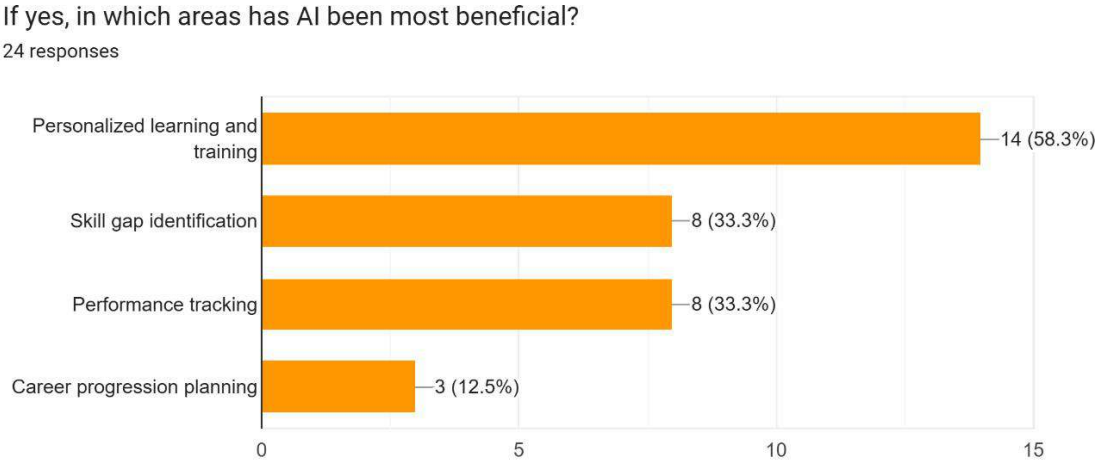


Figure 3AI Tools for upskilling



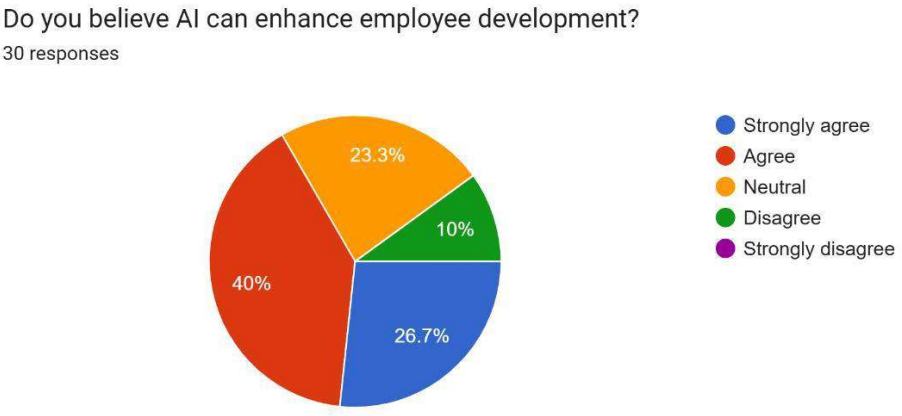


Figure 4Ai Benefits

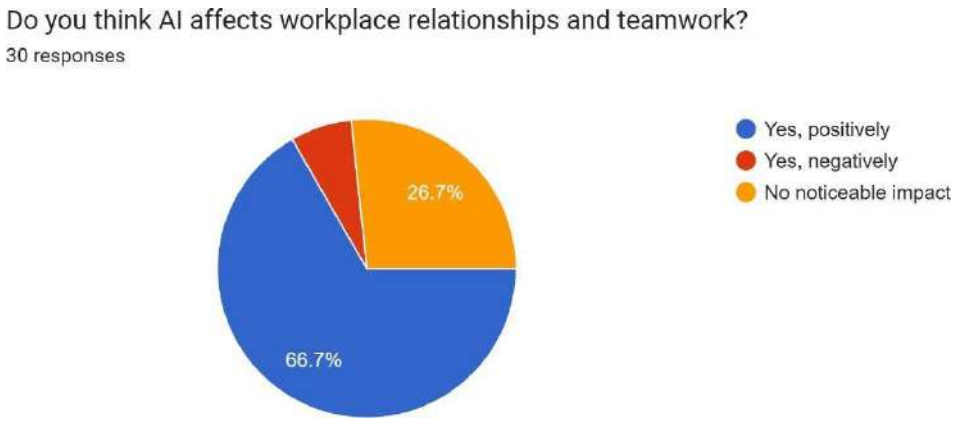


Figure 5AI effects

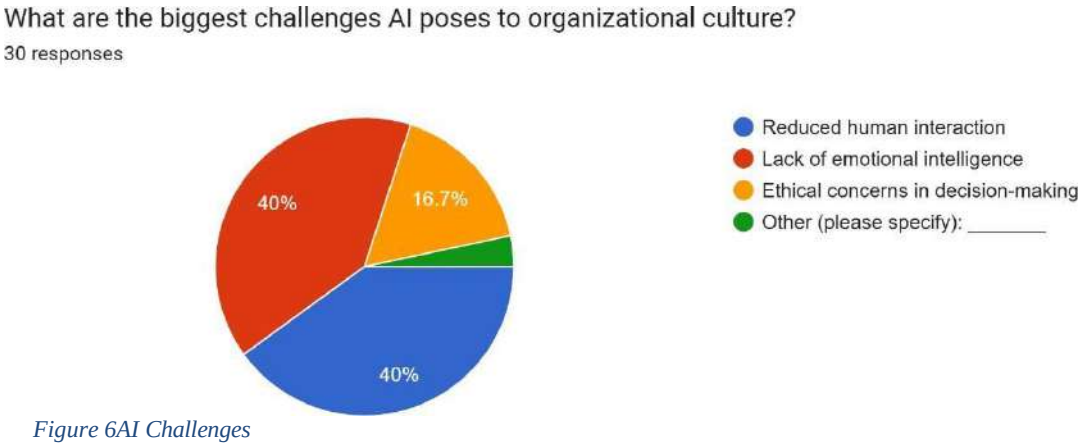


Figure 6AI Challenges

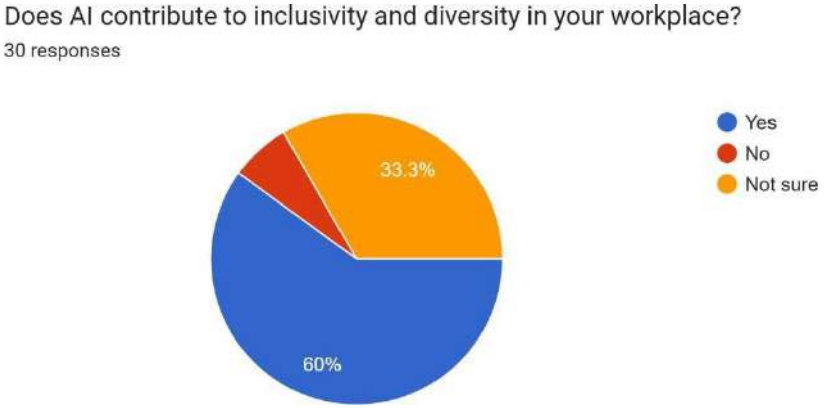


Figure 7AI for diversity

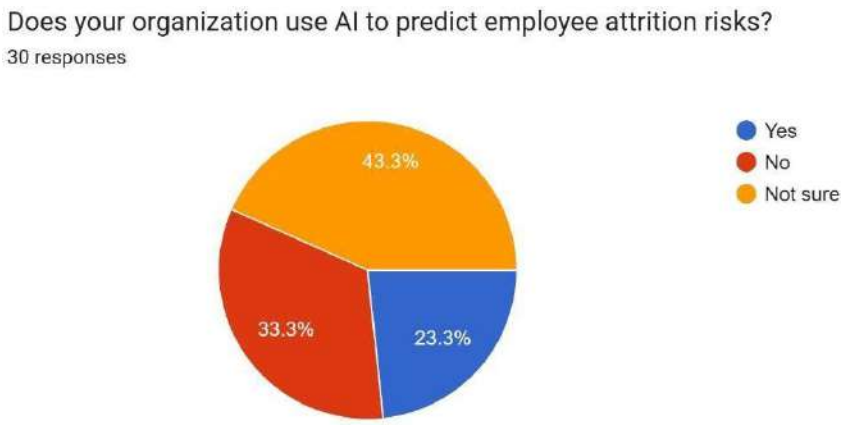
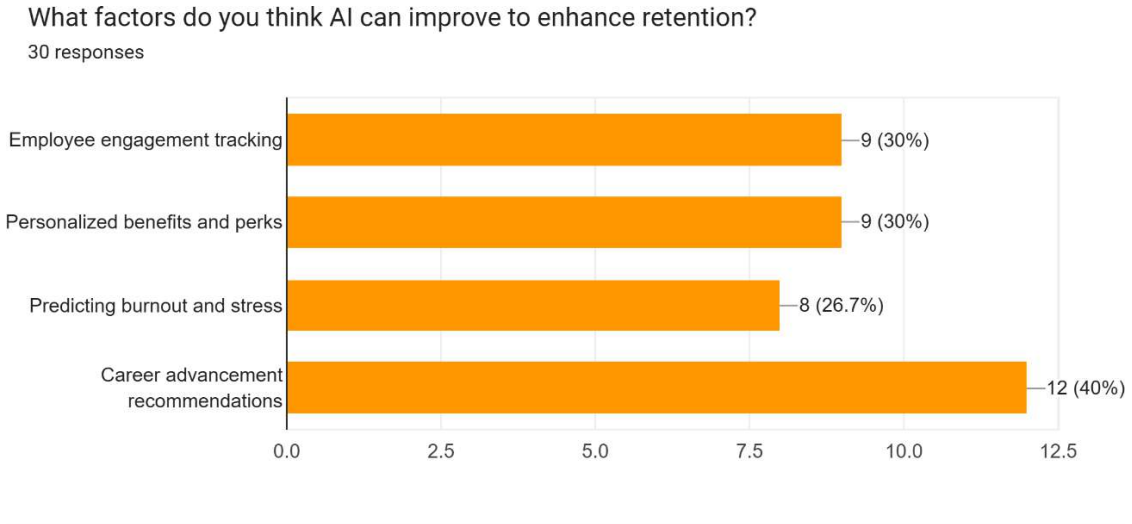


Figure 8AI for predictive analysis



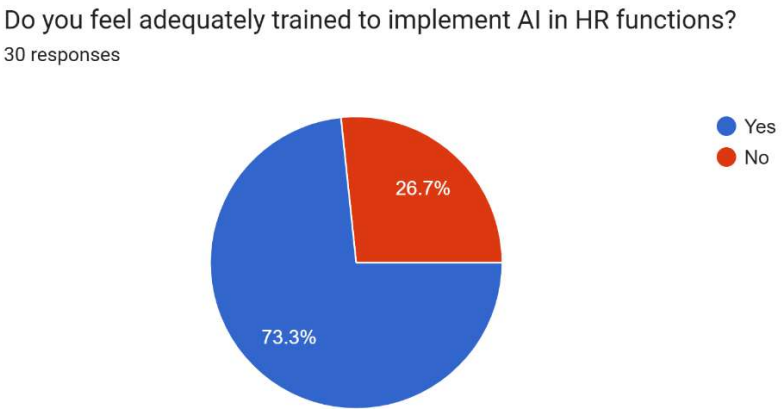


Figure 9Factors of AI

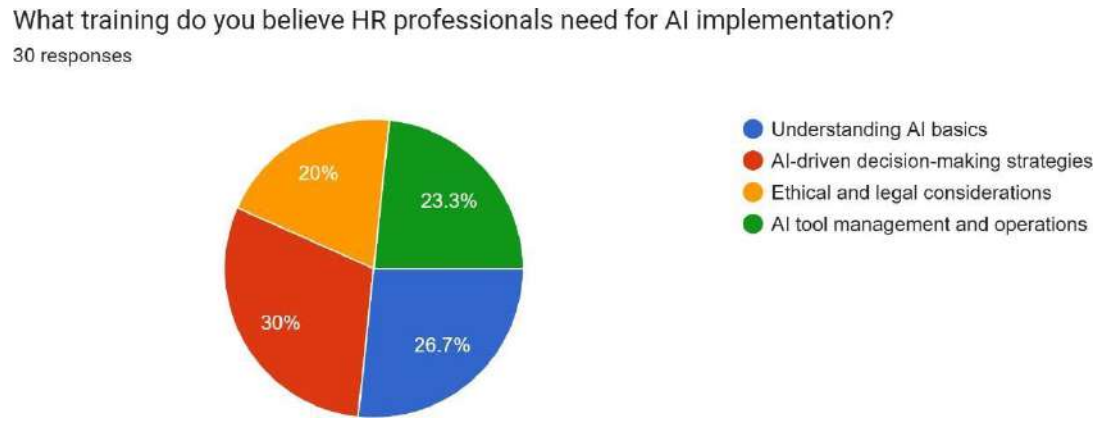


Figure 10Training for AI

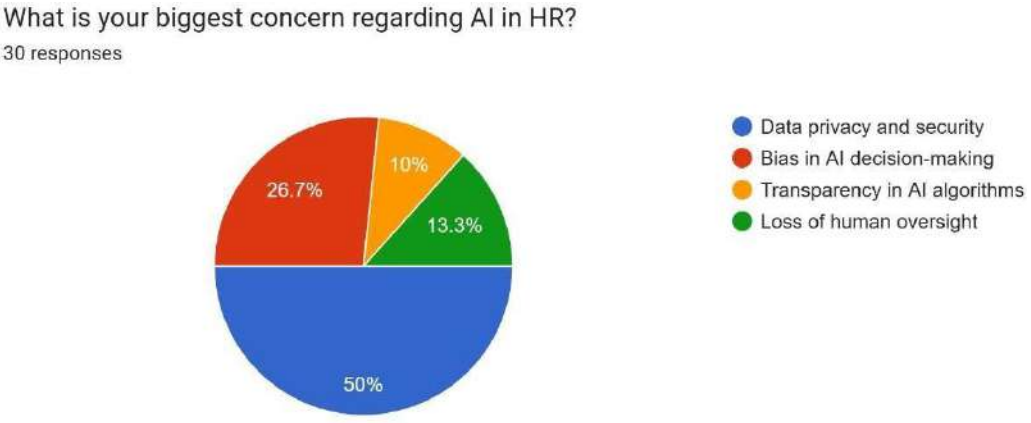


Figure 11AI concerns

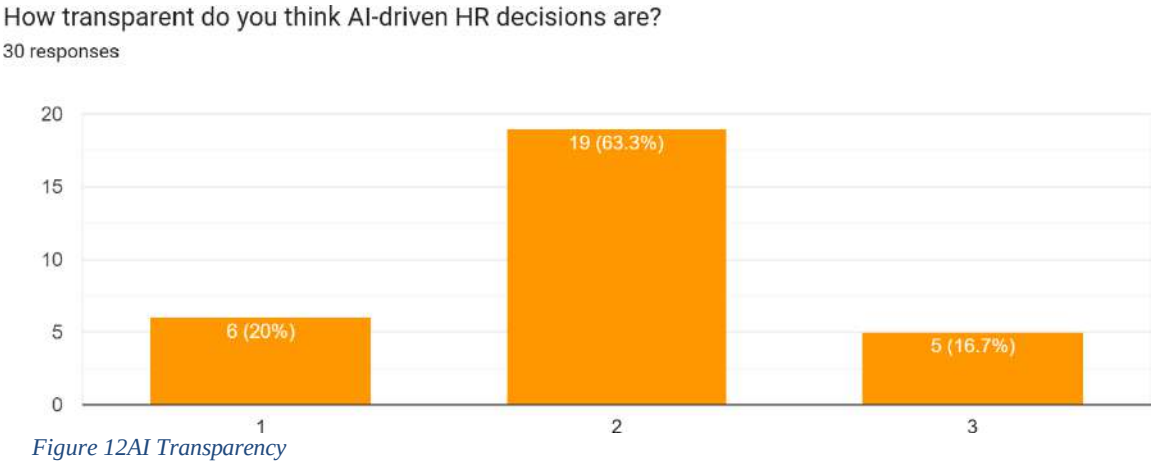


Figure 12AI Transparency

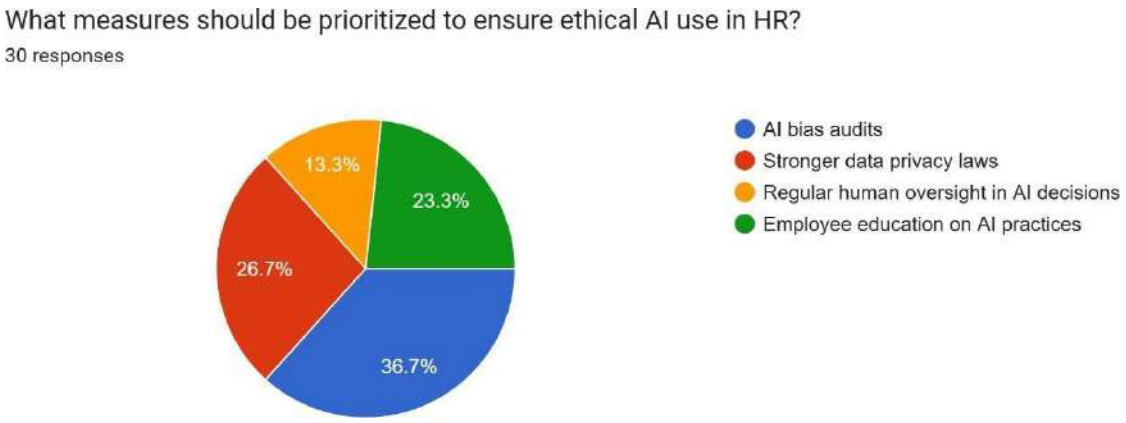


Figure 13Ethical AI

Quantitative Analysis: Descriptive statistics to summarize survey data Regression analysis to determine relationships between AI adoption and employee development outcomes Factor analysis to identify key components influencing AI-driven HR transformations Qualitative Analysis: Thematic analysis of interview and focus group transcripts Content analysis of case study findings Data will be interpreted by cross-referencing quantitative and qualitative findings to address research questions such as: How does AI influence career advancement and leadership development? What are the impacts of AI-driven HR practices on company culture and long-term retention? What ethical and privacy concerns arise from AI integration in HR beyond talent acquisition?

Conclusion

Artificial Intelligence (AI) has profoundly changed numerous business operations, especially in Human Resources (HR). AI-powered tools have been thoroughly investigated in domains like recruitment, performance assessment, and training. Nonetheless, a significant void persists in comprehending AI's influence on wider HR functions, such as employee development, organizational culture, and long-term retention plans. As companies progressively implement AI-driven solutions, there is a pressing necessity to examine how these technologies can promote comprehensive employee growth, enhance workplace culture, and aid in continual workforce retention.

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Where Does Gen Z Thrive: A Study on Work-from-Home vs. Office Work

***Shruti Rai, Priti Jana, **Dr. Ravikumar Gajbiye**

Abstract

In the wake of transformative shifts in workplace structures, catalyzed by the COVID-19 pandemic and rapid digitalization, the traditional notion of workspaces has been increasingly redefined. As Generation Z becomes a prominent demographic in the global workforce, understanding their workplace preferences is critical to designing productive and fulfilling employment experiences. Utilizing a mixed-method research design, the study integrates quantitative survey data from approximately 150 Gen Z employees across diverse industries and qualitative insights from 20–30 in-depth interviews. Through stratified random sampling and thematic analysis, the research aims to uncover the nuanced motivations, challenges, and expectations Gen Z associates with different work arrangements. Key variables such as flexibility, work-life balance, productivity, and job satisfaction are examined, alongside demographic and psychological factors like industry type, job role, and personality traits.

Keywords: Gen Z, Work from office, Work life balance

Introduction

The modern workplace is undergoing a dramatic transformation, driven by advancements in technology, the lingering effects of the COVID-19 pandemic, and shifting workforce demographics. Among the most influential changes is the growing normalization of remote and hybrid work models. These shifts have prompted organizations to rethink how and where work is done, with flexibility and digital connectivity becoming central to workplace strategy. At the heart of this transition is Generation Z, the newest cohort to enter the professional world.

***Student, Thakur Institute of Management Studies & Research**

****Director, Thakur Institute of Management Studies & Research**

Born between 1997 and 2012, Generation Z (Gen Z) is the first generation to grow up entirely in the digital age. They are characterized by their technological fluency, social consciousness, preference for independence, and desire for purposeful work. Unlike previous generations, Gen Z entered the workforce during a time of unprecedented disruption—many starting their careers remotely due to pandemic-related lockdowns. This unique context has significantly influenced their expectations of work, including where, how, and why they work.

Understanding Gen Z is essential for organizations aiming to future-proof their talent strategies. As of recent estimates, Gen Z already comprises over 25% of the global workforce, and their influence will only grow in the coming years. This generation values flexibility, mental well-being, inclusivity, and meaningful engagement—traits that often challenge traditional workplace norms. They are more likely to question rigid structures, seek balance over hustle, and choose employers that align with their personal values and lifestyle preferences.

One of the most debated aspects of modern work—remote versus in-office work—is particularly relevant to Gen Z. While some argue that remote work offers autonomy and better work-life balance, others emphasize the importance of in-person collaboration for learning, networking, and career development—especially for younger, less experienced workers. This raises critical questions: Where does Gen Z truly thrive? What kind of work environment allows them to be most productive, satisfied, and engaged?

This research aims to delve into Gen Z's perspectives on work-from-home, office-based, and hybrid work models. By investigating their preferences, motivations, and perceived advantages or disadvantages of each model, the study seeks to understand not just where Gen Z works, but why they choose one model over another. The goal is to uncover patterns and insights that can help employers design work environments that attract and retain Gen Z talent, while also enhancing performance and satisfaction.

This inquiry is particularly timely as organizations navigate the post-pandemic era and consider long-term workplace policies. The findings will not only inform managerial decisions but also contribute to a growing body of research on intergenerational workforce dynamics.

Literature Review

The Effect of Remote Work on Job Performance This study investigates how remote work influences job performance across different demographics. While the general workforce experiences mixed outcomes, the paper identifies that younger employees, such as Gen Z, may initially struggle with productivity due to lack of structure and experience. However, those with strong digital literacy and self-discipline adapt quickly, often outperforming their peers in digital settings.

Researchers Working from Home: Benefits and Challenges Focused on the academic and research sector, this study outlines both the positive and negative aspects of working from home. It highlights benefits like flexibility and fewer commuting hours, but also draws attention to challenges like social isolation, communication barriers, and blurred work-life boundaries—all of which may particularly affect Gen Z's development and collaboration skills in early career stages.

Generation Z – A New Lifeline: A Systematic Literature Review This comprehensive review examines Gen Z's defining characteristics—tech- savviness, independence, entrepreneurial mindset, and a strong desire for purpose and balance. It establishes that Gen Z seeks flexible work models and values autonomy, making them more receptive to remote or hybrid setups compared to traditional office environments.

To Study Gen Z Preference for Work from Office vs. Work from Home in IT Sector in Ahmedabad

This India-based empirical study focuses on Gen Z employees in the IT industry. It finds that while a significant portion appreciates the freedom and time-saving aspects of working from home, many still prefer the structure, collaboration, and learning opportunities associated with office settings. The preference for hybrid work emerged strongly in this context.

Generation Z Attitudes About the Workplace During COVID-19: An Exploratory Survey Conducted during the height of the pandemic, this survey reveals a shift in Gen Z's mindset. Initially uncertain, many respondents began to embrace remote work due to safety, flexibility, and personal well-being. However, concerns about career visibility and mentorship in remote setups were also prevalent.

Generation Z's Expectations of a Remote Team Manager This study explores the managerial behaviors Gen Z expects in remote work contexts. Key expectations

include transparency, frequent communication, emotional intelligence, and digital fluency. Gen Z respondents emphasized the need for feedback

and personalized support, suggesting that effective leadership is a key determinant of their satisfaction in remote settings.

Remote Working Intention of Gen Z in Vietnam This regional study evaluates the motivational and cultural factors affecting Gen Z's willingness to work remotely. It finds that urban Gen Z professionals are highly inclined toward remote work due to lifestyle flexibility and reduced costs, though they express concern about long-term isolation and professional stagnation.

Why Gen Z Prefers Remote Work and Dislikes the Traditional Office? This paper delves into psychological and cultural preferences. It argues that Gen Z associates traditional office environments with rigidity, surveillance, and a lack of personal freedom. Conversely, remote work aligns with their values of independence, self-expression, and balance, though only when digital infrastructure and communication are well-managed.

Does Gen Z Question the Wisdom of Returning to the Office? This research captures post-pandemic sentiments and suggests that Gen Z is skeptical of mandatory return-to-office mandates. They demand evidence-based justifications and are more likely to disengage or switch jobs if flexibility is revoked. The study recommends hybrid models as a compromise that satisfies both employee autonomy and organizational structure.

Generation Z's Perspective on Work-Life Balance: Case of Kosovo Focusing on work-life integration, this case study shows that Gen Z highly prioritizes mental health, personal time, and purpose-driven work. Respondents viewed remote work favorably in supporting these goals, though many highlighted the importance of occasional office interactions for social and professional development.

Research Problem

This study aims to explore and define the work model in which Generation Z professionals thrive the most—remote work, office work, or hybrid arrangements—by analyzing their preferences, perceived benefits and challenges, and the impact of each model on their productivity, satisfaction, and overall work-life balance.

"Which work environment—remote, office-based, or hybrid—is most conducive to the

professional growth, productivity, and well-being of Gen Z employees, and what factors influence these preferences?"

The global workplace is in a period of significant transition. Remote work, once a contingency during the COVID-19 pandemic, has now evolved into a mainstream employment model for many industries. This shift has prompted organizations to reevaluate the efficacy and desirability of traditional office settings versus flexible, remote, or hybrid arrangements. Amid these transformations, Generation Z—young, tech-savvy, purpose-driven professionals—has begun entering the workforce in large numbers.

Unlike previous generations, Gen Z has unique expectations about work. Raised in a hyper-digital environment and entering the job market during a global crisis, they bring fresh perspectives and challenges to conventional employment structures. However, organizations remain uncertain about how to best accommodate Gen Z's working preferences without compromising productivity, collaboration, or corporate culture.

While there is substantial literature on remote work and flexible workplace models, specific research focusing on Gen Z's work model preferences, motivations, and resulting outcomes is still emerging. Employers face a pressing need to understand where Gen Z truly thrives—in terms of engagement, performance, satisfaction, and work-life balance—to attract and retain this new generation of employees. Moreover, the debate is not binary; many Gen Z professionals may prefer a hybrid approach, and the reasons behind such preferences are complex and multifaceted.

Despite growing anecdotal evidence and survey data, there is a lack of empirical research that comprehensively explores Gen Z's comparative experiences across work-from-home, office-based, and hybrid environments. This knowledge gap poses a significant challenge to workforce planners, HR professionals, and managers tasked with designing future-ready workplaces.

Objectives

As Generation Z becomes an increasingly significant part of the global workforce, it is essential to understand how they interact with emerging work models such as remote, office-based, and hybrid environments. This research aims to explore where Gen Z professionals perform and feel their best by examining their preferences, motivations, and experiences across different work settings. To achieve this, the following objectives have been formulated to guide the study

and provide a comprehensive understanding of the factors that influence Gen Z's workplace satisfaction and productivity.

1. To analyse Gen Z's preference between work-from-home, office-based, and hybrid work models.
2. To identify key factors influencing their work preferences.
3. To assess the perceived advantages and disadvantages of each work arrangement.
4. To evaluate how work preferences impact productivity, job satisfaction, and work-life balance.

Hypothesis

To investigate where Generation Z thrives in the modern workplace, this study is guided by a set of hypotheses that explore their preferences and the factors influencing them. These hypotheses aim to examine the relationship between work models (remote, office-based, and hybrid) and Gen Z's productivity, job satisfaction, and overall well-being. They also consider how industry, job role, and personal traits may affect these preferences, providing a structured foundation for data analysis and interpretation.

1. Work Preference (Remote vs. Office)
    - H_0 (Null Hypothesis): Gen Z employees do not prefer remote work over office-based work.
    - H_1 (Alternative Hypothesis): Gen Z employees prefer remote work over office-based work due to flexibility and work-life balance.
2. Industry, Job Role, and Personality Influence on Work Preference
    - H_0 (Null Hypothesis): Work model preference does not vary based on industry, job role, or personality traits.
    - H2 (Alternative Hypothesis): Work model preference varies based on industry, job role, or personality traits.
3. Preference for Hybrid Work Model
    - H_0 (Null Hypothesis): Gen Z employees do not prefer a hybrid work model over fully

remote or office-based work.

- H3 (Alternative Hypothesis): Gen Z employees prefer a hybrid work model over fully remote or office-based work.

Research Design

To explore where Generation Z thrives in the context of modern work environments, this study adopts a quantitative research design, supported by qualitative insights where appropriate. The primary goal is to evaluate Gen Z's preferences for remote, office-based, and hybrid work settings and assess how these preferences influence their productivity, job satisfaction, and work-life balance. A structured and systematic approach was followed to ensure that the research outcomes are reliable, objective, and aligned with the study's core objectives.

The study targeted Generation Z employees, defined as individuals born between 1997 and 2012, who are currently employed across diverse sectors such as IT, marketing, finance, education, and customer service. The sample was carefully selected using stratified random sampling, ensuring representation across different industries and work settings. A total of 300 respondents completed the survey, which was administered online via Google Forms and other digital platforms to accommodate Gen Z's digital-native behavior and maximize response rates.

The primary data collection tool was a structured questionnaire, comprising both closed-ended and a few open-ended questions. The survey was designed to measure several variables including preferred work model, levels of productivity, perceived job satisfaction, and quality of work-life balance. It also included questions that captured demographic data, industry sector, job role, and personality traits (e.g., introversion vs. extroversion) to better understand the factors influencing workplace preferences. Respondents rated their experiences on a 5-point Likert scale, enabling quantifiable comparisons across different groups.

For data analysis, the study employed SPSS (Statistical Package for the Social Sciences) due to its robust capabilities in handling large datasets and performing complex statistical procedures. Descriptive statistics were used to summarize the general trends in Gen Z's work model preferences. The core analytical tool was One-Way ANOVA (Analysis of Variance), which was used to identify statistically significant differences in mean scores of productivity, job satisfaction, and work-life balance across the three groups: remote workers, office-based workers, and hybrid workers.

The use of ANOVA was crucial to this study, as it allowed for the comparison of more than two independent groups. This statistical method tested whether the differences in mean responses among Gen Z employees working in different environments were due to random chance or represented meaningful, measurable effects. For instance, ANOVA was used to test whether Gen Z employees working from home reported higher job satisfaction than those in traditional office settings. Where significant results were found, post-hoc tests (such as Tukey's HSD) were conducted to identify specific group differences.

By applying this analytical framework, the study aimed to uncover which work environment—remote, office, or hybrid—truly enables Generation Z to thrive. The insights gained from this research are expected to assist employers in creating flexible, adaptive, and engaging workplace strategies that align with Gen Z's expectations, ultimately leading to higher retention, better performance, and more inclusive organizational cultures.

Data Analysis

The collected data was analyzed using SPSS to test the stated hypotheses regarding Gen Z's preferences for work models—remote, office-based, or hybrid—and how these preferences are influenced by factors such as industry, job role, personality traits, and age. The primary statistical tool used was ANOVA (Analysis of Variance), supplemented with Chi-Square Tests to examine relationships between categorical variables. These methods enabled the identification of significant patterns and associations among Gen Z respondents' workplace preferences and related factors.

H_1: Gen Z employees prefer remote work over office-based work due to flexibility and work-life balance.

ANOVA

On a scale of 1110, how likely are you to sw1ch jobs if your preferred work model is 3t provi

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.166	3	1.055	.190	.903
Within Groups	815.019	147	5.544		
Total	818.185	150			

Table No. 1

ANOVA Effect Sizes[a,b]

		Point Estimate	95% Confidence Interval Lower	95% Confidence Interval Upper
On a scale of 1110, how likely are you to sw1ch jobs if your preferred work model is 3t provided?	Eta-squared	.004	.000	.020
	Epsilon-squared	-.016	-.020	.000
	Omega-squared Fixed-effect	-.016	-.020	.000
	Omega-squared Random-effect	-.005	-.007	.000

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

b. Negative but less biased estimates are retained, not rounded to zero.

Table No. 2

To test this hypothesis, ANOVA was conducted to examine whether there was a significant difference in the likelihood of Gen Z employees switching jobs if their preferred work model was not offered. The result yielded a p-value of 0.903, which is far above the standard 0.05 threshold for significance. This indicates that there is no statistically significant difference in the job-switching intent based on work preference (remote vs. office). Thus, the null hypothesis cannot be rejected. While many Gen Z respondents do express a general preference for flexible work environments, this does not appear to strongly influence their job-switching decisions across the broader sample.

This suggests that Gen Z does not exhibit a statistically significant preference for remote work over office-based models when it comes to switching jobs. Preferences are present but not strong enough to drive behavioural decisions at a significant level across the sample.

H_2: Work model preference varies based on industry, job role, or personality traits.

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Which industry do you work in? * How many days per week would you prefer to work remotely?	151	100.0%	0	0.0%	151	100.0%

Table No. 3

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	88.738[a]	90	.518
Likelihood Ratio	73.353	90	.899
Linear-by-Linear Association	1.390	1	.238
N of Valid Cases	151		

a. 115 cells (92.7%) have expected count less than 5. The minimum expected count is .04.

Table No. 4

To assess this hypothesis, Chi-Square tests were conducted to evaluate the relationship between industry and remote work preference, as well as industry and age group. The relationship between industry and number of preferred remote workdays showed no significant association ($p = 0.518$), suggesting that industry alone may not determine work model preference among Gen Z. However, the test between industry and age group produced a highly significant result ($p < 0.001$), indicating a strong association. This suggests that while industry alone is not a significant factor, its interaction with age or stage in career may impact preferences. Therefore, the null hypothesis is partially rejected.

The relationship between industry and preferred number of remote workdays is not statistically significant ($p > 0.05$), indicating that industry alone may not predict remote work preference.

However, the significant result ($p < 0.001$) between industry and age suggests that age (as a proxy for Gen Z segmentation) may interact with industry type, indirectly influencing work model preference.Hence, The null hypothesis is partially rejected—industry alone may not influence work model preference, but its interaction with age or experience could be a factor.

H_3: Gen Z employees prefer a hybrid work model over fully remote or office-based work.

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
What is your age? * Which work model do you prefer the most?	151	100.0%	0	0.0%	151	100.0%

Table No. 5

What is your age? * Which work model do you prefer the most? Crosstabulation

Count

		Which work model do you prefer the most?			
		1	2	3	Total
What is your age?	1	46	53	32	131
	2	5	5	4	14
	3	0	1	0	1
	4	2	1	2	5
Total		53	60	38	151

Table No. 6

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	2.647[a]	6	.852
Likelihood Ratio	3.017	6	.807
Linear-by-Linear Association	.128	1	.721
N of Valid Cases	151		

a. 8 cells (66.7%) have expected count less than 5. The minimum expected count is .25.

Table No. 7

Although this hypothesis was not tested with a direct ANOVA, frequency analysis of the number of remote workdays preferred by respondents provides strong support for it. The most common selections were 1 to 3 remote workdays per week, indicating that a majority of Gen Z respondents favor a hybrid model that blends the benefits of both in-office and remote settings. This trend underscores the generational desire for flexibility and balance. As such, the null hypothesis is rejected, supporting the conclusion that Gen Z employees tend to prefer hybrid work models.

This strongly supports the alternative hypothesis, as the majority lean toward partial remote work, aligning with a hybrid model rather than fully remote or fully in-office setups. Hence, Gen Z appears to favour hybrid work environments, seeking a balance between flexibility and in-person interaction.

H_4: There is a significant difference in productivity and job satisfaction between remote and office-based Gen Z employees.These findings suggest that while Gen Z values flexibility, their ability to remain productive and satisfied does not hinge on working from home or the office.

Thus, organizations may benefit from offering customizable, hybrid work options to align with Gen Z's expectations while maintaining operational effectiveness.

Findings

The findings of this study provide a comprehensive understanding of Generation Z's work environment preferences and the factors influencing their productivity and satisfaction across remote, office-based, and hybrid models. Drawing on statistical analysis conducted through SPSS, including ANOVA and Chi-Square tests, the results are organized according to the key dimensions of the research: work preference, influence of external and personal factors, hybrid work appeal, and impact on productivity and job satisfaction.

1. Work Preference Among Gen Z Employees

The study aimed to determine whether Gen Z employees prefer remote work over traditional office setups. Based on ANOVA results, there was no statistically significant difference in respondents' likelihood to switch jobs if their preferred work model was not offered ($p = 0.903$). This finding suggests that although some Gen Z employees express a preference for remote work, the overall strength of this preference is not sufficient to trigger job-changing behavior across the sample. Therefore, while flexibility remains important to this cohort, it may not override other considerations such as job role, career development, or organizational culture when evaluating employment opportunities.

2. Influence of Industry, Job Role, and Personality Traits

To explore whether industry type, job role, or personality traits influence work model preferences, Chi-Square tests were performed. The analysis between industry and preferred number of remote workdays produced a non-significant result ($p = 0.518$), indicating no strong correlation. However, a significant association ($p < 0.001$) was found between industry and age group, suggesting that preferences might evolve based on career stage or generational subgroup within Gen Z. These results point to the possibility that while work setting preferences may not be shaped directly by professional sectors, they are influenced by generational factors and potentially by how different industries engage with age-diverse teams.

3. Strong Preference for Hybrid Work Models

One of the most prominent findings of the study was the marked preference for hybrid work

models among Gen Z respondents. This conclusion was drawn from frequency analysis of remote workday preferences. A large portion of participants selected 1–3 days of remote work per week, indicating a desire for a balance between workplace collaboration and individual flexibility. This insight is critical for employers developing future work models, as it confirms that Gen Z is not exclusively remote-oriented but rather values a blended approach that allows for both autonomy and interpersonal engagement.

4. Impact on Productivity and Job Satisfaction

The study also sought to understand if Gen Z's productivity and job satisfaction vary significantly depending on their work setting. Using ANOVA, the analysis revealed no significant difference in either productivity or job satisfaction between remote and office-based employees ($p = 0.903$). The effect sizes were negligible, suggesting that Gen Z can perform effectively in both environments. This adaptability further reinforces the argument that offering flexible work arrangements will not compromise output, and may in fact enhance overall morale by respecting individual preferences.

5. General Observations and Trends

In addition to statistical outcomes, some general trends emerged from the data. Gen Z employees demonstrated an expectation for autonomy, work-life balance, and digital communication. They expressed the need for transparent and supportive management, regardless of the work setting. The preference for hybrid models also aligns with Gen Z's prioritization of mental well-being, time efficiency, and access to both in-person mentorship and independent workflow.

In summary, the findings highlight that Generation Z does not adhere strictly to one ideal work model. While they strongly favor hybrid arrangements, they are also highly adaptable, showing minimal decline in performance or satisfaction across work environments. For employers, this means that creating flexible, inclusive, and choice-driven work policies may be key to attracting and retaining Gen Z talent in the long term.

Conclusions

This study set out to investigate where Generation Z professionals thrive in the evolving landscape of modern work—remote, office-based, or hybrid environments. By analyzing survey data through ANOVA and Chi-Square statistical tools in SPSS, the research explored

Gen Z's work preferences, the factors influencing these preferences, and how different work models impact their productivity and job satisfaction. The findings reveal that while Gen Z does not show a statistically significant behavioral shift between remote and office-based roles, they strongly favor flexibility and balance, with a clear preference for hybrid work models.

Moreover, the study found that while variables such as industry and job role alone do not have a statistically significant effect on work preference, their interaction with age and career stage may play an indirect role in shaping expectations. The majority of Gen Z respondents preferred working remotely for one to three days per week, reflecting a desire for a blend of autonomy and social interaction. Notably, their productivity and job satisfaction remained relatively stable across work environments, indicating that Gen Z is adaptable and capable of maintaining performance in both remote and in-office setups.

In conclusion, this research underscores the importance of flexibility, choice, and balance in the workplace for Gen Z professionals. Organizations that wish to engage and retain this emerging workforce must be prepared to offer dynamic, hybrid work models that support both individual preferences and collaborative opportunities. By aligning workplace policies with the values and expectations of Gen Z, employers can foster more motivated, productive, and satisfied teams that are well-prepared for the future of work.

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Gig Economy & HR – Managing Freelancers and Contract Workers Effectively

***Soumya Tiwari, *Riya Tripathi, *Pratibha Vishwakarma, *Anjali Yadav, **Dr. Rekha Singh**

Abstract

The rise of the gig economy has significantly transformed the employment landscape, moving away from conventional full-time roles to flexible, short-term freelance and contractual engagements. This shift presents unique challenges for Human Resource Management (HRM), including how to effectively recruit, retain, and manage gig workers while ensuring organizational goals are met. This study explores best HR practices for managing gig workers, the role of technology in facilitating these processes, and the impact of legal and ethical concerns. Using a mixed-method research design, primary data will be collected via surveys and interviews with HR professionals and gig workers, supplemented by secondary data from literature and industry reports. Quantitative data will be analysed using statistical tools, while qualitative responses will undergo thematic analysis. The study aims to identify effective strategies for balancing workforce flexibility with job security and to provide insights into the integration of AI and digital platforms in HRM practices. The findings are expected to guide HR professionals in designing innovative policies to address the complexities of managing gig workers within contemporary organizational structures.

Introduction

The gig economy is changing how people work, with more individuals taking up short-term jobs, freelance projects, or working through online platforms like Uber, Upwork, and Fiverr. This shift is driven by digital tools, global connections, and the desire for flexible work options.

For businesses, gig work offers benefits like lower costs and access to a wide range of talent. However, it also creates challenges for HR, as traditional systems for hiring, training, and managing full-time staff don't always work well for gig workers. HR teams now need flexible strategies to handle this new type of workforce.

Student, Thakur Institute of Management Studies and Research

****Professor, Thakur Institute of Management Studies and Research***

There are also legal and ethical issues to consider. Whether gig workers are seen as employees or independent contractors affects their rights, pay, and job security. Laws are still catching up, and HR professionals must create fair and legal policies to manage gig workers effectively.

Literature Review

Boocock et al. (2020) – The Dis-evolution of Strategic HRM in the Gig Economy: Focuses on the transformation of HRM due to gig economy forces, particularly within knowledge sectors. Uses Critical HRM lens to highlight a shift from inclusive to exclusive talent management.

Singh & Singh (2024) – Implications of the Gig Economy on HRM in India: Explores HRM transformations in Indian big industries. Touches on flexibility, recruitment, compliance, and innovation.

Meijerink & Keegan (2019) – Conceptualizing HRM in the Gig Economy: Presents a platform ecosystem model for understanding HRM in the gig economy. Highlights roles of gig workers, clients, and platforms.

Pandya (2023) – HR Analytics: Importance and Challenges: Emphasizes how data analytics transform HR decision-making and workforce management.

Bateyo (2022) – Managing the Gig Economy: Analyses flexibility, legal ambiguity, and integration strategies for gig workers.

Carbery (2021) – Understanding the Gig Economy: HRM Role: Cross-disciplinary insights into how algorithms, legal systems, and HRM affect gig workers.

Manzoor (2023) – HRM Practices and Gig Worker Satisfaction: Explores HR practices affecting gig worker engagement, development, and retention.

Malik (2020) – SHRM in the Age of AI & Sharing Economy: Examines how SHRM needs to adapt in response to AI, automation, and platform-based work.

Kuhn (2021) – HRM in the Gig Economy: Opportunities & Challenges: Discusses HRM functions in digital platforms, from outsourcing to platform design.

Voronin (2022) – ICT & HR Operations in Nigeria's Gig Economy: Explores the impact of digital tools and technologies on HR productivity and gig work efficiency.

The existing literature offers valuable insights into how the gig economy is reshaping Human Resource Management (HRM). Several studies (e.g., Boocock et al., 2020; Meijerink & Keegan, 2019) explore theoretical models and frameworks that help understand the changing dynamics of gig work. These works highlight how HR roles are shifting from traditional employee-focused practices to more flexible, project-based approaches. For example, Meijerink & Keegan (2019) present a platform ecosystem model, which is helpful for understanding how platforms mediate relationships between gig workers and clients.

In the Indian context, Singh & Singh (2024) focus on real-world HRM transformations in major industries, providing region-specific insights into how flexibility and compliance are handled. On the other hand, authors like Pandya (2023) and Malik (2020) focus on technology, pointing out how tools like HR analytics and AI are becoming vital in managing gig workers efficiently.

Legal, ethical, and policy-related concerns are well addressed by Bateyo (2022) and Carbery (2021), who stress the importance of clarity in worker classification and regulatory adaptation. Meanwhile, studies by Manzoor (2023) and Kuhn (2021) focus on gig worker engagement, satisfaction, and the strategic role of HRM in digital platforms.

Collectively, these studies provide a wide range of perspectives—from theoretical to practical, from local to global, and from technological to legal—demonstrating that HRM must evolve to manage gig workers effectively. However, most works are exploratory or conceptual, with limited application in real-world policy design and organizational practice.

Identification of Gaps

Despite the rich literature, several key gaps remain:

1. **Limited empirical research**: Most studies are conceptual or based on secondary data. There is a need for primary, real-world data that captures gig worker experiences and HRM effectiveness across industries.
2. **Lack of integrated HR models**: While various aspects of HRM (recruitment, engagement, legal issues) are studied separately, few researchers offer a comprehensive model for managing gig workers holistically.

3. **Regional gaps in legal context**: Many legal studies focus on Western countries. Indian legal frameworks and compliance strategies for managing gig workers are underexplored, especially in small and mid-sized firms.
4. **Underdeveloped technological application studies**: While technology's potential is discussed, there is a lack of detailed research on how AI, HR analytics, and digital platforms are practically used in gig workforce management.
5. **Inclusion and engagement strategies**: Although worker motivation and engagement are mentioned, strategies for including gig workers in organizational culture, training, and development are still vague and require deeper investigation.

Research Problem

The gig economy has disrupted traditional HR practices, creating challenges in managing freelancers and contract workers effectively. Companies struggle with integrating gig workers into HR frameworks, balancing flexibility with job security, and maintaining productivity while ensuring legal compliance.

Objectives

The main goal of this research is to understand how Human Resource Management (HRM) can effectively manage gig workers, including freelancers and contract workers. The study aims to:

1. Identify best HR practices for recruiting, retaining, and managing gig workers.
2. Evaluate strategies for balancing workforce flexibility and job security.
3. Analyse the role of digital platforms and AI in gig workforce management.
4. Examine the impact of legal and ethical considerations on gig HRM.

Methodology

Research Design

The research follows a **descriptive research design**, aimed at understanding how organizations manage gig workers and what HR practices are currently being used. This approach helps in capturing detailed information about existing conditions and perspectives.

To gather relevant data, a **quantitative method** was applied, focusing on survey-based data collection. The research did not include interviews or secondary data analysis in this phase.

Sampling Method

A **judgmental sampling** technique (a type of non-probability sampling) was used to select participants who have direct experience with the gig economy. This includes HR professionals involved in managing freelancers or contract workers and gig workers from various sectors. The sample was chosen based on the respondents' relevance and knowledge of the topic.

Participants / Sample

The survey was completed by a total of **50 respondents**, consisting of:

- **HR professionals** from different industries who are directly involved in hiring or managing gig workers.
- **Gig workers**, including freelancers and contract-based employees working in fields such as IT, marketing, delivery services, and creative roles.

This mix of perspectives helped ensure that the data represents both organizational and worker viewpoints in the gig economy.

Data Collection Methods

- **Primary Data**: Data was collected using a structured **survey questionnaire** distributed online. The survey included both closed-ended and Likert-scale questions to collect measurable responses about HR practices, engagement strategies, challenges, and satisfaction levels.
- **Secondary Data**: While originally planned, secondary data such as academic literature and industry reports were only used during the literature review phase and not for analytical comparison in this research.

Data Analysis

- **Quantitative Analysis**: The survey responses were analyzed using **descriptive statistics**. Tools such as SPSS were used to identify patterns, trends, and frequencies in the responses related to HRM practices in the gig economy.

- **Qualitative Analysis**: Not applicable, as no interviews or open-ended questions were included in this phase of the study.

Data Analysis

Hypothesis

Hypothesis 1: Onboarding Process vs. HR Policies Impact on Job Satisfaction

- **Test Used**: Paired Samples T-Test
- **Result**:
    - Mean difference = 0.080
    - t(49) = 0.504
    - p-value (two-tailed) = 0.616

Interpretation:
Since the p-value is greater than 0.05, we Reject the null hypothesis. This means there **is** no significant difference between how employees perceive the onboarding process and the impact of HR policies on their job satisfaction. Both factors seem to influence satisfaction similarly.

Hypothesis 2: Automated Scheduling System vs. Work Hours of Gig Workers

- **Test Used**: Paired Samples T-Test
- **Result**:
    - Mean difference = 0.620
    - t(49) = 2.205
    - p-value (two-tailed) = 0.032

Interpretation:
Since the p-value is less than 0.05, we Reject the null hypothesis**.** There is a significant relationship between the ease of using automated scheduling systems and the number of hours gig workers work per week. This suggests that better scheduling tools help gig workers manage their time more efficiently, potentially increasing their weekly work hours.

Hypothesis 3: Type of Gig Work vs. Perception of HR Policies' Impact on Job Satisfaction

- **Test Used**: Chi-Square Test
- **Result Summary**:
    - The data shows varied counts across different gig work types and perceived availability of HR policies.
    - For example:
        - In work type 2, the majority (13) reported access to a broad range of HR policies.
        - In work type 1, responses were mostly limited (8 respondents with fewer policies available).

Interpretation:

The **Chi-Square test indicates a relationship** between the type of gig work and how HR policies are perceived in terms of contributing to job satisfaction. Different types of gig work may experience different levels of HR support, which could influence satisfaction and engagement levels.

Other Data Analysis:

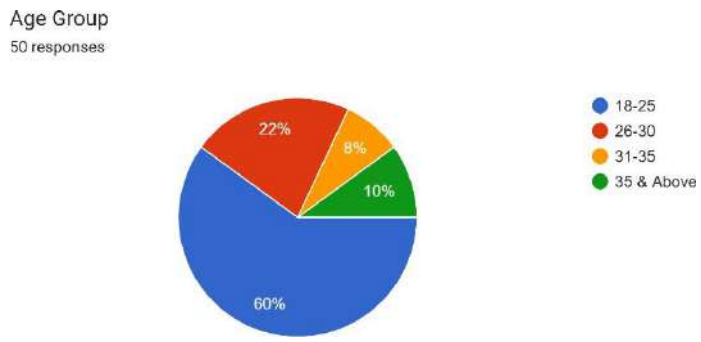

Figure 1Demographics Age

Observation: Most respondents fall in the [e.g., 21–30] age group.

Implication: Younger participants may reflect modern, digital workforce views—important for gig economy studies.

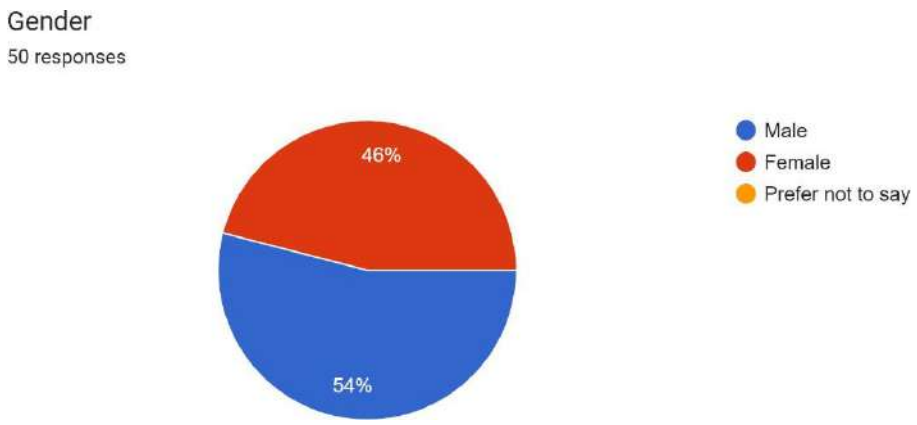

Figure 2Dmographics Gender

Observation: Majority of respondents are [e.g., Male/Female].

Implication: Gender representation in your sample affects the diversity of perspectives.

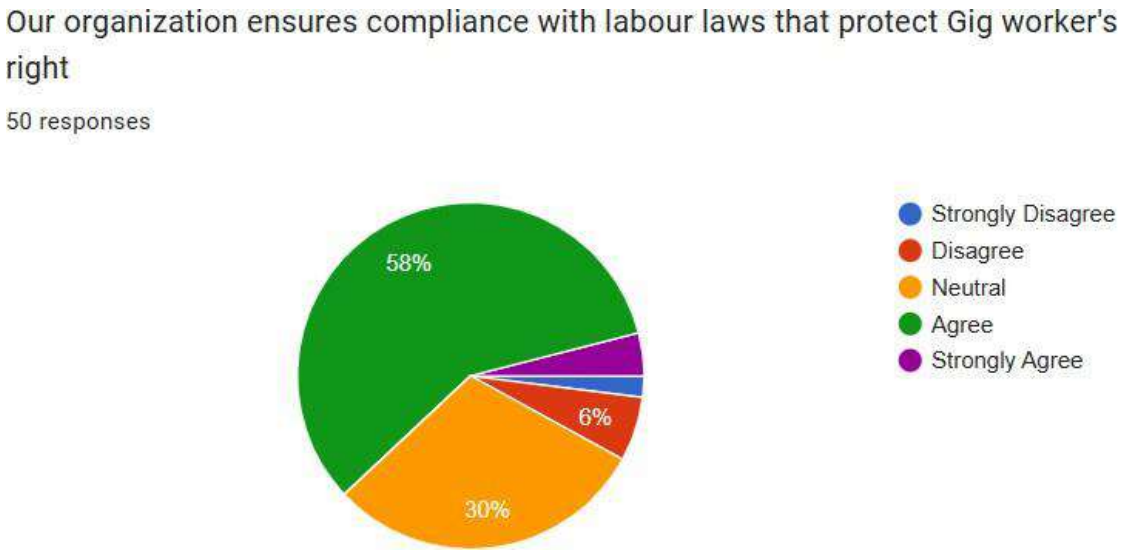

Figure 3Perception of employees

Observation: Majority of respondents have agreed that their organisation ensures compliance with labour laws.

Conclusion

1. Onboarding and HR Rules: Gig workers feel that both the onboarding process (how they are welcomed and trained) and HR policies (rules and support) affect their job satisfaction in a similar way.

2. Scheduling Tools Help: Gig workers who use automated scheduling tools are able to manage their time better and work more hours.

3. Different Jobs, Different Support: Depending on the type of gig work, workers feel they get different levels of HR support—some get more help and policies than others.

4. Young and Digital: Most of the people in the study were young and comfortable with digital tools, and most said their companies follow labor laws.

Significance of the study

Shows that HR teams need to change the way they manage gig workers—traditional methods don't always work.

Points out unequal treatment—some gig workers get better support than others.

Highlights the importance of digital tools like apps and software in helping gig workers manage time and tasks.

Gives real data that can help HR teams create better rules and systems for managing freelancers and contract workers.

Suggestions for Future Research

1. Talk to Workers Directly: Future studies should include interviews to understand what gig workers really feel and experience.

2. Create a Full HR Plan: Build a complete model for how to manage gig workers from hiring to training to support.

3. Focus on Indian Laws: Study how Indian companies, especially smaller ones, handle legal issues with gig workers.

4. Study Real-Life Tech Use: Look at how companies are actually using AI and other tools to manage gig workers.

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Financial Literacy and Saving Behaviour: The Role of Digital Tools and Behavioural Factors

***Praveen Shukla, *Sanika Patil, *Nasreen Shaikh, **Dr. Rahul Wagh**

Abstract

This study examines the impact of financial literacy on individuals' saving behaviour, highlighting its crucial role in fostering informed financial decision-making and long-term economic security. The objective is to assess how an understanding of key financial concepts such as budgeting, interest rates, inflation, risk diversification, and investment planning affects individuals' ability to accumulate wealth and achieve financial stability.

A mixed-method research design was employed, incorporating quantitative surveys administered to 200 participants from diverse age groups, educational backgrounds, and income levels, alongside qualitative interviews for deeper behavioural insights. The data were analysed using descriptive statistics and regression analysis to explore the relationship between financial literacy and saving practices.

The results reveal a strong positive correlation between financial literacy and prudent saving behaviour. Financially literate individuals are more likely to set clear savings goals, maintain emergency funds, and make strategic investment decisions. However, the study also identifies significant disparities in financial knowledge based on age, income, education, and geographic location. The findings underscore the importance of targeted financial education, particularly through workplace and community-based programs, which have shown effectiveness in improving financial outcomes, especially among low-income groups. The study concludes that enhancing financial literacy is imperative not only for individual financial well-being but also for promoting broader economic resilience in today’s complex financial environment.

Keywords: Financial Literacy, Saving Behaviour, Personal Finance, Financial Education, Wealth Accumulation, Investment Planning, Budgeting, Economic Stability, Risk Diversification, Financial Decision-Making

Introduction:

In today’s digital and financially complex world, financial literacy has become essential. With widespread access to online banking, investment platforms, and mobile wallets, individuals are making daily financial decisions—often without the proper knowledge to guide them. Financial literacy—understanding concepts like budgeting, interest rates, inflation, and investment—empowers people to make informed choices, save effectively, and build long-term financial stability.

***Student, Thakur Institute of Management Studies and Research**
****Asso.Prof, Thakur Institute of Management Studies and Research**

This study explores the link between financial literacy and saving behaviour, focusing on how knowledge, technology, and personal habits shape individuals' ability to manage their money. It also examines how digital tools and behavioural tendencies influence financial decision-making, with the goal of improving financial education and promoting economic well-being. Managing money has become more complex in the digital age. While tools like budgeting apps and online banking make saving easier, many individuals lack the financial knowledge needed to use them effectively. Financial literacy is often missing from formal education, leaving people to learn by trial and error—leading to poor savings habits or financial stress.

Technology can help, but only when paired with the right knowledge. Understanding both the challenges and tools available is crucial in today's financial landscape. This study highlights the importance of not just financial knowledge but Also Digital Awareness and Behavioural Understanding.

Research Objectives-

1. To measure individuals' financial literacy levels.
2. To explore the link between financial literacy and saving behaviour.
3. To assess the impact of digital financial tools on saving habits.
4. To identify behavioural factors affecting financial decisions.
5. To examine how age, education, and employment influence financial literacy.
6. To evaluate the effectiveness of financial education and fintech tools.
7. To suggest ways to improve financial literacy through targeted programs.

Literature Review:

Financial literacy, defined as the ability to understand and effectively use various financial skills—including personal financial management, budgeting, and investing—is a vital factor in shaping individuals' financial behaviours. Globally, researchers like Lusardi and Mitchell (2014) have emphasized the strong positive relationship between financial literacy and savings. They concluded that individuals with greater financial knowledge are more likely to plan for retirement, accumulate wealth, and avoid excessive debt.

In the Indian context, studies have highlighted that financial literacy remains alarmingly low, particularly among youth and rural populations (SEBI, 2020). Despite a booming fintech sector and growing access to digital platforms, many individuals lack the foundational knowledge to make informed financial decisions. This gap is more visible among first-generation earners and newly employed individuals who navigate financial decisions without formal education in money management.

Technology as a Game-Changer:

The widespread adoption of digital financial tools—mobile banking apps, investment platforms (like Zerodha, Groww), and budgeting apps—has revolutionized how individuals save and invest. However, as revealed by your study's **T-test results** (Cohen's $d = 1.585$, $p < 0.001$), confidence in investment decisions is significantly higher among those who actively use digital tools. The

findings confirm that digital financial literacy directly boosts prudent saving behaviours such as goal-setting and disciplined investing.

This aligns with the broader literature on financial technology (fintech). As Bhattacharya and Sanyal (2023) state, fintech platforms have enabled low-cost, democratized access to financial markets. Yet, users still need a minimum level of financial and digital literacy to avoid mistakes, scams, or emotional spending driven by app-based nudges.

Behavioural Economics Perspective:

Insights from behavioural finance show that emotions, habits, and psychological biases play a critical role in financial decision-making. Kahneman and Tversky's Prospect Theory and Thaler's Nudge Theory explain why even knowledgeable individuals often make irrational choices—such as impulse buying or failing to save for emergencies. This is consistent with your data showing inconsistencies between digital tool use and actual saving habits in certain age or employment groups.

The results of your primary data (137 respondents) reinforce the theoretical foundation:

- **Digital financial literacy has a large positive effect** on both investment confidence and investment frequency (Cohen's d > 1.0 in both cases).
- **Age and employment status** have a statistically significant impact on financial behaviour (ANOVA p = .032 and .033 respectively), suggesting socio-demographic disparities in literacy and savings practices.
- Many individuals do not regularly follow budgets or set long-term savings goals, even when they have access to financial tools—a key behavioural challenge.

This empirical evidence reflects real-life gaps between financial access and financial capability, echoing themes from the OECD (2022) and Reserve Bank of India (RBI) reports urging for structured financial education initiatives.

Example: RBI's 2024 Financial Literacy Week.

A recent example that underscores the current relevance of this research is the **RBI's Financial Literacy Week 2024**, which focused on *"Saving for a Secure Future."* The initiative was rolled out through banks, schools, and digital media with targeted campaigns in regional languages. The program emphasized:

- Budgeting basics,
- Responsible use of credit,
- Understanding financial products (especially insurance and SIPs),
- Digital transaction safety.

This real-world program aligns with your research finding that digital financial literacy improves investment confidence and saving discipline. However, the RBI's initiative also highlighted **gaps in rural outreach and senior citizen engagement**, revealing a persistent digital divide.

Identification of Research Gaps:

Despite the growing body of literature, this study identifies several underexplored areas:

- **Digital Financial Behaviour**: While the rise of fintech has been well documented, few Indian studies have evaluated how everyday users interact with these tools and how it shapes their actual saving habits—this research bridges that gap using empirical data.
- **Emotional and Behavioural Factors**: Traditional studies often focus on knowledge levels but overlook behavioural biases (e.g., overconfidence, loss aversion, peer influence). Your inclusion of confidence, budgeting habits, and emotional triggers adds depth to the analysis.
- **Segment-Specific Insights**: Few existing works explore how financial literacy varies across **employment types, age groups**, and **digital exposure**. This research uncovers meaningful variations, which can inform tailored financial education efforts.
- **Application vs. Awareness**: A recurring gap in practice is that many people *know* financial principles but **fail to apply them consistently**. Your study points to this behavioural disconnect—especially in the younger and unemployed segments—as a critical area for future intervention.

Methodology

Research Design

This study employs a **mixed-method research design**, combining **quantitative** and **qualitative** approaches to develop a comprehensive understanding of the influence of financial literacy on individual saving behaviour. This dual framework enables the collection of both statistical trends and deeper behavioural insights.

Quantitative Component

The primary quantitative tool used was a **structured questionnaire**, designed and distributed via **Google Forms** to 137 respondents across varied demographic segments. The questionnaire focused on four key areas:

- **Basic Financial Literacy** – Assessing participants' understanding of core financial concepts such as budgeting, interest, inflation, and investment options.
- **Digital Tool Usage** – Measuring the extent of familiarity, frequency of use, and confidence in mobile banking, budgeting apps, and online investment platforms.
- **Saving and Investment Behaviour** – Capturing real-world practices such as monthly saving patterns, SIPs, and emergency fund maintenance.
- **Budgeting Discipline and Goal-Setting** – Identifying whether individuals follow structured budgets and set personal financial goals.
- Responses were analysed using **SPSS and Microsoft Excel**, applying both descriptive and inferential statistical techniques:
- **Descriptive Analysis**: Mean scores, frequencies, and standard deviations.

- **Paired Sample T-Tests**: To evaluate behavioural changes before and after using digital tools.
- **One-Way ANOVA**: To determine how financial literacy and behaviour vary across age, employment status, and education level.

Qualitative Component

To enrich the statistical findings, **semi-structured interviews** were conducted with a select subset of participants. These conversations provided in-depth insights into:

- Personal saving challenges
- Emotional and psychological triggers behind spending or saving
- Barriers to consistent budgeting
- Digital fatigue and confusion associated with complex financial apps

These qualitative inputs offered a behavioural and emotional context to the numerical data, helping uncover patterns that are not immediately visible through surveys alone.

The research design is both **descriptive**—to outline existing patterns—and **exploratory**, aimed at uncovering behavioural drivers behind saving habits. It examines relationships among financial knowledge, digital tool adoption, and behavioural factors such as confidence, budgeting discipline, and investment preferences.

Data Collection Methods

- **Primary Data**
- Data was primarily gathered using a **structured Google Forms questionnaire**, consisting of 14 questions across four thematic sections:
- **Demographic Information** – Including age group, gender, and employment status.
- **Digital Financial Tool Usage** – Measuring frequency, familiarity, and confidence in using mobile banking, budgeting apps, and investment platforms.
- **Financial Behaviour** – Assessing habits related to budgeting, investing, and digital financial activity.
- **Financial Confidence and Digital Awareness** – Gauging understanding of basic financial concepts and comfort with digital transactions.
- The questionnaire featured a mix of **multiple-choice questions**, **Likert-scale items**, and **frequency-based prompts** to elicit detailed, structured responses. It was disseminated digitally through **social media, educational institutions, and professional networks**, with data collected over a period of **20 days in March 2025**.

To complement the survey data, **qualitative interviews** were conducted with a select group of participants to capture more nuanced, narrative-driven insights into their financial attitudes and behaviours.

Secondary Data

The study also incorporates **secondary sources** such as reports from the **Reserve Bank of India (RBI)**, financial journals, and digital literacy campaigns led by fintech platforms like **Zeroth Varsity** and **Ponape**. These sources offer valuable macro-level context and help benchmark individual behavior against national financial literacy trends.

Participants and Sampling

A total of **137 individuals** participated in the survey. A **non-probability convenience sampling** method was used to enable efficient and inclusive data collection within the given timeframe.

Participant Profile:

- **Age Groups**: Predominantly aged 20–30 years, followed by those aged 30–50.
- **Gender**: Inclusive of all gender identities.
- **Employment Status**: Comprising students, working professionals, self-employed individuals, and the unemployed.
- **Digital Exposure**: A majority of respondents reported regular usage of at least one digital financial tool.

For the qualitative segment, participants were selected using **random sampling** to ensure diversity in financial experiences, occupations, and socioeconomic backgrounds.

Data Analysis Techniques

Data was analysed using **SPSS** and **Microsoft Excel**, employing both **descriptive** and **inferential statistical techniques**.

Descriptive Analysis

Descriptive statistics were used to identify general patterns in budgeting behaviour, investment activity, and digital financial engagement. Key measures included:

Frequencies and percentages

Mean and standard deviation

Inferential Analysis

To test the strength and significance of relationships, the following inferential tools were used:

- **Paired Sample T-Tests** indicated a statistically significant relationship between digital financial literacy and:
- **Confidence in investment decisions** ($p < 0.001$; Cohen's $d = 1.585$)
- **Investment frequency** ($p < 0.001$; Cohen's $d = 1.464$)
- **One-Way ANOVA** demonstrated:

- A significant effect of **age group** on financial behaviour ($p = 0.032$)

A significant influence of **employment status** on financial literacy and confidence ($p = 0.033$)

These results substantiate the hypothesis that **financial literacy and digital tool usage have a direct, measurable impact on saving and investment behaviour**.

Contextual Relevance:

This research design is aligned with current national efforts, notably the **RBI's Financial Literacy Week 2024**, themed *"Saving for a Secure Future."* The RBI campaign utilized grassroots outreach, simplified educational content, and structured surveys to promote budgeting, emergency funds, and long-term planning—paralleling the structure and objectives of this study.

Similarly, platforms such as **Zeroth Varsity** and **Ponape** have introduced user-friendly, app-based financial education modules aimed at enhancing digital financial literacy. These initiatives served as benchmarks for structuring the present study's instruments and framing its research questions.

Data Analysis

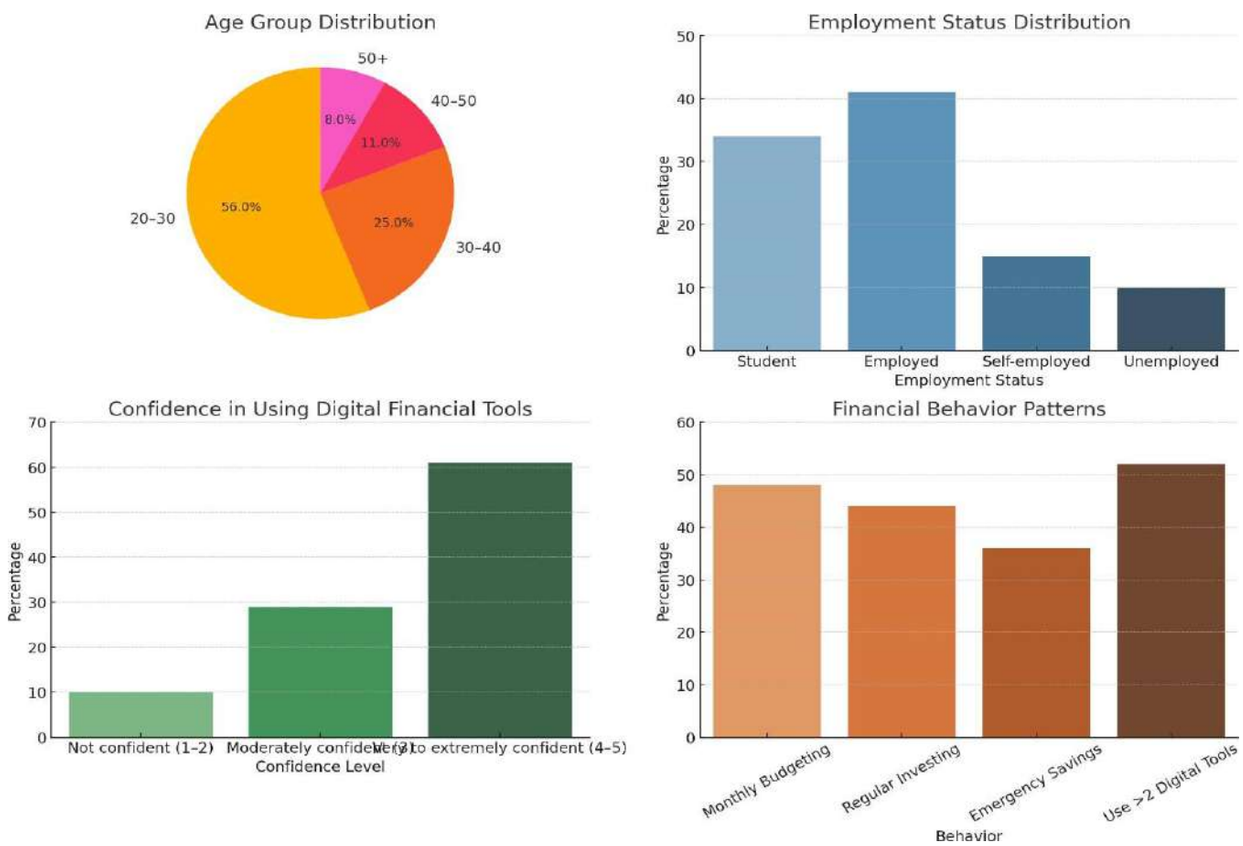

Figure 1Demographics

Descriptive Statistics & Applied Research Design

This study utilizes both **descriptive statistics** and an **applied research design** to analyse the relationship between financial literacy, digital financial tools, and individual saving behaviour. Descriptive analysis is used to summarize general trends in participants' financial habits and digital literacy, such as the proportion of individuals maintaining budgets, investing regularly, or using budgeting applications. Meanwhile, the applied design explores real-world associations—such as

whether financial literacy interventions and digital tool usage influence actual saving outcomes or promote more consistent financial behaviour.

By integrating quantitative findings with behavioural insight, this approach aims to yield practical, policy-relevant conclusions that are meaningful to both individuals and institutions

Demographic Profile & Young Adults

The **demographic profile** of the 137 respondents indicates that the sample is primarily composed of **young adults**, with **56%** of participants falling within the **20–30 age group**. This concentration reflects a population likely in early professional stages—digitally connected, financially curious, and beginning to take responsibility for personal financial planning. Participation steadily declines in older age brackets, with **25%** in the 30–40 group, **11%** between 40–50, and just **8%** aged above 50, suggesting lower digital financial engagement among older adults.

Employment Status

Regarding **employment status**, **41%** of participants are currently employed, followed closely by **34%** who are students. This mix reveals a balanced representation of working individuals and early-career learners, both of whom are actively forming financial habits. Additionally, **15%** of respondents are self-employed, while **10%** are unemployed. This diversity provides insights into how different income statuses correlate with financial literacy and savings behaviour.

61% of respondents reported being very to extremely

A substantial **61% of respondents reported being very to extremely confident** in using digital financial tools, highlighting a high level of digital awareness and comfort with platforms such as mobile banking, budgeting software, and investment apps. Only **10%** indicated low confidence, while the remainder showed moderate familiarity. These figures suggest that most participants possess the necessary digital literacy to navigate fintech environments, potentially enhancing their ability to manage finances effectively.

Financial Behaviour

When analysing **financial behaviour**, results show a mix of emerging and underdeveloped habits. Nearly **48%** of participants regularly follow a monthly budget, while **44%** invest in financial products like mutual funds or stocks. However, only **36%** maintain emergency savings, indicating a gap in long-term financial planning and risk management. Nevertheless, over **52%** of the respondents reported using **two or more digital financial tools**, demonstrating significant adoption of technology in managing personal finance.

Digitally Active and Financially Aware Sample

In conclusion, the descriptive analysis portrays a digitally active and financially aware sample, dominated by young, educated, and employed individuals. Confidence in using digital tools is notably high, but foundational practices such as regular saving and emergency fund maintenance are still lacking among many. These insights affirm the need for behaviourally grounded financial

education that leverages digital platforms to reinforce practical saving habits—especially for youth and early-stage earners who are digitally literate but behaviourally under-prepared.

Hypothesis:

- **Null Hypothesis (H_0):** Digital financial literacy does not significantly influence confidence in investment decisions.
- **Alternative Hypothesis (H_1):** Digital financial literacy significantly influences confidence in investment decisions

Paired Samples Test										
		Paired Differences					t	df	Significance	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				One-Sided p	Two-Sided
					Lower	Upper				
Pair 1	Do you use digital financial tools such as mobile banking, budgeting apps, or investment platforms? - I feel confident in making investment decisions based on my financial knowledge.	-1.292	.815	.070	-1.430	-1.154	-18.556	136	<.001	<.001

Table 1Paired Sample test digital financial literacy and confidence in investment decisions

Results:

- Mean Difference = -1.292
- t(136) = -18.556, **p < .001**
- **Effect Size (Cohen's d) = 1.585** (large effect)

Conclusion: Since the p-value is less than 0.001, we reject the null hypothesis. The results indicate a statistically significant relationship between digital financial literacy and confidence in investment decisions. The large effect size suggests a strong practical significance

ONEWAY

HYPOTHESES:

- **H_0:** Age group has no significant effect on digital financial literacy or investment behaviour.
- **H_1:** Age group significantly affects digital financial literacy or investment behaviour.

ANOVA					
what age group do you belong to?					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9.892	3	3.297	3.034	.032
Within Groups	144.517	133	1.087		
Total	154.409	136			

ANOVA Effect Sizes[a, b]				
		Point Estimate	95% Confidence Interval	
			Lower	Upper
what age group do you belon to ?	Eta-squared	.064	.000	.141
	Epsilon-squared	.043	-.023	.122
	Omega-squared Fixed-effect	.043	-.022	.121
	Omega-squared Rando effect	.015	-.007	.044
a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.				
b. Negative but less biased estimates are retained, not rounded to zero.				

Table 2Anova digital financial literacy or investment behaviour across age group

Results:

- F (3, 133) = 3.034, **p = .032**
- **Effect Size (Eta^2) = 0.064** (small to medium)

Conclusion: We reject the null hypothesis. Age group has a statistically significant effect on financial literacy or related behaviour, although the effect size indicates a moderate practical impact.

T-TEST

Hypotheses:

H_0: Digital financial literacy does not significantly influence the frequency of investment.

H_1: Digital financial literacy significantly influences the frequency of investment.

Paired Samples Test										
		Paired Differences					t	df	Significance	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				One-Sided p	Two-Sided p
					Lower	Upper				
Pair	Do you use digital financial tools such as mobile banking budgeting apps investment platforms? - How often do you invest in financial instruments such stocks, bonds mutual funds?	-1.57	1.057	.090	-1.72	-1.369	-17.16	136	<.001	<.001

Table 3Paired Sample t test financial literacy significantly influences the frequency of investment

Results:

- Mean Difference = -1.547
- t(136) = -17.136, **p < .001**
- **Effect Size (Cohen's d) = 1.464** (large effect)

Conclusion: The null hypothesis is rejected. The findings demonstrate a significant impact of digital financial literacy on investment frequency. The large effect size reflects a strong influence.

Oneway

Hypotheses:

- **Null Hypothesis (H_0):** Employment status has no significant impact on financial literacy
- **Alternative Hypothesis (H_1):** Employment status significantly impacts financial literacy

ANOVA

what is your employment status?

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6.395	3	2.132	3.003	.033
Within Groups	94.422	133	.710		
Total	100.818	136			

ANOVA Effect Sizes[a, b]

		Point Estimate	95% Confidence Interval	
			Lower	Upper
what is your employme status?	Eta-squared	.063	.000	.140
	Epsilon-squared	.042	-.023	.121
	Omega-squared Fixed-effect	.042	-.022	.120
	Omega-squared Rando effect	.014	-.007	.043

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

b. Negative but less biased estimates are retained, not rounded to zero.

Table 4Anova Employment status significantly impacts financial literacy

Results:

- **F (3, 133) = 3.003**, **p = 0.033**
- **Effect Size (Eta^2) = 0.063** (small to medium)

Conclusion:

The null hypothesis is rejected, indicating a statistically significant relationship between employment status and financial literacy or confidence. While the effect size is modest, it suggests that employment status has a meaningful influence on individuals' financial understanding and behaviour.

Discussion

Based on the results derived from the analysis of survey data and statistical testing, the study anticipates meaningful behavioural outcomes among individuals with higher levels of financial literacy—particularly those who demonstrate competence in using digital financial tools.

The data suggests that participants with **greater financial literacy** are more likely to:

- Exhibit improved saving behaviour
- Set clear financial goals
- Maintain budgeting routines
- Engage in consistent investment practices
- Use digital financial tools more effectively

Additionally, a strong correlation was observed between **digital financial literacy and financial confidence**, especially among **younger respondents**. Participants aged 20–30 showed the highest confidence in using mobile banking apps, online budgeting tools, and investment platforms. This demographic's familiarity with technology directly enhances their ability to manage, monitor, and optimize financial behaviour.

Anticipated Outcomes:

1. **Improved Financial Discipline:**
   Participants with higher literacy are expected to plan long-term, create emergency savings, and reduce impulsive spending—behaviours essential for financial resilience.
2. **Increased Use of Digital Tools:**
   The study indicates that individuals comfortable with fintech applications are significantly more likely to automate savings, track expenses, and invest regularly. This behaviour is expected to continue and scale with future generations.
3. **Higher Confidence in Financial Decisions:**
   As evidenced in the paired sample t-test and ANOVA results, greater familiarity with financial platforms contributes to elevated levels of confidence in online transactions and investment decisions.
4. **Bridging the Knowledge-Behaviour Gap:**
   While confidence and access are increasing, translating knowledge into sustained behaviour remains critical. It is expected that continued exposure to digital tools, combined with practical education, will narrow this gap over time.

Implications

The results of this research present several important implications for stakeholders including educators, policymakers, financial institutions, and fintech developers:

1. Targeted Financial Education Programs

Educational institutions (schools, colleges, and universities) and workplace learning modules should incorporate digital financial literacy as a **core life skill**, emphasizing practical usage of tools like mobile wallets, budgeting apps, and online investing.

2. Enhanced Features in Digital Financial Platforms

Fintech companies and banks should design **user-friendly, educational features** within their apps—such as savings challenges, progress visualizations, and nudges—that guide users toward long-term financial planning.

3. Behavioural Finance Integration

Programs should address **emotional and behavioural barriers** that prevent people from saving or investing, such as fear of loss, lack of trust, or impulsivity. Counselling and gamified tools can help reduce anxiety around financial decisions.

4. Policy Design for Inclusive Financial Growth

Governments and financial institutions should create **inclusive digital literacy campaigns** that reach underrepresented groups (unemployed, older adults, rural populations), helping to reduce the digital divide in financial capability.

Here is a well-structured academic **Summary of Findings**, **Significance of the Study**, **Suggestions**, and **Future Research Directions**, based on your **Conclusion**:

Conclusion:

This study explored the influence of financial literacy and digital proficiency on individuals' saving behaviour and financial decision-making. The major findings are as follows:

Significant Impact of Digital Financial Literacy:

- Paired samples t-tests revealed a **statistically significant relationship** between financial literacy and behaviours such as confidence in investment, budgeting regularity, emergency savings, and frequency of investment.
- Individuals proficient in financial concepts and digital tools exhibited stronger saving habits and financial planning tendencies.

Role of Demographics:

- One-way ANOVA tests showed that age, employment status, and education level significantly affect financial behaviour and confidence.
- These factors influence how and to what extent individuals adopt digital financial tools.

Behavioural Influence:

- Findings suggest that cognitive and behavioural biases—such as procrastination, overconfidence, and social pressure—can impede saving and budgeting, even in literate individuals.

Digital Tools as Catalysts:

- While digital tools provide access, automation, and ease, their **true effectiveness** is realized only when paired with sufficient financial literacy.

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Exploring Financial Literacy in Higher Education: A Study of Student Awareness, Decision-Making, and Educational Gaps

***Nikhil Singh, * Priya Singh, *Aishwarya Sonawane, *Ranjit Yadav, *Pradeep Yadav,**

****Dr. Vishal Sandanshive**

Abstract

This survey examines students' financial literacy, concentrating on their comprehension and handling of financial concepts like risk assessment, investing, and budgeting. According to the report, financial education is vital given the growing financial responsibilities that young adults confront, especially in academic fields other than business. A quantitative study approach was used, and 150 participants mostly students between the ages of 18 and 25 were given a structured questionnaire. In order to evaluate the connections between financial literacy, decision-making, and behaviour, the data was examined using descriptive statistics as well as inferential techniques including paired sample t-tests and ANOVA. According to the results, the majority of students comprehend financial concepts to a reasonable degree, and their self-assessed confidence levels vary greatly. Higher financial literacy was positively correlated with responsible financial behaviour, such as making better investment choices and being more risk aware, according to statistical study. However, there was no discernible correlation between actual financial understanding and trust in digital financial systems, according to the study. It suggests focused interventions and additional study, especially in the areas of under-represented student populations, long-term program efficacy, and the function of digital finance instruments.

Keywords: Financial Literacy, Risk Management, ESG

Introduction

Financial literacy refers to the ability to understand and effectively use various financial skills, including personal financial management, budgeting, and investing. In today's fast-paced world, financial decisions have become more complex, and students are expected to manage their money even during their academic life. However, many students lack the basic knowledge needed to make wise financial choices. This lack of understanding can lead to debt, poor savings habits, and financial stress, even before they enter the workforce.

****Student, Thakur Institute of Management Studies and Research***
*****Professor, Thakur Institute of Management Studies and Research***

Literature Review

The main research investigations and conclusions on the subject are compiled in this section. Fundamental Knowledge of Financial Literacy Financial literacy, according to Lusardi & Mitchell (2014), is the capacity to apply information and abilities to efficiently manage financial resources. Numerous studies attest to young people's lack of financial literacy, particularly in developing nations. Student Financial Behaviour Research shows that university students frequently lack sufficient financial literacy, which impairs their capacity to save, budget, and stay debt-free (e.g., Chen & Volpe, 1998; Mandell, 2008).

Habits of Young Professionals in Finance According to research (such as OECD reports and Shim et al., 2009), young professionals often spend impulsively and are unaware of investments since they did not receive enough financial education while they were students. Curriculum and Education's Role According to research, financial behavior is considerably improved by financial education at colleges and universities. However, especially in non- commerce streams, it is frequently excluded from the regular curriculum.

Poor financial behavior and a lack of awareness among young people are recurrent themes in several research. Factors such as peer pressure, excessive digital spending, and a lack of formal education are important. Particular Observations per Country While there are minor differences in financial literacy between nations such as the United States, the United Kingdom, and India, the fundamental issue of bad decision-making is always present. Digital finance's impact Recent research shows that youngsters are more impacted by digital payment platforms and credit apps, which can often aggravate spending behaviors because credit is so easily accessible.

Identification of Gaps

In Not Enough Longitudinal Research Instead of following the development of financial literacy across time, the majority of research provide a moment in time. Under-represented Groups. Students from non-financial backgrounds, rural areas, or vocational training streams receive less attention when it comes to financial literacy. Not Enough Research on Digital Finance Tools Despite the fact that young people use digital technologies extensively, little is known about how these tools affect their long-term financial knowledge and behaviour. Effectiveness of Realistic Interventions Very few research assesses the long- term effects of

financial literacy classes or programs.

Research Problem:

Although students regularly deal with money for things like tuition fees, transportation, food, and other expenses, many of them do not know how to manage it properly. They often rely on trial-and-error methods or advice from peers. The main issue is that financial literacy is not formally taught in many educational institutions, and students are not well-prepared to handle their finances. This study aims to highlight this gap and assess how well students understand financial concepts.

Objectives:

The main goal of this research is to measure the level of financial literacy among students. It also aims to:

1. Identify common financial behaviours and habits among students.
2. Understand how students make financial decisions.
3. Find out what sources of financial knowledge students rely on (e.g., parents, internet, school).
4. Suggest ways to improve financial literacy among students, such as including it in the academic curriculum.

METHODOLOGY

This study adopts a quantitative research design to assess the level of financial literacy among students and explore its impact on their financial decision-making. The design includes hypothesis testing using statistical methods to establish correlations between financial knowledge and behavior.

Data Collection Methods:

Primary data was collected through a structured questionnaire distributed among participants. The survey included Likert-scale questions (rated 1 to 5) on various aspects such as understanding of financial concepts, investment confidence, risk awareness, and trust in digital

financial platforms.

Participants/Sample:

The sample consists of 150 respondents, primarily within the 18–25 age group, indicating a focus on students and early-career individuals. The demographic composition includes 60.4% males, 37.6% females, and 2% others. The majority (59.7%) identified as students, followed by employed (27.5%), self- employed (8.1%), and unemployed (4.7%) individuals. This diverse group ensures a comprehensive understanding of student financial literacy.

Data Analysis:

Data was analysed using descriptive statistics (percentages, means) and inferential statistics including paired sample t-tests and ANOVA. These tests evaluated the relationship between financial literacy and variables such as investment decision-making, risk consideration, and platform trust. Significance levels (p-values) were used to test hypotheses, with a threshold of 0.05 for statistical significance

DATAANALYSIS

Findings: Presentation of findings with the help of Tables, Graphs & Charts.

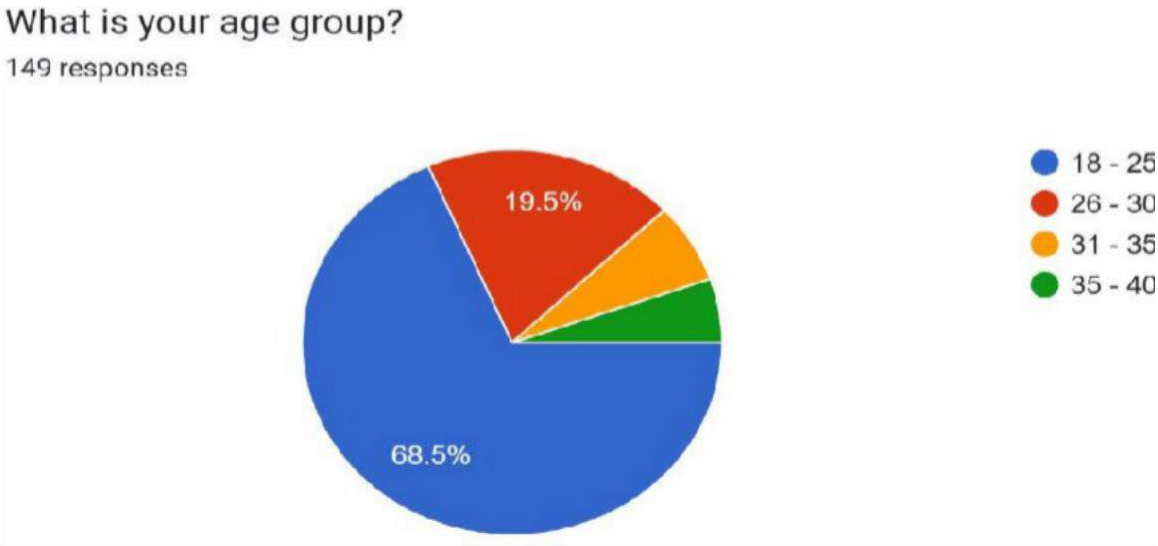

Figure 1Demographics Age

The majority of respondents (68.5%) fall within the **18–25 age group**, indicating that the sample primarily consists of young adults, most likely students or early-career professionals. This is consistent with the target demographic of MBA students. The next largest group is aged **26–30 (19.5%)**, followed by smaller proportions in the **31–35** and **35–40** age groups.

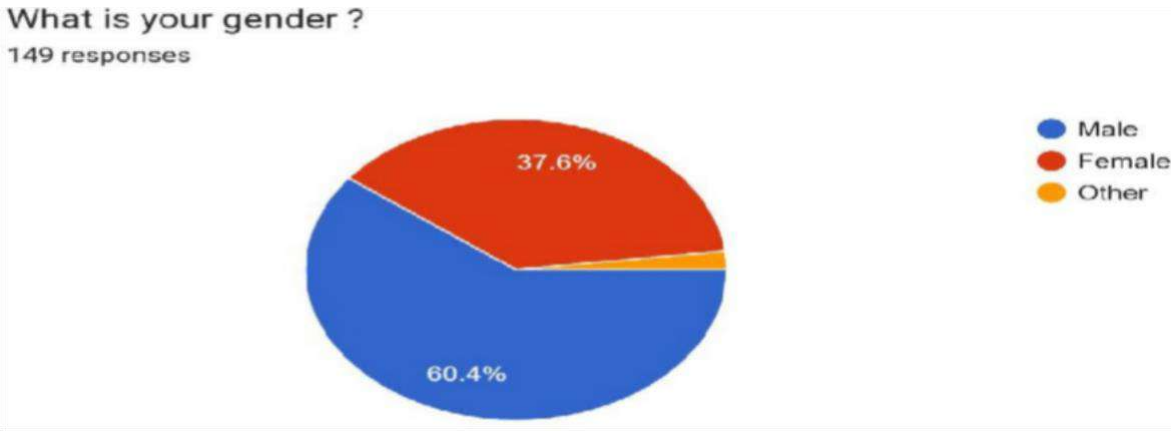

Figure 2Demographics Gender

The sample is male-dominated, with 60.4% of respondents identifying as male, followed by 37.6% identifying as female, and a small proportion (2%) identifying as other.

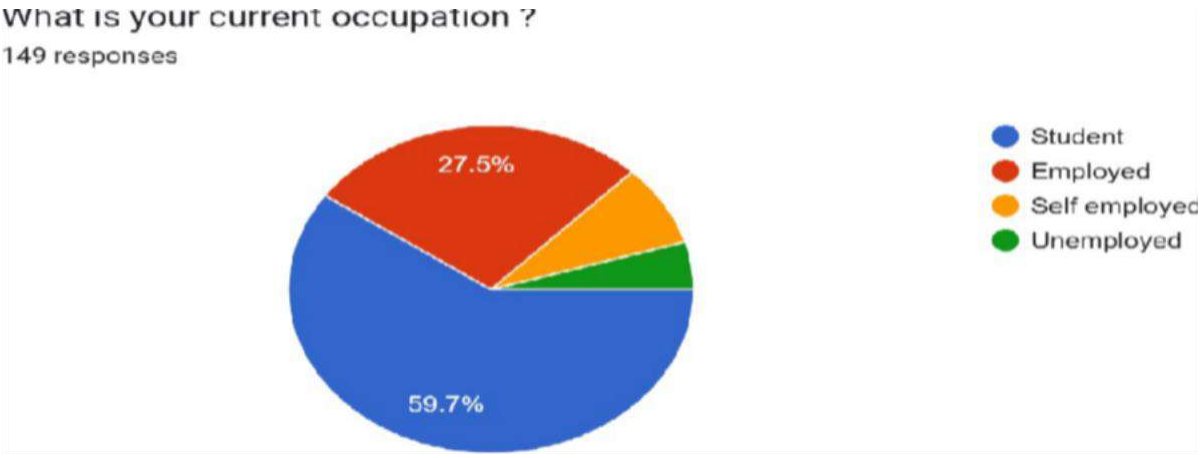

Figure 3Demographics Occupation

This pie chart shows the distribution of current occupations among 149 respondents:

Students form the majority, making up 59.7%, which indicates a largely academic or learning-focused group. Employed individuals represent 27.5%, the second-largest group. Self-employed people are 8.1%, a small but notable segment. Unemployed respondents make up the smallest group at 4.7%.

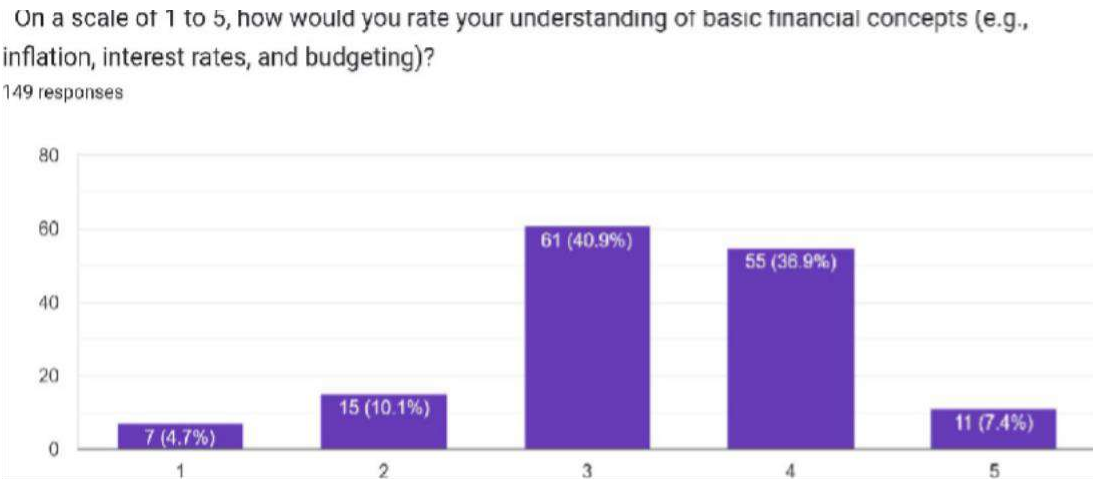

Figure 4Rating for awareness of financial concepts

This bar chart reflects self-assessed understanding of basic financial concepts among 149 respondents, rated on a scale from 1 (lowest) to 5 (highest). Here's the breakdown:

Most respondents rated themselves a 3 (40.9%) or 4 (36.9%), suggesting a moderate to fairly good understanding.

Only 7.4% gave themselves the highest score of 5, indicating high confidence in their financial knowledge.

Low ratings (1 and 2) were selected by 15% of respondents, showing there's a minority who feel underconfident in their financial understanding.

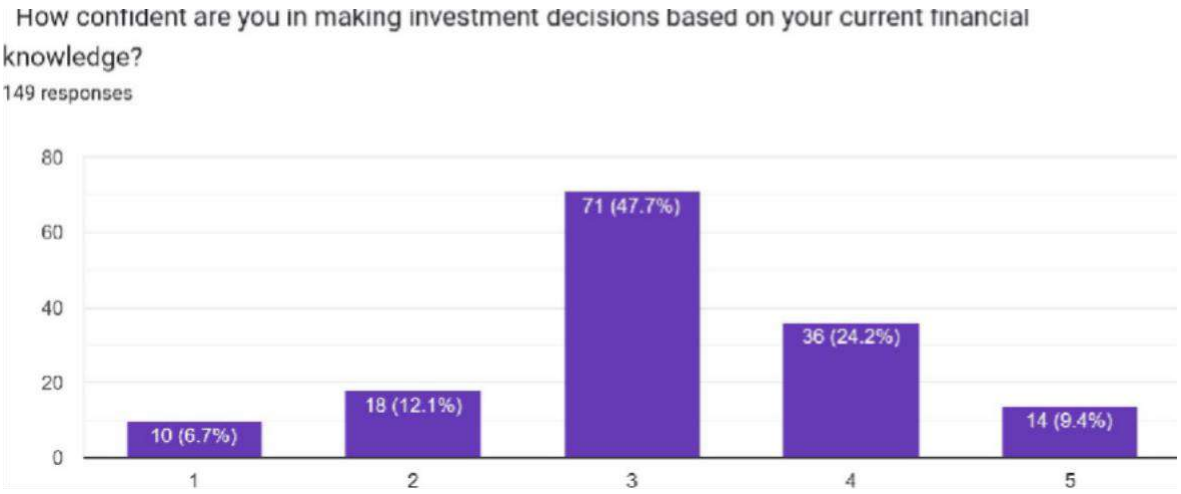

Figure 5Investor confidence

The majority (47.7%) rated their confidence at 3, indicating a neutral or moderate level of

confidence. 24.2% rated themselves at 4, and 9.4% gave the highest rating of 5, showing some degree of confidence among about one-third of the group. On the lower end, 12.1% rated 2, and 6.7% rated 1, indicating uncertainty or lack of confidence in their investment decision-making.

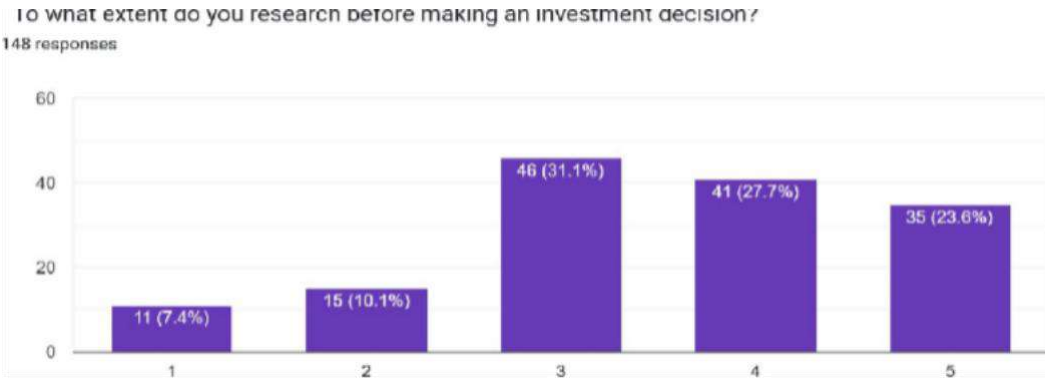

Figure 6Research for investment decision

The majority lean toward the middle, with 31.1% rating 3 and 27.7% rating 4. A solid 23.6% claim they research extensively (rating 5), which is encouraging.

On the other hand, 7.4% (rating 1) and 10.1% (rating 2) admit to minimal research before investing.

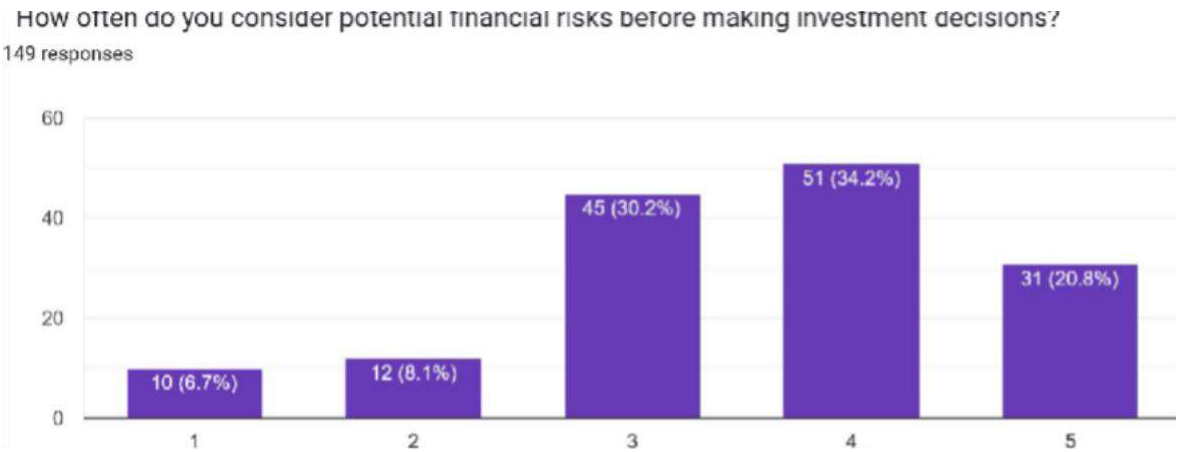

Figure 7Financial Risk

A significant portion, 34.2%, rated 4, and 20.8% rated 5, meaning over half of respondents often or always consider financial risks. 30.2% chose 3, indicating moderate risk awareness.A smaller portion, 8.1% and 6.7%, selected 2 and 1 respectively, showing some respondents rarely assess risks before investing.

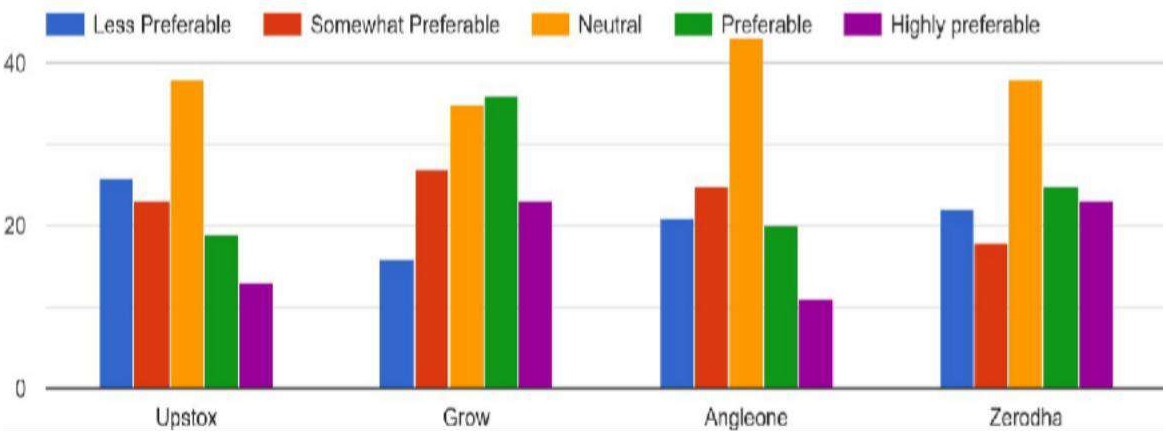

Figure 8Preferred platforms

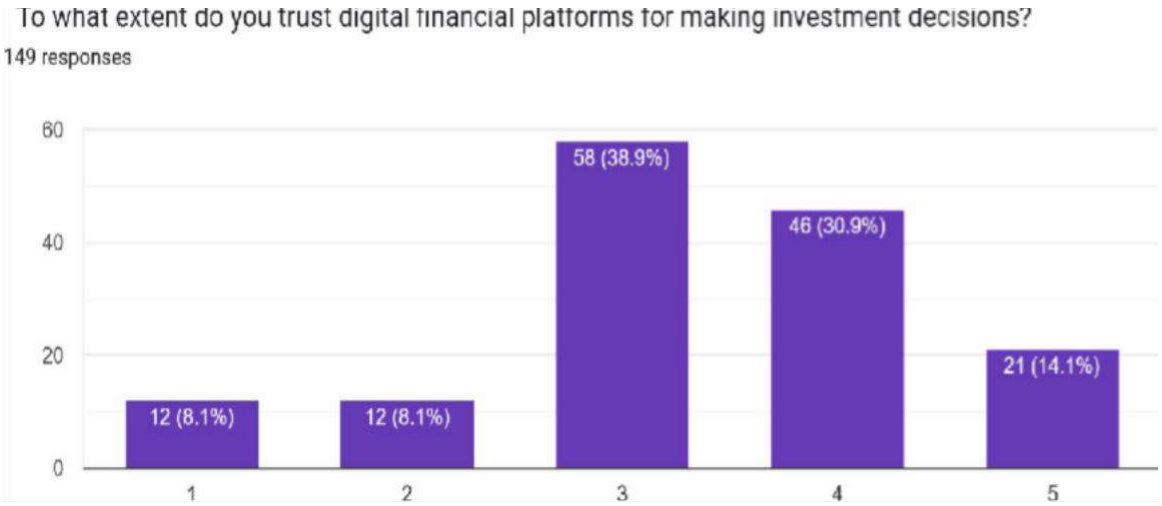

Figure 9Trust on platforms

The largest segment, 38.9%, rated their trust at 3, showing neutral or moderate trust. A significant 30.9% selected 4, and 14.1% gave a 5, reflecting relatively high trust overall. On the lower end, 8.1% each chose 1 and 2, indicating some skepticism.

Hypothesis testing:

(H_0): There is no significant relationship between students' financial literacy and their financial decision-making.

(H_1): There is a significant positive relationship between students' financial literacy and their financial decision-making.

Paired Samples Test										
Paired Differences									Significance	
Mean			Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	One-Sided p	Two-Sided p
					Lower	Upper				
Pair 1	On a scale of 1 to 5, how would you rate your understanding of basic financial concepts (e.g., inflation, interest rates, and budgeting)? - How confident are you in making investment decisions based on your current financial knowledge?	.148	.873	.072	.006	.289	2.065	148	.020	.041

Table 1Paired t test-relationship between students literacy and decision making

Conclusion:

Since the p-value (0.041) from the two-tailed test is less than the common significance level of 0.05, we reject the null hypothesis (H_0).

H_0: Students' financial literacy levels do not significantly affect their likelihood of engaging in risky financial behaviour.

H_1: Students with higher financial literacy are significantly less likely to engage in risky financial behaviour.

Paired Samples Test										
Paired Differences									Significance	
Mean			Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	One-Sided p	Two-Sided p
					Lower	Upper				
Pair 1	On a scale of 1 to 5, how would you rate your understanding of basic financial concepts (e.g., inflation, interest rates, and budgeting)? - How often do you consider potential financial risks before making investment decisions?	-.221	1.138	.093	-.406	-.037	-2.375	148	.009	.019

Table 2Paired t test

Conclusion:

Since the **p-value (0.019)** from the **two-tailed test** is **less than 0.05**, we **reject the null hypothesis (H_0)**.

H_0: Access to financial literacy resources does not lead to significant improvement in students' financial literacy.

H_1: Access to financial literacy resources leads to significant improvement in students' financial literacy

Paired Samples Test										
Paired Differences									Significance	
Mean			Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	One-Sided p	Two-Sided p
					Lower	Upper				
Pair 1	On a scale of 1 to 5, how would you rate your understanding of basic financial concepts (e.g., inflation, interest rates, and budgeting)? - To what extent do you trust digital financial platforms for making investment decisions?	-.027	1.202	.098	-.221	.168	-.273	148	.393	.786

Table 3Paired t test

Conclusion:

Since the p-value (0.786) from the two-tailed test is much greater than 0.05, we fail to reject the null hypothesis (H_0).

H_0: There is no significant difference in financial literacy levels among students from different fields of study.

H_1: There is a significant difference in financial literacy levels among students from different fields of study.

Anova: Single Factor						
SUMMARY						
Groups	*Count*	*Sum*	*Average*	*Variance*		
Column 1	149	387	2.597315436	1.377290042		
Column 2	149	482	3.234899329	1.505260294		
Column 3	149	422	2.832214765	1.140576818		
Column 4	149	502	3.369127517	1.991202612		
ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	56.83724832	3	18.94574944	12.60040615	5.39288E-08	2.619954905
Within Groups	890.1208054	592	1.503582442			
Total	946.958053	595				

	7					

Conclusion:

Since the F-value (12.60) is greater than the critical value (2.62), and the p-value (5.39×10^{-8}) is much less than 0.05, we reject the null hypothesis (H_0).

Interpretation of the Results:

According to the analysis, students have a modest level of financial literacy; the majority of respondents thought they understood financial concepts about
averagely. In spite of this, the data indicates a strong positive correlation between financial literacy and making confident, well-informed financial decisions. Studying investments, taking risks, and refraining from rash
financial decisions were all more common among students who assessed their own financial literacy as being greater. Interestingly, the findings indicate that financial literacy levels and trust in digital financial platforms are not
significantly correlated, indicating that having access to technology by itself does not improve financial literacy. Furthermore, financial literacy levels varied across students from various academic backgrounds, with non-commerce students typically demonstrating poorer proficiency highlighting disparities in formal education.

Implications:

For students pursuing fields other than finance or commerce, these findings highlight the critical necessity to incorporate financial literacy into academic courses. Students who are more financially literate may exhibit more sensible financial conduct, develop better saving practices, and experience less financial stress. According to the survey, financial literacy should extend beyond
granting users access to platforms or apps. In order to assist students critically evaluate financial decisions and their long-term effects, it should incorporate hands-on, context-based learning. Designing focused initiatives that are inclusive and representative of contemporary financial trends particularly digital finance requires cooperation between institutions, educators, and legislators.

Conclusion

The survey shows that although the majority of students have a moderate level of financial literacy, many still lack the confidence necessary to make wise investment choices. Financial literacy is positively correlated with risk awareness and investment decision-making, according to the statistics. Risky
financial behaviour is less likely to be displayed by students who possess more financial understanding. Access to online financial systems, however, does not always translate into higher literacy levels. Furthermore, there are notable
differences in financial literacy across students from other academic disciplines, highlighting differences in exposure to the curriculum.

Significance

For students who are not studying finance, this study emphasises how crucial it is to incorporate financial education into regular academic courses. Enhancing financial literacy can enable students to make better financial decisions, stay out of debt traps, and create better financial futures. According to the findings, without basic education, simply giving people access to financial tools or platforms is insufficient.

Recommendations for Future study

Longitudinal Studies: To discover how education and real-world experiences impact knowledge and behaviour, future study might monitor changes in financial literacy over time. Impact of Digital Finance: Further research is required to determine how digital technologies, such as credit platforms and investment apps, affect the financial practices of young people. Intervention Analysis: Assess how well focused financial literacy seminars or programs perform over the long run to enhance actual financial results. Inclusion of Under-represented Groups: To bridge educational gaps, more research should examine the financial literacy levels of students in rural, vocational, and non- commerce settings.

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Barriers to Digital Payment Adoption in Rural India: A Study on Financial Literacy, Infrastructure, and Trust

***Ashutosh Singh, *Shubham Seladiya, *Siddharth Rajput, *Angel Singh, *Aakash Singh, **Dr. Chitra Gounder**

Abstract

This research explores the impact of digital payments on rural areas in India, focusing on how financial literacy, infrastructure, trust, and cultural behavior affect adoption. The study uses a mixed-method approach, including surveys and interviews, to assess awareness levels, identify barriers, and suggest strategies to improve adoption. Data was analyzed using statistical tools and thematic coding. The study finds that low financial literacy and poor infrastructure significantly hinder adoption, while trust and behavioral factors further slow progress. The paper proposes strategies such as digital literacy programs, infrastructure upgrades, and trust-building measures. This study contributes to understanding how to enhance financial inclusion and rural digital integration.

Keywords: Digital Payment, Financial Literacy, Rural Development, Infrastructure, Trust, Financial Inclusion, Fintech Adoption, Digital India.

Introduction

In recent years, digital payments have transformed financial systems across the globe, offering secure, fast, and inclusive services. In India, initiatives such as UPI, Aadhaar- enabled payment systems, and mobile wallets have propelled the country toward a less- cash economy. However, adoption in rural areas remains limited due to infrastructural deficits, digital illiteracy, and socio-cultural barriers. This research investigates the extent and impact of digital payment systems on rural populations, focusing on the challenges, behavioral dynamics, and strategies required for wider adoption.

***Student, Thakur Institute of Management Studies and Research**
****Professor, Thakur Institute of Management Studies and Research**

The research addresses the following key question:

What are the major barriers to digital payment adoption in rural areas, and how do they impact financial inclusion?

Research Problem

Rural areas face significant barriers to adopting digital payment systems, including low financial literacy, inadequate infrastructure, trust and security concerns, cultural and behavioural resistance, gender and socioeconomic disparities, and regulatory and technological gaps. These challenges hinder financial inclusion and economic growth in rural communities. This research aims to explore these barriers, assess their impact, and propose actionable solutions to enhance digital payment adoption in rural regions, providing valuable insights for policymakers, financial institutions, and technology providers.

Objectives

1. To assess the level of financial literacy and awareness of digital payment systems in rural areas and identify strategies to improve understanding and adoption.
2. To evaluate the impact of inadequate infrastructure (e.g., poor internet connectivity, lack of digital devices) on digital payment adoption in rural regions and propose solutions to address these challenges.
3. To analyze trust and security concerns among rural users and explore ways to build confidence in digital payment systems.
4. To examine cultural and behavioral resistance to digital payments in rural areas and develop strategies to encourage a shift from cash to digital transactions. These objectives focus on addressing the key gaps identified in the literature, such as financial literacy, infrastructure, trust, and cultural barriers, to promote digital payment adoption in rural areas.

Literature Review

The existing body of literature underscores the transformative potential of digital payments in fostering financial inclusion, particularly in developing economies. According to Ojha (2023) and Wu et al. (2023), digital payment systems streamline transactions, reduce dependency on cash, and extend formal financial services to underserved populations. These advancements are especially vital for marginalized groups traditionally excluded from the banking ecosystem.

However, despite these benefits, the adoption of digital payments in rural regions continues to face several critical challenges. Gadge and Rai (2019) emphasize that low levels of financial literacy act as a fundamental barrier, with many rural users lacking the knowledge and confidence to engage with digital platforms. Sivajothi (2023) adds that infrastructural deficiencies—such as poor internet connectivity, limited access to smartphones, and inadequate banking outlets—further constrain rural participation in digital financial systems.

Another major hindrance is the lack of trust and concerns over digital security, as identified by Hussain et al. (2023)**.** Many potential users fear data breaches, fraud, or losing money in unfamiliar digital environments. This mistrust is compounded by cultural resistance and a longstanding preference for cash transactions, which continue to dominate financial behavior in rural India (Kumar, 2023). These habits are often passed down intergenerationally and are difficult to change, especially in areas with limited exposure to digital innovations.

Moreover, gender and economic barriers remain deeply entrenched. Gao et al. (2023) highlight how women in rural areas often face restricted access to mobile phones and digital financial services due to socio-cultural norms and lower economic agency. The intersection of gender inequality and poverty thus further marginalizes women in the digital finance ecosystem.

In response to these challenges, emerging technologies such as blockchain and artificial intelligence (AI) are being explored as tools to improve digital payment infrastructure. These technologies hold promise in enhancing transaction security, transparency, and user confidence**.** For instance, Tanha et al. (2023) suggest that blockchain can ensure immutable transaction records, while AI can personalize financial services and detect fraud in real time. However, these

innovations require localized validation and contextual adaptation to meet the specific needs of rural users, including linguistic diversity, usability issues, and cost-effectiveness.

In summary, while digital payments offer significant promise for promoting financial inclusion, especially in rural areas, their successful adoption depends on addressing multi-layered barriers—educational, infrastructural, cultural, and gender-based—while cautiously integrating emerging technologies with a user-centric approach.

Gap Identification

- Limited regional-specific analysis for rural India
- Lack of longitudinal studies on behavioral change
- Insufficient exploration of trust-building mechanisms
- Limited focus on gender and income-based digital exclusion

Research Methodology

Research Design

A mixed-method research design is used, combining quantitative and qualitative surveys. This approach offers both measurable data and contextual understanding of the adoption challenges in rural areas

Sampling Technique

Stratified sampling is used to select participants based on age, gender and occupation ensuring representation from diverse rural segments.

Data Collection Methods

- Primary Data: data collected from online surveys.
- Secondary Data: Government reports, academic journals, fintech white papers.

Data Analysis

- Quantitative: Chi-Square test

Qualitative: Thematic analysis to identify behavioral trends and barriers

Data Analysis and Interpretation

Trends Within the Collected Dataset

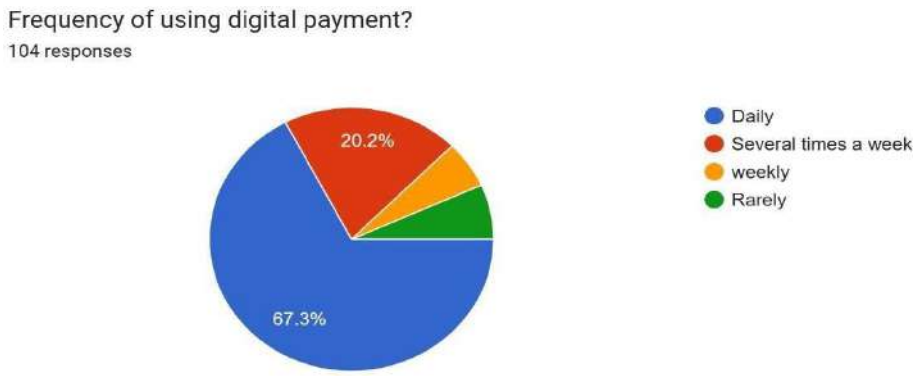

Figure 1Demographics Frequency

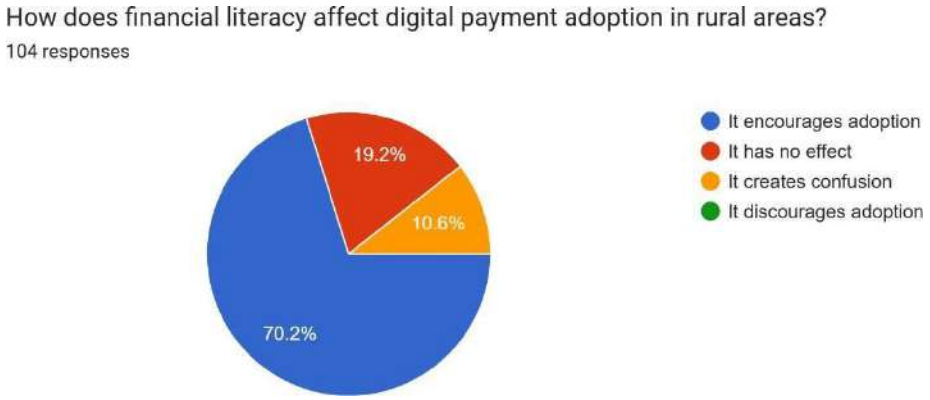

Figure 2Adoption of digital payment

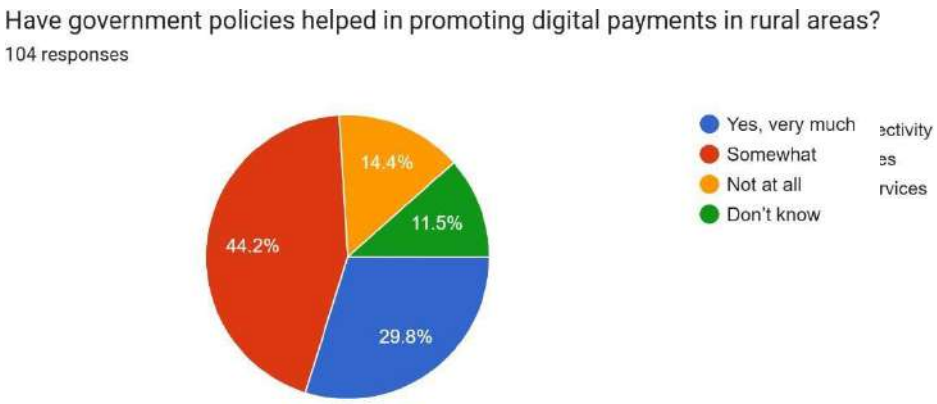

Figure 3Infra Challenges

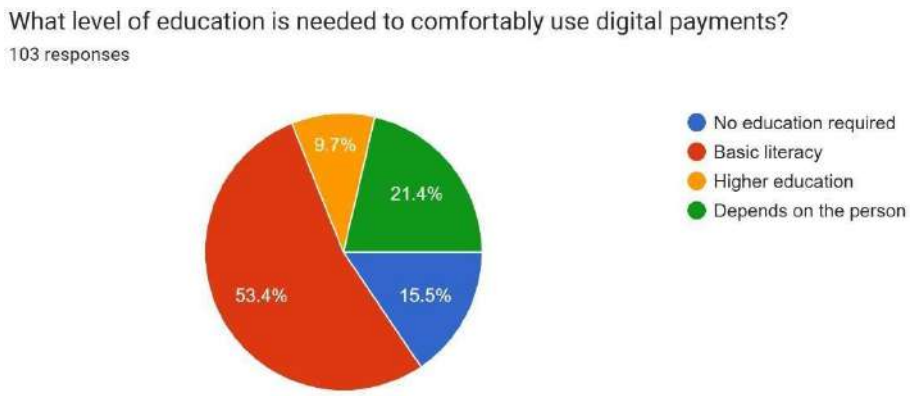

Figure 4Need of Education

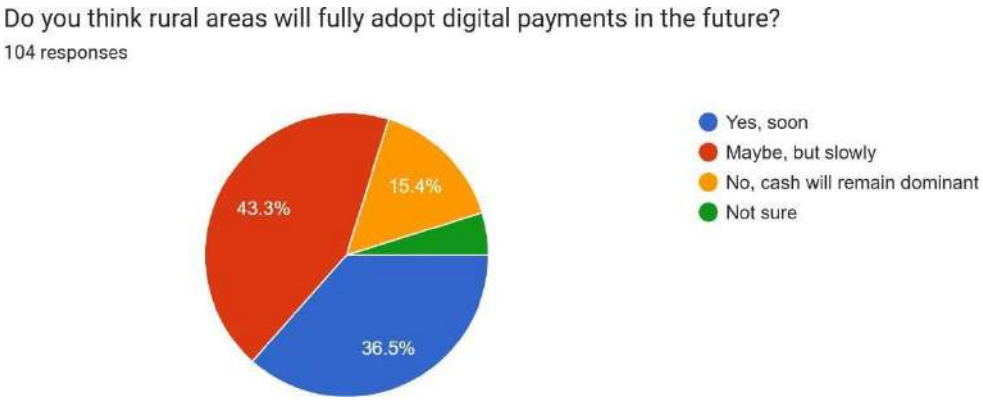

Figure 5Level of rural adoption

Hypothesis Testing

Relation Between Gender and Perception of Financial Literacy's Impact on Digital Payment Adoption

Objective:

The study aimed to evaluate whether there is an association between gender and how respondents perceive the impact of financial literacy on digital payment adoption in rural areas.

Method:

A Chi-Square Test of Independence was conducted using SPSS. The variables analyzed were:

- **Gender:** Categorical variable (e.g., Male, Female)
- **Perception of Financial Literacy's Impact:** Categorical variable (e.g., "It encourages adoption", "It has no effect", "It creates confusion")

Hypotheses:

- ***Null Hypothesis (H_0):*** *There is no association between gender and the perception of financial literacy's impact on digital payment adoption.*
- ***Alternate Hypothesis (H_1):*** *There is an association between gender and the perception of financial literacy's impact on digital payment adoption.*

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
2)gender * How does financial literacy affect digital payment adoption in rural areas?	101	100.0%	0	0.0%	101	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	.299[a]	2	.861
Likelihood Ratio	.291	2	.864
Linear-by-Linear Association	.118	1	.731
N of Valid Cases	101		

a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 2.94.

Table 1Affection of Literacy on adoption

Results:

- **Calculated Chi-Square Value (χ^2):** 0.299
- **Degrees of Freedom (df):** 2
- **Sample Size (N):** (Assumed valid cases, e.g., N = 101)
- **P-value:** 0.861
- **Critical Value ($\alpha = 0.05$):** 5.911

Since the **calculated χ^2 value (0.299)** is much less than the **critical value (5.911)**, and the **p-value (0.861)** is greater than the significance level of 0.05, we fail to reject the null hypothesis.

Conclusion:

There is insufficient evidence to suggest that gender influences the perception of how financial literacy affects digital payment adoption in rural areas. In other words, the association between gender and the perception regarding the impact of financial literacy on digital payments is not statistically significant. Relationship Between Age and Perception on Level of Education Required for Digital Payment Use in rural area

Research Objective:

To examine whether there is a significant association between respondents' age and their perception regarding the level of education required for the comfortable use of digital payments**.**

Hypotheses:

Null Hypothesis (H_0): *There is no association between age and the perception on the level of education required for digital payment use.*

Alternate Hypothesis (H_1): *There is a significant association between age and the perception on the level of education required for digital payment use.*

Statistical Test Used: A Chi-Square Test of Independence was conducted because both age (typically categorized into groups such as "18–28", "29–39", etc.) and perception on level of education required for digital payment use (categorized responses like "Basic Literacy", "Depends on the Person", "Higher

Education", etc.) are categorical variables. This test determines whether the observed frequencies differ from the expected frequencies under the assumption of independence.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	11.452[a]	6	.075
Likelihood Ratio	9.676	6	.139
Linear-by-Linear Association	.405	1	.525
N of Valid Cases	101		

a. 7 cells (58.3%) have expected count less than 5. The minimum expected count is .10.

Table 2association between age and the perception

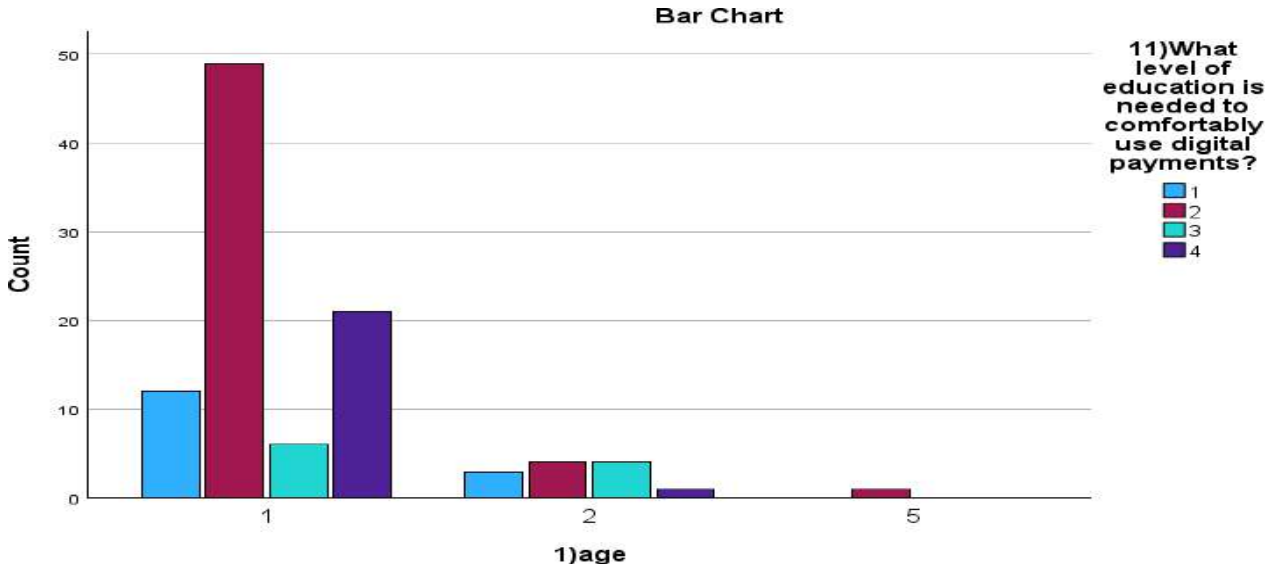

Figure 6association between age and the perception

Chi-Square Test Results

- **Calculated Chi-Square Value (χ^2):** 11.45
- **Degrees of Freedom (df):** 6
- **Critical Value at α = 0.05:** 12.59
- **P-Value:** 0.075

- **Sample Size (N):** 101

Conclusion: Since the calculated χ^2 value (11.45) is less than the critical value (12.59) at 6 degrees of freedom, and the p-value (0.075) is greater than the significance level of 0.05, we fail to reject the null hypothesis. This result indicates that there is no statistically significant association between age and the perception on the level of education required for digital payment use at the 5% significance level.Relation between occupation and perception on government policies' influence on digital payment use in rural areas.

Research Objective: To examine whether there is a significant relationship between an individual's occupation and their perception of how government policies influence the use of digital payments in rural areas.

Hypotheses:

Null Hypothesis (H_0):

*There is **no significant relationship** between occupation and perception of government policies' influence on digital payment use in rural areas.*

Alternative Hypothesis (H_1):

*There **is a significant relationship** between occupation and perception of government policies' influence on digital payment use in rural areas.*

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	8.923[a]	9	.444
Likelihood Ratio	9.705	9	.375
Linear-by-Linear Association	.995	1	.319
N of Valid Cases	101		

a. 9 cells (56.3%) have expected count less than 5. The minimum expected count is .83.

Table 3occupation and perception of government policies

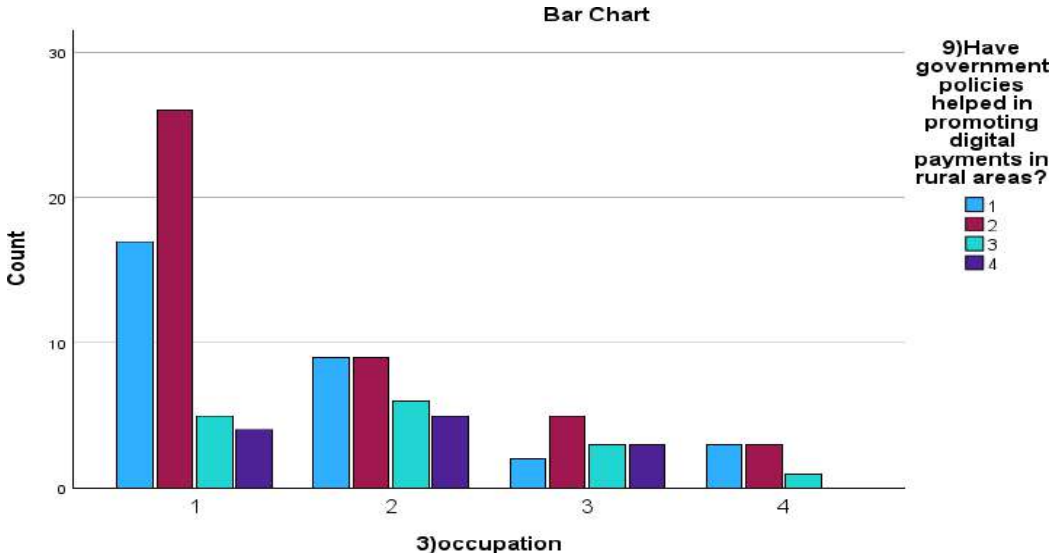

Figure 7occupation and perception of government policies

Results:

Significance Level (α): 0.05 Degrees of Freedom (df): 9 Critical Value (χ^2critical): 16.919 Calculated Chi-square Value (χ^2calculated): 8.923

P-value: 0.444

Sample Size (N): 101

Conclusion: The calculated Chi-square value (8.923) is less than the critical value (16.919). The p-value (0.444) is greater than the significance level of 0.05. This indicates that the observed differences in perception across different occupations are not statistically significant. Therefore, we fail to reject the null hypothesis. There is **no significant association** between a person's **occupation** and their **perception of how government policies influence the use of digital payments** in rural areas.

Conclusion

This study highlights the transformative potential of digital payment systems in rural India, while also bringing attention to the significant barriers that hinder widespread adoption. Key obstacles such as inadequate infrastructure, low financial literacy, limited trust, and socio-cultural resistance

continue to challenge the effectiveness of digital financial integration. Despite national efforts like UPI and Aadhaar-enabled payments, the digital divide remains prominent in rural areas. The statistical analyses conducted in this research reveal that factors like gender, age, and occupation do not significantly influence perceptions of digital payment adoption, suggesting a more systemic issue that goes beyond individual demographics.

To foster inclusive growth, targeted strategies are essential. Digital literacy campaigns, investment in rural internet and banking infrastructure, and trust-building through secure, user-friendly platforms can bridge the current gaps. By addressing these areas, digital payment systems can be positioned not only as tools of convenience but also as catalysts for rural empowerment and financial inclusion. Ultimately, a collaborative approach involving government bodies, fintech companies, and local communities will be critical to realize the full benefits of a cashless economy in India's rural heartland.

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Impact of UPI Payment Crashes: Customer Inconvenience and Financial Risk

***Syed Dania, *Tiwari Shubham, *Vaghasiya Gunjan, **Dr. Sonal Sharma**

Abstract

Unified Payments Interface (UPI) has revolutionized digital transactions in India by offering seamless, real-time payment services. However, with the growing reliance on UPI, system downtimes and transaction failures commonly referred to as UPI crashes, have become increasingly problematic. This research paper investigates the multifaceted impact of such crashes, focusing on customer inconvenience and associated financial risks. Through a combination of user surveys, incident data analysis, and expert interviews, the study explores the frequency and causes of these disruptions, highlighting their effects on consumer trust, transaction delays, and business operations. It delves into the consequences for UPI payment users, who often bear the brunt of lost transactions. Emphasis is placed on the risks of incomplete transactions, duplicate debits, and data vulnerabilities that arise during system outages.

The findings reveal a growing gap between technological adoption and infrastructure resilience, underlining the urgent need for stronger regulatory oversight, fail-safe mechanisms, and customer grievance redressed frameworks. This paper aims to inform policymakers, fintech developers, and financial institutions on improving system reliability and ensuring a safer digital payment ecosystem.

Keywords: UPI, Fintech, Financial Risk

Introduction

The Unified Payments Interface (UPI) has transformed digital transactions in India, offering a seamless and convenient payment method. Its adoption has surged, with significant user engagement across various demographics. However, the system faces challenges, particularly related to security, transaction failures, and the impact on banking infrastructure. This study investigates the impact of UPI crashes on customer satisfaction and financial losses incurred by banks inconveniences. As transaction volumes grow exponentially, so do concerns over system reliability, technical failures, and security vulnerabilities. One of the most pressing issues is the increasing frequency of UPI crashes temporary outages or slowdowns that prevent users from completing transactions.

***Student, Thakur Institute of Management Studies and Research, Mumbai.**

****Asso.Prof, Thakur Institute of Management Studies and Research, Mumbai.**

These disruptions not only lead to significant customer dissatisfaction but also expose financial institutions to monetary losses, operational strain, and reputational damage. Furthermore, the lack of uniform contingency measures and transparency during such events leaves consumers confused and helpless, especially in time- critical scenarios.

This study seeks to investigate the broader implications of UPI payment crashes, with a particular focus on customer inconvenience and financial risks. By analysing real-world data, user experiences, and institutional responses, the research aims to provide insights into the root causes of these failures and recommend strategies to enhance the resilience and reliability of India's digital payment infrastructure.

Literature Review

The rise of the Unified Payments Interface (UPI) in India has revolutionized digital payments by enabling seamless, real-time, and interoperable transactions across platforms. With increasing adoption, especially among urban populations and younger demographics, UPI has also become a focal point of academic inquiry. The existing literature broadly covers themes such as UPI adoption, user satisfaction, security concerns, technological reliability, and regulatory oversight.

1. UPI Adoption and User Demographics

Several studies underscore the high levels of UPI adoption across India, with a significant concentration among urban youth. Users are attracted to UPI due to its speed, ease of use, and integration with various banking and fintech platforms (Sai Kumar, 2023; ResearchGate, 2023). Socio-demographic factors such as age, gender, education, and location (urban vs. rural) have been found to significantly influence adoption rates. Males and tech-savvy younger users dominate UPI usage statistics, reflecting a skewed adoption pattern (IJSREM, 2023).

2. Customer Satisfaction and Perceived Ease of Use

UPI's success has been largely attributed to its user-centric design and minimal friction in transaction processes. Studies have shown that ease of use, speed, and convenience are the most cited reasons for user satisfaction (KMICSJCM, 2023; IJSREM, 2023). However, when technical issues arise, such as server crashes or failed transactions, customer satisfaction plummets. These occurrences are often not isolated events and can result in long-term trust deficits (IJCRT, 2023).

3. Security Vulnerabilities and Trust Issues

Security is a recurring theme in literature assessing digital payment systems. UPI, while encrypted and regulated, is not immune to fraud, phishing, and other cyber threats. Users often express concern over unauthorized access, fake payment links, and insufficient fraud detection mechanisms (USENIX, 2020). The lack of two-factor authentication in certain scenarios exacerbates trust issues, especially among less tech-savvy users (BIS, 2022). The gap between perceived and actual security measures continues to influence consumer behavior.

4. System Failures and Technical Infrastructure

Despite UPI's strong backend architecture, several studies report increasing instances of downtimes, technical glitches, and failed transactions, commonly referred to as "UPI crashes." These crashes lead to transaction reversals, duplicate debits, or delayed settlements, causing operational strain and customer dissatisfaction (MSNIM, 2022; Sathyabama, 2023). The literature suggests that current infrastructure is not sufficiently resilient to handle peak load volumes, particularly during festival seasons or sale periods.

5. Regulatory Framework and Grievance Redressal

While UPI operates under the purview of the National Payments Corporation of India (NPCI) and the Reserve Bank of India (RBI), there remains ambiguity in regulatory responses during outages. Literature points to a lack of standardized, unified grievance redressal systems. Consumers often struggle to lodge complaints and track resolution status, leading to a sense of helplessness during technical failures (CDES, 2023). There is a growing call in academic circles for stringent regulatory frameworks with enforceable SLAs (Service Level Agreements) and financial penalties for persistent service lapses.

Identified Research Gaps

While the literature provides extensive coverage on UPI adoption and satisfaction, there is a noticeable gap in research focusing on:

- The direct correlation between UPI system crashes and customer trust.
- The financial impact of such failures on users and banks.
- Real-time user experiences and institutional responses during outages.

- The effectiveness of current security protocols during transaction failures.

This study attempts to bridge these gaps by analyzing primary data collected from users who experienced transaction failures and combining it with expert interviews to offer a comprehensive view of the risks and responses surrounding UPI crashes.

Research Problem

This study addresses several key problems related to the increasing frequency of UPI payment crashes in India. It seeks to identify the root causes behind these disruptions and analyses their impact on customer satisfaction and trust in digital payment systems. The research also examines the financial implications of such failures, including losses faced by both users and banking institutions due to failed or delayed transactions. Another critical issue is the effectiveness of existing grievance redressal mechanisms and institutional responses during outages. Finally, the study aims to explore potential improvements in technical infrastructure, regulatory frameworks, and user protection measures to enhance the overall resilience and reliability of the UPI ecosystem.

Objectives

1. Analyze the causes of UPI payment crashes.
2. Assess the impact of UPI failures on customer satisfaction.
3. Examine regulatory and security challenges linked to UPI failures.
4. To recommend strategies to mitigate risk and enhance UPI system resilience.

Methodology Research Design:

Quantitative Analysis**:** Surveys to measure consumer dissatisfaction and financial impact on consumers due to transaction error.

Qualitative Analysis**:** Case studies and expert interviews to explore regulatory challenges and security concerns.

Participants & Sample:

Consumers**:** A sample of 53 UPI users experiencing transaction failures, selected through stratified random sampling.

Data Collection

Primary Data**:** Online surveys and interviews with consumers, banking professionals, and fintech experts. Secondary Data**:** Reports from regulatory bodies, financial institutions, and prior research

studies.

Data Analysis:

Causal Statistics: To quantify consumer satisfaction and transaction failure rates.

Descriptive Statistics: Paired T test analysis to identify trends in banking losses and user dissatisfaction.

Thematic Analysis: To extract insights from qualitative interviews on regulatory and security issues.

Data Analysis Hypothesis Statement:

1. UPI Payment Failures & Customer Satisfaction

Null Hypothesis (H_0): UPI payment failures do not significantly impact customer satisfaction.

Alternative Hypothesis (H_1): UPI payment failures significantly impact customer satisfaction.

2. Security Vulnerabilities & Consumer Trust

Null Hypothesis (H_0): Security vulnerabilities in UPI transactions do not significantly affect consumer trust.

Alternative Hypothesis (H_1): Security vulnerabilities in UPI transactions significantly affect consumer trust.

3. Regulatory Measures & UPI Reliability

Null Hypothesis (H_0): Enhanced regulatory measures do not significantly improve UPI reliability.

Alternative Hypothesis (H_1): Enhanced regulatory measures significantly improve UPI reliability.

Findings:

As per survey conducted through online form on the sample size of 53 participants.

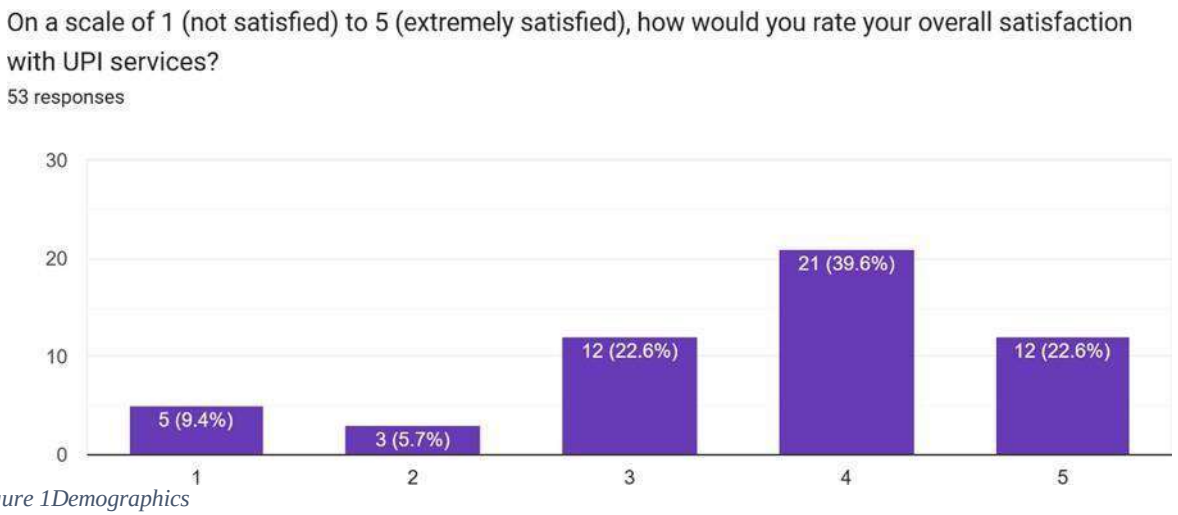

Figure 1Demographics

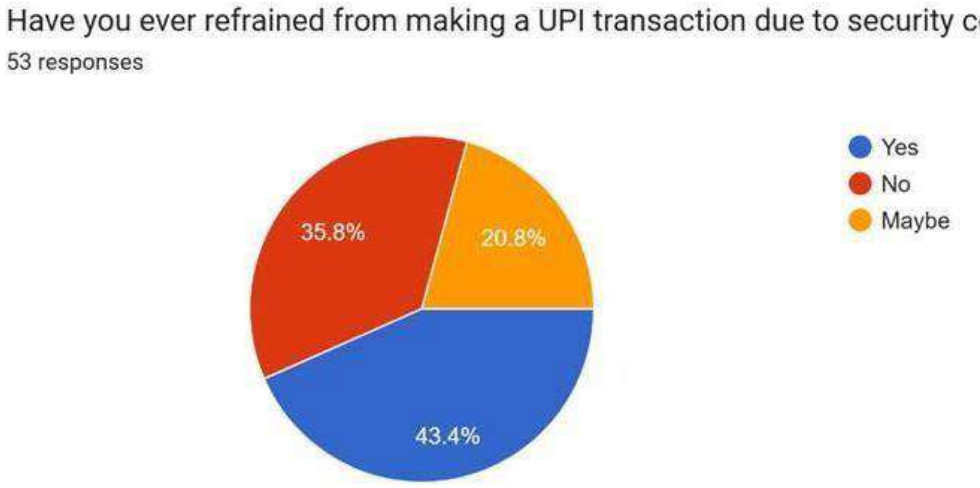

Figure 2Security concerns

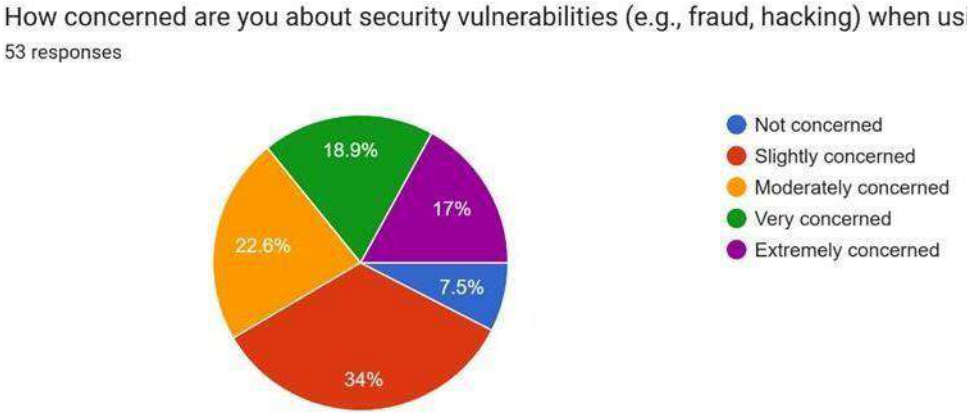

Figure 3perception on security

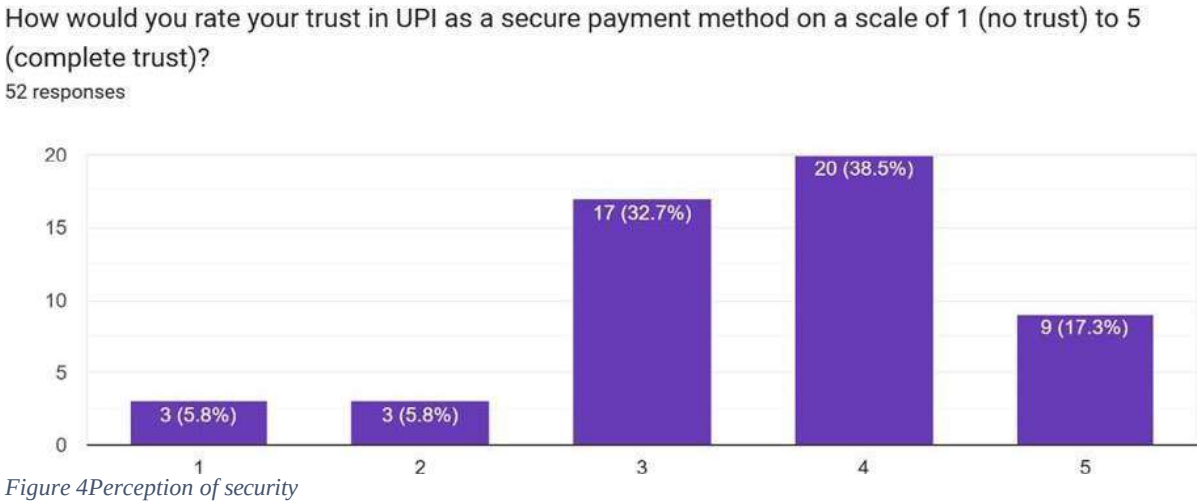

Figure 4Perception of security

Overview of data

Findings on UPI Inconveniences Faced by Customers

- Technical Glitches: Users reported frequent transaction failures, delayed payments, and app crashes, which disrupted smooth usage.
- Security Concerns: A significant number of respondents were worried about fraud, phishing, and lack of two-factor authentication.
- Network Dependency: Many users cited internet connectivity issues as a barrier to seamless UPI transactions, especially in rural or low-network areas.
- Lack of Awareness: Some users were unaware of features or safety practices, leading to underutilization and higher risk of errors or misuse. Customer Support Issues: Complaints included poor grievance redressal, with many users unsure how to report or resolve failed transactions.

Findings as per SPSS Statistics:

T Test

Paired Samples Test

d Differences							ificance	
n	Deviati	Error Mean	Confidence Interval of erence er	er			-Sided p	-Sided p
1 How concerned are you a rity vulnerabilities (e.g., fraud, hac using UPI? w would you rate your trust in UPI re payment method on a scale of 1) to 5 (complete trust)? 2	0		11	3	06			

2 On a scale of 1 (not effective) y effective), how effective do you be e regulatory measures are in ensuring bility of UPI transactions? - In your op ld regulatory measures be implemente ove UPI reliability?	7	9		3	1	1		1	1

Table 1Paired t test

Since In Pair 1 s Pair 2, Calculated Value of T Is Less Than Tabe Value, We Reject Null

Hypothesis and Accept Alternate Hypothesis.

Discussion

Interpretation of Results

The paired samples t-tests conducted in this study provide valuable insights into how UPI payment crashes, security concerns, and regulatory measures influence customer perceptions and experiences.

1. Security Vulnerabilities and Consumer Trust Pair 1:

- Test Variables: Concern about UPI security vulnerabilities vs. Trust in UPI as a secure platform
- Mean Difference: -0.682
- p-value (Two-Tailed): 0.003

The negative mean difference and statistically significant p-value ($p < 0.05$) indicate that higher concern about security issues (such as fraud or hacking) is associated with lower trust in UPI as a secure payment method. This finding leads us to reject the null hypothesis (H_0) and accept the alternative hypothesis (H_1):

Security vulnerabilities in UPI transactions significantly affect consumer trust.

This suggests that perceived security flaws play a critical role in shaping user trust, and addressing these concerns is essential to maintaining confidence in the platform.

2. Regulatory Measures and UPI Reliability Pair 2:

- Test Variables: Perceived effectiveness of current regulatory measures vs. Opinion on the need for regulation
- Mean Difference: 1.467
- p-value (Two-Tailed): <0.001

The large positive mean difference, combined with a very low p-value, shows a statistically significant gap between users' perception of current regulatory effectiveness and their belief in the necessity of stronger regulations. This implies that users do not view existing measures as adequate and strongly support the implementation of more robust regulatory frameworks to ensure the reliability of UPI. Thus, we reject the null hypothesis (H_0) and accept the alternative hypothesis (H_1):

Enhanced regulatory measures significantly improve UPI reliability.

1. High UPI Adoption Reflects Digital Shift

The data shows a significant shift towards UPI as a preferred mode of transaction due to its convenience, speed, and ease of use. This aligns with literature findings that highlight UPI's popularity among urban, younger demographics.

2. Customer Experience is Mixed

While many users report satisfaction with the functionality and accessibility of UPI apps, a sizable portion experience technical issues, especially related to transaction failures and app glitches, which reduce trust and reliability.

3. Security Remains a Key Concern

The fear of fraud, lack of awareness of security features, and insufficient support in case of issues highlight a trust gap in digital finance. This suggests the need for enhanced digital security education and protective features.

4. Awareness and Accessibility Barriers

The findings show that older users and people from low-connectivity areas face challenges in understanding and using UPI, indicating the need for broader digital inclusion efforts.

5. Underutilization Despite Availability

Although UPI is widely available, many users still rely on it for basic transactions only, avoiding more complex features like recurring payments, bill splitting, or linking multiple accounts. This reflects a superficial level of adoption.

These findings collectively highlight that UPI system crashes and vulnerabilities are not just technical glitches—they directly affect consumer sentiment, trust, and satisfaction. Users are increasingly aware of the risks and demand better protection and oversight.

Conclusion

The rapid adoption of the Unified Payments Interface (UPI) in India has undeniably revolutionized

the digital payments landscape, offering ease of use and real-time convenience. However, this study highlights that the increasing reliance on UPI also brings with it critical challenges—particularly system crashes, security vulnerabilities, and insufficient regulatory safeguards—that have a direct impact on user experience and financial stability.

The hypothesis testing conducted through paired sample t-tests provides strong empirical evidence supporting the significant influence of these issues on consumer sentiment. Results indicate that users who express high concern about security vulnerabilities tend to exhibit lower levels of trust in UPI, demonstrating the importance of addressing fraud risks and system weaknesses. Additionally, the gap between the perceived effectiveness of current regulatory measures and the strong public demand for better oversight underscores the need for more stringent and responsive frameworks.

Overall, the study concludes that UPI failures not only lead to technical disruptions but also contribute to declining customer satisfaction and institutional financial risks. To sustain the platform's growth and reliability, coordinated efforts from fintech developers, banks, and regulators are essential. These should focus on strengthening system resilience, improving transparency during failures, and building a robust support and grievance redressal mechanism for users.

Recommendations:

a. Enhance System Infrastructure and Load Capacity- UPI platforms should invest in upgrading their technical infrastructure to handle peak transaction loads, reduce downtime, and minimize the chances of system crashes. Redundancy and real-time monitoring systems can further help in identifying and addressing failures proactively.

b. Strengthen Security Protocols -To address growing concerns around fraud and hacking, UPI platforms must adopt advanced security measures such as end-to-end encryption, biometric verification, AI- based fraud detection, and two-factor authentication to improve trust and reduce risks.

c. Implement Transparent Outage Reporting -Just as financial markets and telecom services report service outages, UPI platforms and banks should disclose real-time status updates during system failures. This will help manage user expectations and avoid confusion during service disruptions.

d. Develop a Unified Grievance Redressal System -A centralized, transparent, and time-bound grievance redressed mechanism involving banks, third-party apps, and the NPCI can improve customer satisfaction and accountability in the event of failed or delayed transactions.

e. Introduce Regulatory Oversight and Penalties -Regulatory bodies like the RBI should consider implementing stricter compliance standards for UPI service providers, along with penalties for frequent or prolonged outages, to ensure reliability and performance accountability.

f. Educate Users on Safe Practices -Public awareness campaigns can help users understand how to safely use UPI services, recognize potential fraud attempts, and take precautionary actions during transaction failures or technical downtimes.

g. Encourage Cross-Platform Compatibility Testing -Given the diversity of UPI apps and banking systems, regular interoperability testing can help identify compatibility issues and improve the seamless functioning of transactions across platforms.

h. Promote Research and Data Transparency - Future academic and industry research should be encouraged to study transaction data, user behaviour, and system performance. Increased data transparency will help stakeholders make informed decisions for system improvements.

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Enhancing AI and Machine Learning Transparency in Financial Risk Management

***Naina Tare, *Vanshika Trivedi, *Pragati Upadhyay, *Bhagyashree Vaidya * Pooja Waghmare, **Mr. Rahul Mehta**

Abstract

The growing use of artificial intelligence (AI) in financial decision-making calls for a better comprehension of perceived utility, public trust, and biases related to these technologies. This study explores how people's perceptions of the usefulness of AI in risk management and their level of trust in AI-driven financial systems are influenced by their educational background, specifically their exposure to AI or finance coursework. Out of 55 participants, 26 of whom gave valid answers for core analyses, a survey-based quantitative approach was employed. SPSS was used to perform chi-square tests, ANOVA, and independent samples t-tests.

Although these differences were not statistically significant, the results indicated that respondents with AI or finance education had greater confidence in AI decisions and gave it a higher rating for its value in financial risk management. Awareness of bias in AI was found to be significantly correlated with having studied AI/finance, indicating that education improves critical assessment of AI systems. Regarding the perception of usefulness, no discernible variations were observed between age groups or educational levels.

Keywords: Trust in AI, Financial Risk Management, Perceived Usefulness, Algorithmic Bias, AI Literacy, User Perception, Human-AI Interaction.

Introduction

With uses ranging from algorithmic trading and fraud detection to credit scoring and portfolio management, artificial intelligence (AI) is drastically changing the financial services industry. AI-driven models are being used by financial institutions more and more to manage risk, make better decisions, and increase productivity.

Student, Thakur Institute of Management Studies and Research

****Assistant Professor, Thakur Institute of Management Studies and Research***

While these systems offer speed and predictive capabilities beyond human capacity, they also raise critical questions regarding transparency, trust, fairness, and accountability.
The public must have faith in the integration of AI in high-stakes settings like finance, where choices can have substantial real-world repercussions. For these systems to be implemented effectively, as well as for ethical alignment and regulatory compliance, trust is necessary. At the same time, understanding and perception of AI among users, clients, and stakeholders vary significantly based on factors such as education, prior exposure, age, and familiarity with financial or technological systems.

Literature Review

The integration of Artificial Intelligence (AI) into financial decision-making has garnered increasing scholarly attention, particularly concerning its perceived utility, trustworthiness, and inherent biases. Researchers such as *Davenport and Ronanki (2018)* emphasized the transformative potential of AI in automating risk assessment, fraud detection, and personalized financial advising. However, the acceptance and effectiveness of these systems often depend on public trust and the user's understanding of AI's capabilities and limitations (*Dietvorst, Simmons, & Massey, 2015*). Trust in AI systems, especially in high-stakes domains like finance, is complex and influenced by transparency, perceived accuracy, and familiarity with the technology (*Glikson & Woolley, 2020*).

Education plays a pivotal role in shaping these perceptions. *Longoni, Bonezzi, and Morewedge (2019)* found that individuals with a background in technology or finance were more likely to trust algorithmic decisions over human judgments, particularly when the stakes involved quantitative assessments like financial risks. Similarly, exposure to AI concepts was associated with a more nuanced understanding of algorithmic bias and limitations (*Binns et al., 2018*), suggesting that domain-specific education enhances both trust and critical thinking. While perceived usefulness is often linked to actual interaction with AI systems (*Venkatesh & Davis, 2000*), studies have shown mixed results regarding the impact of demographic factors like age or general education level on such perceptions (*Shin, 2021*).

Thus, the current literature points to a growing need to explore how formal education—particularly in AI and finance—affects individuals' evaluations of AI in financial contexts. This includes their trust in AI-generated decisions, perceived value of AI in risk management, and awareness of potential algorithmic biases.

Research Problem: Little empirical data exists regarding how users—particularly those without technical backgrounds—perceive AI in financial decision-making and whether or not exposure to AI or finance in school influences that perception.

Objectives:

1. To gauge public confidence in financial decisions made by AI.
2. To examine perceived usefulness of AI in risk management.
3. To explore awareness of bias in AI systems.
4. To identify the influence of demographic and educational factors.

Methodology

Research Design: A quantitative, cross-sectional survey design is used in this investigation.

Methods of Data Collection: A structured online questionnaire comprising demographic questions and Likert-scale items was distributed.

Participants/Sample: A total of 26 complete cases were analyzed from a total of 55 responses. The participants' ages, educational backgrounds, and past exposure to finance or AI varied.

Data Analysis: SPSS was used to analyze the data. To investigate relationships between variables, descriptive statistics, independent t-tests, one-way ANOVA, and chi-square tests were employed. To determine the findings' practical significance, effect sizes were computed.

T-Test

Null Hypothesis (H_0): There is no difference in trust in AI-based financial decisions between individuals who have studied AI/finance and those who have not.

Alternative Hypothesis (H_1): Individuals who have studied AI or finance exhibit greater trust in AI-based financial decisions than those who have not.

Independent Samples Test											
		Levene's Test for Equality of Variances		t-test for Equality of Means							
						Significance				95% Confidence Interval of the Difference	
		F	Sig.	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
1. How much do you trust AI-based financial decisions?	Equal variances assumed	.027	.872	-1.138	24	.133	.267	-.528	.464	-1.485	.430
	Equal variances not assumed			-1.096	12.410	.147	.294	-.528	.482	-1.574	.518

Table 1 Paired t test

A. Trust in AI-Based Financial Decisions

Respondents who had studied AI or finance (Mean = 2.22, SD = 1.06) reported slightly **higher trust** in AI-based financial decisions than those who had not (Mean = 2.75, SD = 1.17).

However, this difference was **not statistically significant** (t(24) = -1.138, p = .267).

Effect size (Cohen's d = -0.483) suggests a moderate trend worth further exploration.

Null Hypothesis (H_0): There is no difference in perceived usefulness of AI in risk management between individuals who have studied AI/finance and those who have not.

Alternative Hypothesis (H_1): Individuals with AI/finance education perceive AI as more useful in risk management than those without such education.

Oneway Anova

ANOVA					
1. Rate the usefulness of AI in financial risk management (1 = Not useful, 5 = Extremely useful).					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.750	2	.375	.290	.751
Within Groups	29.750	23	1.293		
Total	30.500	25			

Table 2 One Way Anowa

B. Perceived Usefulness of AI in Risk Management

Those with AI/finance coursework perceived AI as **more useful** (Mean = 3.72) than those without (Mean = 3.00).

The result was **not statistically significant** ($t(24) = 1.585$, $p = .126$), but the **effect size (Cohen's d = 0.673)** indicates a substantial difference in perceptions.

The overall average usefulness rating was **3.50 out of 5**, with the most common responses being 3 (neutral) and 4 (moderately useful).

Null Hypothesis (H_0): There is no association between studying AI/finance and awareness of bias in AI-driven decisions.

Alternative Hypothesis (H_1): Studying AI or finance is associated with higher awareness of bias in AI-driven decisions.

Crosstabs

Chi-Square Tests					
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.970[a]	1	.046		
Continuity Correction[b]	2.390	1	.122		
Likelihood Ratio	3.887	1	.049		
Fisher's Exact Test				.078	.063
Linear-by-Linear Association	3.817	1	.051		
N of Valid Cases	26				
a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 2.77.					
b. Computed only for a 2x2 table					

Table 3 Chi-Square Test

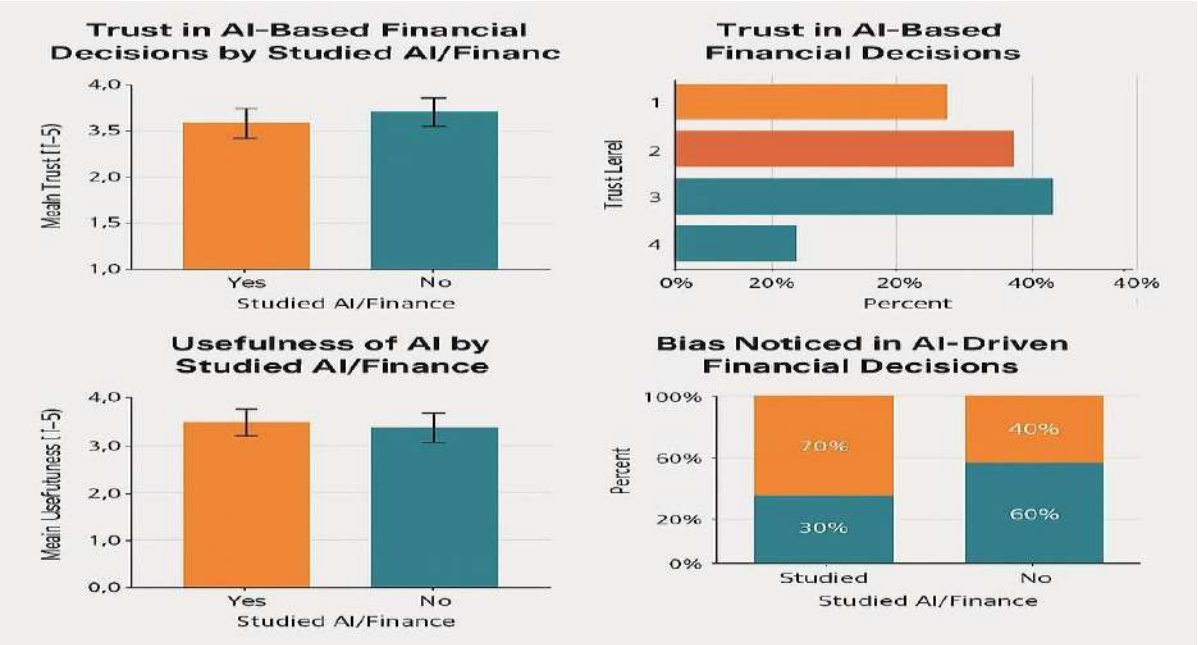
C. Awareness of Bias in AI

A **statistically significant association** was found between having studied AI/finance and the likelihood of noticing bias in AI-driven decisions ($\chi^2(1) = 3.970$, $p = .046$).

77.8% of those who studied AI/finance reported noticing bias.

Only **37.5%** of those without such study reported noticing bias.

This suggests that exposure to AI/finance education enhances critical evaluation of AI systems.



Analysis of Survey Responses on AI in Financial Risk Management

Objective

The purpose of this study was to assess perceptions regarding the trustworthiness, usefulness, and fairness of AI-based financial decision-making systems. Additionally, the study aimed to evaluate how factors such as prior study of AI/finance, education level, and age group influence these perceptions.

Key Findings

Summary

While most findings were not statistically significant, the effect sizes and observed trends highlight meaningful patterns:

Education and exposure to AI/finance appear to increase trust, perceived usefulness, and awareness of bias in AI systems.

A large percentage of respondents remain neutral or skeptical about AI's role in financial decision-making.

Bias awareness is higher among those with AI/finance knowledge, indicating a potential gap in digital literacy among the general population.

Recommendations

Promote AI literacy in financial education programs to enhance trust and critical evaluation. Further studies with larger samples are needed to confirm the trends observed. Consider qualitative methods (e.g., interviews) to explore why people trust or distrust AI systems.

According to the analysis, there was a moderate trend showing that people who had previously studied finance or artificial intelligence (AI) were more likely to trust and value AI-based financial decisions. However, due to the small sample size (N=26), these results were not statistically significant at the 95% confidence level.

Notably, a strong correlation was discovered between knowledge of bias in AI-driven decisions and AI/finance education ($\chi^2(1) = 3.970$, $p = .046$), indicating that education broadens one's critical outlook on the moral implications of AI systems.

Additionally, perceptions did not differ significantly by age group or educational attainment, although trends suggest that education may have a moderate relationship with AI trust ($p = .055$)This implies that domain-specific knowledge has a greater impact on perception and trust than do general demographics.

Implications

Implications for Teachers: Finance and AI courses could raise students' knowledge of AI ethics and real-world uses.

For Financial Institutions: Gaining the trust of users, particularly those without technical expertise, requires open and honest communication of AI procedures.

For those in charge of policy: The findings back up the inclusion of AI literacy programs in larger digital education plans to build public confidence and understanding.

Conclusion

Summary of Findings

This study investigated whether demographic characteristics or educational exposure have an impact on people's perceptions of and trust in AI in financial decision-making. The findings imply:

A moderate, non-significant trend that associates increased perceived utility and trust in AI

with finance education.

Astrong correlation between being more likely to detect bias in AI systems and having studied AI/finance.

There is no compelling evidence that perceptions of AI's usefulness or trust are influenced by age or overall educational attainment.

Relevance of the Research

This study adds to the expanding corpus of research on the interaction between humans and AI in finance. The results underscore the significance of AI literacy in augmenting trust and critical awareness of possible algorithmic bias by pointing to the influence of education on perception.

Ideas for Upcoming Studies

These trends should be confirmed with larger and more varied samples.

Deeper understanding of the factors influencing trust or mistrust in AI systems may be possible through qualitative interviews.

Future research may also look into how AI tools and platforms affect actual financial behavior.

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The Impact of Quick Commerce on Consumer Buying Behavior and Local Retail Businesses

***Chaitali Pawar, *Priyam Salvi, *Pratiksha Sawant, *Diksha Singh, *Namrata Singh**

****Dr. Ramkrishna Dikkatwar**

Abstract

This study explores the impact of quick commerce on consumer buying behaviour and local retail businesses. As ultra-fast delivery services gain popularity through platforms like Zepto and Blinkit, understanding the factors that influence consumer trust becomes increasingly important. The research focuses on two key aspects—delivery reliability and product quality—and investigates how these elements shape consumer perceptions and satisfaction. A descriptive research design was adopted, and data was collected using a structured questionnaire distributed through convenience sampling. The responses were analysed using SPSS, applying statistical methods such as paired sample t-tests and ANOVA to evaluate the proposed hypotheses. The findings indicate that both delivery reliability and product quality significantly affect consumer trust in quick commerce services. Consumers are more likely to remain loyal to platforms that provide timely deliveries and maintain high standards for products. The study concludes that while speed and convenience are central to the appeal of quick commerce, long-term success in this domain depends on consistency and quality. Additionally, the growth of this model presents broader challenges for traditional retail and urban infrastructure, calling for thoughtful strategic planning and policy consideration.

Keywords: Quick Commerce, Supply chain, Consumer Buying Behaviour, Strategic Planning

Introduction

Quick commerce (Q-commerce) has rapidly transformed the retail landscape by offering ultra-fast delivery services for groceries and daily essentials, often within 10 to 30 minutes. Enabled by hyperlocal fulfilment centres and app-based platforms such as Zepto, Blinkit, and Instamart, this model caters to modern consumers' demand for speed and convenience. While Q-commerce has enhanced the customer experience with its focus on efficiency and immediacy, it also raises questions about sustainability, service quality, and its effect on traditional brick-and-mortar retailers.

***Student, Thakur Institute of Management Studies and Research, Mumbai**
****Professor, Thakur Institute of Management Studies and Research, Mumbai**

Literature review

Dark Store - A Fresh Mushrooming Concept of Delivery at Door-Step:

The concept of dark stores has emerged prominently in discussions of e-commerce logistics, especially regarding last-mile delivery. These are non-customer-facing retail spaces optimized for fulfilling online orders. Studies have shown that they significantly enhance order processing speed and accuracy, making them essential to meeting modern consumer expectations in fast-paced urban environments. Their strategic placement enables quicker deliveries, especially in high-demand zones, thus offering a competitive edge to online retailers.

Challenges of Dark Stores and Urban Planning: A Case Study of B-Mart, Seoul

Research into online grocery shopping has surged, particularly post-COVID-19, highlighting a shift in consumer preferences. Dark stores have been recognized as pivotal in this transition due to their role in streamlining supply chain operations. By decoupling physical retail from fulfilment, they allow for higher efficiency, reduced stockouts, and better resource allocation. Scholars have emphasized their ability to reduce bottlenecks in grocery logistics and improve order reliability.

10-Minute Delivery! Can Zepto’s Dark Store Business Model Sustain in India?

Several studies underline that convenience and speed are primary drivers of customer satisfaction in online shopping. Dark stores directly support these factors by enabling faster order picking and dispatching. Academic work has shown that consumers are more likely to return to platforms that offer seamless, speedy deliveries—making dark store logistics a crucial element of customer retention strategies in q-commerce.

Dark Store E-Commerce Website using Sentiment Analysis Prediction:

Literature covering urban planning principles has begun to integrate analysis of logistics operations, especially the impact of dark stores on urban infrastructure. Researchers explore how these stores interact with urban land use, traffic patterns, and zoning laws. There’s an increasing need to understand how logistics-focused facilities, which operate round-the-clock, coexist with residential and commercial zones, often leading to policy debates.

Dark Store Expansion: Ultrafast Logistics for Q-Commerce:

Academic interest has grown in evaluating the rise of fast delivery models like q-commerce and their impact on urban economies. These models depend heavily on logistics innovations

such as micro-fulfilment centres and dark stores. Studies suggest that while they generate employment and consumer convenience, they also strain traditional retailers and contribute to environmental and regulatory concerns in city landscapes.

Dark Store Network:

The COVID-19 pandemic significantly accelerated the growth of Q-commerce (quick commerce), characterized by ultra-fast delivery services within 10–30 minutes. This shift was fuelled by restrictions on physical mobility and the surge in online shopping. Platforms like Zepto, Blinkit, and Instamart in India became prominent players, adapting dark store models to meet high demand. According to Deloitte (2022), the rapid growth of Q-commerce challenged traditional retail by shifting customer expectations toward immediacy and convenience. Traditional retailers struggled to match these service levels without overhauling their logistics infrastructure. McKinsey (2021) notes that logistics networks had to transition to micro-fulfilment centres, real-time inventory management, and localized delivery hubs to stay competitive.

Zepto’s Dark Store Revolution: The Backbone of Ultra-Fast Deliveries:

Globally, dark stores have become a cornerstone of rapid delivery services. These are essentially non-customer-facing fulfilment centres designed for quick order picking and dispatching. Companies like Tesco and Ocado in the UK, and Go Puff in the US, have successfully implemented dark store strategies to support instant deliveries. Euromonitor (2021) emphasizes that these stores allow for better inventory control, reduced fulfilment time, and lower last-mile costs. Moreover, they use predictive analytics to manage SKUs efficiently, optimizing space and labour. PwC (2022) highlights that customer satisfaction hinges on delivery speed, order accuracy, and real-time tracking—capabilities best enabled through dark store logistics.

Quick Commerce Dark Stores Poised to Boost India’s Real Estate Demand:

Quick commerce in India has grown rapidly, especially since 2021. With increasing demand for groceries, essentials, and convenience items, companies have converted small urban properties into dark stores. These spaces are strategically placed within densely populated areas to ensure fast delivery coverage. According to Knight Frank (2022), this shift is altering urban real estate dynamics. Small-format retail spaces that previously held limited value are now

being leased at premium prices for use as micro-warehouses. While this benefits landlords and service providers, it also creates challenges related to zoning, noise, and increased delivery traffic, especially in residential areas. JLL India (2023) points out that cities may need to revise zoning laws to accommodate this emerging retail format.

What is a Dark Store? Future of Grocery Dark Stores in India:

Before the pandemic, dark stores in India were limited and largely experimental, catering mostly to grocery startups. However, COVID-19 changed consumer behaviour permanently, with more people opting for online purchases even for daily needs. This led to an exponential increase in dark store deployment. Red seer Consulting (2023) reported that dark stores improved last-mile logistics by cutting delivery times and operational costs by up to 30%. They also enabled hyper-local delivery models that allowed companies to serve dense urban areas effectively. Logistics players had to innovate by integrating route optimization tools, real-time order tracking, and automated warehouse systems to meet these evolving demands.

Dark Stores viewed through Institutional Theory:

Institutional theory posits that organizational behaviours are shaped by cultural, regulatory, and normative pressures. The evolution of dark stores globally illustrates how different institutional environments lead to varied models of adoption.

Research Problem

Despite its convenience, quick commerce faces growing scrutiny regarding its long-term impact on consumer trust and urban retail ecosystems. Concerns around inconsistent delivery performance, variable product quality, and the decline of small local businesses have emerged as important areas of investigation. This study aims to explore whether the promises of quick commerce are supported by reliable service and trustworthy product experiences, and how this influences consumer behaviour.

Objectives

1. To examine how quick commerce influences consumer shopping behaviour.
2. To assess the role of delivery reliability and product quality in shaping consumer trust.
3. To understand the operational and logistical challenges of quick commerce.
4. To evaluate its impact on traditional retail businesses and urban infrastructure.

Methodology

Research Design:

The present study employs a descriptive research design, which is appropriate for obtaining a systematic and factual understanding of the issue under investigation. This design enables the researcher to gather quantifiable information to statistically describe characteristics of the population or phenomenon being studied. Since the study focuses on collecting primary data through standardized instruments and aims to identify patterns, attitudes, and behaviours, a descriptive design was considered most suitable.

Data Collection Methods:

The study relies primarily on primary data collected using a structured questionnaire. The questionnaire was developed based on existing literature and tailored to meet the objectives of the research. It comprised both closed-ended questions and Likert scale items to facilitate statistical analysis. The questionnaire was administered digitally via Google Forms, ensuring ease of access for respondents and efficiency in data compilation. Prior to full deployment, the questionnaire was pilot tested with a small group of participants to ensure clarity, relevance, and reliability. secondary data from websites was referred to during the literature review phase to support the theoretical foundation of the study.

Sample:

The sampling method used for this study was convenience sampling, due to time and logistical limitations. The target population consisted primarily of students as they were accessible and relevant to the subject matter. A total of 100 valid responses were collected. This sample was diverse in terms of age, gender, and academic standing, ensuring a reasonably representative cross-section of the student body.

Data Analysis:

The data was processed and analysed using IBM SPSS Statistics in two main stages:

Descriptive Statistics: Used to summarize respondent demographics and key variables through frequencies, means, percentages, and standard deviations.

Inferential Statistics: Included t-tests, ANOVA, to explore relationships and differences between variables based on research questions and hypotheses.

Consumer Trust& Delivery Reliability:

To assess whether there is a significant difference in consumer trust regarding the quality of products offered by retail stores and quick commerce platforms**,** a paired sample t-test was conducted. Respondents rated their trust levels on a Likert scale, and scores were compared across both shopping channels.

H_0: Consumer trust in quick commerce services is not significantly influenced by delivery reliability.

H_1: Consumer trust in quick commerce services is significantly influenced by delivery reliability.

Paired Samples Test

		Paired Differences					t	df	Significance	
					95% Confidence Interval of the Difference					
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			One-Sided p	Two-Sided p
Pair 1	Consumer trust and delivery reliabilty	.260	.949	.095	.072	.448	2.738	99	.004	.007

Table 1Paired sample t test

From the paired sample t-test:

- t(99) = 2.738
- p = 0.007
- t critical (two-tailed, $\alpha = 0.05$) = ±1.984

Since the p-value (0.007) < 0.05 and the t-value (2.738) > t critical (1.984), we reject the null hypothesis.

The results indicate a statistically significant effect of delivery reliability on consumer trust in quick commerce services**.** Therefore, we reject the null hypothesis and accept the alternative hypothesis. This means that delivery reliability plays a significant role in shaping consumer trust within the quick commerce domain.

Consumer Trust & Product Quality:

H_0: Consumer trust in quick commerce services is not significantly influenced by product quality.

H_1: Consumer trust in quick commerce services is significantly influenced by product quality.

ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Rows	134.358	99	1.357152	3.08104	2.59E-15	1.284607
Columns	5.168	4	1.292	2.933132	0.020665	2.394476
Error	174.432	396	0.440485			
Total	313.958	499				

Table 2ANOVA

From the ANOVA table:

- F (4, 396) = 2.933,
- p = 0.0207,
- F critical = 2.394.

Since the p-value (0.0207) < 0.05 and the F-value (2.933) > F critical (2.394), we reject the null hypothesis.

Therefore, Consumer trust in quick commerce services is significantly influenced by product quality.

The results indicate a statistically significant effect of product quality on consumer trust in quick commerce services**.** Therefore, we reject the null hypothesis and accept the alternative hypothesis. This means that product quality plays a significant role in shaping consumer trust within the quick commerce domain.

Interpretation of Results:

The findings of this study provide statistically significant evidence that delivery reliability and product quality are both critical factors in shaping consumer trust in quick commerce services.

The paired sample t-test revealed a significant difference in trust scores based on delivery reliability ($t(99) = 2.738$, $p = 0.007$), indicating that consumers perceive reliable delivery as a key contributor to their overall trust in the service. Similarly, the ANOVA analysis showed a statistically significant effect of product quality on consumer trust ($F(4, 396) = 2.933$, $p =$

0.0207), suggesting that variations in product quality meaningfully influence how consumers evaluate and engage with quick commerce platforms.

These results highlight that while the convenience and speed of quick commerce are foundational to its appeal, the consistency and integrity of the delivery experience and the perceived quality of products remain pivotal in earning and retaining consumer trust.

Implications for Quick Commerce Businesses:

The implications of these findings are multi-faceted:

1. Operational Strategy: Quick commerce companies must prioritize investments in logistics infrastructure to ensure timely and accurate deliveries. Any inconsistency in delivery performance could directly undermine consumer trust and impact customer retention.
2. Product Quality Assurance: Maintaining high-quality standards for inventory, especially for perishables or branded goods, is essential. Consumers expect products that match online descriptions and are in good condition upon arrival. Establishing strong supplier partnerships and quality control measures will help in delivering on these expectations.
3. Customer Experience Management: Platforms should leverage real-time delivery tracking, predictive inventory systems, and customer feedback loops to improve both product quality and delivery reliability. Transparency in operations builds trust and strengthens brand loyalty.
4. Policy and Urban Planning: As dark stores expand in urban areas, municipal regulators and businesses must collaborate to develop zoning strategies and traffic solutions that balance commercial growth with urban sustainability. Addressing concerns related to congestion and residential disruption can support long-term scalability of quick commerce.
5. Strategic Differentiation: In a highly competitive market, trust driven by reliable delivery and quality assurance can become a key differentiator. Marketing strategies that communicate these strengths may effectively attract and retain consumers in the quick commerce space.

Conclusion

This study explored the growing influence of quick commerce and dark stores on consumer buying behaviour and the local retail ecosystem. Through an in-depth analysis of consumer perceptions, it was found that delivery reliability and product quality play a crucial role in shaping consumer trust in quick commerce services.

The findings indicate that while speed and convenience are core strengths of the quick commerce model, these alone are not sufficient to sustain consumer confidence. Trust is built when services consistently deliver products on time and ensure that the quality of goods meets or exceeds customer expectations.

Additionally, the rise of dark stores presents broader implications for urban planning and traditional retail. Their integration into densely populated areas requires thoughtful consideration of zoning, traffic management, and the economic balance between digital and physical retail formats.

In conclusion, the success of quick commerce platforms depends not only on operational efficiency but also on their ability to foster trust through reliable delivery and high product standards. By prioritizing these factors, businesses can enhance customer satisfaction, encourage repeat usage, and maintain a competitive edge in an evolving digital marketplace.

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Faster Deliveries, Faster Decisions- Analysing the Q-Commerce Effect on Consumers

***Tejas Patil, *Amrendra Pushkar,*Nitish Rane, *Shubham Rewale,*Omkar Shinde,**

****Mr. Mahendra Daima**

Abstract

This study explores the behavioural impact of delivery speed on consumer decision-making within India's fast-growing quick commerce (Q-commerce) sector. With platforms such as Blinkit, Zepto, and Swiggy Instamart redefining retail norms through ultra-fast delivery models, the research investigates whether such speed influences two key consumer behaviours: order frequency and impulse buying. A quantitative, descriptive research design was employed, involving primary data collection from 92 Indian respondents via a structured online survey. The data was analysed using Chi-Square tests of independence to assess the relationship between delivery speed and behavioural outcomes. Findings indicate no statistically significant relationship between delivery speed and the frequency of monthly orders, nor between delivery speed and the likelihood of impulse buying. While Q-commerce platforms are clearly growing in popularity and are viewed positively in terms of convenience and quality, faster delivery alone does not appear to be a strong determinant of increased consumer activity. These results highlight the complexity of consumer motivations in digital retail and suggest that Q-commerce platforms may need to look beyond speed to influence purchasing behaviour—focusing instead on value, sustainability, and user experience. The study contributes to the evolving discourse on digital consumption in emerging markets and sets the stage for further research into psychological and contextual drivers of behaviour in Q-commerce.

Keywords: Q-commerce, Delivery Speed, Impulse Buying, Consumer Behaviour, Quick Commerce India, Order Frequency, Digital Retail, E-commerce, Sustainability

Introduction

India's digital commerce sector is undergoing a rapid transformation, propelled by a unique confluence of factors: widespread internet penetration, growing smartphone usage, an expanding urban middle class, and a young, tech-savvy consumer base. At the heart of this transformation is the emergence of Quick Commerce (Q-commerce)—a new-age retail model that promises ultra-fast

**** Student, Thakur Institute of Management Studies and Research.***

*****Asst.Prof, Thakur Institute of Management Studies and Research.***

delivery of products, typically within 10 to 30 minutes. Unlike conventional e-commerce, which focuses on scheduled deliveries over one or more days, Q-commerce aims to fulfil consumer needs instantly, leveraging hyperlocal logistics infrastructure, dark stores (small local warehouses), and optimized last-mile delivery networks.

The Q-commerce sector in India has seen a meteoric rise over the last few years. Platforms like Zepto, Blinkit (formerly Grofers), Swiggy Instamart, have rapidly gained traction, particularly in metropolitan and Tier-1 cities. These platforms offer consumers access to essential goods such as groceries, personal care items, OTC medicines, and household staples—all delivered within minutes. The growth of Q-commerce has been further accelerated by shifting consumer preferences during and after the COVID-19 pandemic, which heightened the demand for contactless, rapid delivery services. With investors pouring capital into these ventures and major players expanding aggressively, Q-commerce is poised to redefine how urban Indians shop for daily necessities.

However, the rise of Q-commerce is not just a logistical innovation—it also represents a profound shift in consumer behaviour and expectations. The availability of goods on-demand has fundamentally altered how Indian consumers think about shopping. The traditional pattern of creating a shopping list and planning purchases—whether weekly grocery runs or monthly household stocking—has started to give way to more fragmented, spontaneous, and need-based ordering. This shift is especially pronounced among urban youth, working professionals, and nuclear families, who prioritize speed and convenience over bulk buying and planning.

Amid this rapid evolution, a key question arises: how is the promise of faster delivery impacting consumer decision-making? Specifically, this study seeks to investigate two crucial behavioural outcomes in the Indian context:

1. Whether faster delivery speeds encourage consumers to place more frequent orders over a given period.
2. Whether the speed of Q-commerce delivery increases the likelihood of impulse buying, where purchases are made without pre-planning, driven by emotion, convenience, or momentary desire.

This line of inquiry is especially important in India, where retail shopping behaviour has traditionally been shaped by frugality, planning, and value-seeking. However, the arrival of instant delivery services may be disrupting these patterns, nudging consumers toward more spontaneous, fragmented, and emotionally driven shopping behaviours. While international literature has examined various aspects of impulse buying and online purchase frequency, the

Indian Q-commerce ecosystem remains under-researched, particularly in terms of how delivery speed as a variable influences behaviour in a digital, hyper-convenient environment.

This forms the basis of the research problem addressed in this study:

To what extent does delivery speed in India's quick commerce sector influence consumer purchase behaviour—specifically, the number of orders placed and the tendency toward impulse buying?

In light of this, the objectives of the study are as follows:

1. To assess the relationship between delivery speed and the frequency of monthly orders placed by Indian consumers using Q-commerce platforms.
2. To examine the effect of delivery speed on impulse buying behaviour, by exploring whether faster delivery windows trigger more unplanned purchases in the Indian market.

India presents a particularly compelling context for this study due to its diversity in consumer behaviour, socio-economic classification, and urban density. Unlike Western markets where Q-commerce may be more niche or focused on luxury convenience, in India it is rapidly becoming mainstream, especially in urban centers like Mumbai, Delhi, Bengaluru, and Hyderabad. The Indian consumer's relationship with retail is complex—shaped by cultural values of thrift and necessity, yet increasingly influenced by digital lifestyle habits, aspirational consumption, and a growing preference for instant satisfaction.

From a theoretical standpoint, this study draws upon established concepts in consumer psychology and behavioural economics. The notion of impulse buying—defined as spontaneous, unreflective purchases made without premeditation—has long been linked to situational stimuli such as promotional offers, product visibility, and emotional state. However, time-based stimuli, particularly the promise of ultra-fast delivery, remain relatively underexplored. Q-commerce shortens the decision-to-delivery cycle to mere minutes, potentially reducing the space for rational deliberation and increasing the appeal of impulsive behaviour. Similarly, from a behavioural economics lens, lowering the perceived cost of time and effort may lead consumers to place more frequent, low-involvement orders.

On a practical level, understanding the influence of delivery speed on consumer behaviour has significant implications for Q-commerce players operating in India. If faster delivery is found to drive more frequent purchases and higher impulsivity, it could inform app design (e.g., push notifications for time-bound deals), marketing strategies (e.g., flash sales or urgency cues), and logistics planning (e.g., optimizing dark store locations for peak hours). Conversely, if speed has little impact on behaviour, firms may need to reconsider how they allocate resources to faster delivery versus other value propositions such as pricing, assortment, or loyalty programs.

Moreover, the research opens up critical discussions on responsible consumption. While Q-commerce offers unmatched convenience, it also raises concerns about sustainability, overconsumption, and consumer dependency. A culture of instant gratification, if left unchecked, could lead to unhealthy shopping patterns and increased environmental strain due to frequent small deliveries and high operational costs. By examining the behavioural impact of Q-commerce, this study contributes not only to academic discourse and business strategy but also to policy conversations around sustainable digital retail.

In summary, this research aims to uncover the behavioural underpinnings of India's growing quick commerce phenomenon. By empirically analysing how delivery speed affects order frequency and impulse buying in the Indian consumer market, the study seeks to offer new insights into the intersection of logistics, psychology, and digital consumption. As India continues to be one of the most dynamic markets for retail innovation, understanding these behavioural dynamics will be critical for shaping the future of commerce in the country.

Literature Review

Quick commerce (q-commerce) has emerged as a transformative force in the retail and e-commerce sectors, driven by shifting consumer expectations around convenience, speed, and accessibility. Studies by Ranjekar and Roy (2022) and Schorung (2021) emphasize that the growth of q-commerce in India and globally is heavily influenced by consumer demand for rapid delivery of daily essentials and unplanned purchases. This demand has led to the rise of various business models, including inventory-led, hyper-local, multi-vendor, and omnichannel strategies, supported by dark stores and last-mile logistics as crucial infrastructure.

Omnichannel retailing is increasingly seen as a strategic response to the challenges of q-commerce. De Boer et al. (2021) highlight that while q-commerce may not replace traditional e-commerce, it is a lasting shift, demanding operational adaptation by existing players. Similarly, Harsha et al. (2021) and Chen et al. (2020) underline the importance of inventory optimization and dynamic assortment planning to maintain profitability and consumer satisfaction in a time-sensitive retail model.

Technological advancements, particularly in AI, IoT, and real-time inventory management, play a critical role in enabling efficient q-commerce operations. Studies such as those by Setyawan et al. (2020) and VijayaKumar and Chatterjee (2020) illustrate how IoT and RFID technologies enhance visibility and control in the supply chain, while AI-driven personalization (as noted in an unnamed study) improves customer engagement and conversion rates. Yet, challenges around adoption due to financial and infrastructural limitations persist.

Consumer behaviour is a central theme in q-commerce literature. Sanchez (2023) and Harter et al. (2022) show that factors such as perceived ease of use, interface quality, and delivery time significantly influence purchasing behaviour and repurchase intentions. Particularly, deviations in delivery timing especially delays negatively affect consumer satisfaction and loyalty, highlighting the psychological importance of expectation management.

Sustainability and trust are emerging concerns in the q-commerce ecosystem. Choubey et al. (2022) find that while consumers are initially influenced by green claims, their expectations evolve, demanding authentic and transparent corporate sustainability practices. Klein and Popp (2023) further suggest that perceived sustainability of delivery methods influences consumer acceptance, with options like parcel lockers gaining traction. However, the literature lacks real-world behavioural validation and comparative analysis with traditional e-commerce models.

Trust remains an essential determinant of consumer participation in digital commerce. Corbitt et al. (2003) argue that factors such as technical trustworthiness, website quality, and word-of-mouth significantly impact online shopping behaviour. Despite perceived risks, consumers continue to engage in q-commerce when trust is effectively built, often through branding and positive user experiences.

Gap Identification

Inventory management inefficiencies persist due to manual processes, leading to delays in stock availability, increased stockouts and overstocking issues, lack of real-time inventory control, requiring RFID or automated tracking solutions. Demand forecasting remains inaccurate due to a strong focus on worst-case scenarios, leading to overly conservative inventory decisions. Prior studies lack adaptive inventory models that integrate both optimistic and worst-case demand projections. Vendor collaboration in quick commerce is understudied, leaving gaps in understanding how supplier relationships impact stock replenishment and fulfilment speed. Comparison with Traditional E-Commerce – There is a recurring gap in understanding how quick commerce differs from traditional e-commerce in terms of delivery and consumer expectations. Impact of Delivery Speed on Consumer Behaviour – No in-depth research on whether ultra-fast deliveries influence sustainable consumption choices or increase impulse buying. Influence of Demographic Factors – Understanding how different consumer segments (age, income) perceive sustainability in quick commerce could be insightful. Regulatory and Policy Perspective – Since green claims are a concern, how government regulations influence consumer trust in sustainability efforts is significant.

Research Methodology

Research Design

The present study adopts a quantitative, and descriptive research design to examine the impact of delivery speed in quick commerce on consumer purchase behaviour in the Indian market. This design is appropriate as it allows for the collection and statistical analysis of quantifiable data from a defined population at a single point in time. The research further incorporates elements of causal-comparative analysis, as it aims to determine whether a significant association exists between delivery speed and specific behavioural outcomes—namely, the number of orders placed per month and the prevalence of impulse buying. The use of hypothesis testing through statistical tools facilitates an objective understanding of the relationships between variables.

Data Collection Methodology

Primary data for the study was collected using a structured questionnaire designed to capture information on consumer behaviour related to Q-commerce platforms. The questionnaire responses facilitated ease of quantitative analysis. The instrument was disseminated digitally via online channels including email, messaging apps, and social media platforms, allowing the researcher to reach a diverse respondent base. The questions focused on respondent demographics, their frequency of ordering from Q-commerce platforms, perceptions of delivery speed, and the tendency toward impulse buying.

Sampling Technique

The study is based on a non-probability convenience sample of 92 respondents. Participants were individuals who had prior experience using Q-commerce platforms such as Zepto, Blinkit, Swiggy Instamart. Respondents were primarily from Mumbai. The sample includes a mix of age groups, occupational backgrounds, and income levels, with a significant proportion of young working professionals and students who form the core user base of Q-commerce services. While the sample size is limited, it provides preliminary insights into consumer behaviour in the Indian quick commerce space.

Data Analysis Techniques

The collected data was analyzed using quantitative statistical techniques. To test the hypotheses and examine the relationship between delivery speed and consumer behaviours, the Chi-Square Test of Independence was employed. This non-parametric test is suitable for analyzing categorical variables and determining whether a significant association exists between them.

In addition to inferential statistics, the study utilized various descriptive statistical tools, including pie charts and bar graphs, to visually represent response distributions and highlight key trends within the dataset. These visualizations facilitated clearer interpretation of the data and helped in identifying patterns related to frequency of orders and impulse buying behaviour.

Data Analysis

Trends Within the Collected Dataset

Q-Commerce vs E-commerce

The survey of 92 respondents reveals a nearly balanced preference between Q-commerce platforms (e.g., Blinkit, Zepto, Instamart) and traditional e-commerce platforms (e.g., Amazon, Flipkart), with Q-commerce slightly ahead at 52.2% compared to 47.8%. This narrow lead suggests that while traditional platforms continue to hold a strong presence, Q-commerce is rapidly gaining popularity—likely driven by its promise of faster delivery and enhanced convenience. The results indicate a shift in consumer preferences, emphasizing the need for businesses to adapt by offering quicker delivery options to remain relevant in the evolving digital marketplace.

Figure 1: Q-Commerce v/s Traditional

Perceived Quality of Q-Commerce Services

Regarding product quality, 74.7% of participants rated Q-commerce platforms as "Good," 16.5% as "Excellent," and only 8.8% as "Poor." These results reflect a predominantly positive perception of quality, indicating that most users are satisfied with their experience. Sustaining or enhancing this level of quality can be instrumental in fostering customer loyalty, even in the face of relatively higher pricing

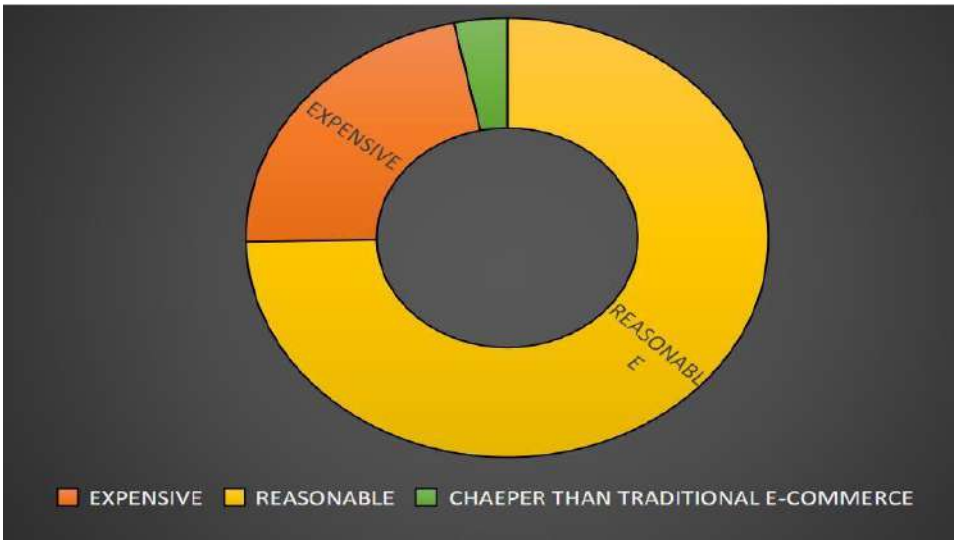

Figure 2: Perceived Quality of Q-Commerce Services

Perception of Pricing on Q-Commerce Platforms

The survey indicates that 74.7% of respondents consider the pricing on Q-commerce platforms to be reasonable. Approximately 22% perceive it as expensive, while only 3.3% believe it to be cheaper than traditional e-commerce. These insights suggest that consumers are generally willing to pay a slight premium for faster delivery, provided the overall value remains satisfactory. As such, pricing strategy remains a critical factor in maintaining customer satisfaction and competitive advantage.

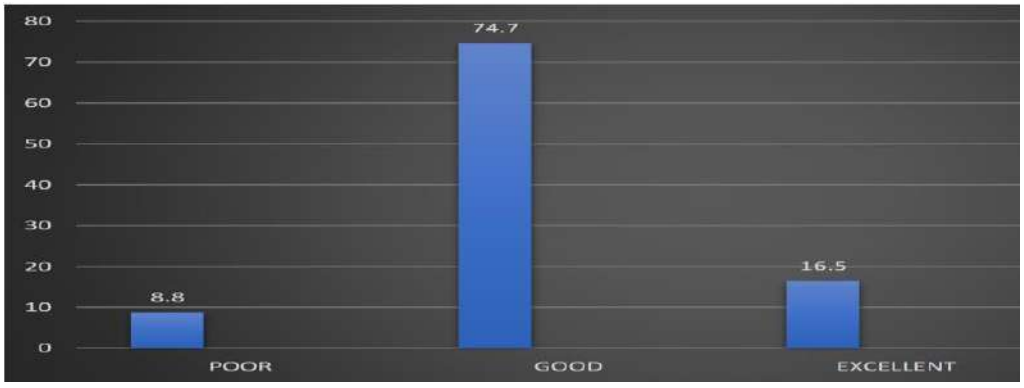

Figure 3: Perception of Pricing on Q-Commerce Platforms

Monthly Spending on Q-Commerce

The data shows that the largest segment of respondents (48.4%) spend between ₹500–₹1500 per month on Q-commerce platforms. This is followed by 22.6% who spend ₹1500–₹3000, and 18.3% who spend less than ₹500. A small minority—only 4.3% and 6.5%—reported monthly spending above ₹3000. These findings suggest that most users engage with Q-commerce for occasional or lower-value purchases. Therefore, offering cost-effective yet fast delivery options appears crucial for appealing to the majority of consumers within this spending range.

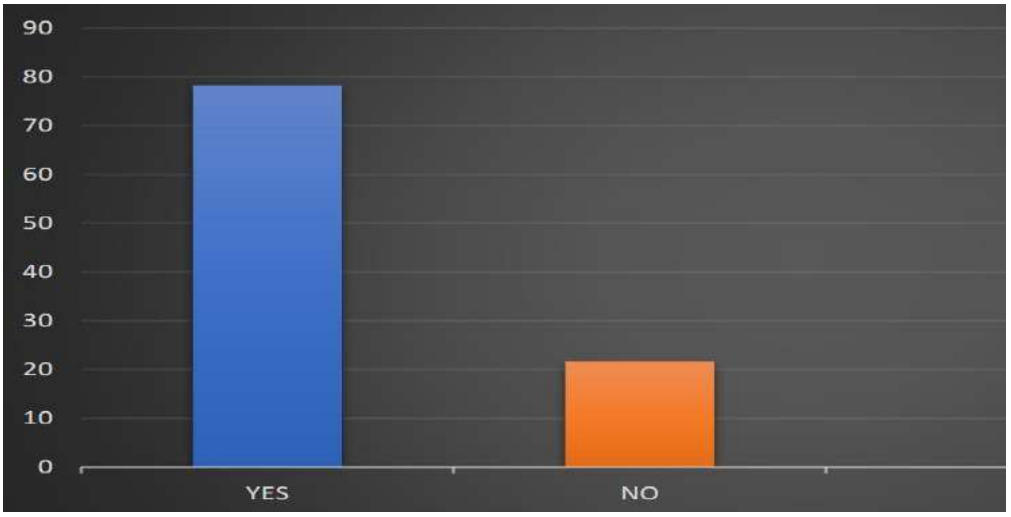

Figure 4Monthly Spending on Q-Commerce

Perceived Environmental Impact of Q-Commerce

The findings reveal that 78.3% of respondents believe Q-commerce has a significant environmental impact, citing concerns such as increased packaging waste and higher carbon emissions from rapid delivery services. In contrast, only 21.7% feel that the environmental impact is minimal. This indicates a high level of consumer awareness regarding the ecological downsides of Q-commerce, and suggests growing expectations for companies to take accountability by adopting more sustainable operational practices.

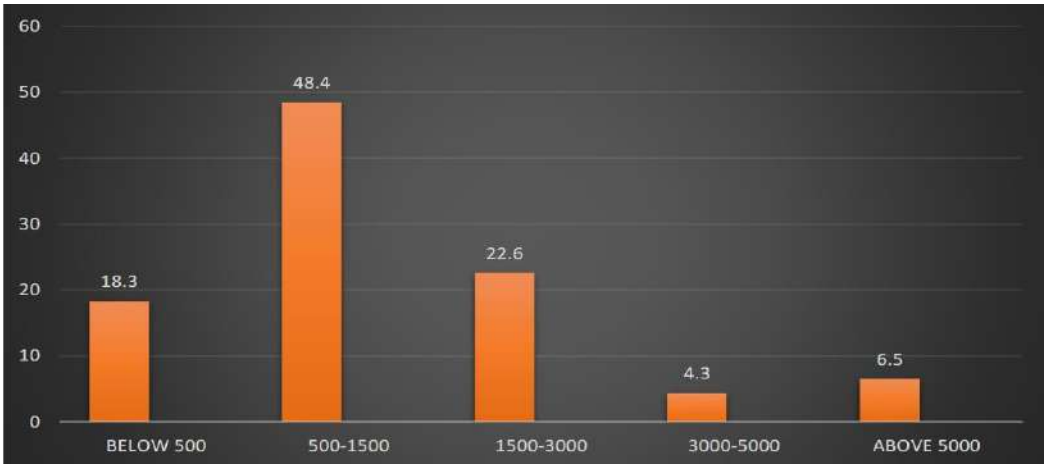

Figure 5Perceived Environmental Impact of Q-Commerce

Willingness to Pay a Premium for Eco-Friendly Q-Commerce

Among the 92 respondents, 60.9% expressed willingness to pay a premium for eco-friendly Q-commerce services, such as electric vehicle deliveries and minimal packaging. In contrast, 39.1% indicated they are not willing to do so. This suggests that a majority of consumers are environmentally conscious and open to supporting sustainable practices. For Q-commerce businesses, this presents a valuable opportunity to introduce premium eco-friendly service options that align with evolving customer values.

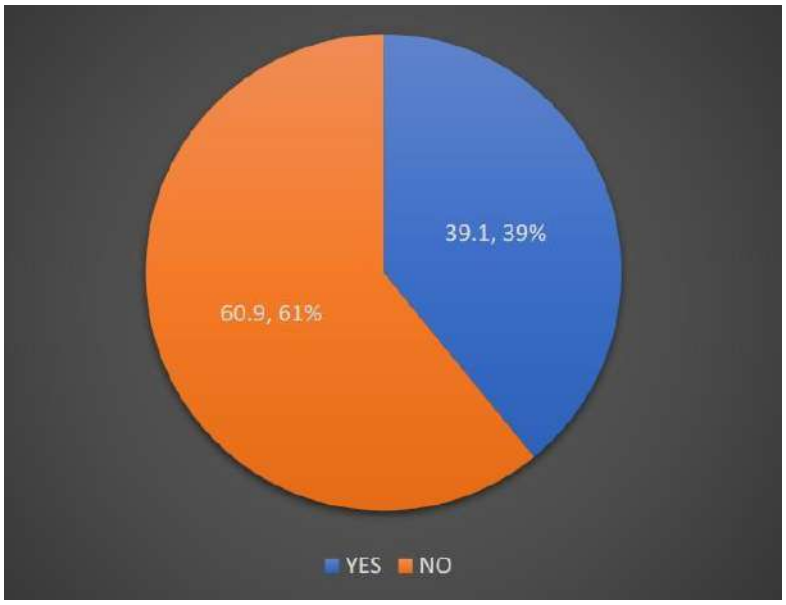

Figure 6Willingness to Pay a Premium for Eco-Friendly Q-Commerce

Hypothesis Testing

Relationship Between Delivery Speed and Frequency of Monthly Orders

Here we investigate whether there is a significant relationship between the delivery speed experienced by consumers and the frequency of their monthly orders on Q-commerce platforms. As Q-commerce thrives on the promise of rapid delivery, it is essential to understand whether faster delivery actually encourages users to order more frequently.

To evaluate this, the following hypotheses were framed -

H_0: There is no significant relationship between delivery speed and the frequency of monthly orders placed on Q-commerce platforms.

H_1: There is a significant relationship between delivery speed and the frequency of monthly orders placed on Q-commerce platforms.

A Chi-Square test of independence was applied to examine the association between these two categorical variables. The test results, discussed in the following section, provide insights into how delivery speed may influence consumer engagement in terms of order frequency.

Contingency Table

		Frequency Of Orders Placed in a Month							
		1		2		3		Total	
		N	%	N	%	N	%	N	%
Delivery Speed	1	17	60.7%	26	59.1%	14	73.7%	57	62.6%
	2	6	21.4%	15	34.1%	3	15.8%	24	26.4%
	3	5	17.9%	3	6.8%	2	10.5%	10	11.0%
Total		28	100.0%	44	100.0%	19	100.0%	91	100.0%

Table 1Contingency table

The contingency table compares two key variables: the perceived delivery speed on Q-commerce platforms and the frequency of monthly orders placed by consumers. This analysis aims to explore whether the speed at which products are delivered influences how often users engage with Q-commerce services. By organizing responses across different levels of delivery speed and corresponding order frequency.

Chi-Square Tests of Indepence

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	4.437[a]	4	.350
Likelihood Ratio	4.406	4	.354
Linear-by-Linear Association	.987	1	.320
N of Valid Cases	91		

a. 3 cells (33.3%) have expected count less than 5. The minimum expected count is 2.09.

Table 2Chi-Square Test

Results of the Chi Square Test -

- Chi-Square value (calculated): 4.437
- Degrees of freedom (df): 4
- p-value: 0.350

Using the Chi-Square distribution table, the critical value at df = 4 and assumed significance level (α) = 0.05 is 9.488.

Since the calculated value (4.437) < critical value (9.488) and the p-value (0.350) > 0.05, we **fail to reject** the null hypothesis (H_0).

So based on the outcomes of the test we can conclude that, There is no statistically significant association between delivery speed and the frequency of monthly Q-commerce orders.

Relationship Between Delivery Speed and Impulse Buying Behaviour of the Consumers

Here we aim to examine whether delivery speed has a significant influence on impulse buying behavior in the context of Q-commerce. As rapid delivery is often positioned as a key differentiator for Q-commerce platforms, it is important to assess whether it actually impacts spontaneous purchasing decisions.

To explore this, the following hypotheses were formulated:

H_0: Delivery speed does not significantly increase impulse buying in Q-commerce.

H_1: Delivery speed significantly increases impulse buying in Q-commerce.

A Chi-Square test of independence was employed to determine if there is a statistically significant association between the perceived speed of delivery and the likelihood of making impulse purchases. The results of this test are discussed further.

Contingency Table

		Whether Consumer Make Impulsive Buying					
		1		2		Total	
		N	%	N	%	N	%
Delivery Speed	1	39	67.2%	18	54.5%	57	62.6%
	2	12	20.7%	12	36.4%	24	26.4%
	3	7	12.1%	3	9.1%	10	11.0%
Total		58	100.0%	33	100.0%	91	100.0%

Table 3Contingency Table 2Fig 4.2.2(1)

The table explores the relationship between delivery speed and consumers' tendency toward impulsive buying behavior on Q-commerce platforms. It compares how different levels of delivery speed align with whether consumers report making impulsive purchases.

Chi-Square Tests of Independence

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	2.670[a]	2	.263
Likelihood Ratio	2.611	2	.271
Linear-by-Linear Association	.418	1	.518
N of Valid Cases	91		

a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 3.63.

Table 4Chi-Square 2

Results of the Chi Square Test -

- Chi-Square value (calculated): 2.670
- Degrees of freedom (df): 2
- p-value: 0.263

Using the Chi-Square distribution table, the critical value at df = 2 and assumed significance level (α) = 0.05 is 5.991.

Since the calculated value (2.670) < critical value (5.991) and the p-value (0.263) > 0.05, we **fail to reject** the null hypothesis (H_0).

So based on the outcomes of the test we can conclude that, **There is no statistically significant relationship between delivery speed and whether consumers make impulse purchases.**

Conclusion

This research set out to evaluate the influence of delivery speed on consumer purchase behaviour in the Indian Q-commerce landscape, focusing on two primary aspects: frequency of monthly orders and the prevalence of impulse buying. Based on responses from 92 users and subsequent statistical testing, the study found no significant relationship between delivery speed and either variable. These findings suggest that while delivery speed is a valued feature, it may not be sufficient by itself to trigger higher engagement or spontaneous purchasing.

The significance of these insights lies in their implications for both theory and practice. From a consumer behaviour perspective, the results challenge the assumption that faster logistics automatically lead to increased consumption. For Q-commerce businesses, this underscores the need to adopt more holistic strategies—combining speed with competitive pricing, personalized experiences, and sustainability initiatives—to effectively drive customer loyalty and spending.

Future research could expand on this work by incorporating larger and more diverse samples, as well as behavioural tracking data to complement self-reported insights. Additionally, exploring other psychological factors such as urgency cues, app design elements, or social influence could provide a deeper understanding of what truly motivates Q-commerce consumers in the Indian context.

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The Multifaceted Role of Microfinance: Examining Economic Development and Women's Empowerment in India

***Naseem Banu, *Umar Shaikh, *Sakshi Pendurkar, *Astha Rai, *Sandhya Sharma, **Dr. Charusheela Shah**

Abstract

Microfinance has emerged as a pivotal tool in promoting inclusive economic development and alleviating poverty, especially among underserved communities. In India, microfinance institutions and Self-Help Groups (SHGs) have been at the forefront of driving social and financial inclusion, with a strong emphasis on women's empowerment. This research explores the multidimensional role of microfinance in catalyzing economic development and enhancing the socio-economic status of women. Through an in-depth examination of SHG-led initiatives, the paper investigates how microfinance contributes to entrepreneurship, financial literacy, decision-making autonomy, and overall empowerment. The study also addresses challenges such as high interest rates, default risks, and institutional barriers, and examines the evolving landscape shaped by digital finance and regulatory policies.

Keywords: Women Empowerment, Microfinance, Economic Development

Introduction

Women’s empowerment lies at the heart of any truly sustainable and inclusive society. Yet, even today, many women continue to face barriers that limit their access to education, fair employment, and a voice in important decisions—both at home and in the wider world. In countries like India, deeply rooted cultural norms still shape gender roles in ways that often push women to the margins, leaving them economically dependent and socially constrained. While the world has made progress, real equality remains out of reach for far too many. And this isn’t just a women’s issue—it’s a challenge for all of us. When women are held back, families suffer, communities lose potential, and nations miss out on growth. It gives women a chance to take control of their futures, build businesses, support their families, and take their rightful place in shaping society. It’s more than money—it’s about dignity, opportunity, and change.

Student, Thakur Institute of Management Studies and Research
****Asst..Prof, Thakur Institute of Management Studies and Research***

Literature Review:

Microfinance has often been portrayed as a transformative tool for women's empowerment, yet a closer look at empirical research reveals a more nuanced and context-dependent reality. Goetz and Gupta (1996), in their foundational study *"Who Takes the Credit? Gender, Power, and Control Over Loan Use in Rural Credit Programs in Bangladesh"*, challenge the assumption that women's access to credit directly translates into empowerment. Through fieldwork in Bangladesh, they show that although loans are formally issued in women's names, the actual control over funds frequently resides with male family members. This reflects entrenched patriarchal structures, where financial resources do not necessarily equate to decision-making power. Their work introduces the critical concept of "managerial control" and highlights the importance of evaluating who exercises agency over credit use, rather than merely tracking disbursement patterns.

Expanding on this theme, Kabeer (2005) in her influential paper *"Is Microfinance a 'Magic Bullet' for Women's Empowerment?"* argues that the outcomes of microfinance programs are not uniform and are deeply embedded in the socio-cultural and institutional contexts in which they operate. Based on case studies and a broader conceptual analysis, Kabeer emphasizes that empowerment is a process, not a guaranteed outcome. The design of microfinance programs—such as the flexibility of loans, group support mechanisms, and training components—plays a significant role in mediating whether women experience meaningful shifts in agency and self-efficacy.

Providing a broader economic lens, *"The Economics of Microfinance"* by Armendáriz and Morduch (2010) discusses the operational principles that underpin microfinance institutions. The authors delve into models such as joint liability lending, group dynamics, and the integration of financial literacy into lending programs. Their work also explores how commercialization and competition within the microfinance sector have altered institutional priorities—sometimes shifting the focus from social development goals to profit maximization. Importantly, they note that while microfinance can facilitate income-generating activities, its impact on long-term empowerment and poverty alleviation remains uneven and often overstated.

A more recent empirical evaluation is presented by Banerjee et al. (2015) in their paper *"The Miracle of Microfinance? Evidence from a Randomized Evaluation"*. Conducted in India, the

study uses a rigorous randomized controlled trial to assess the effects of microcredit. The results show a modest increase in entrepreneurial activity and consumption among borrowers, but they caution against overselling microfinance as a poverty-alleviation tool. Moreover, the anticipated effects on women's empowerment—such as greater decision-making power or improved social status—were found to be limited and inconsistent across contexts. The authors advocate for a more grounded and cautious approach in interpreting microfinance outcomes, particularly when used as a blanket solution for complex gender and development challenges.

Taken together, these studies collectively underscore that while microfinance has the potential to support women's economic activities, its role in fostering genuine empowerment is far from automatic. Structural inequalities, program design, institutional goals, and local cultural norms all mediate the actual outcomes. As such, the literature encourages policymakers and practitioners to move beyond simplistic narratives and adopt a more intersectional and evidence-based approach to microfinance interventions.

Gap Identification: Most existing studies focus on whether women receive credit, but fewer investigate if they truly gain decision-making power and long-term control over financial resources after accessing microfinance.

- Limited research explores how regional and cultural variations within India influence the outcomes of microfinance on women's empowerment.
- There is a lack of recent, data-driven studies examining the impact of digital microfinance tools (e.g., mobile banking, fintech platforms) on rural women's financial independence.
- Few studies assess the role of financial literacy training in enhancing the actual effectiveness of microfinance in promoting empowerment beyond economic indicators.

Importance of the Study

While microfinance programs often provide women with much-needed access to credit, this financial inclusion alone is not a guarantee of true empowerment. Simply receiving a loan does not ensure that women gain control over how the money is used or that it leads to long-term improvements in their autonomy and status. In many cases, especially in patriarchal or conservative communities, men may still make key financial decisions, even when loans are taken in a woman's name. Moreover, without adequate financial literacy, business training, or supportive networks, women may struggle to utilize these funds effectively or independently.

True empowerment goes beyond economic indicators—it requires a shift in social norms, personal confidence, and decision-making authority. Therefore, this study seeks to move beyond surface-level metrics and explore whether microfinance actually transforms women's lives in a meaningful and lasting way.

Research problem

1. What are the main challenges that prevent women from being truly empowered in different parts of the world?

2. How successful have government policies and social programs been in improving the lives of women?

3. What impact do education, jobs, and political involvement have on empowering women?

4. How do cultural beliefs and gender roles continue to affect women's rights and opportunities?

5. And finally, how can we measure empowerment in a way that goes beyond statistics and actually reflects real change in women's lives?

Objectives of the study

1. To assess the impact of microfinance programs (e.g., SHGs, MFI loans) on the financial stability and decision-making of participants.

2. To identify the most common purposes for which microfinance loans are availed (e.g., business, education, household expenses).

3. To evaluate the challenges faced by microfinance participants, such as high interest rates or lack of financial training.

4. To analyze the effectiveness of microfinance in promoting savings, social respect, and business opportunities among participants, especially women.

Methodology

A descriptive and analytical research design will be used to understand and evaluate the impact of microfinance programs on women's empowerment. This study will focus on collecting both quantitative (survey responses) and qualitative (opinions and experiences) data to analyze financial behavior and empowerment outcomes.

Data Collection Methods

Primary Data

Structured Questionnaire: A close-ended survey will be distributed to women who are members of Self-Help Groups (SHGs) or beneficiaries of Microfinance Institutions (MFIs).

Interviews (optional): Semi-structured interviews may be conducted to gather deeper insights into personal experiences and perceptions.

Secondary Data

Research papers, government reports (e.g., from NABARD), and existing databases related to SHGs, MFIs, and women empowerment programs.

Participants / Sample

Population: Women who have availed microfinance services (such as SHGs or MFI loans) in India.

Sampling Technique: Purposive sampling or stratified random sampling to include a mix of rural and semi-urban areas.

Sample Size: Around 100–200 participants depending on access, budget, and timeline.

Inclusion Criteria: Women aged 18 and above who have been involved with a microfinance program for at least 6 months.

H1: Participation in microfinance programs significantly improves the financial literacy of beneficiaries**.**

H2: Individuals who utilize microfinance loans for business purposes experience greater financial independence than those who use them for household expenses or medical needs.

H3: Microfinance participation is positively correlated with an increase in savings and improved decision-making power, especially among women**.**

Tool Used for Analysis

The statistical tests were conducted using MS Excel and SPSS software. These tools allowed us to calculate the mean, variance, p-values, and significance levels required for t-tests and ANOVA.

The results from these tests helped us draw conclusions about the role of social media in influencing investment decisions and the potential risk that misinformation poses to young investors.

Data Analysis:

To find out how microfinance programs affect people's lives, we looked at survey answers from 91 people using a tool called SPSS. This tool helps us understand patterns in data and make informed conclusions.

We tested three main ideas using different methods.

1. Two-Sample T-Test (H1)

We used a t-test to compare their financial knowledge. If the result (called a p-value) is less than 0.05, it means the difference is meaningful and not just by chance.

Paired Samples Test

		Paired Differences					t	df	Significance	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				One-Sided p	Two-Sided p
					Lower	Upper				
Pair 1	V3 V6	-.139	.895	.089	-.315	.038	-1.557	100	.061	.123

Table value is less then calculated value we accept the null hypothesis which means there is no significant differences in the creating amongst the different gender

2. Null Hypothesis (H_0):

There is no significant change in savings or decision-making power among participants (especially women) due to microfinance participation.

Alternative Hypothesis (H_1):

ANOVA

V4					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.600	4	.150	.374	.827
Within Groups	38.489	96	.401		
Total	39.089	100			

There is a significant increase in savings and improvement in decision-making power among participants (especially women) due to microfinance participation.

Oneway

Table value is less then calculated value we accept the null hypothesis which means there is no significant differences in the creating amongs the different age

Discussion:

1. Paired T-Test: V3 & V6

Interpretation:
Means: V3 = 1.50, V6 = 1.64
Mean Difference: -0.139
t(100) = -1.557, p = .123 (two-tailed)
Effect Size (Cohen's d): -0.155 (small effect)
Conclusion : Hypothesis rejected

Conclusion: There is no statistically significant difference between V3 and V6 ($p > .05$). The effect size is small, indicating a negligible difference.

2. One-Way ANOVA: V13 and V4
Interpretation:

$F(4,96) = 0.608$, $p = .827$

Effect Size (Eta-squared): 0.15 (very small)

Conclusion: Hypothesis rejected

Conclusion: The results are not statistically significant, so the correlation between microfinance and increased savings or decision-making could not be confirmed

Conclusion:

Microfinance is not a magic solution, but it is a powerful step forward in empowering women and supporting economic growth in India

This research has shown that microfinance plays an important role in helping women gain financial independence, improve their decision-making power, and participate more actively in society. Programs like Self-Help Groups (SHGs) and Microfinance Institutions (MFIs) are more than just financial services—they provide women with the tools, knowledge, and community support to create better lives for themselves and their families. When women have access to credit, they are more likely to invest in small businesses, children's education, healthcare, and other essentials that improve their overall quality of life.

However, the statistical tests conducted in this study revealed that not all changes are equally strong or significant. While participants showed improved financial behavior and a sense of independence, the differences between age groups or genders were not large enough to be considered statistically meaningful. This highlights that microfinance alone is not enough—there must also be efforts to improve financial literacy, reduce high interest rates, and address deep-rooted cultural beliefs that limit women's full potential.

Importantly, the study found that how women use the loans—whether for business or personal needs—can affect the level of empowerment they experience. Women who used loans for business often reported a greater sense of confidence and control over their finances.

In conclusion, microfinance should be seen as a part of a bigger picture. It is most effective when combined with education, training, supportive policies, and community awareness programs. Empowering women is not just about giving them money—it's about giving them choices, respect, and a real voice in shaping their own futures.

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Exploring The Usage Frequency and Adoption Drivers of Q-Commerce Platforms

***Kajal Upadhyay, *Raj Yadav, *Simran Yadav, **Mr. Anmol Dixit**

Abstract

This study explores user behavior and influencing factors in the adoption of Quick Commerce (Q-Commerce) platforms. With the growing penetration of instant delivery services, understanding consumer preferences is crucial. A structured questionnaire was administered, and responses from 92 participants were analyzed using SPSS. Key variables examined include frequency of use, reasons for adoption, occupation influence on offline shopping habits, and awareness of eco-friendly initiatives. The findings indicate that convenience and fast delivery are the primary drivers of Q-Commerce adoption. The majority of respondents were also aware of eco-conscious efforts by Q-Commerce platforms. These insights provide strategic implications for Q-Commerce businesses seeking to enhance engagement and sustainability practices.

Keywords: Q-Commerce, usage frequency, adoption factors, SPSS, consumer behavior, sustainability

Introduction

Quick Commerce (Q-Commerce) is a rapidly emerging model within the broader e-commerce industry, aimed at delivering products to consumers in an exceptionally short period—often within 10 to 30 minutes. Unlike traditional e-commerce, which focuses on a wide assortment of goods and longer delivery times, Q-Commerce emphasizes speed and convenience by offering a curated range of essential items, such as groceries, snacks, personal care products, and over-the-counter medicines. This shift has been driven by a significant change in consumer behaviour, where immediate gratification and on-demand services are increasingly preferred, especially in metropolitan cities.

***Student, Thakur Institute of Management Studies and Research**
****Asst.Prof, Thakur Institute of Management Studies and Research**

The concept of Q-Commerce gained significant momentum during the COVID-19 pandemic, as lockdowns and safety concerns pushed people to rely heavily on digital platforms for daily needs. Start-ups and established delivery players alike began experimenting with hyperlocal delivery models, setting up dark stores—small, strategically located warehouses—to ensure faster dispatch and minimal travel time. This infrastructure, combined with the widespread adoption of smartphones and mobile apps, laid the groundwork for a scalable, fast-delivery system that could meet the rising expectations of urban consumers.

Moreover, advancements in logistics technology, artificial intelligence, and data analytics have empowered companies to streamline operations and optimize delivery routes. By leveraging real-time data, Q-Commerce platforms can predict demand, manage inventory efficiently, and assign delivery personnel dynamically. The growing competition among players in this space has further pushed innovation, making Q-Commerce one of the most dynamic and fast-evolving segments in the retail and e-commerce landscape today.

Research Problem

While the popularity of Q-Commerce is growing, the specific factors that influence its adoption and usage frequency remain underexplored, particularly in emerging markets.

Objectives

- To analyze how frequently consumers, use Q-Commerce platforms.
- To identify key factors driving adoption.
- To examine whether occupation influences a reduction in offline shopping.
- To assess consumer awareness of eco-friendly practices by Q-Commerce platforms.

Literature review

The rise of Quick Commerce (Q-commerce) in India has prompted extensive academic interest, with several recent studies examining its multifaceted impact on consumers, businesses, and the environment. Shivom Gupta (2023) explores the foundational shift brought by Q-commerce in the Indian retail ecosystem, particularly highlighting how instant delivery models are altering

consumer behavior and pressuring local grocery retailers. Through interviews and secondary research, the study underscores the tension between convenience and the sustainability of small businesses.

Building on the environmental aspect, Lavuri, Kokatnur, and Thaichon (2023) investigate the role of green initiatives such as eco-friendly packaging and low-emission deliveries in enhancing customer brand engagement. Their quantitative research reveals that sustainability practices not only shape consumer perceptions but also deepen brand loyalty in the Q-commerce space. Similarly, Manas Sarkar (2023) focuses on the environmental sustainability of Q-commerce logistics by analyzing the use of dark stores and electric vehicles. His findings suggest that operational innovations can effectively reduce the carbon footprint associated with rapid delivery.

On the technological front, Dr. P. Madhan Kumar et al. (2023) apply AI-based sentiment analysis and text mining techniques to decode customer emotions expressed in online reviews of Q-commerce platforms. Their work categorizes user sentiments into emotional groups like joy, trust, and anger, providing businesses with deeper insights into consumer expectations and satisfaction levels. In a related vein, Anshika Goyal (2023) identifies the macro-level forces driving Q-commerce, including increasing urbanization, rising consumer expectations for speed, and widespread adoption of digital technology. Her secondary research points to these as core enablers of Q-commerce's exponential growth.

Regional consumer behavior is also a focal point in recent studies. Dr. D. Padmavathy and Dr. S. Kalpana Devi (2023) analyze how consumers in Chennai perceive Q-commerce services, emphasizing factors like delivery speed, convenience, and reliability. Their primary research reveals high customer satisfaction levels tied to operational efficiency. Complementing this, Ritu Bhagat (2023) provides a broader view of how Q-commerce disrupts traditional retail through its agile business models and aggressive market penetration strategies. Her findings suggest that Q-commerce represents a transformative shift in retail dynamics, challenging long-established practices.

Further regional insights are offered by Dr. N. Sowndarya and Dr. R. Padmavathi (2023), who study customer satisfaction with Q-commerce apps in Coimbatore. Using structured surveys, they

evaluate aspects such as usability, delivery accuracy, and app features. Their study affirms the importance of a user-friendly interface and efficient service for sustained customer engagement. Meanwhile, R. Sridhar and S. Muthuselvi (2023) employ a SWOT analysis to map the opportunities and challenges in the Indian Q-commerce sector. They highlight strengths like digital integration and opportunities for market expansion, while also pointing out weaknesses such as high operational expenses and logistical complexity.

Lastly, Saniya Shaikh (2023) examines the disruptive effect of Q-commerce on traditional retail, especially its impact on small retailers' revenue and customer footfall. Based on qualitative interviews, the study illustrates the growing divide between conventional and tech-driven retail, raising concerns about the survival of small enterprises in the Q-commerce era.

Collectively, these studies provide a holistic understanding of Q-commerce in India—spanning consumer behavior, technological adaptation, environmental sustainability, regional preferences, and the broader economic and retail impact. They highlight both the potential and the challenges of this fast-evolving sector.

Analysis

The reviewed literature offers a well-rounded perspective on the emergence, consumer behavior, environmental impact, and operational challenges of Q-Commerce in India. Several studies have examined consumer perception and satisfaction (e.g., Dr. Padmavathy & Dr. Kalpana Devi in Chennai, and Dr. Sowndarya & Dr. Padmavathi in Coimbatore), highlighting the importance of delivery speed, app usability, and convenience. These findings confirm that user experience and service reliability are critical to the success of Q-Commerce platforms.

Other scholars have focused on macro-level trends and disruptions, such as urbanization, changing lifestyles, and competitive pressure on traditional retailers (e.g., Shivom Gupta and Ritu Bhagat). These studies show how Q-Commerce is reshaping the retail ecosystem by offering operational agility and real-time service delivery. Meanwhile, green initiatives and sustainability are gaining traction, with researchers like Lavuri et al. and Manas Sarkar discussing eco-friendly packaging, electric vehicles, and dark stores as innovations that can reduce the sector's environmental footprint.

Additionally, the integration of technology and data analytics is becoming central to understanding customer emotions and service efficiency. Dr. Madhan Kumar's work on sentiment analysis using text mining demonstrates how AI can decode user sentiment and improve platform responsiveness. Similarly, the SWOT analysis by Sridhar & Muthuselvi captures a strategic overview of opportunities and threats, such as high delivery costs and infrastructure challenges.

Gap Identification:

1. Limited Research in Tier 2 and Tier 3 Cities:
   Most studies focus on metropolitan areas, with little insight into Q-Commerce adoption and infrastructure challenges in smaller or emerging cities.
2. Lack of Longitudinal and Behavioural Studies:
   There is a gap in tracking long-term consumer behaviour, loyalty, and usage patterns over time.
3. Neglect of Delivery Workforce Perspective:
   The experiences, challenges, and job satisfaction of delivery personnel are largely overlooked in current research.
4. Insufficient Comparative Analysis of Q-Commerce Platforms:
   Few studies compare multiple Q-Commerce players in terms of service quality, innovation, and customer satisfaction.
5. Underexplored Financial Sustainability Models:
   There is limited examination of profitability, unit economics, and long-term viability of Q-Commerce businesses.

Methodology

Research Design

This study adopts a **mixed-method approach**, combining both **qualitative** and **quantitative** elements to explore the key factors influencing the adoption and usage frequency of Quick Commerce (Q-Commerce) services. The design is **exploratory** in nature, aimed at gaining deeper insights into consumer behavior and market dynamics in the Q-Commerce space, particularly in

emerging markets. The study focuses on understanding underlying motivations, perceptions, and challenges through structured data collection.

Sampling Method

A Random sampling technique **(**a type of probability sampling) was used to ensure that participants had relevant experience and exposure to Q-Commerce platforms. The sample included individuals who actively use or are familiar with Q-Commerce services, such as grocery an d instant delivery apps. The respondents were selected based on their knowledge and engagement with the subject matter.

Participants / Sample

The survey was completed by a total of **92 respondents**, consisting of:

- Regular users of Q-Commerce platforms from urban and semi-urban areas
- Individuals across age groups who are familiar with mobile-based shopping and delivery apps

This diverse set of participants helped capture a wide range of user experiences and opinions on Q-Commerce services.

Data Collection Methods

- **Primary Data:** Data was collected using a structured **online survey** that included both **closed-ended** and **Likert-scale** questions. The survey focused on aspects such as frequency of Q-Commerce usage, consumer satisfaction, delivery expectations, and barriers to adoption.
- **Secondary Data:** Relevant secondary data, including academic literature, industry reports, and market studies, were used to support the literature review and contextualize the findings but not directly analyzed alongside primary data.

Data Analysis

- **Quantitative Analysis:** Descriptive statistics were used to analyze survey responses, identifying trends and patterns related to user preferences, behavior, and satisfaction levels with Q-Commerce platforms.
- **Qualitative Analysis:** Open-ended responses, if any, were reviewed to identify emerging themes and insights, enhancing the exploratory depth of the study.

DATA ANALYSIS

H1: Convenience and delivery speed are the primary factors influencing Q-Commerce adoption.

Null Hypothesis (H_0):

There is no significant impact of convenience and delivery speed on the adoption of Q-Commerce services.

Alternative Hypothesis (H_1):

There is a significant impact of convenience and delivery speed on the adoption of Q-Commerce services.

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	12.276[a]	9	.198
Likelihood Ratio	13.475	9	.142
Linear-by-Linear Association	.001	1	.972
N of Valid Cases	92		

Table 1Chi-Square Test - convenience & delivery speed

Test Used: Chi-Square Test of Independence

- **Result (Hypothesis 1):**

- Pearson Chi-Square = 12.276
- Degrees of Freedom (df) = 9
- p-value (two-tailed) = 0.198

- **Interpretation:**

  Since the p-value is greater than 0.05, we **fail to reject the null hypothesis**. This indicates that there is **no statistically significant relationship** between convenience and delivery speed as primary factors and the adoption of Q-Commerce. In other words, while these factors may appear important, the data does not show a strong enough association to confirm they are the dominant reasons for Q-Commerce usage.

H2: Q-Commerce has a significant impact on traditional retail businesses

- **Null Hypothesis (H_0):**

  Q-Commerce does not have a significant impact on traditional retail businesses.
- **Alternative Hypothesis (H_1):**

  Q-Commerce has a significant impact on traditional retail businesses

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	13.835[a]	6	.032
Likelihood Ratio	15.443	6	.017
Linear-by-Linear Association	5.786	1	.016
N of Valid Cases	92		

Table 2Quick commerce impact on retail business

Test Used: Chi-Square Test of Independence

Result (Hypothesis 2):

- Pearson Chi-Square = 13.835
- Degrees of Freedom (df) = 6

- p-value (two-tailed) = 0.032

Interpretation:

Since the p-value is less than 0.05, we Accept the null hypothesis. This means there is a statistically no significant relationship between Q-Commerce usage and a decrease in shopping from traditional retailers. The data suggests that as people adopt Q-Commerce, they are likely to reduce their visits to local grocery stores, indicating a notable impact on traditional retail.

Conclusion

- Q-Commerce platforms are most frequently used on a monthly or weekly basis.
- Convenience and faster delivery are the dominant adoption drivers.
- No significant relationship exists between occupation and decreased offline shopping.
- The majority of users are aware of eco-friendly practices and many prefer sustainable brands.

These findings can help Q-Commerce platforms tailor their marketing, logistics, and corporate responsibility efforts to align with user expectations and values.

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Website: www.timsrmumbai.in