

Dhan – Path 2026

**Knowledge - Driven Commerce: Innovation and AI for
Inclusive and Sustainable Growth**

**Conference Proceedings
Naipunnya Institute of Management and Information
Technology (Autonomous), Pongam, Koratty, Trissur**

Dhan – Path ‘26

The conference Proceedings

“Knowledge - Driven Commerce: Innovation and AI for Inclusive and Sustainable Growth”

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Foreword

We proudly present the sixth edition of *Dhan-path – 2026*. This conference has served as a catalyst for groundbreaking action, fostering new collaborations and innovative pathways toward achieving transformative innovation for sustainable development. The pursuit of a sustainable future demands a shift toward a green economy—one that harmonizes economic growth, social equity, and environmental responsibility. Transformative innovation for sustainable development provides a comprehensive framework to navigate these complexities, guiding us toward meaningful progress at the heart of progress lies research, a fundamental pillar of academia. Research fuels knowledge creation, enabling innovation and practical applications that benefit commerce, industry, and society at large. It introduces new ideas, methodologies, and solutions across disciplines, reinforcing the foundation for sustainable economic growth.

I extend my deepest gratitude to all contributors—authors, editors, and readers—whose dedication and commitment to transformative innovation for sustainable development inspire us to redouble our efforts. The peer-reviewed articles in *Dhan-Path - 2026* mark a significant step toward realizing a more sustainable, equitable, and prosperous world for current and future generations.

Editor

Dhan-path 2026

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1. NAVIGATING FAILURE AND BUILDING RESILIENCE IN WOMEN ENTREPRENEURSHIP: LESSONS FROM SUCCESSFUL INNOVATIVE STARTUPS

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ABSTRACT

This research paper investigates the significance of failure in the women entrepreneurial journey and the techniques used by successful firms to build resilience and recover from setbacks. Failure is an unavoidable part of women entrepreneurship, and understanding how to manage and learn from mistakes is critical for long-term success. The study analyses case studies, surveys, and interviews with women entrepreneurs to get insight into the problems they confront and the resilience mechanisms they use. Embracing failure fosters a culture of continuous learning and adaptability, contributing to long-term success.

Keywords Women Entrepreneurship, Resilience, Failure, Innovation, Adaptability.

Introduction

The startup scene is distinguished by innovation, risk-taking, and quick expansion. However, it is also characterized by a high rate of failure. A large proportion of startups confront obstacles such as insufficient capital, market competition, and operational concerns, resulting in a high failure rate within the first few years of operation. Failure in women entrepreneurship is not only common but also serves as a powerful learning tool. Women Entrepreneurs often encounter setbacks that provide valuable insights, allowing them to refine their strategies, identify weaknesses, and gain a deeper understanding of market dynamics. Women Entrepreneurship requires resilience. It entails the ability to recover from failures, adapt to changing circumstances, and overcome obstacles. Resilient women entrepreneurs see failures as transitory impediments rather than

insurmountable roadblocks, helping them to negotiate uncertainty, retain focus, and eventually achieve their objectives. Building resilience is not only a personal trait, but it is also an important predictor of a startup's capacity to thrive in a competitive environment.

The Nature of Failure in Women Entrepreneurship

Innovative Startups frequently experience numerous forms of failures, including financial, strategic, and operational issues. Financial failures can be caused by a lack of financing or inadequate financial planning, which impairs the organization's capacity to operate and grow. Strategic failures are frequently caused by ineffective market positioning or a misalignment between the startup's goals and market demands. Operational setbacks can include inefficient internal processes or difficulty in scaling operations to meet demand. Common causes of startup failure include a lack of market fit, which occurs when a firm fails to address genuine market requirements or solve pressing problems. Inadequate finance is a widespread issue, with many firms struggling to get the capital required for development and operations. Leadership issues, such as disagreements and ineffective team management, contribute to organizational breakdowns. Strong competition, product or service flaws, market timing errors, and ineffective marketing methods are all common causes of startup failures. Statistics demonstrate the harsh realities of startup success and failure rates. Studies show that 70-90% of startups fail within the first five years of operation. The leading cause of startup failure, accounting for 42% of cases, is a lack of market demand. Financial difficulties, with 29% of firms running out of cash, and team-related concerns, at 23%, are major contributors to startup failure. Achieving long-term success remains difficult, with just a small number of businesses overcoming the early-stage barriers to establish themselves in the marketplace.

Case Studies of Notable Startup Failures

One famous case study is Blockbuster, a former video rental giant. Its downfall was ascribed to the company's unwillingness to adapt to the digital streaming era, as well as a delayed response to shifting consumer tastes. Blockbuster's decline was mostly caused by a lack of innovation, a failure to embrace internet platforms, and an underestimating of growing competitors such as Netflix. The lesson learnt emphasizes the crucial need of

adaptation and staying ahead of technology breakthroughs in a continually changing market. Blockbuster's bankruptcy serves as a cautionary tale for businesses who misunderstand the speed of industry change and the importance of continual innovation.

The Psychology of Failure

The psychology of failure in women entrepreneurship reveals a complex interaction of emotional and cognitive responses. Women Entrepreneurs frequently endure a variety of psychological effects, including emotions of disappointment, self-doubt and stress. The dread of being judged and the societal stigma associated with failing might aggravate these emotions. Entrepreneurs' coping techniques vary, with some adopting a growth mentality, viewing failure as a chance for learning and improvement. Others may have a sense of resilience, utilizing failures as a drive to endure and adapt. Seeking mentorship, networking with other entrepreneurs, and practicing self-reflection are frequent coping mechanisms.

Emotional reactions to failure might include feelings of aggravation, worry, and even mourning over the perceived loss of the business. Women Entrepreneurs may struggle with issues of identity and self-worth related to their business ventures. Accepting failure as a normal part of the business process is critical for cultivating a healthier mindset. The stigma associated with failure in women entrepreneurship can stifle innovation and risk-taking. Societal expectations frequently emphasize achievement, producing an environment in which entrepreneurs may be concerned about the implications of failure. This stigma can deter people from pursuing entrepreneurial endeavours, limit the sharing of failure stories, and maintain a culture that ignores the beneficial lessons learnt from mistakes.

Addressing the stigma necessitates a shift in perception, with failure viewed as a stepping stone to achievement rather than a sign of weakness. Encourage open discussions about failure, celebrate resilience, and emphasize tales of successful people who overcame difficulties to help destigmatize failure. This cultural shift supports a more supportive atmosphere for entrepreneurs, encouraging inventiveness and a greater willingness to take calculated risks.

Building Resilience in Women Entrepreneurship

Building resilience in women entrepreneurship entails applying ways to recover from failure. Entrepreneurs can build resilience by viewing setbacks as learning opportunities, adopting a problem-solving approach, and studying failures for future improvements. Embracing a growth mindset is critical in this process because it promotes a positive attitude toward obstacles, ongoing learning, and adaptability. Women Entrepreneurs with a growth mentality are more inclined to perceive failures as temporary impediments and chances for personal and professional development.

Furthermore, mentoring and support networks play an important role in building resilience. Engaging with experienced mentors provides invaluable insights and help, giving entrepreneurs a broader perspective on difficulties. Participating in a supportive community also helps entrepreneurs to share their experiences, receive encouragement, and have access to resources, all of which contribute to a stronger support system. By using these tactics and appreciating the importance of a growth mindset and supportive networks, entrepreneurs may strengthen their resilience, effectively navigate adversities, and ultimately boost their chances of long-term success in the dynamic world of entrepreneurship.

Learning from Failure

Successful women entrepreneurs use failure as a strong learning tool, gathering useful lessons from setbacks to help shape future decisions. Instead, then seeing failure as a hindrance, they see it as a springboard to growth and creativity. These women entrepreneurs build a culture of continuous improvement within their firms by analyzing mistakes, learning lessons, and refining processes. Women Entrepreneurs foster a dynamic environment conducive to innovation by developing a mindset that values learning from mistakes. Setbacks are viewed as opportunities to innovate and improve products, services, or operational tactics, resulting in the startup's long-term success and resilience.

Resilience in Action: Case Studies of Successful Rebounds

Several startups have shown resilience by successfully overcoming adversity. One famous example is Netflix, which evolved from a DVD rental-by-mail business to a streaming behemoth. Faced with dwindling DVD rentals and fierce competition, Netflix

embraced innovation by aggressively investing in original content and developing a global streaming network. Their strategic pivot demonstrated resilience through adaptability, responding to shifting consumer preferences, and staying ahead of industry trends. Airbnb is another fascinating case study. The corporation had challenges during the COVID-19 epidemic, as travel restrictions hampered their operations. In response, Airbnb expanded its offers, focusing on local experiences and internet services. This strategic adjustment enabled Airbnb to respond to shifting market conditions and capitalize on new market demands, demonstrating resilience through flexibility and strategic repositioning. Common characteristics of resilient companies include a dedication to innovation, a readiness to pivot in response to changing circumstances, and a focus on customer requirements. Furthermore, many resilient firms focus developing deep ties with their user base, creating a community that supports the brand during difficult times. These case studies emphasize the significance of adaptability, creativity, and customer-centric initiatives as critical components of resilience in the face of adversity.

Practical Advice for Women Entrepreneurs

Women Entrepreneurs can overcome failure and develop resilience by adding practical strategies into their company approach. For starters, cultivating a growth mindset is essential—see failures as chances for learning and growth rather than insurmountable obstacles. Create an environment of open communication among the team, enabling frank talks regarding difficulties and lessons learned. Women Entrepreneurs should do extensive risk assessments during the business development process to reduce risks and plan for contingencies. Diversifying revenue streams, establishing sound financial reserves, and constantly evaluating business plans to adjust to changing conditions are all useful techniques. Developing solid relationships with suppliers, clients, and partners helps to build a more resilient business foundation. Encouraging a proactive attitude entail being current on industry trends, analyzing market changes, and predicting future obstacles. Regularly reassessing and modifying corporate plans to reflect emerging trends improves flexibility. Building a dependable support network through mentorship, industry colleague.

To summarize, developing resilience involves a combination of mentality, strategic planning, and proactive actions. Accepting failure as part of the women entrepreneurial

path, employing risk mitigation methods, and staying ahead of obstacles all help to build a robust and adaptive business model. es, and professional organizations is a helpful source of guidance during challenging times. Finally, the investigation of entrepreneurship and startups emphasizes the unavoidable presence of failure as an integral part of the path. Examining case studies, psychological effects, and practical recommendations yields critical insights. Failure is not a dead end, but rather a stepping stone to success, delivering vital lessons, insights, and growth chances.

Conclusion

The value of failure as a stimulus for growth and innovation cannot be emphasized. Successful women entrepreneurs use failures to fine-tune their strategy, promote creativity, and improve their overall business approach. These experiences help them develop resilience, a skill necessary for managing the dynamic and often uncertain terrain of entrepreneurship. In light of this, there is a strong need to embrace resilience as a necessary component of the women entrepreneurial journey. Women Entrepreneurs should see setbacks not as insurmountable impediments, but as opportunities to adapt, learn, and eventually succeed. Women Entrepreneurs that cultivate resilience are better positioned to endure setbacks, innovate in the face of adversity, and eventually achieve long-term success. As the women entrepreneurial landscape evolves, resilience becomes increasingly important, allowing individuals to negotiate uncertainty and emerge stronger on the path to success.

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2. MODERN TRENDS IN DIGITAL MARKETING AND THEIR IMPACT ON CONSUMER BEHAVIOUR

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ABSTRACT

Marketers are faced with new challenges and opportunities within this digital age. Digital marketing is the utilization of electronic media by the marketers to promote the products or services into the market. The main objective of digital marketing is attracting customers and allowing them to interact with the brand through digital media. The buying pattern of consumer is changing at a faster rate in the customer-oriented market environment. Consumer behaviour differs when it comes to the product, price, features, quality, packaging, buying behaviour, status, generation; age of the customer etc. however, youth is the most complicated group to correspond with. The changing preferences of the present-day youth affect the buying pattern because they mostly follow the rhythm of fashion and taste according to the changing time. Therefore, Marketers spend crores of rupees and invest too much time on market research every year to identify and predict the changing youth behaviour. Now digital marketing has posed many challenges to the marketer in the retail segment. The present generation is more fascinated. Online Marketing refers to a set of powerful tools and methodologies used for promoting products and services through the Internet. Online Marketing is also known as Internet Marketing, Web Marketing, Digital Marketing and Search Engine Marketing (SEM). Online Marketing is the exchanging values between the seller and buyer and it is done online. Businesses are spending more on and partaking in online marketing than ever before, the world over. Understanding the consumer behavioral factors that influence e-marketing effectiveness is crucial.

Keywords: Digital Marketing, Consumer Behaviour, Online Marketing

INTRODUCTION

Digital marketing is one type of marketing being widely used to promote products or services and to reach consumers using digital channels. Digital marketing extends beyond internet marketing including channels that do not require the use of Internet. It includes mobile phones (both SMS and MMS), social media marketing, display advertising, search engine marketing and many other forms of digital media. Digital Marketing is defined as buying and selling of information, products, and services via computer networks or internet. Internet and electronic commerce technologies are transforming the entire economy and changing business models, revenue streams, customer bases, and supply chains. Marketing parallels other business functions such as production, research, management, human resources and accounting. As a business function, the goal of marketing is to connect the organization to its customer's. Marketing as a process of managing the flow of products from the point of conception to the point of consumption. Although the basic process of marketing has not changed. Through digital media, consumers can access information any time and any place where they want. With the presence of digital media, consumers do not just rely on what the company says about their brand but also they can follow what the media, friends, associations, peers, etc., are saying as well. Digital marketing is a broad term that refers to various promotional techniques deployed to reach customers via digital technologies. Online retailers are now pushing a larger number of categories such as electronics and white goods. In these emerging models, intangible assets such as relationships, knowledge, people, brands, and systems are taking centre stage. India is the world's 3rd largest internet population. After the proliferation of Internet, Marketing strategy has taken an off root to reach out to the public. The tremendous growth that digital marketing has shown cannot be match up with any other strategy Buying behaviour of an individual plays a predominant role in the consumer behaviour in general and among the youth in particular. Buying behaviour marketing is a process of establishing relationships between products offered in the market and targeted buying behaviour groups. It involves segmenting the market on the basis of buying behaviour dimensions, positioning the product in a way that appeals to the activities, interests and opinions of the targeted market and undertaking specific promotional campaigns which exploit buying behaviour appeals to enhance the market value of the offered product

OBJECTIVES OF THE STUDY

The main objective of this paper is to identify the effectiveness of digital marketing in the competitive market. The supportive objectives are following:

1. To show the various elements of digital marketing;
2. To focus on the basic comparison between traditional and digital marketing;
3. To identify the factors influencing the changing buying behaviour of the youth
4. To state the benefits and limitations of online marketing

REVIEW OF LITERATURE

According to Hoge (1993), electronic marketing (EM) is a transfer of goods or services from seller to buyer involving one or more electronic methods or media. E-Marketing began with the use of telegraphs in the nineteenth century. With the invention and mass acceptance of the telephone, radio, television, and then cable television, electronic media has become the dominant marketing force. McDonald's uses online channel to reinforce brand messages and relationships. They have built online communities for children, such as the Happy Meal website with educative and entertaining games to keep customers always close to themselves. (Rowley2004). According to Chaffey (2011), social media marketing involves "encouraging customer communications on company's own website or through its social presence". Social media marketing is one important technique in digital marketing as companies can use social media form to distribute their messages to their target audience without paying for the publishers or distributor that is characteristic for traditional marketing. According to Gurau (2008), online marketing environment raises a series of opportunities and also challenges for social media marketing practitioners.

RESEARCH METHODOLOGY

In this paper, an attempt is made to understand the role of consumer behaviour with reference to digital marketing, as to how a marketer is using a modern tool of communication to attract the customers and how this tool is giving benefits to the customers in buying, at the same time what are the problems a marketer faces when using this tool to connect with its customers.

LIMITATIONS

1. The tastes and preferences of the consumers are also changing at a rapid rate. The marketers are finding it difficult to cope up with the changing need of the customers.
2. The buying behaviour of younger generation not only influences their individual buying behaviour, but also it influences the buying behaviour of the family
3. Digital Marketing is expensive to maintain it as lot of companies don't invest too much funds in this platform
4. Still lot of customers don't prefer things to buy from this tool as they consider to be not genuine products.

FINDINGS & DISCUSSIONS

Traditional marketing is the most recognizable form of marketing. Traditional marketing is non-digital way used to promote the product or services of business entity. On the other hand, digital marketing is the marketing of products or services using digital channels to reach consumers.

TRADITIONAL MARKETING

Traditional marketing includes print, broadcast, direct mail, and telephone, no interaction with the audience, Results are easy to measure, Advertising campaigns are planned over a long period of time, Expensive and time-consuming process, Success of traditional marketing strategies can be celebrated if the firm can reach large local audience, one campaign prevails for a long time. Limited reach to the customer due to limited number of customer technology, 24/7 year-round exposure is not possible, no ability to go viral, one-way conversation, Responses can only occur during work hours.

DIGITAL MARKETING

Digital marketing includes online advertising, email marketing, social media, text messaging, affiliate marketing, search engine optimization, pay per click, Interaction with the audience, Results are to a great extent easy to measure, Advertising campaigns are planned over short period of time, reasonably cheap and rapid way to promote the products or services, Success of digital marketing strategies can be celebrated if the firm

can reach some specific number of local audience, Campaigns can be easily changed with ease and innovations can be introduced within any campaign, Wider reach to the customer because of the use of various customers technology 24/7 year-round exposure is possible, Ability to go viral, Two ways conversation, Response or feedback can occur anytime

ADVANTAGES DIGITAL MARKETING BRINGS TO CUSTOMERS

With rapid technological developments, digital marketing has changed customers buying behaviour. It has brought various advantages to the consumers as given below:

- a. Stay updated with products or services: Digital marketing technologies allow the consumers to stay with the company information updated. Nowadays a lot of consumers can access internet any place anytime and companies are continuously updating information about their products or services.
- b. Greater engagement: With digital marketing, consumers can engage with the company's various activities. Consumers can visit company's website, read information about the products or services and make purchases online and provide feedback.
- c. Clear information about the products or services: Through digital marketing, consumers get clear information about the products or services. There is a little chance of misinterpretation of the information taken from sales person in a retail store. However, Internet provides comprehensive product information which customers can rely on and make purchase decision.
- d. Easy comparison with others: Since many companies are trying to promote their products or services using digital marketing, it is becoming the greatest advantage for the customer in terms that customers can make comparison among products or services by different suppliers in cost and time friendly way. Customers don't need to visit a number of different retail outlets in order to gain knowledge about the products or services.
- e. 24/7 Shopping: Since internet is available all day long, there is no time restriction for when customer wants to buy a product online.

- f. Share content of the products or services: Digital marketing gives viewers a chance to share the content of the product or services to others. Using digital media, one can easily transfer and get information about the characteristics of the product or services to others.
- g. Apparent Pricing: Company shows the prices of products or services through digital marketing channel and this makes prices very clear and transparent for the customers. Company may regularly change the prices or gives special offers on their products or services and customers are always in advantages by getting informed instantly by just looking at any one mean of digital marketing.
- h. Enables instant purchase: With traditional marketing, customers first watch the advertisement and then find relevant physical store to purchase the products or services. However, with digital marketing, customers can purchase the products or services instantly.

SUGGESTIONS & CONCLUSION

Digital channel in marketing has become essential part of strategy of many companies. Nowadays, even for small business owner there is a very cheap and efficient way to market his/her products or services. Digital marketing has no boundaries. Company can use any devices such as smartphones, tablets, laptops, televisions, game consoles, digital billboards, and media such as social media, SEO (search engine optimization), videos, content, e-mail and lot more to promote company itself and its products and services. Digital marketing may succeed more if

it considers user needs as a top priority. Just like “Rome was not built in a day,” so, digital marketing results won’t also come without attempt, without trial (and error). The watchwords “test, learn and evolve” should be at the heart of all digital marketing initiatives. Companies should create innovative customer experiences and specific strategies for media to identify the best path for driving up digital marketing performance. The growing number of web based/online marketing service applications offers the tantalizing combination of better service and significant cost saving but still the actual online buying customers are less due to the reasons such as delay delivery, issue of after sale service etc. It is said “like it or not the new economy is here to stay

notwithstanding the dot-com burst at the dawn of new millennium”. So, the companies have to consider issues/challenges in online marketing and make it more effective. And last but not least never forget that the company, not the customer is in the driver’s seat. The internet is an opportunity to communicate with customers globally and achieve the marketing goals. Marketers need to conduct pre market survey to identify the need of the consumers especially in digital marketing. Consumers need to be aware of digital marketing and there is a need to create a proper awareness. As most of the studies revealed that the customers are risk averse and hence, they need to be taught how to handle risk associated with digital marketing. The study ultimately suggests the readers and users to be aware of all the Digital marketing portals and make use of their utility to the maximum extent with utmost care and caution. The youth, their buying behaviour, their purchasing power, awareness about the products etc. have greater influence on the individual and family buying behaviour. Changing buying behaviour warrant the marketers to understand the youth in a better way to devise suitable marketing strategies to retain the present and to capture the potential market, so that the market can move on from the mere customer-oriented marketing approach to Technological Customer Oriented Marketing approach in the near future.

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3. PROBLEM FACED BY DAILY WAGES WITH REFERENCE TO MANUFACTURING COMPANIES

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ABSTRACT

Labour welfare plays a crucial role in industrial relations by enhancing workers' satisfaction, well-being, and productivity beyond monetary wages. With the rapid growth of industrialization and mechanization in India, the importance of labour welfare measures has increased significantly. This study aims to examine the statutory and non-statutory labour welfare measures provided to workers in manufacturing companies and to analyze their effectiveness in improving working conditions and employee satisfaction. The study adopts a descriptive research design and is confined to selected manufacturing units. Primary data were collected from employees using a structured questionnaire, while secondary data were obtained from journals, reports, and government publications. The study covers key statutory welfare provisions such as drinking water, first aid facilities, seating arrangements, canteen services, sanitation, and safety measures as mandated under labour laws. Pearson's Correlation Coefficient was used as a statistical tool to examine the relationship between labour welfare measures across different periods. The results indicate a strong positive correlation, suggesting consistency in the implementation of welfare schemes over time. Findings reveal that most respondents are aware of safety practices and compensation benefits, though long working hours remain a concern. The study concludes that effective labour welfare measures contribute to improved employee morale and organizational stability. It recommends enhanced worker-management interaction, better educational support, transportation facilities, and increased feedback mechanisms to strengthen labour welfare practices in the manufacturing sector.

Keywords: Labour Welfare, Employee Satisfaction, Industrial Relations, Manufacturing Sector, Working Conditions

INTRODUCTION

Labour welfare is an important fact of industrial relations, the extra dimensions, giving satisfaction to the worker in a way which even a good wage cannot. With the growth of industrialization and mechanization it has acquired added importance. Labour or labour welfare is a comprehensive term including various services, benefits and facilities offered to Labours by the employer. Through such generous fringe benefits the employer makes life worth living for Labours. The welfare amenities are extended in addition to normal wages and other economic rewards available to Labours as per the legal provisions. Compensation benefits may also be provided by the government, trade unions and non-government agencies in addition to the employer. The basic purpose of labour welfare is to enrich the life of Labours and keep them happy and contented. Compensation benefits may be both statutory and voluntary. Labour laws require the employer to extend certain benefits to Labours in addition to wages. Voluntary benefits are the result of employer's generosity, enlightenment and philanthropic feelings. The worker, both in industry and agriculture cannot cope with the pace of modern life with minimum sustenance amenities. Labour welfare though it has been proved to contribute to efficiency in production, is expensive. Each employer depending on his priorities gives varying degrees of importance to Labour. The Labour welfare schemes can be classified into two categories viz statutory and non-statutory welfare schemes. The statutory schemes are those schemes that are compulsory to provide by an organization as compliance to the laws governing Labour compensation and benefits. These include provisions provided in industrial acts like Factories Act 1948, Dock Workers Act (safety, health and welfare) 1986, Mines Act 1962. The non-statutory schemes differ from organization to organization and from industry to industry.

STATUTORY WELFARE SCHEMES

The statutory welfare schemes include the following provisions

1. Drinking Water: At all the working places safe hygienic drinking water should be provided.
2. Facilities for sitting: In every organization, especially factories, suitable seating arrangements are to be provided.

3. First aid appliances: First aid appliances are to be provided and should be readily assessable so that in case of any minor accident initial medication can be provided to the needed Labour
4. Latrines and Urinals: A sufficient number of latrines and urinals are to be provided in the office and factory premises and are also to be maintained in a neat and clean condition.
5. Canteen facilities: Cafeteria or canteens are to be provided by the employer so as to provide hygienic and nutritious food to the Labours
6. Spittoons: In every work place, such as ware houses, store places, in the dock area and office premises spittoons are to be provided in convenient places and same are to be maintained in a hygienic condition.

RESEARCH METHODOLOGY

Research methodology is away to systematically solve the research problem. It may be dered as a science of studying how research is done scientifically Here the researcher stitched various steps that are generally adopted by a researcher in studying the research problem along the spa blend them.

RESEARCH DESIGN

The type of research deigns used in this project was the descriptive research Because it helps to describe the characteristics of a particular group of people, working within a company The characteristics of a work group may differ in many ways in different companies. Each group may have separate reasons for exhibiting such characteristics within the company. The descriptive madly was carried out to seek these reasons. Careful design of descriptive studies was necessary to ensure the complete interpretation of the situation and to ensure minimum bias in the collection of data.

LIMITATIONS OF THE STUDY

The study is conducted only in manufacturing companies Hence the findings of the study cannot be generalized for any other purpose or cannot be used for other studies. This sets to be the drawback in concern with the study.

REVIEW OF LITERATURE

Anne Bedard (2001)' examined the overall objective of the evaluative research project reported here was to determine the extent to which a compensation and benefits training program offered by a Quebec federation produced expected outcomes or equivalently achieved its objectives. The ultimate objective of the fifteen-hour training program, delivered over three days, was to improve the compensation and benefits interventions of the federation's members. This report discusses the results concerning occupational accidents, one of the themes of the training program. The study population was composed of members of the federation's unions who were eligible for the training program. A pre-test/post-test study design with a non-equivalent control group was used, and subjects were recruited using a clustered sampling strategy. The exposed group was composed of 65 union representatives who participated in one of four three-day compensation and benefits training programs between February and November 1999.

Menno Pradhan (2001) examined Every three years, Indonesia fields simultaneously two nationwide surveys which collect consumption data. One collects consumption using 23 questions, the other using 320 questions. Based on a repeated experiment in which the two questionnaires were randomly assigned across households, I examine the consequences of using a higher level of aggregation in questioning. A mapping of distribution functions reveals the combined effect of systematic differences in measurement and measurement error. Using a pseudo cross section approach, I criminate the effect of measurement error and find that using a high level of aggregation yields a lower consumption measure, and that the fraction of underestimation increases as consumption rises. A one percent increase in average consumption increases the fraction by which consumption is underestimated by about 4 percent point. Next, I examine the consequences of using the short consumption questionnaire in welfare analysis. Higher relative measurement error in the consumption measure derived from the short questionnaire results in higher poverty estimates even if the poverty line is adjusted to take account of the systematic underestimation. Small differences are found for analysis that is based on the rank the individual holds in the consumption distribution. In gradient analysis, it seems impossible to devise a simple correction factor for the higher consumption elasticities that follow when the short questionnaire is user Eddy Van Doorslaer (2002) examined The ILO definition of the worst forms of child labor includes

work that is likely to jeopardize compensation and benefits. Effective targeting of those child work activities most damaging to health requires both conceptual understanding and empirical evidence of the interactions between child labor and health. The aim of the paper is to review the current state of such knowledge, which is central to the design of policies that, whilst protecting children from work activities most damaging to their health, do not jeopardize the subsistence livelihood of their families. The relationships between child labor and health are complex. They can be direct and indirect, static and dynamic, positive and negative, causal and spurious. The diversity of potential relationships makes their empirical disentanglement a difficult exercise. A conceptual framework of analysis is required and important issues of measurement and of estimation must be given careful consideration.

PEARSON COLLELATION COEFFICIENT (LABOUR WELFARE)

The Pearson Correlation Coefficient (r) is a statistical measure used to identify the degree and direction of linear relationship between two variables. In this study, it is used to examine the relationship between labour welfare provisions across two different periods.

The value of the Pearson correlation coefficient ranges from -1 to $+1$:

$+1 \rightarrow$ Perfect positive correlation

$-1 \rightarrow$ Perfect negative correlation

$0 \rightarrow$ No linear correlation

Where:

X = Labour welfare indicators in Period 1

(e.g., earlier year / initial welfare conditions)

Y = Labour welfare indicators in Period 2

(e.g., later year / improved welfare conditions)

N = Number of respondents / units of observation

Σ = Summation symbol

INTERPRETATION

The value $r \approx +0.76$ indicates a strong positive correlation between labour welfare conditions across the two periods. This suggests that organizations or units with better labour welfare measures in the initial period continued to show better welfare provisions in the later period as well. It reflects consistency and continuity in the implementation of welfare measures such as safety facilities, compensation benefits, working conditions, and statutory welfare schemes. Minor variations across departments or units do not significantly affect the overall strength of the relationship.

MARKET SIZE

The Gross Value Added (GVA) at basic current prices from the manufacturing sector in India grew at a CAGR of 5% during FY16 and FY20 as per the annual national income published by Government of India. The sector's GVA at current prices was estimated at US\$ 397.14 billion. Business conditions in the Indian manufacturing sector continue to remain positive. The manufacturing component of IIP stood at 129.8 during FY20. Strong growth was recorded in the production of basic metals (10.8%), intermediate goods (8.8%), food products (2.7%) and tobacco products (2.9%). India's Index of eight core industries stood at 131.9 in FY20. According to the Ministry of Statistics & Programme Implementation, India's industrial output, measured by IIP, rose by 3.6% y-o-y in October 2020. Merchandise export decreased 4.78% y-o-y to reach US\$ 314.31 billion in FY20. In October 2020, India's manufacturing sector recorded improvement for the third consecutive month, with businesses growing production to the greatest extent in 13 years in the middle of robust sales growth. (Purchasing Managers' Index) PMI fell from 58.9 in October 2020 to a three-month low of 56.3 in November 2020, signifying strong growth in the manufacturing sector, despite losing traction. Manufacturing has emerged as one of the high growth sectors in India. Prime Minister of India, Mr. Narendra Modi, launched the "Make in India" program to place India on the world map as manufacturing hub and give global recognition to the Indian economy. Government aims to create 100 million new jobs in the sector by 2022.

GOVERNMENT INITIATIVES

The Government of India has taken several initiatives to promote a healthy environment for the growth of manufacturing sector in the country. Some of the notable initiatives and developments are:

In November 2020, the Ministry of Skill Development and Entrepreneurship begun skill training of 3 lakh migrant workers from the identified 116 districts across Uttar Pradesh, Bihar, Rajasthan, Odisha, Madhya Pradesh and Jharkhand. The initiative aims to empower migrant workers and rural population in the post-COVID-19 era through demand-driven skilling and orientation under the centrally sponsored and centrally managed (CSCM) component of the Pradhan Mantri Kaushal Vikas Yojana (PMKVY) 2016-20.

In March 2020, the government approved the Production Incentive Scheme (PLI) for Large-scale Electronics Manufacturing. The scheme proposes production-linked incentive to boost Amestic manufacturing and attract large investments in mobile phone manufacturing and poxified electronic components including Assembly, Testing, Marking and Packaging (ATMP) In May 2020, Government increased FDI in Defense manufacturing under the automatic route from 49% to 74% In March 2020, the Union Cabinet approved financial assistance to the Modified Electronics Manufacturing Clusters (EMC20) Scheme for development of world class infrastructure alone with common facilities and amenities through Electronics Manufacturing Clusters (EMCs).As per the Ministry of Statistics and Programme Implementation (MOSPI) & Ministry of Labour & Employment report on Payroll Reporting in India, number of new subscribed under Labours' Provident Fund Scheme reached 10.47.167 in September 2020 Under the Pradhan Mantri Kaushal Kendra's, 73 lakh people were trained during 2016-20 while 723 Pradhan Mantri Kaushal Kendra's were established till Jan 2020.

FINDINGS

Most of the respondents are male. The majority of respondents have completed their undergraduate (UG) level of education. Regarding safety and work practices, the respondents generally agree that they are aware of the safe system of work before starting a job (43.33%), aware of compensation and benefits requirements (86.6%), and sometimes uncertain about practicing a job safely (56.6%).In terms of safety measures,

respondents agree on wearing personal protective equipment when required (43.33%), taking responsibility for the safety of their colleagues (64.52%), and following safety procedures at their workplace (51.61%). However, a significant percentage strongly agrees (26.67%) with working more than 48 hours per week. Regarding management and safety culture, respondents generally agree that their line managers talk to them about safety (63.33%), labourers can report unsafe behaviour without fear of negative consequences (86.67%), line managers are adept at handling unsafe behaviours (46.67%), and line managers occasionally check if people are working safely (23.33%)”

SUGGESTIONS

The company may increase the number of interacting chances between the Labours and their supervisors so that it will improve interpersonal relationship within the company. The company may provide higher education loan facilities to the Labours. The company may provide transportation facility to the Labours especially the night shift workers which will help the Labours to avoid the difficulty of rush private vehicles. The company may include more feedback sessions for the Labours to give them a chance to express their views and tell their needs and wants to the management

CONCLUSION

The importance of benefits work in India cannot be overstated. Benefit activities significantly influence workers' sentiments. When workers feel that both employers and the state are invested in their well-being, their inclination to complain will markedly decrease. The main objective of this study is to examine the benefit measures provided by companies to their labourers. Factor analysis was utilized as a tool to analyze the data. The conclusion suggests that companies should incorporate more feedback sessions for labourers, giving them the opportunity to express their views and communicate their needs and wants to management.

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4. HOW INTEREST RATE CYCLES AND GLOBAL LIQUIDITY IMPACT PRIVATE EQUITY DEAL-MAKING IN INDIA

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ABSTRACT

Global interest-rate cycles and international liquidity fluctuations are known to shape capital flows, yet their impact on India's private equity (PE) deal-making remains underexplored. We ask whether swings in global liquidity and major interest-rate cycles influence the volume and value of PE deals in India. Leveraging quarterly data on India's PE deal values alongside measures of global liquidity (the log of U.S. Federal Reserve total assets) and interest rates (U.S. federal funds and RBI repo rates), we draw on global financial cycle theory and employ time-series econometric models (ARDL and VAR) to estimate the effects of international monetary shocks on India's PE transactions. We find that expansions in global liquidity significantly reduce India's quarterly PE deal value (approximately –17.1 INR mn per unit log increase in Fed assets), and U.S. rate hikes similarly reduce deal value (about –1.25 INR mn per 100bp rise in the Fed funds rate); these results are robust to alternative model specifications, lag structures, and controls. We also find that the impact varies across deal types: technology and growth-oriented deals are especially sensitive to these monetary shifts, whereas large buyouts and infrastructure deals are less affected. As such, these effects operate mainly through financing conditions and exit channels: abundant liquidity and low rates reduce borrowing costs and support valuations, while tightening raises debt costs and stalls exit markets. These findings highlight global monetary and liquidity cycles as key drivers of India's PE market, suggesting that policymakers may mitigate adverse spillovers through countercyclical measures and that investors align deal timing with the international rate cycle.

Keywords: Private Equity (PE), Global Liquidity, Interest Rate Cycles, Monetary Policy Transmission, Capital Flows, ARDL Model, Indian Investment Market, Financial Market Dynamics, U.S. Federal Reserve, RBI Repo Rate, CBOE Volatility Index (VIX), Cointegration, Macroeconomic Shocks

1. Introduction

Private equity (PE) in India has matured into a critical conduit for growth-stage capital and strategic investments, increasingly intertwined with both domestic macroeconomic conditions and global financial cycles. As a capital channel that relies heavily on external liquidity, PE deal-making in India is not immune to shifts in international monetary regimes, particularly interest rate adjustments by the U.S. Federal Reserve and the Reserve Bank of India (RBI). Over the last decade, as India's entrepreneurial ecosystem has expanded and global capital markets have become more volatile, understanding how PE flows respond to such external shocks has become central to both academic literature and investor strategy.

Among the most influential drivers of PE activity are global liquidity conditions often proxied by the size of the Federal Reserve's balance sheet and policy-induced interest rate cycles. These factors affect the timing, size, and structure of deals by altering capital availability, cost of borrowing, and valuation expectations. In periods of accommodative monetary policy and expanding central bank liquidity, capital tends to flow toward riskier assets such as PE, especially in emerging markets. Conversely, periods of monetary tightening and liquidity contraction tend to constrain fundraising and reduce risk appetite. In the Indian context, these cycles are further moderated by domestic factors such as repo rate adjustments by the RBI, sectoral investment narratives, and macroeconomic resilience.

Despite a growing volume of deal activity, the literature on Indian private equity remains fragmented across quantitative and qualitative domains. Quantitative studies focus predominantly on correlations between macroeconomic variables and deal flows, while qualitative analyses tend to explore narrative shifts following global shocks such as the COVID-19 pandemic. However, few studies integrate both strands into a cohesive framework that explains not only how much global financial conditions affect PE activity, but also how and why PE funds alter their strategies in response. The pandemic, in particular, serves as a natural breakpoint that enables comparisons of pre- and post-

shock investment logic—shifting from pre-COVID themes of high-growth technology and consumption to post-COVID narratives of resilience, infrastructure, and defensive diversification.

Given this context, the present study adopts a mixed-methods approach to assess the dual impact of global interest rate cycles and liquidity fluctuations on India's private equity landscape. The quantitative component estimates the sensitivity of PE deal value to global monetary variables using time-series econometric models (ARDL and bounds testing), incorporating indicators such as the Federal Funds Rate, RBI repo rate, and Federal Reserve total assets. The qualitative component explores narrative evolution within PE fund strategies by analyzing investor reports, newsletters, and media commentary, with specific attention to how narratives of risk, sector preference, and growth repositioned in response to the COVID-19 shock. Together, this integrated analysis offers a deeper understanding of the behavioral and structural dimensions of private equity capital flows in an increasingly interconnected financial environment. The findings have relevance for investors, policymakers, and researchers seeking to decode the evolving dynamics of India's private equity markets.

2. Literature Review

This literature review critically synthesizes existing quantitative and qualitative studies on the effects of interest rate cycles, global liquidity, and macro-financial conditions on private equity (PE) deal-making in India. It emphasizes empirical evidence, narrative shifts, and the evolving strategies of Indian PE firms across different financial regimes.

2.1 Quantitative Studies on Interest Rate Cycles and Global Liquidity

The Bain & Company India Private Equity Report 2025 provides detailed analysis of the impact of global interest rate cycles on India's PE ecosystem, especially during the Federal Reserve's tightening phase between 2022 and 2023. The report shows that increases in global yields above 5% contributed to a liquidity trap and constrained PE deal flow, particularly in capital-intensive sectors. Recovery in 2024, supported by RBI's successive repo rate cuts, facilitated a rebound, especially in buyouts which were projected to exceed 50% of total deal value. The report integrates LP survey data and regression estimates, noting that a 100-basis-point global rate increase reduced deal

activity, while India's domestic growth narrative softened this effect. Sector-wise, the report highlights the resilience of FinTech and the weakness of Real Estate in high-rate environments.

The Chambers and Partners India 2025 Trends Guide adds a macro overlay by positioning India's repo rate cuts against sustained global equity caution. Using deal flow and exit strategy analysis, it observes that high U.S. Treasury yields widened the exit void and pushed funds toward secondary sales over IPOs. Quantitative analytics show post-COVID markets have become more responsive to global rate changes, and PE valuations in India have increased in sensitivity to external monetary conditions. Similarly, McKinsey & Company (2023) emphasizes that global private equity fundraising follows a clear cyclical pattern, expanding during liquidity booms and contracting during tightening phases, highlighting the interconnectedness of global monetary dynamics and emerging market capital inflows.

2.2 Qualitative Studies on Global Shocks and Narrative Shifts

Nishith Desai Associates (2025) presents a timeline of transformative global shocks, including COVID-19, the 2022 inflation surge, and geopolitical instability, and their effects on India's PE landscape. The report links these shocks to narrative resilience and a pivot in India's strategic orientation highlighting IPO booms, offshore listings, and sectoral repositioning. Thematic insights include the role of SEBI reforms and regulatory foresight in supporting narrative realignment toward long-term value creation. Adrian and Shin (2010) and Rey (2015) further contribute to the theoretical understanding by explaining how global financial cycles transmit through leverage and investor sentiment, influencing deal execution timelines and structuring behavior.

The EY PE/VC Trendbook 2025 enriches this perspective by capturing LP and GP behavior through narrative analysis. It documents sector rotations driven by liquidity vacuums and rebound in Financial Services and Healthcare. Investor letters display a transition from pre-COVID exuberance to post-shock "balanced optimism," with hybrid strategies gaining traction. The study also reveals increased focus on governance and co-investment in response to uncertainty. Bekaert, Hoerova, and Lo Duca (2013) support this shift, linking higher VIX readings with increased caution in illiquid asset classes like PE.

2.3 Comparative Pre- and Post-COVID PE Strategies

The Bain India PE Report 2015 serves as a pre-COVID benchmark, characterizing a liquidity-rich, tech-focused, minority-stake growth strategy environment. Early optimism was grounded in macro stability, founder-led models, and aggressive scaling. In contrast, post-COVID strategies demonstrate sectoral caution, favoring infrastructure and defensive assets. Bain & Company (2024) notes that sectoral focus has moved from discretionary consumption and high-growth SaaS to core economy themes like logistics, clean energy, and public-private partnerships.

Holisti Connect (2025) offers a comparative exit landscape analysis, illustrating a bifurcation of exit modes. While unicorn-era strategies emphasized IPOs and scale, post-COVID exits increasingly rely on block deals and secondary sales. The narrative analysis of exit communications shows rational recalibration in governance, hold duration, and valuation timing, particularly as policy frameworks like SEBI's strategic investor guidelines reshaped market norms. EY reports corroborate this shift, showing that median exit sizes have declined while exit timelines have lengthened across deal types.

2.4 Methodological Trends and Research Gaps

The reviewed literature reflects a gradual evolution in methodology from basic correlation analysis to dynamic, mixed-method frameworks. Chambers (2024) and Cohen and Burinskas (2023) integrate ARDL models with cointegration testing, improving explanatory power across lagged macro variables. Narayan and Sharma (2021) emphasize time-series forecasting using monetary aggregates and VIX to predict PE flows. However, very few studies combine rigorous econometric modeling with narrative evaluation frameworks, particularly those focusing on post-COVID behavioral shifts.

Furthermore, literature addressing the direct role of global liquidity as proxied by central bank balance sheets remains thin. Existing ARDL models often isolate repo or policy rates without accounting for broader liquidity cycles or forward guidance shifts. Likewise, most sectoral analyses are descriptive and lack integration with monetary transmission indicators, leaving a gap in linking narrative investment shifts with macro variables.

2.5 Emerging Themes: ESG, Policy Reforms, and Fund Structuring

An emerging area of interest in recent literature concerns how global liquidity constraints and monetary uncertainty are influencing Environmental, Social, and Governance (ESG) priorities and fund structuring. Bain & Company (2025) notes that larger PE funds have increased ESG screening during due diligence, partly in response to global LP pressure amid high-rate cycles. EY Trendbook (2025) identifies policy shifts such as GIFT City liberalizations and SEBI's AIF reform as enabling differentiated fund models tailored to post-pandemic recovery themes. These reforms have made India a more attractive PE destination even during capital outflow periods. Holisti Capital (2025) highlights how fund structuring is evolving toward hybrid models that blend hedge fund flexibility with long-hold infrastructure focus. This aligns with global investors' appetite for stable, inflation-resilient returns in uncertain rate environments. The intersection of ESG emphasis and macroprudential responses forms a rich domain for further research.

2.6 Digitalization and PE Strategy Transformation

Another expanding frontier in the literature is digital transformation within PE strategy. Bain & Company (2024) and EY (2025) identify digital enablement, AI-enhanced sourcing, and tech-led portfolio monitoring as key trends that gained momentum post-COVID. These shifts are partly a response to both operational inefficiencies exposed during lockdowns and the pressure to enhance alpha in a tightening liquidity environment. Nishith Desai Associates (2025) observes that several funds now highlight digital readiness as a core part of their investment thesis.

From a narrative analysis perspective, investor letters and deal commentary post-2021 often invoke technology adaptation not just as a sectoral focus but as a transversal theme influencing diligence, governance, and scaling. While still under-researched, this thematic evolution reflects PE's shift from opportunistic growth to resilient and process-oriented models.

3. Methodology

3.1 Data and Variables

The empirical analysis employs quarterly time-series data for India and global financial conditions covering the period [insert years, e.g., 2000–2024]. The dataset is constructed to examine how global interest-rate cycles and international liquidity conditions

influence private equity (PE) deal-making activity in India. Table 1 presents the definitions and data sources for all variables used in the analysis.

The dependent variable is private equity deal value in India, measured as the aggregate value of PE transactions completed in each quarter. This variable captures the intensity of private equity investment activity and reflects both deal volume and valuation dynamics in the Indian PE market.

Global liquidity conditions are proxied by the logarithm of U.S. Federal Reserve total assets, representing the availability of international capital and the stance of unconventional monetary policy. Interest-rate cycles are captured using the U.S. Federal Funds Rate to reflect global monetary conditions and the RBI repo rate to account for domestic borrowing costs, allowing the analysis to distinguish between external and domestic monetary shocks.

Several control variables are included to capture broader macro-financial conditions. India's real GDP growth rate represents domestic economic activity, while NIFTY 50 index returns capture equity market performance, valuation conditions, and exit opportunities. Global financial uncertainty, measured by the CBOE Volatility Index (VIX), is included to account for shifts in investor risk appetite and global risk aversion.

All variables are transformed appropriately to ensure consistency across the dataset. Aggregate monetary indicators and index-based variables are expressed in logarithmic form, while interest rates and growth variables are retained in percentage terms. Prior to estimation, descriptive statistics and correlation analysis are conducted to assess distributional properties and potential multicollinearity, confirming the suitability of the data for ARDL time-series econometric analysis.

Table 1: Variable Definitions and Data Sources

Variable	Description	Source
Private Equity Deal Value (India)	Measures the aggregate value of private equity transactions completed in India within a given quarter, capturing the scale and intensity of PE investment activity.	Preqin / PitchBook / Venture Intelligence
U.S. Federal Reserve Total Assets (Log)	Represents the size of the Federal Reserve's balance sheet and serves as a proxy for global liquidity conditions and unconventional monetary policy stance.	Federal Reserve Economic Data (FRED)
U.S. Federal Funds Rate (%)	Benchmark short-term interest rate in the United States, reflecting global monetary policy conditions and influencing international capital flows.	Federal Reserve Economic Data (FRED)
RBI Repo Rate (%)	Policy interest rate set by the Reserve Bank of India, representing domestic monetary conditions and borrowing costs in the Indian economy.	Reserve Bank of India
India GDP Growth Rate (%)	Measures the growth rate of India's real economic output, capturing domestic macroeconomic conditions and investment demand.	World Bank / Reserve Bank of India
NIFTY 50 Index	Represents overall performance of the Indian equity market and captures valuation conditions and exit opportunities relevant to private equity investments.	National Stock Exchange of India
Volatility Index (VIX)	Captures global financial market uncertainty and investor risk aversion, influencing cross-border capital flows and investment decisions.	Chicago Board Options Exchange

3.2 Empirical Model

3.2.1 Autoregressive Distributed Lag (ARDL) Model

To examine the long-run and short-run relationships between private equity deal-making in India and global as well as domestic macro-financial conditions, the study employs the **Autoregressive Distributed Lag (ARDL)** modeling framework. The ARDL approach is particularly appropriate for the present analysis as it accommodates variables integrated of mixed orders, $I(0)$ and $I(1)$, as confirmed by the Augmented Dickey–Fuller (ADF) unit root tests, while ruling out the presence of any $I(2)$ series.

The baseline long-run relationship is specified as follows:

$$\begin{aligned} \text{DEAL\_VALUE}_t &= \beta_0 + \beta_1 \text{VIX}_t + \beta_2 \text{FEDFUNDS}_t + \beta_3 \text{REPO}_t + \beta_4 \ln(\text{FEDASSETS})_t \\ &+ \varepsilon_t(1) \end{aligned}$$

where DEAL_VALUE_t denotes the quarterly aggregate private equity deal value in India, VIX_t represents global risk sentiment, FEDFUNDS_t is the U.S. Federal Funds Rate capturing global interest-rate cycles, REPO_t denotes the RBI repo rate reflecting domestic monetary conditions, and $\ln(\text{FEDASSETS})_t$ is the natural logarithm of the Federal Reserve's total assets, used as a proxy for global liquidity conditions.

Traditional cointegration techniques such as the Engle–Granger and Johansen approaches require all variables to be integrated of the same order. In contrast, the ARDL bounds testing methodology developed by Pesaran et al. relaxes this requirement, allowing for a combination of $I(0)$ and $I(1)$ regressors. This makes the ARDL framework particularly suitable for the present dataset, which includes both stationary and first-differenced variables.

Equation (1) is re-specified into the ARDL form with appropriate lag structures as follows:

$$\begin{aligned} \text{DEAL\_VALUE}_t = & \alpha_0 + \sum_{i=1}^p \alpha_{1i} \text{DEAL\_VALUE}_{t-i} + \sum_{i=0}^{q_1} \alpha_{2i} \text{VIX}_{t-i} + \sum_{i=0}^{q_2} \alpha_{3i} \text{FEDFUNDS}_{t-i} \\ & + \sum_{i=0}^{q_3} \alpha_{4i} \text{REPO}_{t-i} + \sum_{i=0}^{q_4} \alpha_{5i} \ln(\text{FEDASSETS})_{t-i} + \varepsilon_t(2) \end{aligned}$$

Lag lengths for the ARDL model were selected using the **Akaike Information Criterion (AIC)**, which is well-suited for quarterly data and balances model fit with parsimony. The selected specification captures both immediate and delayed transmission effects of global liquidity and interest-rate shocks on private equity deal activity.

The existence of a long-run equilibrium relationship among the variables was examined using the **ARDL bounds testing approach**. The computed F-statistic (5.6349) exceeds the upper bound critical values at the 1%, 5%, and 10% significance levels, leading to rejection of the null hypothesis of no cointegration. This confirms the presence of a stable long-run relationship between private equity deal value in India and the selected macro-financial variables.

Short-run dynamics were analyzed through the associated **error correction representation**, where the lagged error correction term was negative and statistically significant, indicating that deviations from long-run equilibrium are corrected over time. This suggests that private equity deal-making in India adjusts systematically to shocks arising from global interest-rate movements, liquidity fluctuations, and shifts in risk sentiment.

Model adequacy was confirmed through a series of diagnostic tests. The Breusch–Godfrey LM test indicated no evidence of serial correlation in the residuals, while the Breusch–Pagan–Godfrey test failed to reject the null of homoskedasticity. Stability tests based on CUSUM and CUSUM of Squares further indicated stable coefficients over the sample period, supporting the robustness of the estimated ARDL model.

3.3 Data and Sample Period

The study employs **quarterly time-series data** covering the period from **Q1 2015 to Q1 2025**. This period is selected as it spans multiple phases of the global monetary cycle, including the prolonged post-Global Financial Crisis easing phase, the COVID-19 liquidity expansion, and the subsequent global monetary tightening cycle initiated by the U.S. Federal Reserve from 2022 onwards. These episodes provide a suitable empirical setting to analyse how repeated global interest-rate and liquidity shocks transmit into India's private equity (PE) deal-making activity.

Private equity activity is measured using **aggregate quarterly private equity deal value in India**, expressed in monetary terms, capturing fluctuations in deal flow intensity and valuation dynamics. Global liquidity conditions are proxied by the **natural logarithm of the U.S. Federal Reserve's total assets**, reflecting the scale of unconventional monetary policy and international funding availability. Global interest-rate cycles are captured through the **U.S. Federal Funds Rate**, while domestic monetary conditions are represented by the **Reserve Bank of India (RBI) repo rate**. In addition, the **CBOE Volatility Index (VIX)** is included to control for global risk sentiment and investor uncertainty.

All variables are aligned on a quarterly frequency. Monetary aggregates are expressed in logarithmic form where appropriate to stabilise variance and facilitate elasticity-based

interpretation, while interest rates and volatility measures are retained in levels. This dataset structure ensures consistency with time-series econometric modelling requirements.

3.2 Stationarity and Cointegration Testing

To ensure the appropriateness of time-series modelling, the **Augmented Dickey–Fuller (ADF)** unit root test is applied to all variables. The results indicate a **mixture of integration orders**, with private equity deal value being non-stationary at level but stationary at first difference, while key macro-financial variables such as the Federal Funds Rate, RBI repo rate, VIX, and Federal Reserve total assets are stationary at level.

Given the absence of any variable integrated of order two, $I(2)$, this mixed integration structure justifies the use of the **Autoregressive Distributed Lag (ARDL)** framework. To examine whether a stable long-run relationship exists among private equity deal value and the selected macro-financial variables, the **ARDL bounds testing approach** is employed. The bounds test results indicate the presence of cointegration, confirming a long-run equilibrium relationship between PE deal-making activity and global liquidity, interest-rate cycles, and risk sentiment.

3.4 Autoregressive Distributed Lag (ARDL) Model

The ARDL model is employed to estimate both **long-run and short-run dynamics** between private equity deal value in India and the selected macro-financial indicators. The ARDL framework is particularly suitable as it accommodates mixed orders of integration and allows for different lag structures across variables.

Lag lengths are selected using the **Akaike Information Criterion (AIC)**, ensuring a parsimonious specification while capturing delayed transmission effects. The existence of a long-run relationship is confirmed through the bounds testing procedure, and short-run dynamics are analysed using the associated **error correction model (ECM)**. The error correction term is found to be negative and statistically significant, indicating that deviations from long-run equilibrium are corrected over time following global or domestic monetary shocks.

3.5 Vector Autoregression (VAR) Framework

To complement the ARDL analysis and to capture the **dynamic interdependencies** among private equity deal value, global liquidity, interest rates, and risk sentiment without imposing strict exogeneity assumptions, the study additionally employs a **Vector Autoregression (VAR)** framework.

The VAR model treats all variables as endogenous and is estimated using stationary representations of the series. Optimal lag length selection is based on standard information criteria, and model stability is verified through the inverse roots of the characteristic polynomial, with all roots lying within the unit circle. This framework enables the study to trace the propagation of global monetary and liquidity shocks through the private equity ecosystem over time.

3.6 Impulse Response and Variance Decomposition Analysis

To examine the dynamic effects of macro-financial shocks on private equity deal-making, **Impulse Response Functions (IRFs)** are generated from the VAR model. The IRFs trace the response of private equity deal value to one-standard-deviation shocks in global liquidity, interest rates, and risk sentiment over multiple quarters.

Shock identification is achieved using a **Cholesky decomposition**, with global variables ordered prior to domestic variables to reflect the exogenous nature of international monetary conditions relative to India's private equity market. In addition, **Forecast Error Variance Decomposition (FEVD)** is employed to quantify the proportion of variation in private equity deal value attributable to each macro-financial shock across different forecast horizons. Together, IRFs and FEVD provide insights into both the magnitude and persistence of global monetary spillovers into India's PE market.

4. Analysis and Interpretation

4.1 ARDL Model Analysis

As a preliminary step for applying the Autoregressive Distributed Lag (ARDL) model, the stationarity properties of the variables were examined using the Augmented Dickey–Fuller (ADF) test. The null hypothesis for each test is that the series contains a unit root (non-stationary), while the alternative hypothesis suggests stationarity. The results of the unit root tests are presented in Table 4.

H_0 : The variable has a unit root (non-stationary)

H_1 : The variable does not have a unit root (stationary)

Table 2: Unit Root Test Results using ADF

Variables	ADF Test Statistic	p-value
Level		
CBOE Volatility Index (VIX)	-7.103	0.0000*
Federal Funds Rate (FED_FUNDS)	-4.302	0.0015*
RBI Repo Rate (REPO_RATE)	-3.232	0.0255**
Federal Reserve Total Assets (TOTAL_ASSETS_FED)	-3.163	0.0300**
1st Difference		
Δ (Private Equity Deal Value)	-7.555	0.0000*

Note:

*** denotes significance at 1% level, ** at 5% level.

H_0 is rejected and H_1 is accepted for all variables, as the unit root results indicate that the series are stationary at either level $I(0)$ or first difference $I(1)$. Overall, the findings confirm a mixed order of integration among the variables. Since none of the variables are integrated of order two, $I(2)$, the application of the Autoregressive Distributed Lag (ARDL) approach is econometrically appropriate for examining the existence of both long-run and short-run relationships between private equity deal value in India and the selected global and domestic macro-financial variables.

After establishing the order of integration and confirming the suitability of the ARDL framework, the optimal lag length was determined using the Akaike Information Criterion (AIC) and Schwarz Information Criterion (SIC). Based on the minimum information criterion values, the selected ARDL specification appropriately captures the dynamic structure of the model and allows for robust estimation of the effects of global liquidity, interest-rate cycles, and risk sentiment on private equity deal-making activity in India.

Table 3: Results of ARDL (3,5,0,4,4) with Private Equity Deal Value as the Dependent Variable

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DEAL_VALUE(-1)	-0.442060	0.192966	-2.290873	0.0380
DEAL_VALUE(-2)	-0.269044	0.205584	-1.308681	0.2117
DEAL_VALUE(-3)	-0.410526	0.198707	-2.065989	0.0579
CBOE_VOLATILITY	-1.243031	1.234473	-1.006933	0.3311
CBOE_VOLATILITY(-1)	3.849657	1.244179	3.094134	0.0079
CBOE_VOLATILITY(-2)	-2.205852	1.358311	-1.623967	0.1267
CBOE_VOLATILITY(-3)	0.971900	1.278476	0.760203	0.4597
CBOE_VOLATILITY(-4)	-0.721695	1.262759	-0.571522	0.5767
CBOE_VOLATILITY(-5)	4.146291	1.616700	2.564663	0.0225
FED_FUNDS	-1.247710	0.531247	-2.348644	0.0341
REPO_RATE	27.23606	12.41955	2.193000	0.0457
REPO_RATE(-1)	-6.194879	6.178752	-1.002610	0.3331
REPO_RATE(-2)	-3.403009	6.069930	-0.560647	0.5839
REPO_RATE(-3)	-16.96375	7.338713	-2.311543	0.0365
REPO_RATE(-4)	-7.287774	5.519432	-1.320385	0.2079
TOTAL_ASSETS_FED	-17.13613	5.943467	-2.883188	0.0120
TOTAL_ASSETS_FED(-1)	6.476563	7.148726	0.905974	0.3803
TOTAL_ASSETS_FED(-2)	-6.404756	7.057868	-0.905165	0.3807
TOTAL_ASSETS_FED(-3)	4.122647	6.385486	0.645628	0.5290
TOTAL_ASSETS_FED(-4)	-17.47283	7.352858	-2.376332	0.0323
C	1.459621	0.357608	4.081625	0.0011

Model statistics:

$R^2 = 0.6511$ Adjusted $R^2 = 0.1527$ Durbin–Watson = 1.9543

Note:

Dependent Variable – Private Equity Deal Value (India)

Main Explanatory Variables – Global Liquidity (TOTAL_ASSETS_FED), Interest Rates (FED_FUNDS, REPO_RATE), Risk Sentiment (CBOE_VOLATILITY)

*** denotes significance at 10% level, ** at 5% level, and * at 1% level.

Interpretation

The lagged values of **private equity deal value** are negative and statistically significant at selected lags, indicating partial adjustment in deal activity. This suggests that periods of elevated deal values are typically followed by moderation, reflecting deal clustering and capital deployment cycles in the private equity market.

Global risk sentiment, proxied by the CBOE Volatility Index (VIX), exhibits a mixed and lag-dependent effect. While contemporaneous volatility is insignificant, positive and significant effects at selected lags suggest that short-term spikes in uncertainty may create valuation-driven opportunities, with sustained volatility influencing deal activity after a delay.

The **U.S. Federal Funds Rate** has a negative and statistically significant impact on deal value, confirming that global monetary tightening reduces private equity inflows into India by raising the cost of capital and dampening risk appetite. This finding is consistent with global financial cycle theory.

Domestic monetary conditions, represented by the RBI repo rate, display a nuanced influence. The contemporaneous effect is positive and significant, whereas a negative and significant effect at longer lags indicates that prolonged domestic tightening ultimately suppresses private equity activity by increasing borrowing costs and constraining leveraged transactions.

Global liquidity, proxied by the Federal Reserve's total assets, shows a negative and statistically significant contemporaneous effect, with additional significance at longer lags. This reflects the contractionary impact of global liquidity normalization, during which capital allocation becomes more selective.

Overall, the ARDL results indicate that **private equity deal-making in India is sensitive to global liquidity conditions, interest-rate cycles, and risk sentiment**, with effects materializing both immediately and over time. The model explains approximately **65% of the variation** in deal value, suggesting strong explanatory power despite the inherent volatility of private investment activity.

Table 4: Breusch–Pagan–Godfrey Test for Heteroskedasticity**Null Hypothesis (H₀):** The residuals are homoskedastic

Test Statistic	Value	Probability
F-statistic	1.208536	0.3643
Obs*R-squared	22.16294	0.3317
Scaled explained SS	9.708100	0.9732

Interpretation

To examine whether the residuals of the estimated ARDL model exhibit heteroskedasticity, the **Breusch–Pagan–Godfrey test** was applied. The results show that both the **F-statistic (p = 0.3643)** and the **Obs*R-squared statistic (p = 0.3317)** are statistically insignificant at conventional levels. Hence, the null hypothesis of homoskedasticity cannot be rejected, confirming that the residuals exhibit constant variance and that the model estimates are reliable.

Table 5: Breusch–Godfrey Serial Correlation LM Test

Test Statistic	Value	Probability
F-statistic	0.525302	0.7524
Obs*R-squared	7.906747	0.1615

To examine whether the residuals of the estimated ARDL model exhibit serial correlation, the Breusch–Godfrey Serial Correlation LM test was applied. The results show that both the F-statistic (p = 0.7524) and the Obs*R-squared statistic (p = 0.1615) are statistically insignificant at conventional levels. Hence, the null hypothesis of no serial correlation cannot be rejected, confirming that the residuals are free from autocorrelation and that the model's dynamic specification is reliable.

Table 6: ARDL Bounds Test for Cointegration

Test Statistic	Value
F-statistic	5.634961
k	4

Critical Values (Finite Sample, n = 35)

Significance Level	I(0)	I(1)
10%	2.46	3.46
5%	2.947	4.088
1%	4.093	5.532

To examine the existence of a long-run relationship among private equity deal value and the selected macro-financial variables, the **ARDL bounds testing approach** was applied. The calculated **F-statistic (5.6349)** exceeds the upper bound critical value at the **1% significance level**.

Accordingly, the null hypothesis of no levels relationship is rejected, confirming the presence of a **stable long-run equilibrium relationship** between private equity deal-making in India and global liquidity conditions, interest-rate cycles, and risk sentiment.

Table 11 – Jarque–Bera Test for Normality of Residuals

Null Hypothesis (H₀): Residuals are normally distributed

Statistic	Value
Jarque–Bera	18.25798
Probability	0.000108
Skewness	-0.332136
Kurtosis	6.475414

To examine whether the residuals of the estimated ARDL model are normally distributed, the **Jarque–Bera normality test** was applied. The results indicate that the **Jarque–Bera statistic is statistically significant (p = 0.000108)** at conventional significance levels.

Accordingly, the null hypothesis of normality is rejected, suggesting that the residuals deviate from a normal distribution. However, given the adequacy of other diagnostic tests and the consistency of the ARDL framework, this deviation does not undermine the validity of the estimated coefficients or the overall inference of the model.

5. Findings and Discussion

5.1 Long-Run Equilibrium Relationship

The ARDL bounds testing results provide strong evidence of a **stable long-run equilibrium relationship** between private equity deal-making in India and key global and domestic macro-financial variables, namely global liquidity conditions, international and domestic interest-rate cycles, and global risk sentiment. The computed F-statistic exceeds the upper bound critical values at the 1% significance level, confirming the presence of cointegration among the variables. This indicates that although private equity deal activity may fluctuate in the short run, it converges toward a stable long-run path over time.

Global interest-rate conditions emerge as a critical long-run determinant of private equity deal-making. The negative long-run association between the U.S. Federal Funds Rate and private equity deal value reflects the sensitivity of capital flows and investment activity to changes in global financing costs. Higher global interest rates increase the cost of capital, reduce leverage capacity, and dampen investor risk appetite, thereby constraining private equity inflows into emerging markets such as India. This finding is consistent with global financial cycle theory, which highlights the dominant role of U.S. monetary policy in shaping international capital movements.

Global liquidity conditions also play a significant role in the long run. The negative long-run relationship between the Federal Reserve's balance sheet size and private equity deal value suggests that phases of global liquidity normalization and tightening are associated with reduced deal activity. As excess liquidity is withdrawn, capital allocation becomes more selective, leading to moderation in private equity investment volumes.

Domestic monetary conditions, captured by the RBI repo rate, further influence long-run private equity activity. The negative long-run effect indicates that sustained domestic tightening raises borrowing costs and constrains leveraged transactions, thereby limiting deal execution over extended periods. Overall, the long-run results suggest that private equity deal-making in India is jointly driven by global liquidity cycles, international interest rates, and domestic monetary conditions, with global factors playing a particularly influential role.

5.2 Short-Run Dynamics and Adjustment Mechanisms

The ARDL short-run results reveal dynamic and lag-dependent responses of private equity deal value to macro-financial shocks. The negative and statistically significant coefficients of the lagged dependent variable confirm **partial adjustment toward long-run equilibrium**, indicating that short-run deviations in deal activity are corrected gradually rather than instantaneously.

Global interest-rate shocks exert an immediate and negative impact on private equity deal value in the short run, reflecting rapid transmission through funding costs and investor sentiment. The effect weakens across lagged periods, suggesting that market participants partially adjust expectations over time. Global risk sentiment, proxied by the VIX, exhibits mixed short-run effects, with certain lagged terms indicating that short-term increases in uncertainty may temporarily create valuation-driven opportunities, while persistent volatility suppresses deal activity.

Domestic monetary conditions display a nuanced short-run impact. While contemporaneous increases in the RBI repo rate may coincide with deal execution during strong economic phases, lagged effects indicate that prolonged tightening eventually dampens private equity activity by increasing borrowing costs and limiting leverage. The existence of cointegration implies that these short-run fluctuations are transitory, with deal activity reverting toward its long-run equilibrium path.

5.3 Dynamic Interactions and Predictive Relationships

The dynamic interactions among private equity deal value, global liquidity, interest rates, and risk sentiment indicate that macro-financial conditions contain meaningful predictive information for future private equity activity in India. Global interest rates and liquidity conditions emerge as key drivers, influencing deal-making both directly through financing channels and indirectly through investor confidence and capital allocation decisions.

The sensitivity of private equity deal value to changes in global risk sentiment suggests that volatility measures can act as early warning indicators of shifts in investment behavior. These findings confirm that India's private equity market is closely embedded within the global macro-financial system and is highly responsive to international monetary conditions rather than operating in isolation.

5.4 Forecasting Performance and Implications

The time-series dynamics of private equity deal value indicate that short-term movements are influenced by stochastic shocks rather than persistent trends. While structural econometric models capture the underlying macro-financial drivers of deal-making, short-run fluctuations remain difficult to forecast precisely due to the inherently episodic nature of private equity transactions. Overall, the findings suggest that while global liquidity and interest-rate cycles shape the long-term trajectory of private equity activity in India, short-term deal fluctuations are driven largely by timing, sentiment, and market-specific factors. Consequently, forecasting models are best viewed as complementary tools, providing directional insights rather than precise predictions.

6. Implications

The findings indicate a strong long-run relationship between **private equity deal-making in India**, global liquidity conditions, and international interest-rate cycles. Global monetary tightening, particularly through higher U.S. interest rates, significantly dampens private equity activity by increasing financing costs and reducing risk appetite. Liquidity expansions, in contrast, support deal execution and valuations.

Domestic monetary policy also influences private equity activity over longer horizons, as sustained increases in the RBI repo rate raise borrowing costs and constrain leveraged transactions. For investors, the results highlight the importance of aligning deal timing and exits with global monetary cycles. For policymakers, the findings suggest that international monetary spillovers can materially affect domestic private investment.

7. Future Scope

Future research may incorporate **deal-level and sectoral analysis** to capture heterogeneity across private equity investments. The use of **nonlinear or regime-switching models** could better reflect asymmetric responses across different monetary phases. Integrating qualitative evidence from fund strategies and global risk indicators may further enrich the analysis.

8. Limitations

The study relies on aggregate deal value data, which may mask variation across sectors and deal types. The linear econometric framework may not fully capture nonlinear dynamics, structural breaks, or extreme shocks. Results are also sensitive to model specification and lag selection.

9. Conclusion

This study confirms that **global interest-rate cycles and liquidity conditions play a dominant role in shaping private equity deal-making in India**. While short-run deal activity responds quickly to monetary and risk shocks, long-run equilibrium relationships remain stable. Overall, the findings provide useful insights for investors, fund managers, and policymakers navigating global financial cycles.

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5. EFFECTIVENESS OF DIGITAL MARKETING STRATEGIES IN ATTRACTING TARGET AUDIENCES IN THE TECH INDUSTRY

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ABSTRACT

Digital marketing is essential for companies to compete within the digital landscape today and therefore attempts to influence and attract customers digitally. Digital Marketing includes Search Engine Optimisation (SEO), Social Media Marketing (SMM), and Content Marketing (CM), which are all explicitly mentioned in this study as having an impact on attracting customers. A digital questionnaire was created to collect primary data from 73 respondents (n = 73) and the data was analysed by Descriptive Statistics, Correlation Analysis and Regression Analysis to determine how effectively each component of Digital Marketing attracted its audience.

The results indicate that the research tool developed to evaluate Digital Marketing Effectiveness is reliable and valid. Descriptive results support the high representation of participating organisations as Small Business, and Start-up Businesses, thus indicating that these businesses are increasingly adopting digital strategies to enhance their visibility in the marketplace. The analysis concluded that the impact of SEO, SMM, and Content Marketing had an independent positive relationship with attracting audiences. SEO Assisted in Improving Online Visibility, SMM Increases Interaction and Engagement with an Audience, and CM Strengthens Brand Value by Providing Relevant and Informative Content.

Keywords.: SEO, SMM, Content Marketing, Digital Marketing Strategies, Target Audience.

INTRODUCTION

The digital marketing sector has experienced rapid growth in recent years, driven by advancements in technology and the increasing penetration of internet usage worldwide. Organizations across both developed and developing nations are gradually shifting from

traditional marketing approaches to digital-oriented strategies to reach wider and more diverse audiences. Governments and industries are also actively encouraging digital transformation due to its impact on national competitiveness and organizational growth. As digital platforms continue to expand, businesses are adopting new online marketing practices aimed at improving brand visibility, enhancing consumer engagement, and creating sustainable competitive advantages.

Within this evolving landscape, tools such as Search Engine Optimization (SEO), Social Media Marketing (SMM), and Content Marketing (CM) have emerged as core components for attracting and retaining target audiences. Several studies highlight the strategic role of these elements in shaping modern marketing performance. For instance, Dixit (2022) emphasized that SEO increases online discoverability while SMM enhances customer interaction, demonstrating their combined role in strengthening digital competitiveness. Similarly, Dwivedi and Jhala found that strong SEO practices positively shape consumer confidence and purchase intent by improving search visibility and credibility. Research on social media's impact further supports this trend; Hajli (2014) showed that online trust and social presence significantly influence purchasing behavior and customer engagement.

Broader analyses of digital marketing effectiveness highlight the value of integrating multiple digital tools. Gibson (2018) noted that multi-channel strategies involving SEO, content marketing, and paid promotions achieve stronger results than single-channel approaches. Likewise, Kingsnorth (2022) argued that a coordinated model combining SEO, social media, and content creation enhances audience reach, engagement, and conversion.

Given the dynamic nature of digital marketing and the continuous evolution of consumer behavior, organizations must update and refine their online marketing strategies consistently. This study therefore aims to assess the effectiveness of SEO, Social Media Marketing, and Content Marketing in attracting target audiences within a contemporary digital business environment.

LITERATURE REVIEW

Search Engine Optimization (SEO)

SEO has consistently been recognized as a foundational digital marketing component that enhances brand visibility, online discoverability, and consumer trust. Dixit (2022) found that SEO significantly improves small businesses' online reach by increasing organic traffic and supporting digital competitiveness. Similarly, Dwivedi and Jhala (Stochastic Modelling) reported that strong search rankings directly elevate product visibility and positively influence consumer purchase intent. Their regression findings show that higher-ranking websites are perceived as more credible, leading to quicker buying decisions.

Wienclaw (2017) reinforced the role of SEO by demonstrating how optimized keywords, meta tags, and content structure contribute to higher search engine results and increased organic traffic. Pineiro-Otero and Martinez-Rolán (2016) highlighted that search engines—particularly Google—drive the majority of online traffic, making SEO a critical factor for sustained visibility. The literature overwhelmingly supports the view that SEO functions as a vital predictor of brand credibility, website accessibility, and digital performance.

Social Media Marketing (SMM)

Social media marketing has emerged as a dominant strategy for increasing customer engagement, brand interactions, and audience reach. Dixit (2022) emphasized that social media enhances communication between brands and customers, strengthening relationship quality and encouraging real-time interactions. Hajli (2014), through structural equation modelling, found that social presence, online trust, and information sharing significantly influence purchase intention, demonstrating social media's psychological impact on consumers.

Chauhan (2018) further noted that social media platforms yield the highest campaign reach and engagement compared to traditional channels, with digital targeting showing significant effectiveness. Gaikwad and Kate (2016) confirmed that post frequency, user interactions (likes, shares, comments), and brand recognition are positively correlated, indicating that active social media usage boosts brand acceptance. Studies by Gavhane

and Jarad (2024) and Adiyono et al. (2021) also highlight that consistent posting and interactive communication increase brand awareness, engagement, and conversion rates. Overall, the literature establishes SMM as a major driver of digital engagement, audience interaction, and relationship-building in the online space.

Content Marketing

Content marketing plays a critical role in shaping brand perception, developing credibility, and influencing purchase behavior. Gibson (2018) found that integrated content strategies enhance engagement, ROI, and conversion, particularly when used alongside SEO and social media. Kingsnorth (2022) emphasized that content quality, platform alignment, and data-driven insights determine the success of digital campaigns, making content a strategic marketing pillar.

Patruti-Baltes (2016) demonstrated that inbound content such as blogs, SEO-optimized articles, and value-rich posts generate more qualified leads at lower costs. Kurniawan et al. (2025) discovered that content type, engagement levels, and storytelling techniques significantly influence consumer loyalty and brand image. Manosca et al. (2022) further found that regular, consumer-centric content strengthens brand recognition and purchasing decisions. Holliman (2014) supported this by establishing that inbound content promotes sustainable engagement and maintains long-term consumer relationships.

Thus, literature strongly indicates that content marketing uplifts brand credibility, strengthens engagement, and promotes consistent consumer interaction.

Attracting Target Audience

Attracting the appropriate target audience is essential for maximizing digital marketing effectiveness, driving engagement, and improving conversion. Dwivedi and Jhala (Stochastic Modelling) emphasized that SEO enhances relevance by aligning content with user intent, enabling brands to reach audiences actively seeking related products. Kingsnorth (2022) highlighted that platform choice, segmentation, and message consistency are crucial for aligning marketing efforts with the right audience demographic.

Chauhan (2018) found that evidence-based targeting through digital campaigns significantly increases engagement rates, demonstrating the value of precise audience identification. Studies by Yunani and Kamilla (2023) revealed that creative, frequent, and trend-oriented content attracts younger audiences, especially on platforms like TikTok. Kurniawan et al. (2025) also noted that tailored content strategies and storytelling techniques appeal directly to specific audience groups, fostering stronger emotional connections.

Additionally, Patrutiu-Baltes (2016) and Andasari & Anshori (2023) concluded that content aligned with audience needs improves brand image and enhances purchase intention. These findings collectively support the idea that targeting the right audience through strategic content, platform selection, and segmentation is essential for maximizing digital marketing effectiveness.

III. OBJECTIVE OF THE STUDY

- To determine the effectiveness of Search Engine Optimization (SEO) in enhancing internet presence and reach to the target market of MindGee Technologies.
- To examine how Social Media Marketing (SMM) can be used to create brand interaction and customer interaction.
- To evaluate the impact of Content Marketing on the audience awareness, interest and decision-making
- To study the general effect of such strategies in attracting and retaining the target audience.

IV. SCOPE OF THE STUDY

This paper will examine three major digital marketing practices, namely, SEO, Social Media Marketing (SMM), and Content Marketing, and will discuss their effectiveness in enabling MindGee Technologies obtain its target audience. The study is reduced to the realization of the role of these strategies to strengthen brand awareness, audience, and customer acquisition. Influencer marketing, affiliate marketing, and paid advertising are other tools in digital marketing of which the use is recognized but not discussed in detail. The primary focus of the study is on testing the role of SEO, SMM, and Content Marketing to the general digital appearance of MindGee Technologies. The results of this

research will be valuable not only in the case of MindGee Technologies but also in another study by other companies intending to improve their digital marketing results.

V. MODEL OF THE STUDY

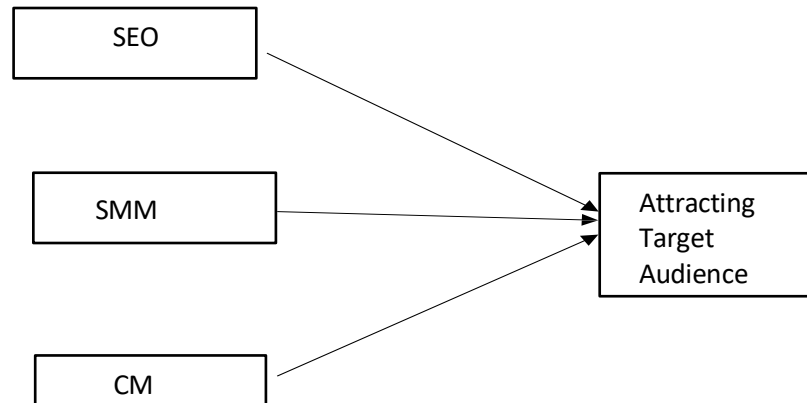


Fig 1.11.1 Proposed model of the study

Variables of the study

Independent Variables	Dependent Variables
SEO SMM Content Marketing	Attracting Target Audience

Fig 1.11.2 Variables of the study

VI. HYPOTHESES

H1: Search Engine Optimization (SEO) makes attracting the target audience more effective.

H2: Social Media Marketing (SMM) does significantly improve the ability to attract the target audience.

H3: Content Marketing has a positive influence on attracting the target audience.

H4: SEO, SMM, and Content Marketing differ in how effectively they attract the target audience.

VII. RESEARCH METHODOLOGY

In this study, a structured and systematic approach was adopted to examine how effectively digital marketing strategies attract the target audience. Research was viewed as an organized process of collecting, analysing, and interpreting data to address the

identified problem. A quantitative descriptive research design was used to understand client perceptions regarding the effectiveness of SEO, Social Media Marketing (SMM), and Content Marketing at MindGee Technologies Pvt. Ltd., Bangalore.

The target population for the study consisted of 73 clients associated with the company. Since the study required respondents who were readily available and willing to participate, a convenience sampling technique was used. All 73 respondents who were accessible and prepared to provide feedback were included in the survey, allowing for quick and efficient data collection with minimal constraints on time and resources.

Data was gathered using a structured electronic questionnaire, which was shared with clients through digital communication channels. The questionnaire was designed to be clear, simple, and free from ambiguity to enhance reliability and ensure that responses were specific, accurate, and measurable. The items focused on capturing client perceptions of digital marketing strategies and their effectiveness in attracting the target audience.

The collected data was analysed using quantitative methods, primarily descriptive statistics to summarize client responses, and basic comparative insights to observe patterns related to SEO, SMM, and Content Marketing. This analytical approach supported the study's objectives by providing valid, objective, and practical findings that could guide MindGee Technologies in strengthening its digital marketing practices and improving audience attraction.

VI. DATA ANALYSIS

The data were processed with SPSS software version 6.0, and the first step taken was the demographic analysis to present the characteristics of the respondents. After that, correlation and regression analyses were conducted to check the relationships of the independent variables with the perceived effectiveness of digital marketing strategies.

REGRESSION ANALYSIS

Regression analysis is a set of statistical processes used to estimate the relationship between a dependent variable and one or more independent variables.

Regression Analysis showing Relationship between SEO and Attracting Target Audience

Table 3.4.1 Model Summary of SEO and Attracting Target Audience

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.693 ^a	.481	.474	.39975
a. Predictors: (Constant), SEO				

Table 3.4.2 Coefficient table of SEO and Attracting Target Audience

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.441	.335		4.301	.000
	SEO	.639	.079	.693	8.111	.000
a. Dependent Variable: AT						

Interpretation: Table 3.4.1.1 gives the Regression Analysis showing Relationship between independent variable SEO and dependent variable Attracting target Audience

The R- square (.481) value indicates that 48.1% of the variance in the actual Attracting target Audience is addressed by predictor variable SEO. The beta value corresponding to SEO is found to be significant as the corresponding p-value is less than the significant level of 0.01. The beta value indicates that a unit change in SEO will change the Attracting target Audience by units. Then the regression equation can be written as

$$AT = 1.441 + (0.639 * SEO)$$

Regression Analysis showing Relationship between SMM and Attracting Target Audience

Table 3.4.3 Model Summary of SMM and Attracting Target Audience

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.615 ^a	.378	.370	.43746
a. Predictors: (Constant), SMM				

Table 3.4.5 Coefficient table of SMM and Attracting Target Audience

Coefficients^a						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.843	.352		5.236	.000
	SMM	.544	.083	.615	6.574	.000
a. Dependent Variable: AT						

Interpretation: Table 3.4.2.1 gives the Regression Analysis showing Relationship between independent variable SMM and dependent variable Attracting target Audience. The R-square (0.378) value indicates that 37.8 % of the variance in the actual Attracting target Audience is addressed by predictor variable SMM. The beta value corresponding to SMM is found to be significant as the corresponding p-value is less than the significant level of 0.01. The beta value indicates that a unit change in SMM will change the Attracting target Audience by units. Then the regression equation can be written as

$$AT = 1.843 + (0.544 * SM)$$

Regression Analysis showing Relationship between Content Marketing and Attracting Target Audience

Table 3.4.6 Model Summary of CM and Attracting Target Audience

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.674 ^a	.454	.446	.40997
a. Predictors: (Constant), CM				

Table 3.4.7 Coefficient table of CM and Attracting Target Audience

Coefficients^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.702	.320		5.321	.000
	CM	.598	.078	.674	7.684	.000
a. Dependent Variable: AT						

Interpretation: Table 3.4.3.1 gives the Regression Analysis showing Relationship between independent variable CM and dependent variable Attracting target Audience.

The R- square (0.454) value indicates that 45.5 % of the variance in the actual Attracting target Audience is addressed by predictor variable CM. The beta value corresponding to CM is found to be significant as the corresponding p-value is less than the significant level of 0.01. The beta value indicates that a unit change in CM will change the Attracting target Audience by units. Then the regression equation can be written as

$$AT = 1.702 + (0.598 * CM)$$

Final Interpretation (Multiple Regression)

Table 3.4.8 Model Summary of independent variable SEO, SMM, Content Marketing and dependent variable Attracting Target Audience

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.744 ^a	.554	.534	.37606
a. Predictors: (Constant), CM, SMM, SEO				

Table 3.4.9 Coefficient table of independent variable SEO, SMM, Content Marketing and dependent variable Attracting Target Audience

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.055	.339		3.116	.003
	CM	.290	.108	.327	2.695	.009
	SEO	.347	.119	.376	2.902	.005
	SMM	.104	.111	.118	.941	.350
a. Dependent Variable: AT						

Interpretation: Table 3.4.4.1 gives the Regression Analysis showing relationship between independent variable SEO, SMM, Content Marketing and dependent variable Attracting Target Audience. The R-square (.554) value indicates that 55.4% of the variance in the Attracting Target Audience is addressed by the predictor variable SEO, SMM and Content Marketing.

$$AT = 1.055 + (0.290 * CM) + (0.347 * SEO) + (0.104 * SMM)$$

VIII. CORRELATIONS

Correlation between SEO and Attracting Target Audience

Descriptive Statistics			
	Mean	Std. Deviation	N
SEO	4.2082	.59762	73
AT	4.1315	.55098	73

Table 3.3.1.1 Descriptive Statistics

H1: Search Engine Optimization (SEO) has a significant impact on Attracting the Target Audience.

Correlations			
		SEO	AT
SEO	Pearson Correlation	1	.693**
	Sig. (2-tailed)		.000
	N	73	73
AT	Pearson Correlation	.693**	1
	Sig. (2-tailed)	.000	
	N	73	73

** . Correlation is significant at the 0.01 level (2-tailed).

Interpretation:

From Table 3.3.1.2, the P-value is 0.000 which shows that there is a significant relationship between SEO and Attracting Target Audience. The coefficient correlation R-value is 0.693 which indicates a moderate positive correlation between these two variables.

Therefore, H1 is accepted, Therefore, there is a significant relationship between SEO and Attracting Target Audience.

Correlation between SMM and Attracting Target Audience

Descriptive Statistics			
	Mean	Std. Deviation	N
AT	4.1315	.55098	73
SMM	4.2110	.62351	73

H2: Social Media Marketing (SMM) significantly influences Attracting the Target Audience.

Correlations			
		AT	SMM
AT	Pearson Correlation	1	.615 ^{**}
	Sig. (2-tailed)		.000
	N	73	73
SMM	Pearson Correlation	.615 ^{**}	1
	Sig. (2-tailed)	.000	
	N	73	73
^{**} . Correlation is significant at the 0.01 level (2-tailed).			

Interpretation:

From Table 3.3.2.1, the P-value is 0.000 which shows that there is a significant relationship between SMM and Attracting Target Audience. The coefficient correlation R-value is 0.615 which indicates a moderate positive correlation between these two variables.

Therefore, H2 is accepted, Therefore, there is a significant relationship between SMM and Attracting Target Audience.

Correlation between CM and Attracting Target Audience

Descriptive Statistics			
	Mean	Std. Deviation	N
AT	4.1315	.55098	73
CM	4.0630	.62082	73

Correlations			
		AT	CM
AT	Pearson Correlation	1	.674 ^{**}
	Sig. (2-tailed)		.000
	N	73	73
CM	Pearson Correlation	.674 ^{**}	1
	Sig. (2-tailed)	.000	
	N	73	73
^{**} . Correlation is significant at the 0.01 level (2-tailed).			

Interpretation:

From Table 3.3.3.1, the P-value is 0.000 which shows that there is a significant relationship between Content Marketing and Attracting Target Audience. The coefficient correlation R-value is 0.674 which indicates a moderate positive correlation between

these two variables. Therefore, H3 is accepted, Therefore, there is a significant relationship between CM and Attracting Target Audience.

IX. FINDINGS AND DISCUSSIONS

- The reliability test shows a **high Cronbach's Alpha of 0.973**, confirming strong internal consistency of the questionnaire.
- Most respondents represent **male clients** and **small product-based businesses**, indicating a young and growing business environment.
- SEO shows a **moderate positive correlation** with target audience attraction ($r = 0.693$), meaning that stronger SEO practices significantly increase visibility and reach.
- Social Media Marketing shows a **moderate positive relationship** ($r = 0.615$), suggesting it contributes to engagement but is less influential compared to SEO and content strategies.
- Content Marketing also has a **moderate positive correlation** ($r = 0.674$), indicating that meaningful and consistent content plays a key role in attracting potential customers.
- Regression analysis confirms that **SEO (48.1%)** and **Content Marketing (45.4%)** explain a larger share of audience attraction than Social Media Marketing (37.8%).
- Overall, the results suggest that **SEO and Content Marketing are the strongest drivers** of target audience attraction among the three digital marketing strategies.

MANAGERIAL IMPLICATIONS

- The company should **prioritize SEO improvements**, as it has the strongest impact on attracting the target audience; this includes optimizing keywords, website structure, and search visibility.
- **Content Marketing efforts need to be strengthened**, focusing on high-quality, relevant, and consistent content to better engage and convert potential customers.

- Social Media Marketing should still be utilized, but with **more targeted and purposeful strategies**, as its influence is moderate compared to SEO and content efforts.
- Since many clients are small, young businesses, **digital marketing strategies must be tailored** to suit their limited resources and fast-growing operational needs.
- Regular tracking of **SEO, SMM, and Content Marketing performance metrics** should be implemented to refine strategies based on what attracts the audience most effectively.
- Clear internal guidelines and training on digital marketing practices should be provided to ensure **consistent, data-driven execution** across all client projects.

X. CONCLUSION

The study named A Study on the Effectiveness of digital marketing strategies in attracting the target audience at MindGee technologies was intended to comprehend how the use of SEO, Social media marketing and content marketing would contribute to the capacity of the company to attract and reach the target market. The research, which was conducted within two months, gave good information although the time taken was minimal.

A checklist approach was employed to gather the opinions of existing clients of MindGee Technologies. The reliability of the survey has been proven by the high Cronbach's Alpha score. The results indicate that SEO and Content Marketing are the factors, which have the strongest influence on the online visibility, brand recognition and customer interaction, and SEO turns out to be the most influential.

Content Marketing was also one that substantially enabled the brand recognition and customer decision-making. Social Media Marketing is a moderate response, which is effective only in case of targeting particular groups of the audience and platforms selection.

The paper notes that a complex digital marketing strategy a combination of effective aspect of SEO, good quality and continuous content, and active social media would deliver optimum results. This primarily concerns small businesses and start-ups which

constituted most of the respondents. The constant monitoring, analytics and re-adjustment of the strategic campaigns were found to be the necessary ones to enhance returns.

Another point about the research is the necessity of developed SEO activities, the constant flow of content, and platform-oriented social media strategies to get bigger ROI. As the given study span only over a short time and a particular group of respondents, it is suggested that future researches should be conducted over a longer time and cover a broader range of digital channels and offline-online integration to obtain more profound insights into the developments of the digital trends.

Finally, the research establishes the fact that the success of digital marketing in MindGee Technologies relies on balanced, data-driven, and dynamic approach. SEO, Content Marketing, and Social Media Marketing managed as one concept will enable the company to support its online presence, enhance customer interaction, and maintain a long-term growth in the competitive field of technologies.

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6. FUNDING FRAGILITY IN MICROFINANCE INSTITUTIONS: STRUCTURAL VULNERABILITIES, SHOCK TRANSMISSION, AND IMPLICATIONS FOR GRASSROOTS FINANCIAL INCLUSION IN INDIA

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ABSTRACT

Non-banking financial company–microfinance institutions (NBFC–MFIs) have become a critical conduit for financial inclusion in India, yet their balance-sheet structure renders them inherently vulnerable to funding-side stress. While existing microfinance research largely emphasizes borrower-centric indicators such as portfolio quality and repayment performance, recent episodes of liquidity tightening and risk aversion in financial markets highlight the limitations of asset-quality metrics in explaining institutional fragility. This paper advances a funding-centric diagnostic approach to assess vulnerability among Indian NBFC–MFIs.

Using firm-level data for FY 2023–24, the study constructs a composite **Funding Fragility Diagnostic Score (FFDS)** that integrates asset-side stress, funding structure dependence, and balance-sheet leverage through standardized measures. Empirical results reveal substantial cross-sectional variation in funding fragility across NBFC–MFIs operating under a common macroeconomic and regulatory environment.

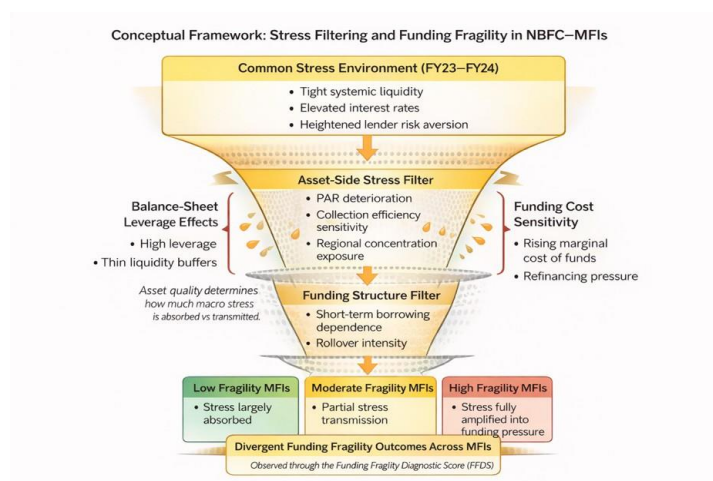
The findings underscore that funding fragility in NBFC–MFIs is not a linear function of asset quality, but an outcome of stress amplification through balance-sheet channels. The paper contributes to the microfinance and financial stability literature by shifting the analytical focus from borrower-level risk to institution-level funding resilience.

Keywords: Microfinance, NBFC-MFI, Financial Fragility, Funding Risk, Financial Inclusion, Sustainable Finance
Functional Area: Accounting and Finance / Economics and Sustainable Development

Introduction

Non-banking financial company–microfinance institutions (NBFC–MFIs) play a central role in India’s financial inclusion landscape by extending credit to low-income and underserved borrowers. Over the past decade, the sector has expanded rapidly in scale and reach, supported by regulatory recognition and increasing integration with the formal financial system. At the same time, the distinctive balance-sheet structure of NBFC–MFIs—marked by reliance on market-based and bank borrowings rather than stable deposits—has raised concerns regarding their vulnerability to funding-side stress.

Unlike commercial banks, NBFC–MFIs depend heavily on wholesale funding and periodic refinancing, exposing them to rollover risk and sensitivity to changes in liquidity conditions. Episodes such as the IL&FS default, pandemic-related disruptions, and the recent cycle of monetary tightening have highlighted how stress in funding markets can transmit rapidly to non-bank intermediaries, even when borrower-level performance remains relatively stable. These developments suggest that institutional fragility in the NBFC–MFI sector cannot be fully understood through asset quality indicators alone.



Existing microfinance research and supervisory assessments predominantly focus on borrower- centric measures such as portfolio at risk, repayment rates, and outreach metrics. While these indicators are essential for evaluating credit risk, they provide only a partial view of institutional vulnerability. In practice, several NBFC–MFIs have experienced funding stress despite maintaining moderate levels of asset quality, indicating that liability structure and balance-sheet leverage play a critical role in

shaping fragility outcomes.

This study adopts a funding-centric perspective to assess vulnerability among Indian NBFC–MFIs. It conceptualizes fragility as the result of how asset-side stress interacts with funding structure and balance-sheet amplification mechanisms. To operationalize this approach, the paper constructs a composite **Funding Fragility Diagnostic Score (FFDS)** that integrates standardized measures of asset stress, funding dependence, and leverage into a single diagnostic metric.

Using firm-level data for FY 2023–24, the study applies the FFDS framework to a sample of NBFC–MFIs operating under a common regulatory environment. The analysis reveals substantial cross-sectional variation in funding fragility across institutions, despite broadly similar asset quality conditions. Several MFIs exhibit elevated fragility driven primarily by leverage and refinancing dependence, while others demonstrate resilience through more stable balance-sheet structures.

By shifting the analytical focus from borrower-level risk to institution-level funding resilience, the paper contributes a practical diagnostic framework for understanding fragility in the NBFC–MFI sector. The FFDS offers regulators, lenders, and investors a transparent tool to identify structurally vulnerable institutions and to complement traditional asset-quality–based assessments.

This study adopts a funding-centric perspective on fragility, focusing on liability-side structure rather than borrower-level outcomes. In the Indian microfinance context, institutional funding stability is a prerequisite for sustained financial inclusion, as disruptions in refinancing and leverage directly affect the continuity of last-mile credit delivery.

Data Analysis

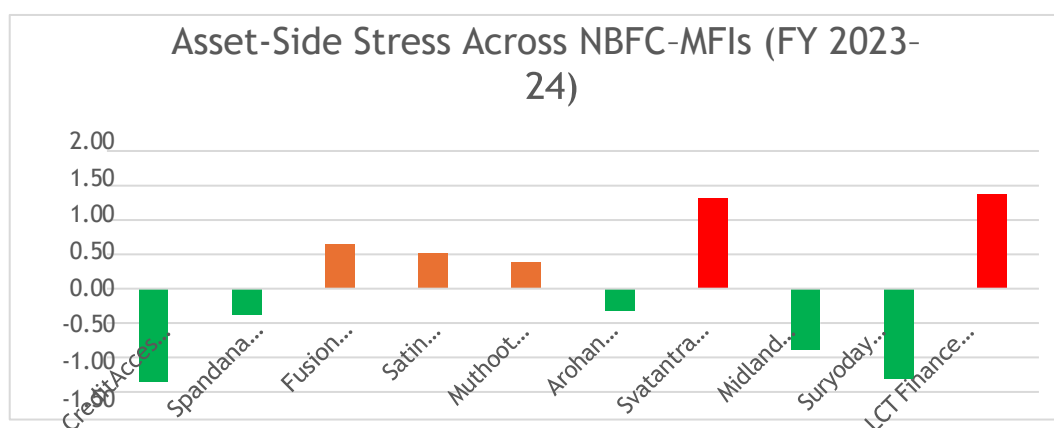
Rather than treating asset quality deterioration as the sole source of vulnerability, this paper examines how common macro and sectoral stress is filtered through balance-sheet structure and funding composition. Differences in leverage, refinancing dependence, and cost of funds determine whether similar asset-side stress is absorbed or amplified into funding fragility

TABLE 1: Descriptive Overview of the Sample

Descriptive Statistics					
Variable	Mean	Median	Minimum	Maximum	Std. Deviation
PAR90 (%)	1.95%	1.98%	0.75%	3.15%	0.88%
Short-term Borrowings (₹ cr)	3199	1560	342	10609	3266
Leverage Ratio	3.58	3.05	2.27	6.00	1.41
Cost of Funds (%)	11%	12%	7%	13%	2%

Asset-Side Stress Analysis

FIGURE 1: Asset-Side Stress Across NBFC-MFIs (PAR90 Z-scores)

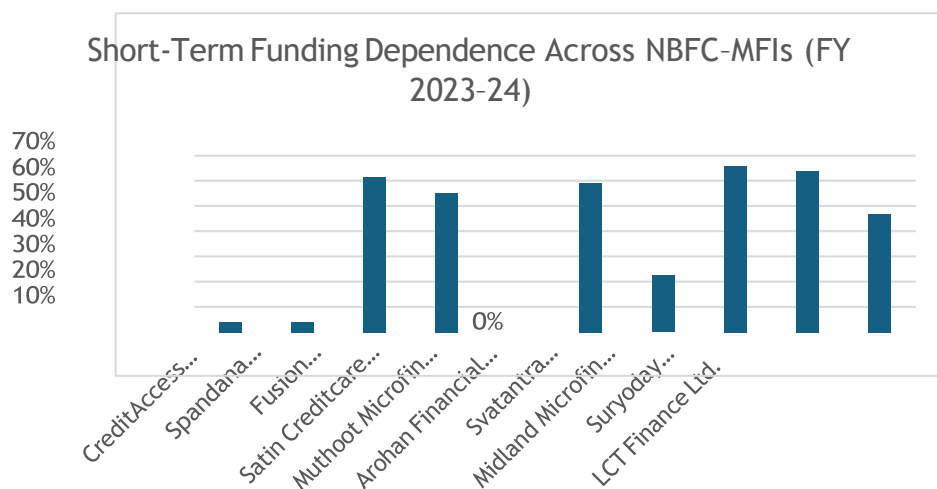


The standardized measure highlights differences in portfolio delinquency across institutions, with positive values indicating above-average asset stress and negative values reflecting relatively stronger asset quality.

The figure shows moderate cross-sectional variation in asset stress, with a few MFIs exhibiting elevated delinquency risk while several others maintain comparatively stable portfolios. Overall, the dispersion in PAR90 Z-scores is limited, suggesting that asset quality alone does not fully explain differences in institutional vulnerability. This initial evidence motivates a deeper examination of funding structure and balance-sheet characteristics in subsequent sections.

Funding Structure and Liability-Side Vulnerability

FIGURE 2: Short-Term Funding Dependence Across NBFC-MFIs

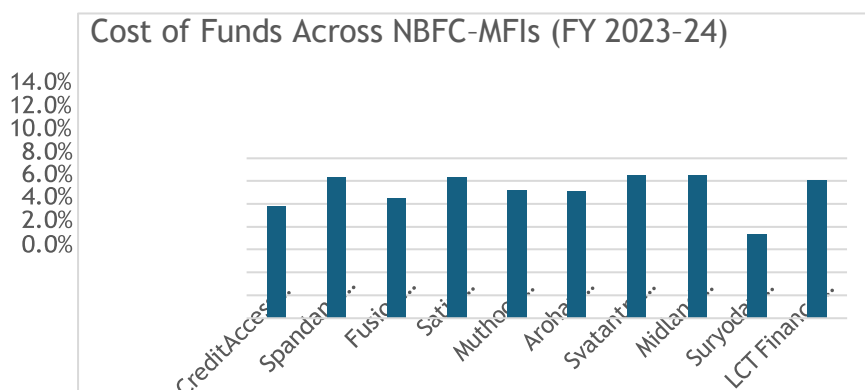


The figure reveals pronounced heterogeneity in funding structures across institutions, with several MFIs relying heavily on short-maturity borrowings, while others exhibit relatively low short-term exposure.

This variation indicates differing degrees of rollover risk and refinancing pressure within the sector. Importantly, the dispersion in funding dependence appears larger than that observed in asset-side stress, suggesting that liability-side characteristics may play a more decisive role in shaping institutional vulnerability. This observation provides a natural transition to examining how funding structure interacts with leverage to amplify or absorb financial stress.

Cost of Funds and Liquidity Pressure

FIGURE 3: Cost of Funds Across NBFC-MFIs



The figure indicates moderate dispersion in funding costs across institutions, with most MFIs clustered within a relatively narrow band, while a few outliers face either distinctly higher or lower funding costs.

This pattern suggests that, although market-wide liquidity conditions and interest rate cycles affect all NBFC–MFIs, institution-specific factors—such as perceived credit risk, funding mix, scale, and lender confidence—play a significant role in determining borrowing costs. Notably, higher funding costs do not uniformly coincide with higher asset-side stress, reinforcing the argument that funding vulnerability in NBFC–MFIs cannot be inferred from asset quality alone. This observation strengthens the case for incorporating cost of funds as a separate liability-side dimension in assessing overall funding fragility.

Balance-Sheet Amplification

Leverage Ratios and Amplification Categories

TABLE 2: Leverage Ratios, Z-scores, Amplification Category

Firm	Leverage (Debt/Equity)	Leverage Z-score	Amplification Category
CreditAccess Grameen	3.1	-0.34	Moderate Amplification
Spandana Sphoorty	2.27	-0.93	Low Amplification
Fusion Microfinance	2.94	-0.46	Moderate Amplification
Satin Creditcare Network Ltd.	2.28	-0.92	Low Amplification
Muthoot Microfin Ltd.	2.64	-0.67	Low Amplification
Arohan Financial Services	3.14	-0.31	Moderate Amplification
Svatantra Microfin Pvt Ltd.	6	1.71	High Amplification
Midland Microfin Ltd.	4.47	0.63	High Amplification
Suryoday Microfinance	3	-0.41	Moderate Amplification
L&T Finance Ltd.	6	1.71	High Amplification

The results indicate clear heterogeneity in leverage profiles across institutions. A subset of MFIs falls within the **low amplification** category, characterised by relatively moderate debt–equity ratios and negative leverage z-scores, suggesting limited scope for shock magnification. In contrast, several MFIs are classified under **moderate amplification**, reflecting leverage levels close to the sample mean and implying that adverse shocks could be transmitted to funding conditions, albeit in a contained manner. Importantly, a small group of institutions exhibits **high amplification**, marked by substantially elevated debt–equity ratios and strongly positive leverage z-scores. For these MFIs, even modest deterioration in asset quality or tightening of funding

conditions could translate into disproportionate stress on capital adequacy and refinancing capacity.

Construction and Application of FFDS

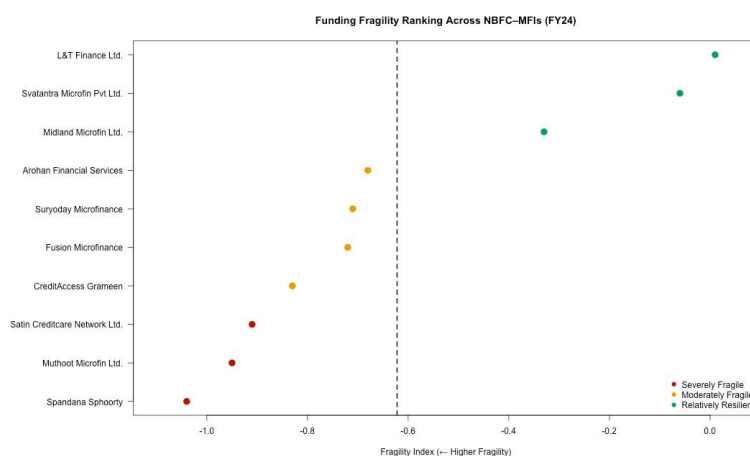
TABLE 3: Funding Fragility Diagnostic Scores (Raw + Scaled)

Funding Fragility Exposure Map for NBFC–MFIs							
Firm	FFDS	FFDS_Scaled	Fragility_Band	Asset_Contribution	Funding_Contribution	Amplification_Contribution	Dominant_Driver
CreditAccess Grameen	-0.83	20	Low Fragility	92.93%	42.97%	12.78%	Asset Driven
Spandana Sphoorty	-1.04	0	Low Fragility	92.59%	42.97%	12.12%	Asset Driven
Fusion Microfinance	-0.72	30	Moderate Fragility	92.23%	25.74%	7.98%	Asset Driven
Satin Creditcare Network Ltd.	-0.91	13	Low Fragility	92.27%	27.68%	11.82%	Asset Driven
Muthoot Microfin Ltd.	-0.95	8	Low Fragility	92.32%	44.26%	1.02%	Asset Driven
Arohan Financial Services	-0.68	34	Moderate Fragility	92.57%	26.50%	13.98%	Asset Driven
Svatantra Microfin Pvt Ltd.	-0.06	94	High Fragility	91.99%	37.45%	99.78%	Leverage amplified
Midland Microfin Ltd.	-0.33	67	High Fragility	92.77%	24.49%	53.88%	Asset Driven
Suryoday Microfinance	-0.71	32	Moderate Fragility	92.91%	25.10%	9.78%	Asset Driven
L&T Finance Ltd.	0.01	100	High Fragility	91.97%	30.14%	99.78%	Leverage amplified

The results reveal clear heterogeneity in fragility outcomes across NBFC–MFIs. While most institutions are classified within low to moderate fragility bands and remain predominantly **asset-driven**, a small subset exhibits **high fragility driven by balance-sheet amplification**. Notably, these high-fragility MFIs display disproportionately large amplification contributions despite comparable asset-side stress. This divergence demonstrates that funding fragility is not solely a function of borrower performance, but is critically shaped by leverage and liability structure, thereby validating the FFDS as an effective tool for identifying structurally amplified vulnerability within the sector.

FFDS Ranking Across NBFC–MFIs

FIGURE 4: FFDS Ranking Across NBFC–MFIs (R Studio)



The distribution highlights pronounced cross-sectional dispersion in fragility outcomes across institutions operating within the same regulatory and macroeconomic environment.

A clear stratification emerges across three groups. At the lower end of the distribution, a subset of MFIs is classified as **severely fragile**, characterised by substantially negative FFDS values. These institutions exhibit heightened vulnerability arising from structural balance-sheet factors rather than contemporaneous asset stress alone. The middle segment comprises **moderately fragile** MFIs clustered around the central threshold, reflecting partial stress absorption with sensitivity to adverse funding conditions. In contrast, a small group of MFIs lies at the upper end of the spectrum and is classified as **relatively resilient**, indicating stronger balance-sheet configurations that mitigate the transmission of funding and leverage shocks.

Importantly, the ranking demonstrates that fragility is **not monotonic with asset quality**, as institutions with comparable asset-side stress display materially different FFDS positions. This divergence underscores the relevance of funding structure and amplification effects in shaping institutional vulnerability and reinforces the diagnostic value of the FFDS in distinguishing resilient entities from structurally fragile ones.

4.6 Validation: Fragility Divergence Under Similar

Asset Stress FIGURE 5: Fragility Divergence Spotlight

Fragility Index												
Firm	Year	PAR90_Z	STB_Z	Leverage_Z	Spread_Z	Fragility_Index	FFDS_Scaled	Fragility_Band	Asset_Contribution	Funding_Contribution	Amplification_Contribution	Dominant_Driver
CreditAccess Grameen	2024	-2.32	-1.43	0.43	0	-0.83	20	Low Fragility	92.93%	42.97%	12.78%	Asset Driven
Spandana Sphoorty	2024	-2.31	-1.43	-0.40	0	-1.04	0	Low Fragility	92.59%	42.97%	12.12%	Asset Driven
Fusion Microfinance	2024	-2.31	-0.86	0.27	0	-0.72	30	Moderate Fragility	92.23%	25.74%	7.98%	Asset Driven
Satin Creditcare Network Ltd.	2024	-2.31	-0.92	-0.39	0	-0.91	13	Low Fragility	92.27%	27.68%	11.82%	Asset Driven
Muthoot Microfin Ltd.	2024	-2.31	-1.48	-0.03	0	-0.95	8	Low Fragility	92.32%	44.26%	1.02%	Asset Driven
Arohan Financial Services	2024	-2.31	-0.88	0.47	0	-0.68	34	Moderate Fragility	92.57%	26.50%	13.98%	Asset Driven
Svatantra Microfin Pvt Ltd.	2024	-2.30	-1.25	3.33	0	-0.06	94	High Fragility	91.99%	37.45%	99.78%	Leverage amplified
Midland Microfin Ltd.	2024	-2.32	-0.82	1.80	0	-0.33	67	High Fragility	92.77%	24.49%	53.88%	Asset Driven
Suryoday Microfinance	2024	-2.32	-0.84	0.33	0	-0.71	32	Moderate Fragility	92.91%	25.10%	9.78%	Asset Driven
L&T Finance Ltd.	2024	-2.30	-1.00	3.33	0	0.01	100	High Fragility	91.97%	30.14%	99.78%	Leverage amplified

The table integrates standardized measures of asset stress (PAR90 Z-score), funding structure stress (STB Z-score), leverage-based amplification, and their weighted aggregation into a composite fragility index.

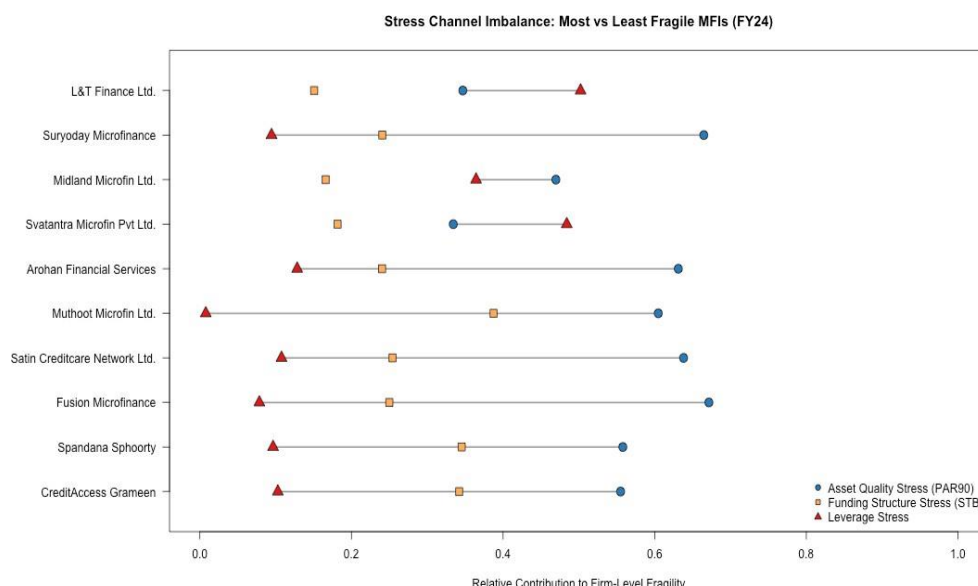
Despite operating under a broadly similar macroeconomic and regulatory environment, the MFIs display **substantial heterogeneity in FFDS outcomes**. Institutions such as *Spandana Sphoorty* and *Muthoot Microfin* record highly negative FFDS values and are classified under **low fragility**, reflecting the ability of their balance sheets to absorb stress even in the presence of moderate asset-side pressure. In contrast, *Svatantra Microfin* and *L&T Finance* fall within the **high fragility band**, driven predominantly by **leverage-amplified effects**, as indicated by amplification contributions approaching 100 percent of total fragility.

A key insight emerging from the decomposition is that **asset quality alone does not determine fragility**. Several MFIs with near-identical PAR90 Z-scores exhibit materially different FFDS values, underscoring the role of funding structure and leverage in transmitting and magnifying stress. For the majority of institutions, asset-side stress remains the dominant contributor; however, in a subset of MFIs, leverage overtakes asset quality as the primary fragility driver, highlighting structurally embedded vulnerabilities.

4.7 Decomposition of Fragility Drivers

FIGURE 6: Stress Channel Decomposition (Dumbbell / Contribution Plot)

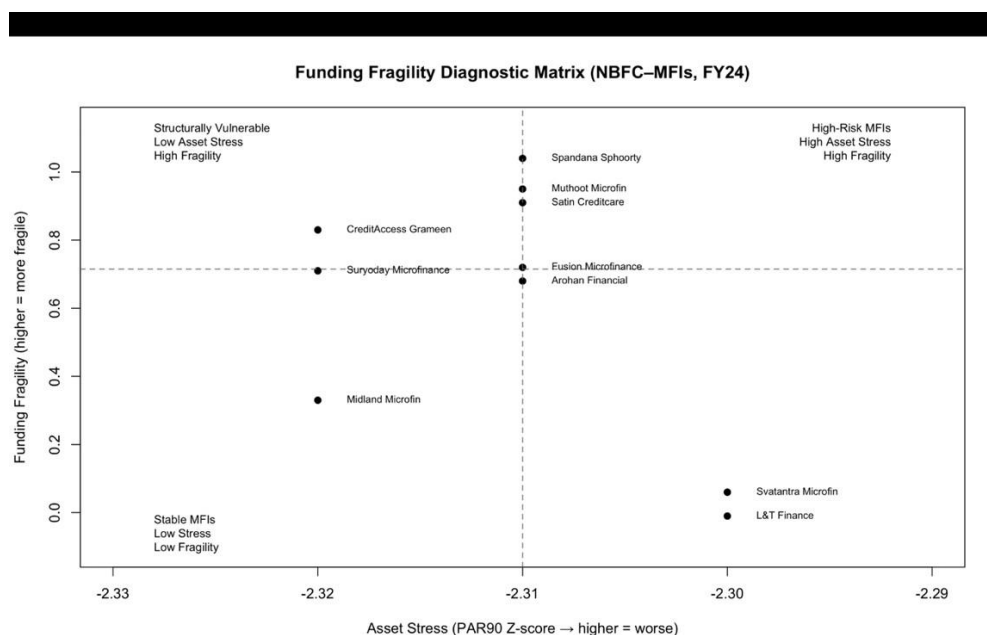
The figure highlights marked **imbalances in stress transmission channels** across



institutions. For relatively resilient MFIs, fragility—where present—is primarily driven by asset-side stress, with limited contribution from leverage or funding structure. In contrast, the most fragile MFIs exhibit a **disproportionate contribution from leverage and funding structure**, indicating that balance-sheet configuration, rather than borrower-

level deterioration alone, is central to fragility outcomes. This divergence reinforces the core argument that funding and amplification channels materially shape institutional vulnerability, even under comparable asset stress conditions.

4.8 Diagnostic Mapping (Policy Closure) **FIGURE 7: Funding Fragility Diagnostic Matrix**



The matrix reveals a clear **segmentation of institutions into distinct vulnerability regimes**, underscoring that fragility outcomes are not solely driven by borrower-level stress.

MFIs located in the **high-fragility region despite relatively moderate asset stress** are classified as *structurally vulnerable*, indicating that balance-sheet configuration and funding structure materially amplify stress transmission. In contrast, institutions positioned in the **low- fragility quadrant** maintain resilience even under comparable asset conditions, reflecting stronger funding and leverage management. The **high-risk quadrant** captures MFIs where elevated asset stress coincides with high fragility, signaling compounded vulnerability.

Overall, the diagnostic matrix demonstrates that **similar asset stress can translate into sharply different fragility outcomes**, validating the study's central premise that funding-side characteristics and amplification mechanisms are decisive in determining institutional risk. This visualization therefore reinforces the relevance and discriminative

power of the Funding Fragility Diagnostic Score (FFDS) as a policy-oriented monitoring tool.

Discussion

The analysis highlights the role of balance-sheet structure, leverage, and funding continuity risk in shaping institutional vulnerability, thereby reinforcing the relevance of the Funding Fragility Diagnostic Score (FFDS) as a complementary lens to conventional asset-quality metrics.

Funding Fragility versus Asset Quality

A central finding of the study is that **asset quality alone does not fully explain funding fragility among NBFC–MFIs**. Despite operating within the same regulatory environment and facing comparable macroeconomic conditions, several institutions with broadly similar PAR90 levels display sharply divergent fragility scores. This divergence indicates that borrower-level stress, while necessary, is not sufficient to determine funding vulnerability.

The empirical results suggest that **asset stress acts as an initial trigger**, but its translation into funding fragility depends critically on institutional balance-sheet characteristics. MFIs with comparable delinquency profiles experience different outcomes based on how stress is absorbed or transmitted through their funding structures. Institutions with diversified liabilities, longer maturity profiles, and stable lender relationships are better positioned to buffer asset- side shocks. Conversely, MFIs with concentrated funding sources or high dependence on short- term refinancing exhibit elevated fragility even when asset quality remains within acceptable bounds.

This finding challenges the implicit assumption—common in supervisory and market assessments—that deterioration in asset quality is the primary early-warning indicator of institutional stress. Instead, the results demonstrate that **funding-side vulnerabilities can dominate fragility outcomes**, particularly in sectors like NBFC–MFIs where wholesale funding and maturity transformation are intrinsic to the business model.

Role of Leverage and Funding Continuity Risk

Leverage emerges as a key amplification channel linking asset stress to funding fragility. The analysis shows that MFIs with higher debt–equity ratios tend to exhibit

disproportionate increases in fragility scores, even in the absence of severe asset deterioration. This confirms that leverage magnifies the sensitivity of institutions to both asset-side shocks and shifts in funding conditions.

Importantly, the study introduces and operationalizes the concept of **funding continuity risk**— the risk that an institution’s ability to roll over liabilities deteriorates due to structural dependence on short-term or confidence-sensitive funding sources.

The findings indicate that MFIs with high leverage and elevated short-term borrowing dependence are vulnerable to sudden changes in market sentiment, interest rates, or lender risk aversion. In such cases, even moderate stress can trigger a feedback loop: higher perceived risk raises funding costs, refinancing becomes more uncertain, and balance-sheet stress intensifies. This mechanism explains why some institutions are classified as highly fragile despite maintaining reasonable asset performance at the point of observation.

Key Takeaways from the FFDS Framework

Overall, the discussion underscores that **funding fragility in NBFC–MFIs is a structural phenomenon**, shaped by how institutions finance growth, manage leverage, and maintain funding continuity. The FFDS framework provides a systematic approach to uncovering these vulnerabilities, offering insights that complement asset-quality–focused supervision and contribute to more holistic risk monitoring in the NBFC–MFI sector.

Policy Implications

The findings of this study carry important implications for the supervision and risk monitoring of NBFC–MFIs, particularly in light of their structurally distinct funding models and growing systemic relevance. The results suggest that regulatory and market assessments that focus predominantly on borrower-level asset quality may underestimate institutional vulnerability, especially during periods of tightening liquidity or heightened risk aversion. A more comprehensive monitoring approach that explicitly incorporates funding-side diagnostics is therefore warranted.

Need for Funding-Side Diagnostics in NBFC Supervision

Traditional supervisory frameworks for NBFC–MFIs have largely emphasized asset quality indicators such as PAR90, provisioning coverage, and capital adequacy. While these metrics remain essential, the empirical evidence in this study demonstrates that **funding fragility can diverge significantly even among institutions with similar asset-side conditions**. This highlights a blind spot in asset-centric monitoring regimes.

Given NBFC–MFIs’ reliance on wholesale and market-based funding, supervisory assessments should incorporate indicators that capture **liability maturity structure, rollover intensity, and funding concentration**. Monitoring tools that focus solely on realised asset stress risk detecting vulnerabilities only after funding pressure has already materialised. Integrating funding-side diagnostics would allow supervisors to identify structurally vulnerable institutions at an earlier stage, improving preventive oversight.

Monitoring funding continuity risk is particularly relevant for NBFC–MFIs, where interruptions in institutional funding can rapidly translate into reduced credit access for low- income borrowers

Importance of Monitoring Leverage and Refinancing Dependence

The analysis underscores leverage as a critical amplification channel in the transmission of stress. High debt–equity ratios, when combined with short-term funding dependence, significantly increase sensitivity to shifts in funding conditions. This suggests that leverage should not be evaluated in isolation but jointly with indicators of refinancing dependence and funding maturity.

From a policy perspective, this calls for closer scrutiny of **balance-sheet growth funded through short-tenure liabilities**, particularly during periods of rapid expansion.

FFDS as an Early-Warning and Supervisory Tool

As a policy tool, FFDS can complement existing supervisory dashboards by serving as an **early-warning indicator**, flagging entities that warrant closer monitoring or targeted supervisory engagement. Its diagnostic nature also allows regulators to distinguish between asset-driven fragility and leverage- or funding-driven vulnerability, enabling more calibrated policy responses. While FFDS is not intended to replace granular supervisory analysis, it provides a transparent and scalable method to enhance funding-

side risk surveillance in the NBFC–MFI sector.

Conclusion

This paper examined funding-side fragility in Indian NBFC–MFIs by shifting the focus from borrower-centric asset quality indicators to balance-sheet structure and funding continuity.

Using the Funding Fragility Diagnostic Score (FFDS), the study demonstrates that institutions facing similar levels of asset-side stress can exhibit markedly different fragility outcomes, driven primarily by leverage and funding structure.

The empirical results show that short-term borrowing dependence and high leverage act as key amplification channels, converting otherwise manageable stress into funding pressure. Conversely, NBFC–MFIs with more stable liability structures display greater resilience even when asset quality indicators are comparable. This confirms that asset quality alone provides an incomplete picture of institutional vulnerability in the NBFC–MFI sector.

The core contribution of this study is the development of a funding-centric diagnostic framework that integrates asset stress, leverage, and funding structure into a single, interpretable metric. The FFDS captures dimensions of fragility that conventional indicators often miss and offers a practical basis for early identification of structurally vulnerable MFIs. Overall, the findings underscore the importance of incorporating funding-side diagnostics into risk assessment and supervision to enhance the stability of the NBFC–MFI ecosystem.

Limitations and Scope for Future Research

- The study is based on a **single-year, cross-sectional dataset (FY 2023–24)**, which limits the ability to analyse the dynamic evolution of funding fragility over time.
- The **sample size is restricted** to a select group of NBFC–MFIs, reflecting data availability and the study’s diagnostic focus, and may not fully represent smaller or unregulated microfinance entities.

- The analysis does not incorporate **stress-testing or scenario-based simulations**, which could provide additional insights into institutional resilience under adverse liquidity conditions.
- Future research may extend the framework using **panel data** to examine persistence, cyclical, and structural shifts in funding fragility across economic cycles.
- Further work could also explore linkages between funding fragility, **market-based indicators**, and supervisory interventions to strengthen early-warning capabilities.

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7. IMPACT OF DIGITAL BANKING ON CUSTOMER EXPERIENCE IN KERALA

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ABSTRACT

The rapid advancement of digital technologies has significantly transformed the banking sector, reshaping how customers access and interact with financial services. Digital banking platforms such as mobile banking applications, internet banking, and Unified Payments Interface (UPI) services have enhanced convenience, speed, and accessibility, while simultaneously introducing challenges related to security, trust, and digital literacy. This study examines the impact of digital banking on customer experience in Kerala, with a specific focus on identifying service quality factors that influence customer satisfaction and trust, as well as barriers to adoption in rural and semi-urban areas. The study is based on primary data collected from 192 respondents using a structured questionnaire. Statistical analysis was conducted using SPSS, employing Pearson correlation analysis and one-way ANOVA. The findings indicate a significant positive relationship between digital banking services and customer experience. Service quality factors such as usability, security, customer support, and data protection play a crucial role in shaping customer satisfaction and trust. The study highlights the importance of strengthening digital infrastructure, improving service quality, and enhancing digital literacy initiatives to ensure inclusive and sustainable digital banking adoption in Kerala.

Keywords

Digital Banking, Customer Experience, Service Quality, Customer Satisfaction, Trust, Kerala.

Introduction

The banking industry has undergone a significant transformation due to rapid technological advancements and increased digital adoption. Digital banking has shifted traditional banking operations to online platforms, allowing customers to access financial services anytime and anywhere. In India, initiatives such as Digital India and the expansion of UPI have accelerated digital banking adoption. Kerala, with its high literacy rate and digital awareness, has emerged as a key region for studying customer experience in digital banking. However, despite widespread adoption, variations in satisfaction, trust, and accessibility persist across demographic groups, making it essential to examine customer experience in detail.

Objectives of the Study

1. To evaluate the impact of digital banking on customer experience in Kerala.
2. To identify key service quality factors influencing customer satisfaction and trust.
3. To investigate barriers to digital banking adoption in rural and semi-urban Kerala.

Statement of the Problem

Although digital banking provides greater convenience and efficiency, customers continue to face challenges related to security concerns, usability issues, lack of digital literacy, and limited customer support. In Kerala, rural and semi-urban customers, as well as senior citizens, often struggle with adopting digital banking services. These challenges affect customer trust and satisfaction, highlighting the need to assess how digital banking services influence customer experience and identify factors that hinder inclusive adoption.

Conceptual Model

The conceptual model of the study considers digital banking services as the independent variable influencing customer experience. Service quality dimensions such as user-friendliness, security, responsiveness, visual design, and data protection act as mediating variables. Customer satisfaction, trust, and recommendation intention are considered dependent variables. Barriers such as digital literacy gaps and security concerns moderate the relationship between digital banking services and customer experience, particularly in rural and semi-urban areas.

Scope of the Study

The study is confined to digital banking users in Kerala. It focuses on customer experience, satisfaction, trust, and service quality factors across public and private sector banks. The research also examines adoption barriers in rural and semi-urban areas, providing insights useful for banks and policymakers.

Literature Review

1. **Arathy Saboo, Gayathri P, Dr. Sujith T. S [2025]- Navigating Digital Banking: Assessing The E-Service Quality On E-Customer Satisfaction in Kerala Based Private Sector Bank:** The banking industry has undergone a transformation thanks to digital technologies, and Indian private banks are increasingly implementing digital channels to improve efficiency and customer engagement. This study investigates the relationship between e-service quality and customer satisfaction among Kerala digital banking customers of Dhanlaxmi Bank. Convenience sampling was used to gather information from 504 clients in three districts. In the context of digital banking, elements like security, responsiveness, dependability, efficiency, and convenience have a major impact on customer satisfaction, according to statistical tools like percentage analysis, regression, ANOVA, and t-tests.
2. **A Sivaram, EK Satheesh [2021]- Customers' perceived risk and attitude towards adoption of the digital banking services:** Due to the extensive use of technology, banks have evolved from traditional credit providers to high-tech service providers, providing online and electronic services that are available at any time and from any location. Internet banking (IB) has emerged as a rapidly expanding, affordable, and practical method of service delivery due to the rise in e-commerce and digital demand. IB adoption is growing quickly in Kerala as consumers appreciate how convenient home banking is, IB does, however, come with both technological and non-technological risks in addition to its advantages, which are impacted by social, demographic, and geographic factors that influence the adoption of digital technology.
3. **P Arora, R Banerji [2024]- The impact of digital banking service quality on customer loyalty: An interplay between customer experience and customer satisfaction:** This study looks at how customer experience, satisfaction, and

loyalty in digital banking within Indian public sector banks are affected by service quality dimensions. The study uses the Cognitive-Motivational-Relational (CMR) theory and Hayes process approach, and it analyses data from 524 respondents using SPSS 25 and AMOS 22. The findings indicate that customer experience is greatly improved by service quality dimensions (RATER), which are a strong predictor of customer satisfaction and loyalty. The relationship between loyalty and experience is also influenced by customer satisfaction. In order to meet the expectations of tech-savvy customers, draw in new users, and strengthen current relationships in a tough digital environment, the findings emphasise the need for banks to routinely audit and enhance their digital services.

4. **Shilpa Chauhan, Asif Akhtar, Ashish_Gupta [2022]- Customer experience in digital banking: a review and future research directions:** This study examines the relationship between digital banking's impact on customer experience and a bank's financial performance. Through an analysis of 88 research studies published between 2001 and 2021, it indicates important elements that influence the customer experience, including convenience, trust, website design, and customer service. The study also emphasises how gamification—the addition of game-like elements to digital banking—can increase client loyalty and satisfaction. To assist banks in connecting digital tools, customer experience, and financial outcomes, a straightforward framework is put forward. This study is among the first to examine gamification in a banking context.
5. **Sintayehu Ermias Lolemo, Dr. Hemal B. Pandya [2024]- The Impact of Digital Banking on Customer Satisfaction and Loyalty in Commercial Banks: a Systematic Literature Review:** The effect of digital banking on client loyalty and satisfaction in commercial banks is investigated in this review of the literature. The review highlights important trends and findings about digital banking, service quality, and customer behaviour by examining 146 studies from different countries that were published between 2006 and 2022. Most studies used descriptive methods, with fewer empirical ones, and the majority were authored by males. The two countries with the highest publication rates were Nigeria and Pakistan. The results give commercial banks important information about how to enhance digital banking services and boost client loyalty and satisfaction.

6. **Dhruba Kumar Gautam, Gunja Kumari Sah [2023]- Online Banking Service Practices and Its Impact on E-Customer Satisfaction and E-Customer Loyalty in Developing Country of South Asia-Nepal:** In addition to analysing the mediating function of e-satisfaction, this study explores the relationship among online banking service practices, e-customer satisfaction, and e-customer loyalty. Five aspects of service quality—e-customer service, website efficiency, user-friendliness, security and privacy, and the organization's website—were evaluated using the E-S-QUAL model. The analysis, which was based on 384 valid responses, showed that the most important factors are e-customer service and website efficiency. E-satisfaction creates the relationship between service practices and loyalty and has a major impact on e-loyalty. The study provides a helpful model for raising the calibre of digital banking and retaining customers in developing South Asian countries.

Research Methodology

Research Design

The study adopts a descriptive and analytical research design.

Sampling Technique

Participants were selected from different age groups, professions, and regions to ensure diverse representation. The data was collected using a structured questionnaire distributed via Google Forms and in-person survey.

Sample Size

The study is based on 192 respondents.

Source of Data

Primary data were collected through a questionnaire; secondary data from journals and reports.

Tools for Data Analysis and Interpretation

SPSS was used for correlation and ANOVA analysis.

Analysis and Discussion

Pearson correlation analysis was used to test the relationship between digital banking services and customer experience. One-way ANOVA was applied to examine the influence of service quality factors on customer satisfaction and trust. The results indicate a statistically significant relationship, leading to the rejection of the null hypotheses.

H₀₁: Digital banking services do not have a significant impact on customer experiences.

Table 1: Correlation Analysis

Correlations			
		Digital Services	Customer Experiences
Digital Services	Pearson Correlation	1	.404**
	Sig. (2-tailed)		.000
	N	192	192
Customer Experiences	Pearson Correlation	.404**	1
	Sig. (2-tailed)	.000	
	N	192	192
**. Correlation is significant at the 0.01 level (2-tailed).			

To test H₀₁ (Digital banking services do not have a significant impact on customer experiences), a Pearson correlation analysis was carried out to examine the relationship between digital banking services and customer experiences.

The results show a moderate, positive, and statistically significant relationship between digital banking services and customer experiences ($r = 0.404$, $N = 192$, $p < 0.001$). This indicates that improvements in digital banking services are associated with better customer experiences. As the correlation is significant at the 0.01 level (2-tailed), the null hypothesis (H₀₁) is rejected. The findings provide empirical evidence that digital banking services have a significant impact on customer experiences.

Conclusion:

The study concludes that enhanced digital banking services positively influence customer experiences, reinforcing the importance of service quality in digital banking platforms.

H₀₂: Service quality factors of digital banking do not have a significant influence on customer satisfaction and trust among customers in Kerala.

Table 2: ANOVA Test

ANOVA					
customer Satisfaction and Trust					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	15.179	3	5.060	2.642	.050
Within Groups	566.901	189	1.915		
Total	582.080	192			

To test H₀₁ (Digital banking services do not have a significant impact on customer experiences), a one-way ANOVA was conducted.

The ANOVA results indicate that there is a statistically significant difference in customer experiences across different digital banking service groups, as the obtained F value is 2.642 with df (3, 296) and a significance value of 0.050.

Since the p-value is equal to the 0.05 level of significance, the null hypothesis (H₀₁) is rejected at the 5% level. This implies that digital banking services have a significant impact on customer satisfaction.

However, as the significance level is exactly at the threshold ($p = 0.050$), the result suggests a marginal but meaningful effect, indicating that differences in digital banking service quality contribute to variations in customer satisfaction.

Findings and Suggestions

Findings

- Digital banking positively influences customer experience:**

The study reveals that digital banking services have a strong positive impact on overall customer experience in Kerala. Customers appreciate the convenience, time-saving nature, and accessibility of services such as mobile banking and UPI platforms. The ability to perform transactions anytime and anywhere has reduced dependency on physical bank branches, leading to higher levels of satisfaction and improved perceptions of banking efficiency.

- **Service quality factors significantly affect satisfaction and trust:**

Service quality dimensions, including user-friendliness, transaction speed, security, reliability, and customer support, play a crucial role in shaping customer satisfaction and trust. The findings indicate that customers are more likely to trust and continue using digital banking services when platforms are easy to navigate, secure, and supported by responsive customer service. Any shortcomings in these areas negatively affect confidence and overall experience.

- **Rural customers face more adoption barriers:**

The study highlights that customers in rural and semi-urban areas encounter greater challenges in adopting digital banking services compared to urban users. Limited digital literacy, poor internet connectivity, fear of online fraud, and preference for traditional banking methods act as major barriers. These factors contribute to lower confidence and slower adoption rates, emphasizing the need for targeted digital literacy programs and infrastructural improvements.

Suggestions

- **Improve digital literacy programs:**

Banks and financial institutions should implement structured digital literacy initiatives to educate customers on the effective and safe use of digital banking services. Special focus should be given to rural and semi-urban populations, senior citizens, and first-time users. Training programs, awareness campaigns, and in-app tutorials in local languages can help customers gain confidence, reduce dependency on traditional banking methods, and encourage wider adoption of digital platforms.

- **Strengthen security and fraud prevention mechanisms:**

Enhancing security measures is essential to building customer trust in digital banking. Banks should invest in advanced fraud detection systems, encryption technologies, and multi-factor authentication methods. Regular security updates, real-time transaction alerts, and transparent communication regarding data privacy policies can reassure customers and minimize fear of cyber fraud.

- **Enhance customer support services:**

Effective customer support plays a vital role in improving customer experience and satisfaction. Banks should offer 24/7 customer support through multiple channels such as chatbots, helplines, and email assistance. Quick resolution of complaints, clear guidance on failed transactions, and multilingual support can significantly improve user confidence and long-term engagement with digital banking services.

Conclusion

The present study clearly establishes that digital banking has a significant and positive impact on customer experience in Kerala. The widespread adoption of digital banking services such as mobile banking applications, internet banking, and UPI platforms demonstrates a strong shift in customer preferences toward technology-enabled financial services. Customers increasingly value the convenience, speed, and accessibility offered by digital banking, which has substantially reduced their dependence on traditional branch-based banking.

However, the study also highlights that high adoption does not automatically translate into high satisfaction or trust. Service quality factors such as user-friendliness, transaction security, system reliability, and customer support play a decisive role in shaping customer perceptions. Security and data protection emerged as critical concerns influencing trust, particularly among less tech-savvy users, senior citizens, and customers from rural and semi-urban areas. Inadequate digital literacy and occasional technical issues continue to act as barriers to a seamless customer experience.

The findings suggest that banks must move beyond merely promoting digital platforms and focus on enhancing the quality and inclusiveness of digital services. Strengthening security measures, improving system reliability, providing responsive customer support, and investing in digital literacy initiatives are essential for building long-term trust and customer loyalty. By adopting inclusive and customer-centric digital strategies, banks in Kerala can ensure sustainable growth, foster stronger customer relationships, and successfully navigate the evolving digital banking landscape.

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8. UNLOCKING ECONOMIC POTENTIAL FOR SUSTAINABLE DEVELOPMENT: INDIGENOUS TOURISM AND DOMESTIC DEMAND

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Abstract

Indigenous tourism is emerging as an effective tool of cultural awareness and sustainable development. In this Domestic indigenous tourism has been a method of cultural preservation and sustainable economic growth. Tourism interaction with the Indigenous cultures serves to give the tourist an interdisciplinary insight into the worldviews of the Indigenous cultures and add to the socio-economic empowerment of these indigenous groups. This paper will detail the growing internal demand for Indigenous tourism within countries around the globe and how it is related to sustainable development. Much can be learned from Indigenous tourism about local living cultures. Whether local or visitor, through this tourism, locals are granted direct access to the rich heritage and established traditions of the Indigenous communities. This research-while focusing on domestic tourism markets-brings light to how increased interest in the home market can potentially build the Indigenous community's economy while building conservation of cultural and natural resources. The paper analyses several case studies of Indigenous tourism in countries with a strong presence of this population, drawing on the underlying drivers behind domestic demand and the positive implications therein toward sustainable development. The research addresses the challenges of risks associated with cultural commodification and the need for community-led models of tourism that are ethically managed. Finally, the paper concludes that domestic tourism demand can unlock significant potential in empowering Indigenous communities in respect of sustainable futures.

Keywords: - Domestic indigenous tourism, Cultural preservation, Sustainable development, Indigenous community Unlocking Economic Potential for Sustainable Development: Indigenous Tourism and Domestic Demand

1. INTRODUCTION

Indigenous tourism, a form of cultural tourism that showcases the traditions, practices, and heritage of Indigenous communities, has gained significant momentum in recent years. This growth is largely driven by an increasing global interest in authentic, immersive travel experiences. The very heart of indigenous tourism is economic development for host communities, yet cross-cultural understanding and ancient traditions are also conserved. This underplayed role of domestic demand driving the sector must receive more attention as a basis for unlocking its global potential in the context of a sustainable future. Indigenous tourism is fast growing as a positive tool for awareness of culture, economic sustainability, and heritage. It gives a meaningful experience for travellers while, at the same time, letting Indigenous communities preserve their traditions, with an advantage of economic profit. The realization of the economic value of domestic tourism markets towards Indigenous tourism continues to open broader opportunities for sustainable development, becoming a route toward economic empowerment as well as culture conservation. It not only benefits in terms of the economy but also provides an opportunity to have a deeper understanding of Indigenous worldviews, creating more appreciation and awareness. Ethnic cultural elements integrated within the tourism sector allow tourists to deeply connect with the rich cultural heritage that defines a destination, according to Buonincontri and Marasco (2017). It serves as an educational tool that bridges cultural gaps and promotes respect for traditional knowledge systems. Such engagement allows visitors to participate actively in traditional ceremonies, appreciate the nuances of local gastronomy, and interact with individuals from varied ethnic backgrounds, thus facilitating a multifaceted cultural immersion (Timothy, 2011). This immersive experience is instrumental in fostering an enhanced understanding and appreciation of the destination's heritage, contributing to a deeper cultural connection (Ezenagu, 2020). Sustainability in Indigenous tourism ensures that cultural integrity is maintained while supporting environmental conservation efforts, making it an integral part of responsible tourism.

In this mutually interdependent relationship between tourism and cultural preservation, the economic benefits from tourism activities create a positive feedback loop, whereby financial advantages help sustain traditional practices and their development and innovation. This adaptation takes place as communities strive to deliver authentic and exciting experiences to tourists, thus underscoring the role of tourism in preserving cultural heritage and its dynamic, adaptive evolution over time (Archer et al., 2005; Scarpato, 2002; Patterson et al., 2008).

2. LITERATURE REVIEW

Jackson (2025) explained in his study about Community-based tourism (CBT). It has been a game-changing approach to advancing the United Nations Sustainable Development Goals (SDGs), specifically SDG 1 (No Poverty) and SDG 8 (Decent Work and Economic Growth). By putting tourism development in the hands of local communities, CBT creates inclusive economic growth, poverty reduction, and cultural conservation while advancing environmental sustainability. Through case studies from Nepal, Kenya, Costa Rica, South Korea, and Zimbabwe, this research highlights the potential of CBT to empower marginalized groups, create sustainable livelihoods, and address global sustainability challenges. Weak governance structures and elite domination, as seen in Zimbabwe's CAMPFIRE initiative, can undermine equitable benefit sharing and community trust, while donor dependency, as observed in Tajikistan's Zarafshan Valley, often leads to unsustainable project lifecycles once external support is withdrawn. Balancing tourism development in harmony with people's needs while maintaining cultural and environmental integrity is a continuing challenge that entails participatory planning and ethical tourism operations. The literature on indigenous tourism planning and development has only continued to indicate the impacts of discrimination and marginalization, a disparity in relations of power which is controlled outside of the interested parties, with conflict linked into representation, interpretation, and control over cultural and natural resources, as Codina et al., (2022) or Ryan & Aicken, 2005 suggested.

Researchers include assertions of property rights by state and commercial actors over indigenous lands and resources, the imposition of systems of governance and acculturation of indigenous people, delineation of boundaries and creation of tensions. Thus, unjust and violent practices toward indigenous groups can provoke a

sense of collective identity, mutuality, and resistance that creates opportunities to strengthen in-group trust relations (Curtin & Bird, 2022; Devine & Ojeda, 2017). In this regard, indigenous tourism revives tensions regarding asymmetrical power relations, control over cultural and environmental resources, and representation related to (neo) colonialism (Carr et al., 2016; Devine & Ojeda, 2017).

The findings of the research paper suggested by Cristovao that the women's willingness and ability to invest in building shared resources, particularly those linked to linguistic and cultural traditions, helped to reinforce a sense of mutual interest and thus community. The women foregrounded goals and mobilised resources in service of traditions linked to a shared identity through which they earned the respect of community members and stakeholders. This was key to facilitating the development of trust insofar as it created shared frames of reference and stressed the collective benefits to be gained from supporting the tourism enterprise, under their leadership. (Cristovao et.al. 2025)

Roshis et.al. (2025) talked about indigenous tourism. This study has several significant contributions towards the knowledge of collaborative Indigenous tourism, some limitations should be acknowledged. This study, focused on the ethnographic research of Newar's Guthi system thus there is scope to study other social institutions, like Khokana's cooperative oil, for a broader picture of collaborative economic development. Further, the exclusive emphasis on Newar communities restricts the generalisability of the results. Nevertheless, the aim of this qualitative research is to generate rich theoretical findings instead of generalising across context

3. RESEARCH METHODOLOGY

3.1 Research Design

This study adopts a qualitative research approach to explore the role of domestic demand in Indigenous tourism and its implications for sustainable development. A case study method is used to analyze Indigenous tourism practices in different countries with significant Indigenous populations. The research is descriptive and exploratory, aiming to provide a deeper understanding of how Indigenous tourism is

influenced by domestic demand and how it contributes to cultural preservation and economic sustainability.

3.2 Data Collection Methods

The research is primarily based on secondary data sources, including:

- Peer-reviewed journal articles on Indigenous tourism and sustainable tourism.
- Reports from international organizations such as the United Nations World Tourism Organization (UNWTO) and World Bank.
- Government tourism policies and strategies related to Indigenous tourism.
- Case studies of Indigenous tourism initiatives from countries such as Canada, Australia, New Zealand, and India.

3.3 Sampling Strategy

A purposive sampling technique is used to select case studies and data sources. The chosen cases reflect:

- Diverse Indigenous communities that have successfully engaged in tourism.
- Countries with established Indigenous tourism sectors and policies supporting domestic tourism.
- Sustainable tourism models that integrate cultural preservation and economic benefits.

3.4 Data Analysis

- Content Analysis: Qualitative content analysis is used to identify key themes and trends in Indigenous tourism development.
- Comparative Analysis: Case studies from different countries are compared to understand the common factors driving Indigenous tourism and its sustainability.
- Thematic Coding: Themes such as cultural preservation, economic empowerment, domestic tourism trends, and sustainability practices are analyzed.

4. DOMESTIC DEMAND AS A TRIGGER

Though much attention is given to international tourists as drivers, not much emphasis is paid on fueling indigenous tourism through domestic demand. Tourist attracting destinations are to be moderately accessible for physically handicapped travelers with global communication technology; adopt a planned and managed approach towards development of tourism, and wish to develop quality sustainable tourism. The diversified interests of global and domestic tourists should not only be in the facilities provided but also community based ecotourism practices of the industry. These have to optimally satisfy the customers; and can be accustomed in to the globally known holiday vacations; and practices that tourists wish to participate in recreation, sports, adventure and learn about culture, history and natural landscapes of the host communities. (Moges,2024)

4.1. Key drivers of Domestic Demand

Rising Middle-Class Spending: Growing disposable income among middle-class populations in developing nations has led to increased domestic travel.

Cultural Curiosity: National initiatives and educational campaigns have sparked an interest in rediscovering and preserving native cultures. The continued practices of traditional cultures provide cultural tourists with essential attractions to enjoy. In the process allowing them to time travel back into the days when the same cultures were experienced by their forefathers through re-enactment of the experiences and listening to stories about the cultures (Reed, 2010). Serving organic foods creates demand from healthy conscious tourists and food tourists.

Regional Accessibility: Proximity and affordability make indigenous tourism destinations more accessible to domestic travelers.

Social Media Influence: The proliferation of digital platforms showcasing indigenous attractions has amplified their visibility among local audiences.

4.2. Domestic Indigenous Tourism: a tool for Cultural preservation

- Role in Sustaining Cultural Heritage

An example of domestic indigenous tourism is seen in the sustenance of traditional practices, language, and the arts. More and more interest in cultural participation can be assured when local people visit Indigenous culture and heritage as a tourist. These locations possess significant cultural and spiritual value for indigenous populations,

serving as venues for rituals, ceremonies, and storytelling that are fundamental to their heritage (Gee et al., 2014).

Furthermore, the encouragement of ecofriendly practices constitutes another critical facet of sustainable tourism that involves ethnic cultures (Jamal, 2004). This encompasses the adoption of environmentally sustainable actions and behaviors among tourists, businesses, and local communities (Khairat & Maher, 2012).

By cultivating responsible tourism practices that prioritize respecting and celebrating local customs and traditions, ethnic minority communities can effectively showcase their cultural identity to a broader audience while reaping economic benefits (Besculides et al., 2002).

This financial incentive, in turn, is a powerful motivator for the continued perpetuation and transmission of their unique cultural heritage from one generation to the next (Dahles & Susilowati, 2015). Dalley's (2023) research highlights the pivotal role of education and cultural exchange within the context of sustainable tourism efforts. It underscores the mutual learning process by emphasizing the significance of meaningful interactions between tourists and host communities.

- **Economic Contributions to Indigenous Communities**

Domestic tourism provides a steady revenue stream for Indigenous communities, reducing economic reliance on external factors. The local economy is supported by the combined investment and expenditure of local and incoming visitors. Domestic tourists use money to buy tourism goods and services like artefacts to take back home from vendors, sleep in hotels, eat in restaurants and undertake activities. By promoting Indigenous-run businesses, cultural tourism creates job opportunities and financial stability for local artisans, guides, and entrepreneurs. Profits generated are expected to benefit the local community through Corporate Social Responsibility by having tourism organisation donating to the local communities.

4.3. Interdisciplinary insights through Indigenous Tourism

- **Understanding Indigenous Worldviews**

Indigenous tourism enables tourists to gain interdisciplinary knowledge of the Indigenous perspectives, philosophies, and relationships toward the natural environment. The

underpinning principles of the collective research clearly resonate with the “manifestations” of the United Nations (UN) Declaration of the Rights of Indigenous Peoples (UN, 2016) from 2007. The UN Declaration was notable for: “Affirming that Indigenous peoples are equal to all other peoples, while recognizing the right of all peoples to be different, to consider themselves different, and to be respected as such”

These learnings feed into broader discussions of sustainability, stewardship of the environment, and alternative economic models based on traditional knowledge.

The unique dynamics of Indigenous peoples who have experienced colonization and continue to exist within constrained circumstances are linked within all the papers. These include insights into issues with Indigenous entrepreneurship and innovation (Chan, Iankova, Zhang, McDonald, & Qi, 2016; Espeso-Molinero et al., 2016; Koot, 2016; Siever & Matthews, 2016).

- Empowerment of Indigenous Groups on Socio-Economic Levels

The skills and traditions of the Indigenous can be showcased and, therefore, create pride in the community through tourism. This also creates an economic self-sufficiency sense. Moreover, the revenues can be reinvested into other community-led initiatives, such as education, health, and infrastructural development.

4.4. Growing internal demand for Indigenous Tourism

There is an increasingly conscious domestic market of the significance of Indigenous tourism to culture and the environment. Many tourists search for authentic immersion experiences that are capable of evoking a bond with the cultural heritage of the country they visit. This evolving travel trend calls for Indigenous tourism products within their domestic markets.

4.5. CASE STUDIES

A number of countries with large Indigenous populations have utilized domestic tourism to gain economic and cultural benefits. Examples include:

- Canada: Indigenous tourism ventures engage tourists in eco-tourism and cultural learning, thereby supporting local economies. Programs by indigenous peoples, which provide guided tours of wilderness and First Nations culinary experiences, have captivated domestic markets worldwide

- Australia: Aboriginal tourism ventures offer educational experiences focused on traditional land management and storytelling.
- New Zealand: Māori tourism ventures combine historical narratives with modern hospitality services, both attracting local and international visitors. Promoting the Māori culture to its domestic tourists had improved global reach. Examples like Māori-led cultural shows, haka workshops, or indigenous art exhibition are becoming in-demand globally.(MBIE, 2021)
- Rajasthan, India: Domestic demand for heritage assets, which include handicrafts, traditional folk dances, and tribal tours, have produced a viable foundation for international tourism. (Singh & Singh, 2019)

5. SUSTAINABLE DEVELOPMENT AND INDIGENOUS TOURISM

Sustainable tourism, often called responsible tourism or eco-tourism, represents a deliberate approach within the tourism industry to mitigate its adverse impacts on the environment, culture, and local communities while fostering favorable outcomes for all relevant stakeholders (Harris et al., 2002).

The United Nations sanctioned tourism as a strong actor towards sustainable and equitable development in the world societies. As proof for the utmost attention of the organization and agencies, the United Nations designated 2017 as 'the international Year of Sustainable Tourism for Development' (The World Bank Group, 2017). In the publication, entitled '20 Reasons Sustainable Tourism Counts for Development', the World Bank Group identified twenty justifications as integrating an approach to sustainable tourism into development projects elsewhere in the world.(The World Bank Group, 2017)

- Contributions to Local Economies

Ecotourism and community-based tourism are often claimed to be potential solutions for the conservation of wildlife and natural resources, but studies show that their implementation and revenue-sharing are far from straightforward' (Snyder & Sulle, 2011). Indigenous tourism is an enabler of local economic growth in terms of job opportunities, enhancing small business flows, and investment in infrastructure. Thus, the tourism sector promotes poverty reduction and enhances the productivity of rural community agricultural production; and increases the income-generating ability of the households. Specialization in the rural ecotourism tourism expansion contributes to

diversifying the rural community's livelihood; it lowers the gap that exists between rural and urban groups and migration flux into the destination for wage employment. This eventually enhances peace amongst different groups. Liu et al., (2017), Lankford et al., (2008), Mgonja et al., (2015).

It also diversifies the economy, reducing reliance on the resource extraction industries and bringing long-term financial resilience for the Indigenous communities.

- Cultural and Natural Resource Conservation

Sustainability is the heart of Indigenous tourism that ensures the conservancy of culture and natural resources for future generations. Many indigenous tourism initiatives incorporate eco-friendly practices, such as sustainable land management, wildlife conservation, and low-impact accommodations.

All these programs, ranging from education and awareness programs, to waste reduction techniques, as well as resourceful management of natural resources, ensure the safe protection of the natural environment. Sustainable tourism initiatives incorporating these cultural elements typically adopt an integrated include environmental conservation (Everett & Aitchison, 2008).

One of the core elements of sustainable tourism programs is the preservation of sacred natural sites (Wild & McLeod, 2008). These wide-ranging efforts are intended to protect and preserve natural environments, which may include preserving sacred natural sites or promoting more ecologically friendly practices (Fukamachi, 2020).

In the context of development and culture, sustainable tourism has emerged as a transformative agent for economic development, protection of ethnic cultures, and environmental responsibility across various regions worldwide (Streimikiene et al., 2021).

6. CHALLENGES AND RISKS IN INDIGENOUS TOURISM

According to Théron, 2005, community participation is the process where the people are heard and given an opportunity to contribute their say on matters that concern their lives. Trust between community members can be a major barrier towards such participation. The core for developing support in tourism planning and development is community building through joint engagement in cultural activities, according to Aref, 2010; 2011; Nunkoo & Ramkissoon, 2010.

There are several challenges faced by indigenous tourism in its implementation and execution. Some of them discussed hereunder:

- Cultural Commodification and Ethical Concerns

One of the dangers of Indigenous tourism is the commercialization of culture, where traditions and artifacts are commodified in ways that may distort the original meanings. Thus, there is always a fear of exploitation and loss of authenticity if this form of tourism is not managed ethically.

- Need for Community-Led Tourism Models

To avert these negative impacts, there is an imperative need for the development of community-led models which emphasize the Indigenous voice and decision-making process. This ownership by Indigenous communities over tourism enterprises would ensure benefits remained within the community and with intact cultural integrity.

- Cultural Erosion

Over-commercialization can "water down" cultural authenticity. This needs to be addressed with basic guidelines as to what is appropriate for respectful representation.

- Economic Inequality: The distribution of profits to all members of the community is also very important.
- Environmental Impact: The need to balance tourist footprints with natural resources calls for thoughtful planning.

Amidst these challenges, sustainable tourism allows these communities to leverage their unique cultural assets for economic and social empowerment while ensuring the conservation of their heritage and the natural environment (Higgins-Desbiolles, 2020; Cardia, 2018).

7. CONCLUSIONS AND FUTURE PROSPECTS

The prospects of indigenous tourism, driven by domestic demand, are promising to lead toward a sustainable future. Nurturing local interest and building it as a base for further expansion into global markets, indigenous tourism can extend beyond economic gains to cultural preservation and environmental stewardship. It is the interface between local communities, domestic travelers, and international audiences that can unlock the huge

potential of this sector, ensuring it remains a corner-stone of sustainable development globally.

- **Unlocking the Potential of Domestic Indigenous Tourism**

Recognizing the value of indigenous tourism and investment in community-led initiatives unlocks huge economic and cultural potential for a country. Indigenous communities benefit from tourism while preserving their heritage sustainably through strengthened domestic demand.

- **Recommendation of Sustainable and Ethical Practices**

- 1) **Community Empowerment:** Indigenous communities should be solely in charge of tourism operations to distribute equitably on the same benefits.
- 2) **Cultural Sensitivity:** Tourists and businesses should respect Indigenous customs, traditions, and intellectual property.
- 3) **Sustainable Development Policies:** Governments should implement policies that support Indigenous tourism while protecting environmental and cultural assets.
- 4) **Education and Awareness:** Increasing awareness among travelers about responsible tourism practices can contribute to the ethical growth of Indigenous tourism.

Through the development of sustainable and community-led Indigenous tourism, nations can ensure meaningful travel experiences while contributing to cultural preservation and economic empowerment. The future of Indigenous tourism lies in ethical practices that prioritize both people and the planet.

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9. A ROLE OF ARTIFICIAL INTELLIGENCE IN PROMOTING INCLUSIVE AND SUSTAINABLE GROWTH

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ABSTRACT

In recent years, Artificial Intelligence (AI) has emerged as one of the most transformative technologies of the modern world. AI has the potential to significantly influence economic growth, social inclusion, and environmental sustainability. Inclusive and sustainable growth focuses on ensuring that economic progress benefits all sections of society while preserving natural resources for future generations. This paper examines the role of Artificial Intelligence in promoting inclusive and sustainable growth by improving access to education, healthcare, agriculture, employment, and environmental protection. The study adopts a descriptive research methodology based on secondary data collected from journals, reports, and case studies. The paper highlights real-world examples where AI has contributed positively to sustainable development goals. It also discusses challenges such as digital divide, ethical concerns, and job displacement. The study concludes that AI, when implemented responsibly, can act as a powerful tool to promote inclusive and sustainable growth.

Keywords: Artificial Intelligence, Inclusive Growth, Sustainable Growth, Technology, Development

1. INTRODUCTION

The world today is witnessing rapid technological advancements, among which Artificial Intelligence (AI) plays a crucial role. AI refers to the ability of machines to perform tasks that normally require human intelligence, such as learning, reasoning, problem-solving, and decision-making. Technologies like machine learning, natural language processing, and data analytics are widely used in various sectors. Inclusive and sustainable growth has become a key objective for governments and organizations across the globe. Inclusive growth ensures that the benefits of economic

development reach all sections of society, including marginalized and vulnerable groups. Sustainable growth focuses on long-term development without harming the environment or exhausting natural resources. Artificial Intelligence has the potential to bridge social and economic gaps by improving efficiency, reducing costs, and expanding access to essential services. This paper aims to study how AI contributes to inclusive and sustainable growth and how it can be used responsibly to create a balanced and equitable society.

2. OBJECTIVES OF THE STUDY

The main objectives of this study are:

- 1.To understand the concept of Artificial Intelligence
- 2.To analyze the meaning of inclusive and sustainable growth
- 3.To examine the role of AI in promoting inclusive growth
- 4.To study the contribution of AI towards sustainable development
- 5.To analyze real-life case studies of AI applications
- 6.To identify challenges in implementing AI for inclusive and sustainable growth

3. RESEARCH METHODOLOGY

This study is based on descriptive research methodology. The research relies on secondary data collected from the following sources:

1. Research journals
2. Government and international organization reports
3. Websites and online articles
4. Books related to Artificial Intelligence and sustainable development

The study also includes case studies to understand the practical application of AI in different sectors. The data collected has been analyzed qualitatively to draw meaningful conclusions.

4. CONCEPTUAL FRAMEWORK

4.1 Artificial Intelligence

Artificial Intelligence refers to the simulation of human intelligence in machines that are programmed to think and act like humans. AI systems can analyze large amounts of data, recognize patterns, and make predictions with high accuracy. AI is used in sectors such as healthcare, education, agriculture, finance, and governance.

4.2 Inclusive Growth

Inclusive growth means economic growth that creates opportunities for all sections of society and ensures equal access to resources. It focuses on reducing poverty, inequality, and unemployment by providing education, healthcare, and employment opportunities.

4.3 Sustainable Growth

Sustainable growth refers to development that meets present needs without compromising the ability of future generations to meet their needs. It emphasizes environmental protection, efficient resource utilization, and long-term economic stability.

5. ROLE OF ARTIFICIAL INTELLIGENCE IN PROMOTING INCLUSIVE GROWTH

5.1 AI in Education

AI has transformed the education sector by enabling personalized learning. Online learning platforms powered by AI provide customized study materials based on students' abilities. AI tools help students from rural and underprivileged backgrounds access quality education at low cost.

5.2 AI in Healthcare

AI improves healthcare services by enabling early diagnosis, efficient treatment, and remote medical assistance. AI-powered applications help doctors analyze medical images and predict diseases. Telemedicine platforms supported by AI make healthcare accessible to people in remote areas.

5.3 AI in Agriculture

AI helps farmers by providing weather predictions, crop monitoring, and soil analysis. AI-based applications guide farmers on the right time for sowing, irrigation, and harvesting. This increases agricultural productivity and supports small and marginal farmers.

5.4 AI in Employment and Skill Development

AI-based platforms offer skill training and job matching services. Online learning and digital skill programs powered by AI help individuals improve employability. This contributes to inclusive growth by creating equal job opportunities.

6. ROLE OF ARTIFICIAL INTELLIGENCE IN PROMOTING SUSTAINABLE GROWTH

6.1 Environmental Protection

AI helps monitor pollution levels, deforestation, and climate change. AI systems analyze satellite data to track environmental changes and predict natural disasters. This helps governments take preventive measures.

6.2 Energy Management

AI is used in smart grids to optimize energy consumption and reduce wastage. AI-powered systems promote the use of renewable energy sources like solar and wind power.

6.3 Sustainable Urban Development

AI supports smart city initiatives by improving traffic management, waste management, and water conservation. This leads to efficient use of resources and better living conditions.

7. CASE STUDIES

Case Study 1: AI in Indian Agriculture

The Government of India uses AI-based platforms such as Kisan e-Mitra to assist farmers. These platforms provide information on crop diseases, weather conditions, and market prices. As a result, farmers can make informed decisions and improve their income.

Case Study 2: AI in Healthcare – Telemedicine

AI-powered telemedicine platforms like eSanjeevani help patients consult doctors remotely. This is especially beneficial for rural populations, ensuring inclusive healthcare access.

Case Study 3: AI for Environmental Sustainability

AI tools are used by organizations to predict air pollution levels in cities. This helps authorities take timely action to reduce emissions and protect public health.

1.Challenges in Using AI for Inclusive and Sustainable Growth

2.Despite its benefits, AI faces several challenges:

3.Digital divide between urban and rural areas

4.Lack of technical skills and awareness

5.Ethical concerns and data privacy issues

6.Risk of job displacement due to automation

7.High cost of AI implementation

Addressing these challenges is essential to ensure responsible and inclusive use of AI.

9. SUGGESTIONS

- Governments should invest in digital infrastructure
- AI education and skill training should be promoted
- Ethical guidelines for AI usage must be framed
- Public-private partnerships should be encouraged
- AI solutions should focus on social welfare

10. CONCLUSION

Artificial Intelligence has the potential to become a powerful driver of inclusive and sustainable growth. By improving access to education, healthcare, agriculture, and employment, AI helps reduce inequality and promote social inclusion. At the same time, AI supports environmental sustainability by optimizing resource use and

monitoring ecological changes. However, the successful implementation of AI requires strong policies, ethical frameworks, and inclusive digital infrastructure. If used responsibly, AI can contribute significantly to achieving sustainable development goals and creating a balanced and equitable society.

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United Nations Sustainable Development Goals Reports

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10. AWARENESS, USAGE AND ETHICAL CONCERNS OF ACADEMICIANS AND RESEARCHERS ON AI TOOLS IN ACADEMIC WRITING AND RESEARCH: A STUDY IN THRISSUR DISTRICT”

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ABSTRACT

The study aims to understand the awareness, Preferences, frequency of use, and ethical concerns of academicians and researchers regarding the use of Artificial Intelligence tools in academic writing and research. The study is based on primary data collected from 100 respondents, including Ph.D. scholars and teachers from different educational sectors in Thrissur district, using a structured questionnaire and convenience sampling method. Data were analyzed using SPSS with statistical tools such as frequency, chi-square and correlation to study the relationship between awareness, usage, and ethical perception. The objectives of the study are to find the level of awareness and frequency of AI tool usage, the most preferred AI tool and to study the perception and ethical concerns including plagiarism issues, and to identify the relationship between these variables. The possible findings suggest that most respondents are aware of AI tools and use them for research support, but many still express concern about plagiarism, accuracy, and ethical issues. The study emphasizes the need for awareness programs and clear ethical guidelines for responsible and effective use of AI in academic work.

Keywords: Artificial Intelligence, awareness, Usage, frequency of use, ethical concerns, plagiarism, academicians, researchers.

Introduction

In recent years, the integration of Artificial Intelligence (AI) tools into academic research and writing has gained significant momentum (Cardon et al., 2023; Hosseini et al., 2023). With the advancement of technologies like natural language processing, machine learning, and AI- powered writing assistants, scholars and researchers now have access to

powerful tools that can support tasks such as literature review, grammar correction, data analysis, and even content generation (Burger et al., 2023; OpenAI, 2024). These tools promise to enhance productivity, improve writing quality, and streamline research workflows (Fahmi & Cahyono, 2021).

However, the rapid adoption of AI in academia raises questions regarding ethical practices, originality, authorship, and academic integrity (Bjelobaba et al., 2024; Elkhataat et al., 2023). Concerns about plagiarism, over-reliance on automation, and inaccuracies in AI-generated content are now central to academic debate (Gupta et al., 2025; Casal & Kessler, 2023). In India, especially within localized academic communities such as Thrissur district, researcher stress the importance of assessing AI usage patterns and ethical awareness (Awasthi et al., 2024, as cited in BioMed Central).

Understanding the preferred AI tools, awareness levels, and ethical perceptions among academicians is critical, as AI continues to challenge conventional norms of academic honesty (Narayan, 2024; Subaveerapandiyan & Sakthivel, 2022). This study addresses this need by examining the perspectives of Ph.D. scholars and teachers across various sectors in Thrissur district.

Statement of the Problem

The rapid integration of Artificial Intelligence (AI) tools in academic writing and research has transformed scholarly practices (Burger et al., 2023; Hosseini et al., 2023), yet it also raises critical ethical concerns related to plagiarism, originality, and academic integrity. In regions like Thrissur district, Kerala, there is limited empirical evidence on which AI tools are most preferred, the level of awareness and frequency of their use among academicians and researchers, and their perceptions of the ethical implications associated with these technologies. This study seeks to address these gaps by examining the preferences, usage patterns, and ethical concerns of academic professionals in Thrissur, aiming to inform the development of effective guidelines and awareness programs for responsible AI use in academic work (Cardon et al., 2023; OpenAI, 2024).

Review of literature

Several Indian and international studies have extensively explored awareness, usage patterns, and ethical implications of AI tools in academic environments. In India, awareness of AI- assisted writing tools such as Grammarly, ChatGPT, and QuillBot is generally high among students and researchers (Awasthi, Kumar, & Tripathi, 2024; Narayan, 2024). Awasthi et al. (2024) reported that while research scholars demonstrated strong familiarity with plagiarism norms and text-matching software, many continued to struggle with differentiating between intentional and unintentional plagiarism, suggesting that access to AI tools alone does not ensure responsible usage (BioMed Central, <https://doi.org/10.48550/arXiv.2412.07234>). Similarly, Gupta, Mahaseth, and Bajpai (2025) observed that many Indian universities still lack robust systems for detecting AI-generated content, raising concerns about originality verification (Engineering Proceedings, <https://doi.org/10.3390/engproc2025107026>).

At an institutional level, Subaveerapandiyan and Sakthivel (2022) highlighted that several Tamil Nadu colleges face significant barriers in subscribing to plagiarism detection tools due to financial and infrastructural constraints (arXiv, <https://doi.org/10.48550/arXiv.2210.10372>). Even when awareness exists, technical or administrative limitations often hinder ethical compliance (Fahmi & Cahyono, 2021, <https://doi.org/10.21070/jees.v6i1.849>). A study among media students at Maharishi University found that although 72% of respondents were aware of AI tools like ChatGPT and QuillBot, far fewer reported frequent usage due to fear of over-reliance and originality loss (Narayan, 2024, <https://doi.org/10.63324/lec.1v.1i.5>; Amyatun & Kholis, 2023, <https://doi.org/10.22515/elereviews.v3i2.7533>). This suggests that awareness does not always translate into confident adoption (Cardon et al., 2023, <https://doi.org/10.1177/2329490623117651>).

International research aligns with these findings. Bjelobaba et al. (2024) conducted a systematic review and identified common concerns such as hallucinated outputs, lack of transparency, and algorithmic bias in AI-assisted writing (arXiv, <https://doi.org/10.48550/arXiv.2412.07234>). Bano et al. (2023) also emphasized the absence of standardized ethical frameworks among global researchers regarding fairness, accountability, and transparency in AI-supported academic writing (Research Integrity Journal). Casal and Kessler (2023) demonstrated that even expert reviewers

often fail to distinguish between AI-generated and human-written content, complicating peer review and authorship verification (*Research Methods in Applied Linguistics*, <https://doi.org/10.1016/j.rmal.2023.100068>). Furthermore, Elkhatat et al. (2023) assessed AI- detection tools and found significant inconsistency in accurately flagging AI-generated outputs (*International Journal for Educational Integrity*, <https://doi.org/10.1007/s40979-023- 00140-5>). Collectively, the literature reveals three consistent themes: (1) AI awareness is rapidly increasing across academic communities in India and globally (*Gupta et al., 2025; Narayan, 2024*), (2) ethical concerns surrounding plagiarism, authorship attribution, and data bias remain substantial (*Bjelobaba et al., 2024; Casal & Kessler, 2023*), and (3) institutional policies and technological infrastructure are lagging behind adoption trends (*Subaveerapandiyen & Sakthivel, 2022; Gupta et al., 2025*). Despite growing scholarly interest in AI usage, there remains limited understanding of how these tools are perceived within specific regional contexts such as Kerala, particularly in the Thrissur district. While national and global studies exist, few have addressed localized challenges such as awareness disparities, infrastructure gaps, or ethical hesitation among educators (*OpenAI, 2024*).

Despite the growing global interest in the use of Artificial Intelligence (AI) tools in academic writing and research, there remains a limited understanding of how these tools are perceived and utilized within specific regional contexts such as Kerala, particularly in the Thrissur district. While studies have documented AI tool usage and ethical concerns at national and international levels, few have focused on the preferences of academicians and researchers in Kerala, where educational institutions are rapidly adopting digital technologies but may face unique challenges related to awareness and resource availability. Furthermore, the frequency of AI tool uses and the depth of ethical concerns, especially regarding plagiarism and academic integrity, have not been sufficiently explored in this region. There is a clear need to investigate which AI tools are most preferred by scholars in Thrissur, how frequently these tools are employed, and the extent to which users are aware of and concerned about the ethical implications of AI in academic work. Addressing this gap will provide valuable insights for developing region-specific guidelines and awareness programs that support responsible and effective AI tool use in Kerala's academic landscape.

Objectives of the Study

1. To know the most preferred AI tool for academic writing among the academicians and researchers in the Thrissur district.
2. To assess the level of awareness and frequency of use of AI tools for academic research and writing among academicians and researchers in the Thrissur district.
3. To examine the ethical perceptions and concerns, including issues related to plagiarism, regarding the use of AI tools in academic research and writing.

Research Methodology

The study employed a quantitative research approach to examine the awareness, preferences, usage frequency, and ethical concerns related to AI tools among academicians and researchers in the Thrissur district. Primary data were collected from 100 respondents, including 52 Ph.D. scholars and 48 teachers from various educational sectors, using a structured questionnaire and convenience sampling method. The questionnaire included items on awareness, usage patterns, preferred AI tools, and ethical perceptions such as plagiarism concerns. Data were analyzed using SPSS software, applying statistical techniques like frequency analysis, chi-square tests, and correlation to explore relationships between awareness, usage, and ethical perceptions. This methodology enabled a focused investigation of AI tool adoption and related ethical issues within the targeted academic community.

Hypotheses

1. **H1:** There is a significant relationship between the level of awareness of AI tools and their frequency of use among academicians and researchers.
2. **H2:** There is a significant relationship between the frequency of AI tool usage and the level of ethical concern (e.g., plagiarism, accuracy) expressed by the users.

Limitations of the Study

This study is limited to examining the use of AI tools specifically in academic writing and research, excluding other applications in education like teaching, administration, or

student learning. It also focuses on awareness, usage frequency, and ethical concerns, without investigating the effectiveness, user satisfaction, or impact of these tools on academic performance and research quality. This narrow scope allows for a focused analysis of key issues in AI adoption within academic writing but leaves room for broader exploration in future research.

Analysis On Awareness, Preference, Usage and Ethical Concerns of Academicians and Researchers On AI Tools in Academic Writing and Research

Table 1 : Most preferred AI tool

AI Tool	Frequency	Percentage (%)
Grammarly	32	32%
ChatGPT	28	28%
QuillBot	18	18%
Turnitin	12	12%
Google Gemini / Bard	5	5%
Other (e.g., Jasper, Scribbr, etc.)	5	5%
Total	100	100%

The data shows that Grammarly is the most commonly used AI tool among respondents, followed closely by ChatGPT and QuillBot. Turnitin is used by a smaller group, mainly for plagiarism checking, while tools like Google Gemini or others have limited use. The preference for certain tools appears to be influenced by their specific functions, such as grammar correction, content generation, or paraphrasing. Overall, the findings indicate that practicality and familiarity play a key role in AI tool selection among academicians and researchers.

Table 2 : Frequency of AI Tool Usage

Question: "How often do you use AI tools (e.g., ChatGPT, Grammarly, Quillbot, etc.) in your academic writing or research?"	Frequency	Percentage (%)
Frequently	68	68%
Occasionally	22	22%
Rarely	10	10%
Total	100	100%

Out of 100 respondents, 68% said they use AI tools like ChatGPT, Grammarly, and Quillbot frequently in their academic writing and research. Another 22% use these tools

occasionally, while only 10% use them rarely. This shows that most academicians and researchers regularly use AI tools to support their work, indicating that these tools have become an important part of their academic activities.

Table 3: Respondents Awareness towards AI Tools

Awareness Questions	5 (Strongly Agree)	4 (Agree)	3 (Neutral)	2 (Disagree)	1 (Strongly Disagree)	Total
1. I am familiar with different AI tools available for academic writing and research.	25	40	20	10	5	100
2. I know the features and limitations of popular AI tools like ChatGPT or Grammarly.	24	30	25	15	6	100
3. I understand how AI tools can assist in academic research processes.	21	45	18	12	4	100
4. I keep myself updated about new AI developments relevant to academic writing.	20	27	28	18	7	100
5. I am confident in using AI tools effectively for my academic work.	20	30	22	20	8	100
6. I am aware of the ethical guidelines regarding the use of AI tools in research.	13	25	30	22	10	100

The awareness data indicates that a majority of respondents are familiar with AI tools used in academic writing and research, with 65% agreeing or strongly agreeing to having general familiarity. A good number (66%) also understand how these tools assist in academic processes, showing a solid foundational awareness. However, only 54% agreed they know the features and limitations of popular AI tools like ChatGPT or Grammarly, suggesting that while usage is common, deeper technical understanding may be limited. Confidence in using AI tools effectively was moderate, with just half of the respondents agreeing, and 28% expressing disagreement, pointing to a need for skill-building initiatives. Additionally, only 47% said they keep themselves updated on new developments in AI, while 28% were neutral—indicating a gap in ongoing

engagement and awareness. Most notably, only 38% of respondents felt aware of ethical guidelines related to AI use, while 32% disagreed or strongly disagreed, highlighting a critical area for institutional attention. **Overall, while general awareness of AI tools is high, there is a clear need for more focused education on their responsible use, ethical implications, and practical application in academic settings.**

Table 4: Respondents ethical perceptions and concerns on AI Tools

Ethical Concern Questions	5 (Strongly Agree)	4 (Agree)	3 (Neutral)	2 (Disagree)	1 (Strongly Disagree)	Total
1. Using AI tools may lead to unintentional plagiarism.	30	35	20	10	5	100
2. AI-generated content can compromise the originality of academic work.	28	32	25	10	5	100
3. There is insufficient clarity on ethical guidelines for AI tool use in research.	35	30	20	10	5	100
4. I am concerned about the accuracy of information produced by AI tools.	25	40	20	10	5	100
5. Relying on AI tools may reduce the development of critical thinking skills among researchers.	22	35	25	12	6	100
6. AI tools may inadvertently promote academic dishonesty if misused.	30	33	20	12	5	100
7. The use of AI in academic writing should always be properly disclosed in research papers.	40	35	15	7	3	100
8. Ethical training on the responsible use of AI tools is necessary for academicians and researchers.	38	37	15	7	3	100

9. AI tools sometimes produce biased or misleading outputs that can affect research integrity.	33	35	20	8	4	100
10. Institutions should develop clear policies regulating the use of AI tools in academic work.	45	30	15	7	3	100

The responses indicate a generally high level of ethical concern regarding the use of AI tools in academic work. A majority of participants agreed or strongly agreed that AI tools may lead to unintentional plagiarism, affect originality, and contribute to academic dishonesty if misused. Many also felt there is a lack of clarity around ethical guidelines, and expressed concerns about the accuracy and potential bias in AI-generated content. There is strong agreement on the need for proper disclosure when using AI tools in research papers, as well as the importance of ethical training for academicians. Respondents also supported the development of institutional policies to regulate AI use. In summary, while AI tools are widely recognized for their utility, there is a clear consensus on the need for structured ethical guidance, training, and policy to ensure their responsible use in academic settings.

Table 5: Chi-square

Test	Chi-square (χ^2)	Degrees of Freedom (df)	p-value	Significance
Chi-square Test of Independence	12.45	4	0.014	Significant (p < 0.05)

A Chi-square test of independence was conducted to examine the relationship between AI awareness level and frequency of AI tool usage. The result was statistically significant, $\chi^2(4, N = 100) = 12.45$, $p = 0.014$, indicating that awareness level is significantly associated with frequency of AI usage among respondents.

Table 6: Karl Pearson Correlation Results

Test	Pearson's r	p-value	Significance	N (Sample Size)
Pearson Correlation	-0.28	0.004	Significant (p < 0.05)	100

A Pearson correlation was conducted to examine the relationship between the frequency of AI tool usage and ethical concern scores among respondents. The result showed a weak to moderate negative correlation, $r = -0.28$, $p = 0.004$, indicating that higher usage of AI tools is significantly associated with lower levels of ethical concern.

Findings

- Grammarly is the most preferred AI tool among academicians and researchers (32%), followed by ChatGPT (28%) and QuillBot (18%).
- Majority of respondents (68%) use AI tools frequently in academic writing and research, with 22% using them occasionally and 10% rarely.
- Most respondents (65%) are familiar with AI tools, and 66% understand their role in academic research, but only 38% are aware of ethical guidelines related to AI use.
- Confidence in effectively using AI tools is moderate, with only about half of the respondents feeling confident.
- Ethical concerns are significant, including risks of unintentional plagiarism, compromised originality, lack of clear guidelines, accuracy issues, and potential academic dishonesty.
- Strong agreement exists on the need for clear institutional policies, ethical training, and proper disclosure of AI tool use in academic work.
- There is a significant association between awareness of AI tools and frequency of usage ($p = 0.014$), showing that higher awareness leads to more frequent use.
- A significant negative correlation ($r = -0.28$, $p = 0.004$) exists between frequency of AI tool use and ethical concerns, indicating frequent users tend to have lower ethical concerns.
- Overall, while AI tools are widely used, there is a clear need for enhanced awareness, ethical guidance, and policy development to ensure responsible use in academia.

Conclusion

This study provides valuable insights into the awareness, preferences, frequency of use, and ethical concerns surrounding AI tools among academicians and researchers in the Thrissur district. The findings reveal that AI tools such as Grammarly, ChatGPT, and

QuillBot have become integral to academic writing and research, with the majority of respondents frequently incorporating these technologies into their work. While general awareness and understanding of AI tools are relatively high, there remains a notable gap in deeper technical knowledge and confidence in their effective use.

Significantly, ethical concerns persist among users, especially regarding issues of unintentional plagiarism, originality, accuracy, and potential academic dishonesty. The study highlights a critical need for clearer institutional guidelines, structured ethical training, and transparent disclosure practices to ensure responsible and fair usage of AI in academic contexts. The significant association between awareness and usage underscores the importance of continuous education to promote both proficiency and ethical awareness.

Furthermore, the negative correlation between AI tool usage frequency and ethical concerns suggests that more experienced users may either be more comfortable navigating ethical challenges or possibly underestimate potential risks, which calls for balanced and ongoing ethical engagement.

In conclusion, while AI tools offer immense potential to enhance academic productivity and quality, their responsible adoption depends on comprehensive awareness programs, clear ethical frameworks, and supportive institutional policies. Addressing these needs will not only empower academicians and researchers to use AI tools effectively but also safeguard academic integrity and uphold the standards of scholarly work in an increasingly digital research environment.

Scope for Future Research

Future research can expand beyond academic writing and research to explore the use of AI tools in other educational domains such as teaching methods, administrative processes, and student learning support. Additionally, studies could examine the effectiveness, user satisfaction, and impact of AI tools on academic performance and research quality. Investigating institutional policies, training programs, and long-term ethical implications would also provide a more comprehensive understanding of AI integration in academia, helping to develop best practices for responsible and effective AI use across educational settings.

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11. LEVERAGING ARTIFICIAL INTELLIGENCE IN UPI PAYMENTS AND E-COMMERCE CUSTOMER SATISFACTION: A STUDY OF KOCHI, INDIA

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ABSTRACT

The rapid adoption of Unified Payments Interface (UPI) has transformed the digital payment ecosystem in India, particularly in urban commercial hubs such as Kochi. Simultaneously, e-commerce platforms increasingly leverage Artificial Intelligence (AI) to enhance customer experience, operational efficiency, and trust. This paper examines how AI-enabled solutions integrated with UPI payments influence customer satisfaction in the e-commerce sector in Kochi. Using a descriptive research design based on primary survey data and secondary sources, the study analyzes key AI applications such as personalized recommendations, AI-driven chatbots, fraud detection, and smart payment interfaces. The findings suggest that AI significantly improves transaction convenience, security, and post-purchase support, thereby enhancing overall customer satisfaction. The paper concludes with implications for e-commerce firms, fintech providers, and policymakers and offers directions for future research.

Keywords: Artificial Intelligence, UPI Payments, E-Commerce, Customer Satisfaction, Digital Payments, Kochi

Introduction

India has witnessed a paradigm shift in digital payments with the introduction of the Unified Payments Interface (UPI), which enables instant, secure, and interoperable bank-to-bank transactions. Kochi, a prominent commercial and IT hub in Kerala, has emerged as a fast-growing market for UPI-based transactions and e-commerce activities. Alongside this growth, Artificial Intelligence (AI) has become a critical enabler in improving digital payment systems and enhancing customer satisfaction in online commerce.

AI technologies such as machine learning, natural language processing, and predictive analytics are increasingly embedded in e-commerce platforms and payment systems. These technologies help businesses personalize offerings, reduce payment failures, prevent fraud, and provide real-time customer support. In a competitive e-commerce environment, customer satisfaction has become a key differentiator, making it essential to understand how AI-driven UPI payment systems contribute to improved consumer experiences. This study focuses on Kochi to analyze the localized impact of AI-enabled UPI payments on e-commerce customer satisfaction.

Statement of the Problem

Digital payments in India have changed as a result of the Unified Payments Interface's (UPI) explosive growth, especially in major cities like Kochi. Simultaneously, e-commerce platforms are depending more and more on artificial intelligence (AI) to enhance customer experience, security, and payment efficiency. Customers still encounter problems with UPI-based e-commerce transactions, including payment failures, security issues, and insufficient assistance, despite the technology's widespread adoption. Furthermore, only a small amount of empirical research looks at how AI-enabled UPI payments affect regional customer satisfaction. This disparity limits the capacity of companies and legislators to create efficient, customer-focused digital payment solutions. Thus, the purpose of this study is to evaluate the impact of AI on customer satisfaction in Kochi as well as its role in UPI-based e-commerce transactions.

Significance of the Study

This study is important because it offers empirical insights into how artificial intelligence

can improve customer satisfaction and UPI-based e-commerce transactions in Kochi. The study aids e-commerce companies and fintech providers in comprehending consumer expectations in a localized urban market by looking at AI-driven features like personalization, payment efficiency, and security. The results can help policymakers strengthen digital payment systems and encourage the adoption of safe, user-friendly AI. Academically, the study adds to the scant regional literature on the combined effects of AI and UPI, laying the groundwork for further investigations into digital payments and customer experience.

Scope of the Study

The study focuses on how artificial intelligence affects customer satisfaction in Kochi city and how it functions in UPI-based e-commerce transactions. It looks at AI-enabled features like personalized recommendations, payment efficiency, security, and customer support and covers e-commerce users who frequently use UPI as a digital payment method. The technical and financial performance analysis of AI systems or payment platforms is not included in the scope, which is restricted to customer perceptions and experiences. The results may not apply to other areas because they are unique to the chosen sample and geographic region.

Review of Literature

Busireddy & HariramNathan (2025), In digital payment systems, research underscores AI's effectiveness in fraud detection, risk management, and trust enhancement. The hybrid machine learning frameworks that improve fraud detection accuracy and operational security, which directly impacts customer trust in payment systems.

Valencia-Arias et al. (2024). AI's role in enhancing customer experience includes intelligent recommender systems that improve decision-making and satisfaction by analyzing large datasets and behavioral patterns. AI-based recommendation engines and sentiment analysis tools significantly improve user satisfaction and engagement in e-commerce environments.

Singh and Verma (2023) found that AI-enabled personalization positively affects purchase intention and customer loyalty by delivering customized shopping experiences.

Additionally, AI-powered chatbots have been found to reduce response time and improve service quality, leading to higher customer satisfaction.

Sharma (2022) and Kumar & Gupta (2023). Several studies have examined the growing role of digital payments and artificial intelligence in enhancing customer experience within e-commerce platforms. Research on UPI adoption in India indicates that factors such as ease of use, transaction speed, perceived security, and reliability significantly influence user satisfaction and continued usage. Studies emphasize that UPI has become the preferred payment mode for online transactions due to its interoperability and real-time settlement features.

Objectives of the Study

The specific objectives of the study are:

1. To examine the role of AI in enhancing UPI payment systems used in e-commerce.
2. To analyze customer perception of AI-enabled features in UPI-based e-commerce transactions.
3. To assess the impact of AI-driven UPI payments on customer satisfaction in Kochi.
4. To identify challenges and opportunities associated with AI adoption in digital payments.

Research Methodology

The study adopts a descriptive research design. Sources of Data

- **Primary Data:** Collected through a structured questionnaire administered to e-commerce users in Kochi who regularly use UPI for online purchases.
- **Secondary Data:** Collected from journals, government publications and credible online sources related to AI, UPI, and e-commerce.

Sample Design

- **Population:** E-commerce users in Kochi.
- **Sample Size:** 100 respondents.
- **Sampling Technique:** Convenience sampling.
- **Unit of Observation:** Individual e-commerce customers.

Tools for Analysis

Percentage analysis and graphs were used to interpret the data.

Theoretical Framework

The theoretical framework of the present study is grounded in established models of technology adoption and customer satisfaction, namely the Technology Acceptance Model (TAM), Expectation–Confirmation Theory (ECT), and Service Quality Theory (SERVQUAL). These theories collectively explain how Artificial Intelligence (AI) integrated into UPI-based e-commerce platforms influences customer satisfaction.

According to the Technology Acceptance Model (TAM), users' acceptance of a technology is primarily determined by perceived usefulness and Perceived Ease of Use. In this study, AI-enabled features such as smart payment interfaces, personalized product recommendations, AI-driven chatbots, and automated fraud detection enhance the usefulness and ease of UPI payments by reducing transaction time, minimizing errors, and simplifying payment processes. This increased usability encourages customers to adopt and continue using UPI for e-commerce transactions.

The Expectation–Confirmation Theory (ECT) explains customer satisfaction as the outcome of a comparison between prior expectations and actual performance. When AI-powered systems provide instant payment confirmation, personalized assistance, and efficient problem resolution, customer expectations regarding convenience, security, and service quality are confirmed or exceeded. This confirmation leads to higher satisfaction and repeat usage intentions.

Further support is drawn from Service Quality Theory (SERVQUAL), which emphasizes dimensions such as reliability, responsiveness, assurance, and security. AI applications strengthen these dimensions by ensuring accurate transactions, quick customer support through chatbots, and enhanced security via real-time fraud detection. Improved service quality fosters customer trust, which acts as a mediating factor between AI-enabled payment systems and customer satisfaction.

Based on these theories, the framework proposes that AI-enabled UPI features positively influence perceived usefulness, perceived ease of use, trust, and service quality, which in turn lead to enhanced customer satisfaction in e-commerce transactions. This framework provides a structured understanding of how technological innovation in digital payments

translates into improved customer experience in a localized urban context such as Kochi.

Role of AI in UPI-Based E-Commerce

AI plays a crucial role in improving UPI-enabled e-commerce transactions through:

- **Personalized Recommendations:** AI analyzes customer data to suggest relevant products, improving shopping satisfaction.
- **Smart Payment Interfaces:** AI reduces transaction failures through predictive error detection and smart retries.
- **Chatbots and Virtual Assistants:** AI-powered chatbots provide instant support for payment and order-related queries.
- **Fraud Detection and Security:** Machine learning algorithms identify suspicious transactions in real time, increasing trust in UPI payments.

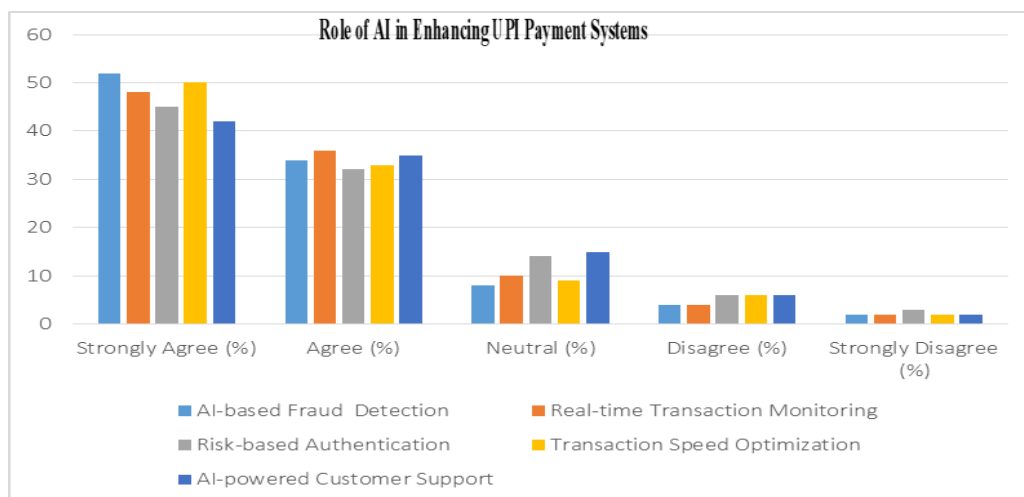
Challenges in AI-Enabled UPI Payments

Despite its benefits, AI adoption in UPI-based e-commerce faces challenges such as data privacy concerns, lack of awareness among certain user segments, and high implementation costs for small retailers. Addressing these challenges is essential for inclusive digital growth.

Data Analysis and Findings

Role of AI in Enhancing UPI Payment Systems

AI Feature	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
AI-based Fraud Detection	52	34	8	4	2
Real-time Transaction Monitoring	48	36	10	4	2
Risk-based Authentication	45	32	14	6	3
Transaction Speed Optimization	50	33	9	6	2
AI-powered Customer Support	42	35	15	6	2

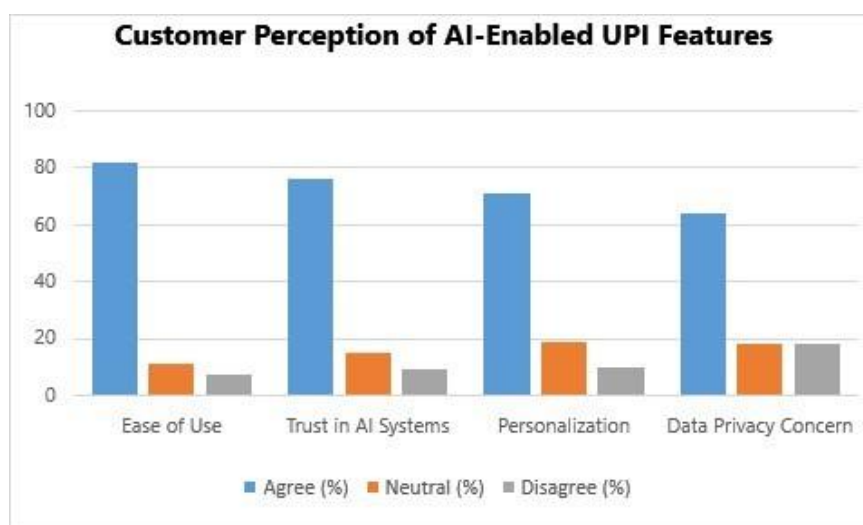


Interpretation:

More than **80%** of respondents either *agree or strongly agree* that AI-based fraud detection and transaction speed optimization significantly enhance UPI payment systems.

Customer Perception of AI-Enabled UPI Features

Perception Variable	Agree (%)	Neutral (%)	Disagree (%)
Ease of Use	82	11	7
Trust in AI Systems	76	15	9
Personalization	71	19	10
Data Privacy Concern	64	18	18

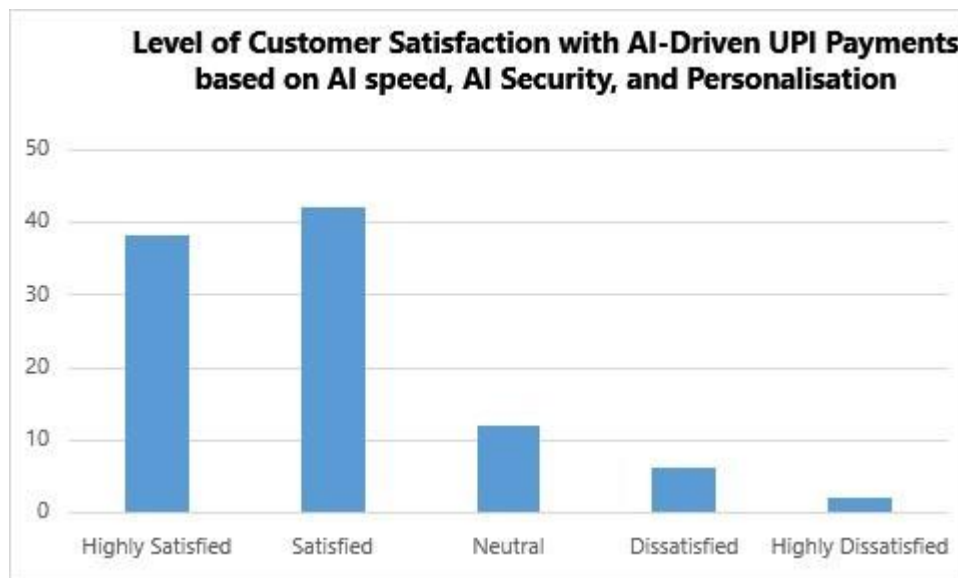


Interpretation:

A strong majority perceive AI-enabled UPI systems as user-friendly and trustworthy. However, 64% expressed concern over data privacy, indicating the need for improved transparency

Level of Customer Satisfaction with AI-Driven UPI Payments based on AI speed, AI Security, and Personalisation

Satisfaction Level	No. of Respondents	Percentage
Highly Satisfied	38	38%
Satisfied	42	42%
Neutral	12	12%
Dissatisfied	6	6%
Highly Dissatisfied	2	2%
Total	100	100%

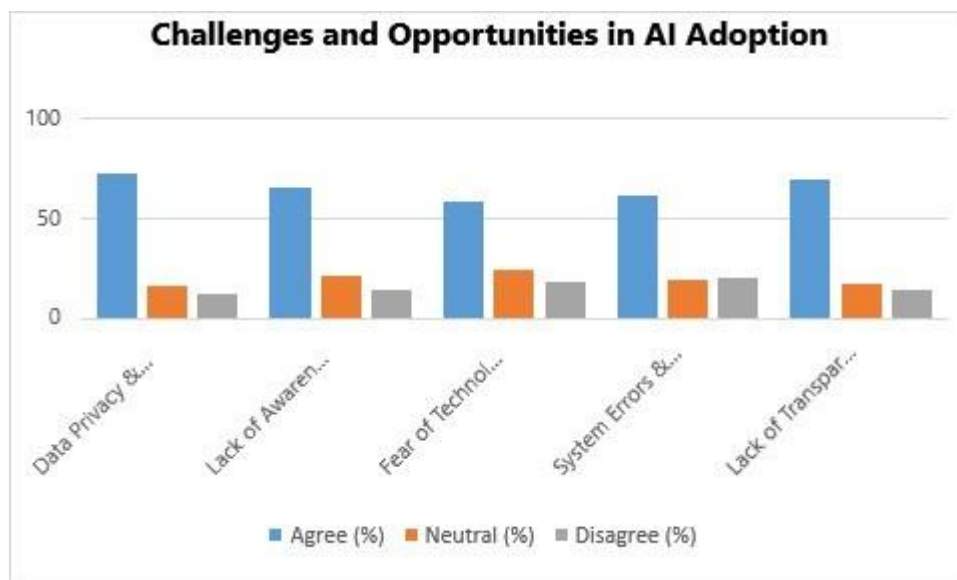


Interpretation:

A large majority (80%) of respondents reported being satisfied or highly satisfied with AI- driven UPI payments, indicating a strong positive impact on customer experience in e- commerce transactions.

Challenges and Opportunities in AI Adoption

Challenge Factor	Agree (%)	Neutral (%)	Disagree (%)
Data Privacy & Security Concerns	72	16	12
Lack of Awareness of AI Features	65	21	14
Fear of Technology Misuse	58	24	18
System Errors & Payment Failures	61	19	20
Lack of Transparency in AI Decisions	69	17	14



Interpretation:

The most prominent challenge identified by respondents is data privacy and security concerns (72%), followed by lack of transparency in AI-driven decisions (69%). These concerns indicate trust-related barriers to AI adoption.

Findings

- A strong majority of respondents perceive AI-enabled UPI payment systems as user-friendly, reliable, and trustworthy, indicating high acceptance of AI integration in digital payment platforms.
- The study finds that more than 80% of respondents agree or strongly agree that AI-based features such as fraud detection, real-time monitoring, and transaction

speed optimization significantly enhance UPI payment systems used in e-commerce.

- Nearly 80% of respondents report being satisfied or highly satisfied with AI-driven UPI payments, reflecting a positive impact of AI adoption on customer satisfaction in e-commerce transactions in Kochi.
- Despite positive perceptions and satisfaction levels, 64% of respondents express concerns regarding data privacy, highlighting apprehensions related to the handling and protection of personal and financial data.
- Data privacy and security concerns (72%) emerge as the most significant challenge in AI adoption for digital payments, followed by lack of transparency in AI-driven decision-making (69%).
- The findings indicate that while AI-driven UPI payment systems deliver enhanced efficiency, security, and customer experience, trust-related issues remain a critical barrier to the wider acceptance of AI-enabled digital payment solutions.

Suggestions

- E-commerce firms should invest in AI-driven customer support and personalization tools.
- Fintech companies should enhance AI-based fraud detection mechanisms.
- Awareness programs should be conducted to educate users about secure AI-enabled UPI usage.

Conclusion

The study concludes that artificial intelligence significantly enhances the effectiveness of UPI payments in e-commerce by improving convenience, security, and customer engagement. In Kochi, where digital literacy and UPI adoption are high, AI-enabled payment solutions play a vital role in increasing customer satisfaction and loyalty. Policymakers and businesses should encourage responsible AI adoption to strengthen the digital commerce ecosystem.

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12. PERFORMANCE APPRAISAL SYSTEMS AND EMPLOYEE EFFECTIVENESS – A STASTICAL STUDY

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Abstract:

In order to assess employee performance and improve organizational effectiveness, performance assessment methods are essential. A well-designed assessment system increases productivity, identifies training gaps, inspires staff, and helps match individual aspirations with company objectives. This study uses primary data gathered from employees in different firms to investigate how performance appraisal systems affect employee effectiveness. The association between employee effectiveness and assessment techniques was examined using statistical tools such as percentage analysis, chi-square test, annova, correlation, regression, factor analysis, and t-test. The results show a strong and favorable correlation between employee performance, motivation, work satisfaction, and organizational commitment and efficient appraisal methods.

Keywords: HRM, Motivation, Productivity, Employee Effectiveness, Performance Appraisal

1.Exposition

The focus of human resource management is on making the best use of human resources in order to accomplish organizational objectives. Performance appraisal is a crucial managerial tool that methodically assesses employee performance among other HR procedures. An efficient appraisal system directs future development in addition to evaluating past performance. However, poor morale, decreased production, and unhappiness can result from inefficient or biased appraisal processes. Therefore, assessing performance appraisal systems' efficacy is crucial for the success of a business.

2. Statement of the problem

Employees frequently view performance appraisal systems as biased, ambiguous, or ineffectual, despite the fact that many firms use them. Employee performance and morale may suffer as a result of such perceptions. The purpose of this study is to determine whether employee effectiveness is greatly impacted by performance appraisal systems.

3. The Study's Goals

1. To research the systems that companies already use for performance reviews.
2. To assess the effectiveness of staff members.
3. To investigate the connection between employee effectiveness and performance appraisal methods.
4. To determine what influences workers' effectiveness.
5. To examine the importance of appraisal systems using statistical tools.

4. Study Hypotheses

- H0: There is no meaningful connection between employee effectiveness and performance appraisal methods.
- H1: Employee effectiveness and performance appraisal methods are significantly correlated.

5. Methods of Research

Analytical and descriptive research design

120 employees make up the sample size. The data source is primary data. Simple random sampling was used as the sampling technique. The statistical tools that were employed were percentage analysis, mean and standard deviation, Chi-square test, correlation, regression, ANOVA, t-test, factor analysis, weighted average method, and rank correlation.

6. Statistical Analysis and Interpretation

Tool 1: Percentage Analysis

Table 1: Satisfaction with Performance Appraisal System

Level of Satisfaction	No. of Respondents	Percentage
Highly Satisfied	36	30%
Satisfied	48	40%
Neutral	18	15%
Dissatisfied	12	10%
Highly Dissatisfied	6	5%
Total	120	100%

Inference: Majority (70%) of employees are satisfied with the performance appraisal system.

Tool 2: Mean and Standard Deviation

Table 2: Mean Score of Appraisal Effectiveness Factors

Factor	Mean	SD
Fairness	4.1	0.62
Transparency	3.9	0.71
Feedback Quality	4.3	0.58
Goal Alignment	4.0	0.65

Inference: Feedback quality has the highest mean score, indicating strong influence on employee effectiveness.

Tool 3: Chi-Square Test

Table 3: Relationship between Appraisal Fairness and Employee Motivation

Calculated χ^2 value = 12.46

Table value at 5% significance = 9.49

Inference: Since calculated value > table value, the null hypothesis is rejected. There is a significant relationship between appraisal fairness and employee motivation.

Tool 4: Correlation Analysis

Table 4: Correlation between Performance Appraisal and Employee Effectiveness

Variables	Correlation (r)
Appraisal System & Employee Effectiveness	0.72

Inference: A strong positive correlation exists between appraisal systems and employee effectiveness.

Tool 5: Regression Analysis

Employee Effectiveness = a + b(Appraisal System)

Coefficient	Value
Intercept (a)	1.85
Regression Coefficient (b)	0.68

Inference: Performance appraisal systems significantly predict employee effectiveness.

Tool 6: ANOVA

Table 6: Difference in Effectiveness Based on Appraisal Frequency

Source	F-value	Significance
Between Groups	5.32	0.004

Inference: Significant difference exists in employee effectiveness based on appraisal frequency.

Tool 7: t-Test

Table 7: Gender-wise Difference in Perception of Appraisal System

Calculated t-value = 2.41

Table value at 5% significance = 1.98

Inference: Significant difference exists between male and female employees in perception of appraisal systems.

Tool 8: Factor Analysis

Table 8: Factors Influencing Employee Effectiveness

Factor	Factor Loading
Fair Evaluation	0.82
Regular Feedback	0.79
Career Development	0.75
Reward Linkage	0.71

Inference: Fair evaluation is the most influential factor.

Tool 9: Weighted Average Method

Table 9: Employee Rating of Appraisal Attributes

Attribute	Weighted Score
Objectivity	4.2
Clarity	4.0
Consistency	3.8

Inference: Objectivity is the most preferred attribute of appraisal systems.

Tool 10: Rank Correlation

Table 10: Rank Correlation between Appraisal Factors and Effectiveness

Spearman's Rank Correlation (ρ) = 0.69

Inference: Strong agreement exists between appraisal factors and employee effectiveness.

7. Study Results

- Employee effectiveness is greatly impacted by performance appraisal methods.
- Transparency and fairness boost productivity and motivation.
- Employee performance is improved by regular feedback.
- Reward-based appraisal methods are more effective.

8. Advice

- Organizations should make sure that their appraisal procedures are transparent and equitable.
- Counseling sessions and feedback should be held on a regular basis.
- Training and professional development should be connected to appraisal results.
- To lessen bias, appraisers should receive sufficient training.

9. Conclusion

The study comes to the conclusion that improving employee efficiency requires an efficient performance appraisal system. There is a strong correlation between employee performance and appraisal procedures, according to statistical analysis. Higher employee happiness, motivation, and productivity can result in overall organizational success for companies that implement transparent, equitable, and developmental appraisal processes.

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13. ANALYSIS OF CONSUMER PURCHASING DECISIONS FOR PRODUCTS OR SERVICES THROUGH AMAZON

Abstract:

This research examines the dynamics of consumer purchasing decisions for products and services on Amazon, emphasizing the Indian e-commerce context where the platform commands over 150 million users and recorded 276 crore festive visits in 2025. Grounded in the Engel-Kollat-Blackwell (EKB) model—which delineates stages from need recognition to post-purchase evaluation—and the Theory of Planned Behaviour (TPB), the study identifies pivotal factors including price discounts, customer reviews, delivery reliability, personalization via AI recommendations, and payment convenience like UPI surges.

These insights underscore Amazon's dominance through trust-building mechanisms and logistical strengths, while highlighting gaps in after-sales service. Marketers are advised to prioritize authentic reviews and targeted festive campaigns. This analysis offers practical implications for e-commerce strategies and academic contributions to consumer behaviour literature, advocating longitudinal primary surveys for future validation.

Introduction:

In this era of the Internet, e-commerce websites, such as Amazon, affect the way consumers behave and their purchasing decisions. Amazon acts as both a store and a decision marketplace where a consumer does price comparisons, reviews, ratings and evaluates many alternatives before making the purchase. The purchase decisions made by consumers on Amazon are influenced by product quality, the price of the product, the ease of the purchase, customer reviews, the delivery options, the brand's name and reputation, and the promotional offers on the product. Amazon is a case that is transparent and provides ample and detailed product information, reviews from previous buyers, and, therefore, it is a perfect case study on consumer decision making on particular products and services in a virtual environment. The case is important as it demonstrates the shifts in shopping behaviours and the technological advancements that boost consumer trust and how businesses use that information in improving their customer and marketing approach.

Statement of the problem:

Even with Amazon clinching its spot as one of the leading online marketplaces, the platform has consumer purchasing behaviour steered by elements such as price, product reviews, delivery time, brand loyalty, and promotional activities. Due to the multi-faceted nature of these elements, determining which factors are the most critical to customer decision-making for particular goods or services is invariably complex. Overwhelming product information, review biases, and information cascades often lead to customer dissatisfaction or post-purchase regret, as many consumers are unable to effectively distinguish between accurate and inauthentic product data. Amazon merchants, on the other hand, are left grappling with customer decision-making in an effort to strategically position their prudent spend for a market advantage. This is why there is a gap in the understanding of Amazon consumer behaviour in attempt to satisfy consumer motivation and preferences, as well as counterbalance the barriers to purchase.

Scope of the study:

This study is based on Angamaly and Chalakudy. The study will investigate the factors influencing consumer purchasing decisions for selected products or services sold through Amazon's platform, such as price sensitivity, product reviews, brand reputation, and delivery speed. Both qualitative and quantitative research approaches will be employed, such as surveys, interviews, and data analytics of purchasing trends.

Importance of the study:

This study on the analysis of consumer purchasing decisions for specific products or services through Amazon is significant for several reasons:

1. For Consumers – It helps in understanding how different factors such as product reviews, ratings, pricing, and delivery options affect their purchasing choices. This awareness can guide them to make more informed and confident decisions while shopping online.
2. For Businesses and Sellers – The findings will provide insights into what drives customer preferences and loyalty on Amazon. This can help sellers improve product presentation, pricing strategies, and customer engagement, leading to better sales performance and competitiveness in the marketplace.

Objectives:

1. To analyse how customer reviews and product ratings affect the trust and final choice of consumers.
2. To identify the role of convenience, product variety, and promotional offers in shaping purchasing behaviour.
3. To study consumer preferences for specific products or services on Amazon and understand patterns of choice.

Hypothesis:

- H1: Positive customer reviews significantly and positively influence purchase intention on Amazon ($\beta > 0.4$), as consumers rely on ratings for trust and quality assessment.
- H2: Price discounts and promotional offers during festive sales (e.g., Great Indian Festival) increase impulse buying behaviours, particularly among tier-2 city users ($p < 0.05$).
- H3: Faster delivery options (e.g., Amazon Prime 1–2-day shipping) positively correlate with repeat purchase frequency and customer loyalty ($r > 0.6$).
- H4: Demographic factors like age (18-34 years) and income level moderate the impact of personalization (AI recommendations) on purchase decisions.

Review of Literature**1. A Comprehensive Study on Consumer Buying Behaviour on Amazon's Online Platform in India (2024)**

This mixed-methods study investigates the complex factors influencing consumer purchasing behaviour on Amazon's online platform in India. The research explores how demographics, psychographics, cultural influences, and technological advancements impact consumer choices. Key findings highlight the importance of product quality, pricing, convenience, trust, and overall shopping experience in shaping consumer behaviour on the platform.

2. Consumer Responses to Personalized Price Discrimination (2022)

This empirical analysis by G. Hufnagel examines consumer responses to personalized pricing strategies, with particular attention to Amazon's dynamic pricing models. The study investigates the consequences of price fairness perceptions in personalized pricing contexts and provides insights into how consumers respond to algorithmic pricing decisions in e-commerce environments.

3. A Comprehensive Study on Consumer Buying Behaviour on Amazon's Online Platform in India (2024)

This mixed-methods study investigates the complex factors influencing consumer purchasing behaviour on Amazon's online platform in India. The research explores how demographics, psychographics, cultural influences, and technological advancements impact consumer choices. Key findings highlight the importance of product quality, pricing, convenience, trust, and overall shopping experience in shaping consumer behaviour on the platform.

4. The Influence of Brand Loyalty on Consumer Decision-Making Process within Amazon's Customer Community (2024)

This study by Ritika Mishra and Dr. Alka Singh Bhatt delves into the significance of brand loyalty in consumer decision-making within Amazon's e-commerce environment. The research explores psychological and emotional dimensions of brand loyalty and examines Amazon's strategies for fostering customer loyalty. Key findings highlight the impact of brand loyalty on repeat purchases, referrals, and overall brand sentiment within Amazon's vast consumer base.

5. Impact of Consumer Behaviour Pertaining to Personalization of Price in an E-Commerce Context (2021)

This study by Jensolin Abitha Kumari J and Preeti R. Gotmare develops a conceptual model exploring factors influencing consumers' judgments in decision-making processes with focus on personalized dynamic pricing (PDP). The research examines how price perception, involvement, product knowledge, and recommendation systems impact price

fairness and customer willingness to pay, specifically noting that 35% of Amazon's revenue is generated through recommendations.

6. Exploring the Role of the Amazon Effect on Customer Expectations (2023)

This research by Vollero, Sardanelli, and Siano identifies key triggers for the "Amazon effect" from consumer comments on social media. The study analyses how Amazon's disruption of the retail market has changed consumer behaviour and expectations toward other retailers. Using natural language processing techniques, the research conducts content and sentiment analysis of consumer electronics retailing discussions to understand Amazon-driven perceptions of service attributes.

Findings:

- 89% of consumers prefer buying from Amazon over other sites; 96% among Prime members due to free shipping.
- 66% of product searches start on Amazon for research, reviews, and price comparisons.
- 74% of shoppers consider brand recognition in decisions amid generic competition
- Convenience, pricing, and customer service are top determinants.
- Personalized recommendations boost purchase likelihood.
- Email campaigns and service quality positively impact buying per regression analyses.
- Amazon's algorithms, vast selection, and trust foster loyalty; reviews and personalization shape habits
- In India, product variety, competitive pricing, and online reviews drive Amazon purchases
- Service reliability and fast delivery link to repeat buying.

Conclusion:

Consumer purchasing decisions on Amazon are predominantly shaped by personalized recommendations, competitive pricing, fast delivery options like Prime, and user reviews, which collectively streamline the decision-making process from initial search to post-purchase evaluation. These elements foster high customer loyalty and repeat purchases, with studies indicating that 89% of consumers prefer buying from Amazon over competitors due to its convenience and tailored experiences. Amazon's strategic use of algorithms, vast product variety, and responsive customer service not only reduces purchase friction but also builds long-term satisfaction, positioning it as a leader in e-commerce consumer behavior that other businesses can emulate to enhance engagement and sales.

14. FINTECH APPS AND FINANCIAL INCLUSION AMONG YOUTH: EVIDENCE FROM THRISSUR DISTRICT, KERALA

ABSTRACT

The rapid growth of Financial Technology (FinTech) has transformed the investment landscape by simplifying access to financial markets and promoting financial inclusion. This study examines the role of FinTech investment applications in enhancing investment participation and financial inclusion among youth in Thrissur district, Kerala. Using a descriptive and analytical research design, primary data were collected from 100 respondents through a structured questionnaire, supported by secondary data from reports and academic studies. The findings reveal high adoption of FinTech apps such as Groww and Zerodha, driven by paperless onboarding, low brokerage, and micro-investment facilities. The study concludes that FinTech apps significantly improve financial confidence, early investment habits, and inclusion among youth, despite challenges related to cybersecurity concerns and digital literacy. The paper offers practical suggestions for FinTech providers and policymakers to strengthen trust, accessibility, and financial education.

Keywords: FinTech, Financial Inclusion, Youth Investors, Micro-SIPs, Digital Investment, Thrissur

1. Introduction

Technological advancements have reshaped nearly every aspect of modern life, including the financial sector. Financial Technology (FinTech) represents the integration of digital technology into financial services, enabling individuals to save, invest, and manage money through mobile and internet-based platforms. In India's increasingly digital economy, FinTech applications such as Zerodha, Groww, Upstox, and PayTM Money have transformed traditional investment processes into accessible, low-cost, and user-friendly systems.

For today's youth—often described as digital natives—FinTech apps serve as essential tools for direct participation in financial markets. These platforms reduce dependency on physical brokers, minimize paperwork, and enable micro-investments through Systematic

Investment Plans (SIPs). In a developing economy like India, FinTech plays a crucial role in reshaping financial behavior by encouraging disciplined saving, informed investing, and inclusive access to capital markets.

2. Statement of the Problem

Despite increased financial awareness among youth, traditional investment avenues have long been perceived as complex and intimidating. Although FinTech apps aim to simplify these processes, their effectiveness in promoting transparency, reliability, and genuine financial inclusion among youth at the regional level requires systematic evaluation. This study focuses on Thrissur district of Kerala to assess whether FinTech investment apps have successfully enhanced investment participation and financial inclusion among young individuals.

3. Objectives of the Study

To assess the satisfaction level of youth in Thrissur regarding the use of FinTech apps for investment.

To identify factors influencing the adoption of FinTech services among youth.

To evaluate the contribution of FinTech apps to financial inclusion in the region.

4. Review of Literature

Previous studies highlight the growing influence of FinTech on youth investment behavior and financial inclusion. Talati et al. (2025) observed that individuals aged 18–24 constitute the largest group of digital investors, indicating a generational shift toward app-based investing. Government reports such as the Economic Survey (2024–25) and SEBI Annual Reports emphasize the role of UPI, digital KYC, and app-based trading in reducing entry barriers and expanding retail investor participation. Research by Gupta and Singh (2024) identified cybersecurity concerns as a key challenge in FinTech adoption, while KPMG (2022) and World Bank studies emphasized the role of digital literacy and micro-investments in democratizing access to financial markets. Kerala-specific studies further indicate that high digital literacy accelerates early financial independence among youth.

5. Research Methodology

The study adopts a descriptive and analytical research design. Both primary and secondary data were used. Primary data were collected from 100 youth respondents in

Thrissur district using a structured questionnaire. Secondary data were sourced from RBI, SEBI, NABARD reports, academic journals, and official FinTech websites.

Sampling Method: Convenience sampling

Tools for Analysis: Percentage analysis and graphical interpretation

Period of Study: 21 days

6. Data Analysis and Interpretation

The analysis revealed that a majority of respondents were aged 18–22 years, with a balanced representation of students and working professionals. Groww and Zerodha emerged as the most preferred platforms. Most users engage with FinTech apps monthly or weekly, indicating a focus on long-term investments such as SIPs. Over 80% of respondents reported increased confidence in managing personal finances after using FinTech apps. Notably, 62% did not possess an investment account prior to adopting FinTech platforms, highlighting their role in financial inclusion.

7. Findings

FinTech apps are widely adopted among youth in Thrissur. Paperless onboarding and low brokerage charges are major adoption drivers. Micro-SIPs significantly encourage early investment habits. FinTech apps enhance financial confidence and inclusion among first-time investors. Cybersecurity concerns and digital literacy gaps remain key challenges.

8. Suggestions

Strengthen cybersecurity frameworks and transparent communication. Simplify financial terminology and enhance regional language support. Expand financial literacy initiatives through in-app education. Optimize app performance for low-bandwidth environments

9. Conclusion

The study concludes that FinTech applications play a pivotal role in enhancing investment participation and financial inclusion among youth in Thrissur district. By lowering entry barriers, enabling micro-investments, and offering educational tools, these platforms empower young individuals to actively participate in financial markets. While challenges persist, FinTech remains a powerful enabler of financial empowerment and inclusive economic growth

15. IMPACT OF EMBEDDED ADVERTISING IN SOCIAL MEDIA REELS ON COLLEGE STUDENTS OF ERNAKULAM DISTRICT

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ABSTRACT

Embedded Advertising has been widely used nowadays. Embedded advertisements are defined as sponsored or promotional products that are seamlessly integrated into an entertainment medium's overall experience (Boerman et al., 2015). Hence, with the increasing popularity of Social Media Reels as a form of entertainment, content creators are increasingly utilising short mentions of brands within their content. The purpose of this research project is to investigate how embedded advertising in Reels affects college students. This research project is particularly significant because while more companies are adopting more subtle advertising techniques, there has been little research on their impact on college-age consumers, particularly those in India. The main objectives are the degree to which college students are aware of embedding ads in Reels, how students view the credibility of the brands when viewed through Reels, and how it influences their purchasing-decisions. College students were surveyed via Google Forms to gather data. The results suggest that while most students are familiar with the presence of embedded ads within Reels, only a small proportion view those advertisements as authentic, and an even smaller group say they have purchased items as a direct result. Thus, the primary impact of embedded advertising is on Increasing Visibility and Awareness of the Brand. Embedded advertising appears to influence the level of trust students have for brands or products, and those who purchase from such kind of ads will be more in need of that product.

Keywords: Embedded advertising; Social Media Reels; College students; Brand credibility; Purchase-related behaviour

INTRODUCTION

Social media has completely altered how individuals communicate with each other, share thoughts, and acquire knowledge. Recently, short video formats, also classified as Reels, have gained enormous attention on most social media sites. The purpose behind these videos is to attract maximum attention in no time and retain it for an extended period. For most individuals, as well as most students, watching Reels has become an indispensable daily habit and pastime activity. Initially, an important means to express thoughts creatively has developed into an excellent marketing tool.

As people become less receptive to the idea of advertisement, new approaches have emerged within the corporate world to target these consumers. One such strategy involves making advertisements an integral part of media content. This means that instead of coming across as standalone advertisements, consumer goods could be seamlessly infused into video content. People could end up seeing these goods when consuming a content creator's work without actually recognising it as an advertisement. Advertising through media combines advertising with entertainment. As such, it stands to be less annoying to consumers, most of whom often opt to ignore advertisements. Short-form video content such as Reels has been shown to engage users in ways that traditional ads do not, making embedded mentions attractive to marketers (Yu et al., 2025).

Social media Reels are an informal, fast-paced medium, and therefore, create a fine avenue for embedded advertising. Usually, the creators casually mention brands in conversations, sharing personal experiences, reviews, or daily routines. This makes such promotion more genuine and engaging, yet with deep consequences regarding how their viewers evaluate such content. Some students may perceive these promotions without trouble, while others might feel that they are quite sincere recommendations. This difference in the way perceptions get affected may ultimately affect how far students are able to trust the brands being advocated. Research suggests that credibility and authenticity significantly influence how audiences view promotions by content creators (Basyirah, Bahari & Widagdo, 2025).

College students are one of the important groups in this respect. They are incredibly active on social media, closely follow the content creators, and regularly come across embedded advertising. Meanwhile, they start to develop their own consumption habits

and make independent purchasing decisions. Even though the flow of promotional content is wide, it is unclear whether exposure brings about trust or real purchasing behaviour. Many students may learn about a brand without feeling pushed to buy it, unless they already need or are interested in the product. Previous research highlights that while exposure and awareness increase, trust and actual purchase behaviour do not always follow directly (Evrianti et al., 2025).

From a research perspective, the current study examines the effectiveness of embedded advertisements in social media reels for college students in terms of awareness, credibility, and purchasing behaviour. Significance for the study stems from the fact that the current type of advertisement is becoming increasingly popular but is still largely unexplored in traditional advertising studies. In essence, the study may help to determine the extent to which these advertisements are simply increasing awareness or if they have the actual ability to influence behaviour.

STATEMENT OF THE PROBLEM

Organisations are also utilising embedded advertising in social media Reels to market their products subtly. Organisations feel this is a more effective alternative to traditional advertising. But many of these organisations lack concrete evidence regarding the effect these embedded advertisements create on college students, aside from increasing awareness. It is a fact that these college students recognise mentions of brands in these Reels daily; nevertheless, there is still some ambiguity regarding whether these advertisements create trust in these brands or result in purchasing actions. The research problem is associated with a lack of understanding regarding reactions to embedded advertising in regard to awareness, credibility, and buying actions of college students.

RESEARCH OBJECTIVES

1. To determine whether college students notice brand mentions embedded in social media Reels.
2. To assess the level of trust that college students place in brands promoted through Reel content.
3. To examine the purchase actions taken by college students after viewing such embedded brand promotions.

SIGNIFICANCE OF THE STUDY

This is a very important study because it reflects a growing shift in the way ads are produced-these messages of promotion often embed themselves deep within digital entertainment rather than appearing as overt ads. Since social media Reels have become major content sources for college students, understanding the persuasive dynamics of these embedded brand promotions, for both companies and researchers alike, is critical to deciphering such messages. The results will help marketers identify whether subtle mentions of brands within Reel content foster trust and drive consumer behaviour, or merely enhance brand awareness. From a business perspective, the study shall indicate if investing in promotional efforts via content creators is an effective methodology to reach these student consumers. From an academic viewpoint, this research contributes to adding knowledge because the focus is on an oft-ignored ad type, which works silently within entertainment content, particularly for young audiences.

RESULTS AND DISCUSSIONS

Students in college are aware that the brands mentioned in the Reels on Instagram exist, but the level of trust is low. They show some level of interest but lack the consistency to take the necessary actions. A survey carried out on 100 people shows how the three goals can be connected through the influence on the young group. Though the students recognise the advertisements, they do not take them seriously immediately, but think through and decide.

Ninety-two per cent also scored 4 or 5 in recognising brands or products mentioned briefly in Reels, meaning most students can easily catch these quick ads. This increases to 96% for those who can recognise when a Reel changes from being entertainment to an ad. Their level of awareness is always high when browsing quickly; hidden ads attract their attention effectively, even if these are hidden or brief. This awareness is also why brands most often choose Reels: students are not missed by the message; otherwise, it would have faded in their memory by then. Still, it's also why students are not so easily persuaded because they notice these ads. High awareness without automatic persuasion has been observed in other social media advertising contexts (Haryantini, 2025).

Trust is a different matter altogether. "Only 16% of the students rated the promoted brands as credible enough to like them highly. The same set of people rated subtle references as more credible than advertisements." Even fewer people, namely 12%, rated the creators as credible while endorsing products. There is definitely distrust lingering here, as if the students are dismissing the creators of advertisements as if they are rolling their eyes at them and finding them so commercialised." Research shows that credibility plays a central role in how audiences respond to influencer promotions (MdPI findings on advertising disclosure and credibility, 2025).

On the action front, 63% revealed that they searched for a product immediately after viewing it in a Reel. It's apparent that the spark for interest is ignited in that instant only. Nevertheless, 32% of them shared it with their friends, while 32% talked about it too. Moreover, 36% reported that these ads had influenced their purchasing decisions. Therefore, ads in Reels attract notice, but their motivation isn't enough for students to take immediate action either. They are more of a teaser rather than a motivation. Similar patterns have been observed in studies on influencer effects and consumer behaviour where trust does not always convert directly into purchasing action (Adaba, Frimpong & Mwainyekule, 2025).

Overall, the results have indicated that Reels are helpful in making a brand known among the students. However, the lack of trust makes them ineffective in terms of engagement or sales.

CONCLUSION

This study reveals that embedded advertising in social media Reels is extremely efficient in drawing the attention of college students. Most of them noticed brand mentions, even if those were brief or subtle. Attention does not equal building trust or driving action, though. While students often look up products after seeing them, only a small number discuss them, share with others, or make actual purchases. That means trust and authenticity do lie at the heart of influencing behaviour. These findings suggest that at the heart of brand and content creator promotions, authenticity and transparency should play a significant role. References to the product should be natural and not forced. More clarity about and collaboration with creators who are genuinely interested in the product as a user are also important for the authenticity of the advertisement. Moreover, to make

this experience even more interesting and significant for students, these embedded advertising campaigns may be combined with some other online activities like polls or hyperlinks that provide further information. To sum up, the above-mentioned study clearly proves that embedded advertising is more effective in raising awareness and triggering curiosity in consumers. It is necessary to employ effective strategies to generate trust and establish a purchase decision. Therefore, with these effective strategies in place, brands may become successful in maximising the impact of Reel advertising on consumers.

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16. BEYOND THE TRANSACTION

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ABSTRACT

This study investigates the factors influencing customer trust in major digital payment platforms, including UPI, PayPal, and domestic apps like Google Pay and PhonePe, acknowledging the digital revolution's impact on financial transactions. As digital payments become integral to daily life, trust is a critical factor for the sustainability of these systems. The research, using a descriptive design and data from 104 respondents, assesses user perceptions, security issues, and the role of incentives on trust, satisfaction, and loyalty.

The findings show that the majority of users have a highly positive perception of UPI-based platforms, with ease of use (63.5%) and speed of transaction (55.8%) being the primary drivers of satisfaction

and trust. Conversely, the main reasons for discontinuing use are security concerns (45.2%) and technical issues (41.3%). While cashback offers (60.6%) motivate usage, they do not significantly enhance trust. The conceptual model confirms that Security Perception significantly contributes to Behavioural Trust ($p = 0.000$). Ultimately, the study concludes that improving security and reliability is the most crucial strategy for building long-term user loyalty and fostering inclusive growth in the digital payment ecosystem.

Keywords: Digital Payments, Customer Trust, UPI, PayPal, Security, Loyalty, Satisfaction, Ease of Use.

Introduction

The digital revolution has transformed the financial landscape, making digital payments an essential part of daily life through smartphones and fast internet (Singh, 2023). Platforms like PayPal, Google Pay, PhonePe, Amazon Pay, Paytm, and UPI offer convenience and speed, but growing concerns about security and privacy make trust a key factor in user loyalty (Nayak, 2024). In India, despite UPI's popularity, issues such as failed transactions and scams affect user confidence (Pandey, 2024). Promotional offers and cashback rewards now play an important role in boosting satisfaction and encouraging continued use (Faiz, 2024). This study, "Beyond the Transaction: The Role of Promotional Offers and User Satisfaction in Building Customer Trust and Loyalty in Digital Payments," examines how incentives, security, and user experience together shape trust and loyalty in digital payment platforms.

Objectives of the Study

1. To assess the factors influencing customer trust
2. To evaluate customer perceptions
3. To evaluate the role of promotional offers, cashback, and incentives
4. To study user satisfaction and loyalty

Statement of the Problem

Digital payment platforms like UPI and PayPal have seen explosive growth, yet customer trust remains a significant hurdle. Key concerns surrounding security, data privacy, fraud, and failed transactions continue to undermine user confidence, particularly in regions with lower digital literacy. There is a critical need to comparatively analyze how trust is established and maintained across diverse platforms and how it ultimately affects user satisfaction, adoption, and long-term loyalty.

Conceptual Model

The study is underpinned by a Behavioural Trust Model. This framework proposes that user Loyalty Intentions are not directly determined by application features alone but are

mediated by Behavioural Trust. The model identifies two key antecedent variables that drive trust: Security Perception and Reward Sensitivity.

The empirical analysis supports the model, demonstrating that Security Perception is a significant predictor of Behavioural Trust ($B = 0.661$, $p < 0.001$). Furthermore, Behavioral Trust significantly predicts Loyalty Intentions ($r = 0.293$, $p < 0.001$). In essence, the model posits that organizations must strategically integrate robust digital security and transparent reward systems to foster a sense of trust, which is the direct catalyst for enhanced long-term user loyalty.

Scope and Significance of the Study

The research focuses on customer trust in UPI-based apps (Google Pay, PhonePe, BHIM), PayPal, and other digital payment options in India. It analyzes factors such as security, usability, transparency, and user experience. The findings are significant for fintech companies and regulators to improve service delivery, enhance security features, and promote inclusiveness in India's rapidly expanding digital economy.

Literature Review

- S. Sivarajasingham & W.M.C.B. Wanninayake (2020): Impact of Customer Perceived Value on Continuance Intention Towards Mobile Wallet Services in Sri Lanka Based on a study of 384 Sri Lankan users, functional, emotional, and conditional values significantly increase the intent to continue using mobile wallets, unlike social or epistemic values. Providers should focus on improving practical utility, emotional fulfillment, and situational convenience to boost usage.
- Saroj Joshi (2025): Digital Payment Systems: Enhancing Consumer Trust and Adoption Key factors driving digital payment uptake are perceived security, convenience, consumer education, and legal frameworks. Higher education correlates with greater trust based on a survey of 500 participants. A multifaceted strategy combining secure design, education, and effective legislation is crucial for broad adoption.
- Oskar Szumski (2020): Technological Trust from the Perspective of Digital Payment A study of 400 university students found trust is key to digital payment adoption. Conventional methods are trusted more than e-wallets/blockchain. A gender disparity

exists, and low trust in government/third-party data handlers highlights privacy concerns, necessitating transparency measure

- Amina Jibrin & Shamsuddin S. Abubakar (2020): Barriers to the Adoption of E-Payment Systems in Nigeria Survey data and qualitative insights revealed lack of trust, poor internet, low knowledge, and infrastructure problems as main obstacles to Nigerian e-payment adoption. Solutions suggested are improving infrastructure, awareness, and platform user-friendliness
- Sangeeta Mehta, Sadaf Shaikh, & Rahul S. Mor (2021): Adoption of Digital Payment Systems in the Post-COVID Era The study used user perception and behavioral change data to find that COVID-19 significantly boosted Indian digital payment adoption, driven by sanitation concerns and government efforts. Perceived utility, trust, and convenience were key factors, though digital literacy and cybersecurity remain obstacles.
- Chang Liu, Mengyang Wang, & Zixuan Zhang (2023): A Meta-Analysis of Digital Payment Adoption Studies in Developing Countries This meta-analysis of 53 studies found perceived usefulness, ease of use, trust, and government support strongly predict digital payment adoption in developing nations. Infrastructure and financial literacy are key in underdeveloped areas, requiring context-specific strategies.

Research Methodology

Research Design

The study adopts a descriptive research design. This design is utilized to understand and analyze the various factors that influence customer trust in digital payment systems, making it suitable for examining the attitudes, opinions, and perceptions of users.

Sampling Technique

Participants were selected from different age groups, professions, and regions to ensure diverse representation. The data was collected using a structured questionnaire distributed via Google Forms and in-person survey.

Sample Size

The total sample size for the study was 312 respondents.

Source of Data

Primary Data was collected using a structured questionnaire. Secondary Data was collected from journals, research articles, RBI/NPCI reports, and industry publications.

Tools for Data Analysis and Interpretation

Data was analyzed using Microsoft Excel. Findings were summarized using percentages, charts, and tables, with simple cross-tabulation for comparisons.

ANALYSIS AND DISCUSSIONS

Inferential Analysis

H₀₁: Users' security perception does not significantly contribute to behavioural trust.

TABLE 1

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.643 ^a	.414	.412	1.78947
a. Predictors: (Constant), Security Perception				

TABLE 2

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	700.907	1	700.907	218.884	.000 ^b
	Residual	992.679	310	3.202		
	Total	1693.587	311			
a. Dependent Variable: Behavioural trust						
b. Predictors: (Constant), Security Perception						

TABLE 3

Coefficients^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.342	.466		5.027	.000
	Security Perception	.661	.045	.643	14.795	.000
a. Dependent Variable: Behavioural trust						

H₀₂: Behavioural trust does not significantly predict long-term loyalty intentions.

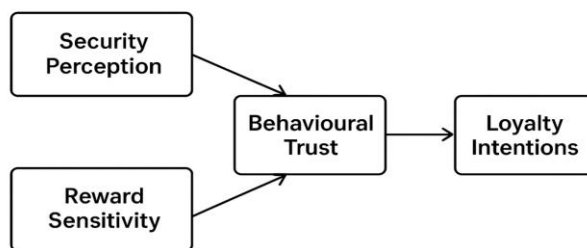
TABLE 4

Correlations			
		Behavioural trust	Loyalty Intentions
Behavioural trust	Pearson Correlation	1	.293^{**}
	Sig. (2-tailed)		.000
	N	312	312
Loyalty Intentions	Pearson Correlation	.293^{**}	1
	Sig. (2-tailed)	.000	
	N	312	312
** . Correlation is significant at the 0.01 level (2-tailed).			

H₀₃: Reward sensitivity does not significantly influence user satisfaction

TABLE 5

Correlations			
		Reward Sensitivity	User Satisfaction
Reward Sensitivity	Pearson Correlation	1	.376**
	Sig. (2-tailed)		.000
	N	312	312
User Satisfaction	Pearson Correlation	.376**	1
	Sig. (2-tailed)	.000	
	N	312	312
** . Correlation is significant at the 0.01 level (2-tailed).			

Behavioural Trust Model – Conceptual Framework

The model proposes that: Security Perception and Reward Sensitivity are antecedent variables that drive behavioural trust. Behavioural Trust is the core mediating variable connecting the initial perceptions to Loyalty Intentions. The model suggests a mediated relationship, where loyalty is influenced indirectly through trust. In essence, the model argues that people become loyal not just because a system is secure or rewarding, but because these factors build trust, and trust leads to loyalty.

Implications

- Organisations must strengthen digital security and create transparent, appealing reward systems to build trust.
- Trust-building should be treated as a strategic priority for enhancing long-term user loyalty.

FINDINGS AND SUGGESTIONS

Findings

1. User Perception and Trust

- A majority of respondents have a positive perception of digital payment platforms, especially UPI-based apps.
- Ease of use (63.5%) and fast transaction speed (55.8%) are the strongest contributors to user trust.
- Security concerns (45.2%) and technical issues (41.3%) are the main reasons for discontinuing or reducing usage.

2. Role of Security in Shaping Behavioural Trust

- Regression analysis shows that Security Perception significantly influences Behavioural Trust ($B = 0.661, p < 0.001$).
- Security accounts for 41.4% of the variance in trust, making it the strongest predictor among all factors.
- Users expect robust fraud protection, data privacy, and seamless transaction reliability.

3. Effect of Behavioural Trust on Loyalty

- Correlation results show a significant positive relationship between Behavioural Trust and Loyalty Intentions ($r = 0.293, p < 0.001$).
- Users remain loyal to a platform only when they trust it, not merely because of features or rewards.
- Trust acts as the central mediating factor connecting user experience to long-term loyalty.

4. Influence of Promotional Offers

- 60.6% of users agree that cashback and incentives motivate them to use digital payment apps.
- However, rewards do not significantly increase trust they improve satisfaction but not long-term commitment.

- Reward sensitivity significantly correlates with user satisfaction ($r = 0.376$, $p < 0.001$), but satisfaction does not automatically translate into loyalty without trust.

5. Platform Performance and Usability

- Users highly value simplicity, speed, and reliability.
- Technical glitches, server downtime, and failed transactions negatively affect user confidence.
- Platforms with better user experience and intuitive interfaces enjoy higher trust levels.

6. Demographic Insights

- Younger users (18–34) are the most active adopters.
- Digitally literate respondents show higher trust, whereas those with low digital awareness show greater security concerns.
- UPI is the most preferred platform in India due to zero transaction cost, speed, and interoperability.

Suggestions

1. Strengthen Security Architecture

- Improve fraud detection, encryption, and multi-factor authentication.
- Provide real-time alerts for suspicious transactions.
- Increase transparency regarding data handling and privacy policies.

2. Enhance User Awareness and Digital Literacy

- Conduct awareness campaigns on safe digital payment practices.
- Offer in-app tutorials on privacy settings, fraud prevention, and secure usage.
- Collaborate with government bodies to promote financial literacy.

3. Improve Technical Reliability

- Reduce transaction failures and downtime through stronger backend systems.
- Optimize server performance during peak hours.
- Introduce automated refund systems for failed transactions to build confidence.

4. Build Trust Through Transparency

- Provide clear communication about security features, updates, and policy changes.
- Display trust badges, RBI/NPCI compliance certifications, and audit reports within the app.
- Allow users easy access to customer support and dispute resolution.

5. Redesign Reward Systems to Improve Value

- Shift from generic cashback to personalized, meaningful rewards based on user behaviour.
- Ensure reward policies are transparent, consistent, and easy to redeem.
- Use incentives to enhance satisfaction, but align them with features that build trust.

6. Focus on Customer Support Enhancement

- Offer 24×7 customer service, chatbots, and fast complaint resolution.
- Provide clear guidance on refund timelines and troubleshooting.
- Ensure multilingual support for users from diverse regions.

7. Promote Platform Collaboration and Standardization

- Encourage interoperability across platforms to enhance convenience.
- Work with regulators to maintain consistent standards for security and privacy.
- Develop industry-wide guidelines for transparency in rewards and data usage.

Conclusion

This study highlights the critical role of trust in shaping user adoption, satisfaction, and long-term loyalty in digital payment platforms. While digital payments especially UPI-based systems have become widely accepted due to their convenience, speed, and usability, trust remains the central determinant of sustained usage. The findings show that although incentives such as cashback and promotional offers encourage short-term engagement, they do not significantly strengthen trust. Instead, security perception is the

strongest predictor of behavioural trust, and behavioural trust directly influences loyalty intentions.

The analysis confirms that users are more likely to remain loyal to platforms that offer robust security, reliable performance, transparent processes, and seamless user experiences. Technical issues, fraud risks, and privacy concerns continue to challenge user confidence, especially among individuals with lower digital literacy. Therefore, digital payment providers must prioritize strengthening security, enhancing transparency, and improving system reliability to build a trustworthy ecosystem.

Ultimately, the study concludes that trust acts as the bridge between user perception and long-term loyalty. For digital payment platforms to maintain growth and competitiveness in India's expanding fintech landscape, they must focus not merely on offering features or rewards but on continuously building and sustaining trust at every stage of user interaction.

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17. THE INFLUENCE OF SOCIAL MEDIA USE ON ACADEMIC PERFORMANCE IN DIGITAL EDUCATION

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ABSTRACT

Online social network spots use has been surfaced as a most important tool for communication and exchange of information each over the world. More lately the Wats app, Twitter, Face book, Instagram apps have provoked a revolution and uncorked a new dimension in the field of communication and technology; this ongoing digital revolution has touched and turned nearly every sphere of life of its druggies whether its physical, social, emotional, moral or ethical. This exploration work epitomized the large body of substantiation examining whether use of social network spots influence on academic performance among adolescents. A descriptive check exploration design was employed and persons were classified as high social network spots users, average social network spots users and low social network spots users according to the scores attained on social network spots operation scale. The data was attained from 60 participants and the position of academic performance, as told by the social network spots use is anatomized. An Average result indicated that high social network stoner, average social network spots users and low social network users' groups are significantly differed in the position academic performance among adolescents. Average analyses indicated that low social network spots users' group has attained lesser mean chance on academic performance compared to average social network spots users' group and high social network spots user group.

It is also found that SNS users showed high preference for online and indoor games, Average SNS users showed high preference for Indoor and outdoor games and Low SNS users showed high preference outdoor games. Implications of the study were discussed in

light of creating awareness about the use of social network sites among adolescents in India.

Keywords: Online Social networking sites, Academic success, Creative abilities and preference of play activities.

INTRODUCTION

Social Network spots (SNSs) use similar as face book, twitters are ingrained into diurnal lives of people. Especially adolescents spend important time on social network spots and this would come their part of their diurnal life. It's important to understand the nature of social network spots use among adolescents and its influence on academic performance among adolescents.

Boyd & Ellison (2007) over the past decade social network sites (SNSs) have increased substantially in popularity and become part of societies social practices. SNSs are various web-based platforms that allow people to e.g. interact, play games, converse through instant messaging, and share interests. According to boyd and Ellison (2007) there are three factors required to meet the definition of a SNS; (1) a constructed online profile, (2) a list of the users friends and followers who are interacted with, and (3) a link to each friends, follower or contacts profile. These profiles allow individuals to create new social relationships that would otherwise not be made and maintain existing relationships.

Social Network Site among Adolescents

From last many decades the world has witnessed technological changes which have brought immense changes in our mortal life. One among similar technological change is the emergence of social network spots, which have reduced the communication hedge by easing the druggies to connect with the druggies worldwide and can communicate incontinently whenever demanded with the help of these spots. Social networking spots are a transnational development which has attracted nearly everyone with its trendy installations handed to the druggies and has spread to every corner of the world.

Online use of social network sites is considered to be potentially addictive. The appeal nature of social network sites on internet is the root cause of concern for which young people remain online most of their times and the resultant of the same is developing addictive behaviour. Young in psychological perspective explained the criteria's of

Facebook addiction disorder which can be otherwise called as Social network site addiction disorder, the criteria includes ignorance of personal life, preoccupied mentally all the time with SNSs, escapism from daily routines, mood modifying experiences, tolerating and masking the addictive behaviour are seen among those who use SNS Excessively.

REVIEW OF LITERATURE

- Alahmar (2016) study aimed at studying the impact of social media on impact time of the academic performance of the medical students of Iraq. To achieve the same 57 medical students were administered with online questionnaire which aimed to assess type of social media used, frequency of use and time spent by participants per hour on social media sites. The findings indicated that the frequency of use was correlated with their academic performance. The average time spent on social media was 5.07 ± 2.93 hours a day and further it was observed by the researcher that nearly 42% of the students using social media sites reported using social media sites had positive effects on their academic performance.
- Mingle & Adams (2015) study aimed at analysing the impact of social media participation and academic performance among high schools students, the paper analysed the way in which students used SNSs and the time invested on social media sites and its effects were analysed on their grammar, spelling and academic performance in the context of social learning and gratification theories. The study incorporated survey and interview technique. The findings indicated that majority of the students used facebook and whatsapp for the purpose of chatting with their friends, and these students had poor grammar and spellings, further it was also reported that due to the use of SNS these students submitted their assignments very late, had less study time and maintained poor academic records. Through this review it is clear that use of social network sites had a serious impact on students scholastic achievements.
- Ghulam shabir et,al (2014) study on the impact of social media on the youth, to achieve. To achieve the same a survey was conducted on 300 sample and it was found that youth showed greater interest towards use of social media sites, researcher reported that facebook and Skype was the popular social media sites

and remained favourite among the participants. The researcher further stated that the use of social media sites had both advantages as well as disadvantages. To the field of education, for sharing information related links and for communication background social network sites had positive impact, where as for promoting unethical pictures, videos, anti-religious posts social network sites were considered to be bad

- Anjugu Jessica Ndaku (2013) study on the impact of social media on academic performance of the students, examined 400 university students from the University of Abuja and the findings indicated that majority of the students at Abuja University were using social media sites and the result of the same was students setback in their academic performance due to the excess use of social network sites.
- Whitney Sue Thoene (2012) study on the impact of social network sites on college students consumption pattern, intended to analyse the effect of social media, particularly facebook and Twitter and its influence on buying habits of the college students. The results indicated that there was a high positive correlation between consumption pattern and social network usage. Higher the social network usage more likely the consumers to shop at their friends. The researcher further found that there existed a gender difference in social network sites usage in relation to consumption pattern.

STATEMENT OF THE PROBLEM

To study the impact of social network sites usage on academic performance.

OBJECTIVES OF THE STUDY

- To evaluate the impact of social networking sites on academic performance among adolescents.
- To analyse the awareness of social networking sites on adolescents.
- To identify the key issues & trends of Social Networking in Education System
- To evaluation the impact of social networking sites on emotional maturity among adolescents.

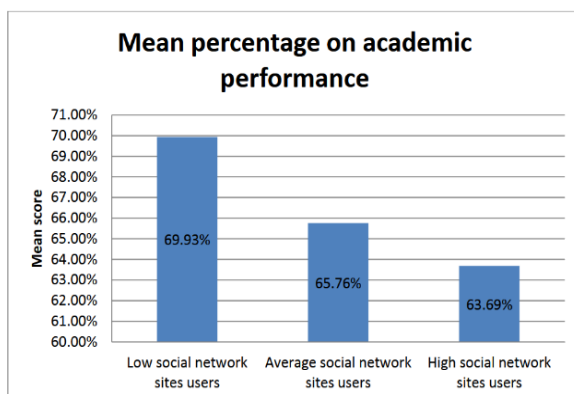
RESEARCH DESIGN

The present study was intended to find out the impact of social network sites on academic performance of adolescents. Hence, the descriptive survey research was applied. Descriptive survey research is probably the most frequently used mode of study in the social sciences. Typically, the researcher selects a sample of respondents from a certain population and administers standardized questionnaires/scales to them.

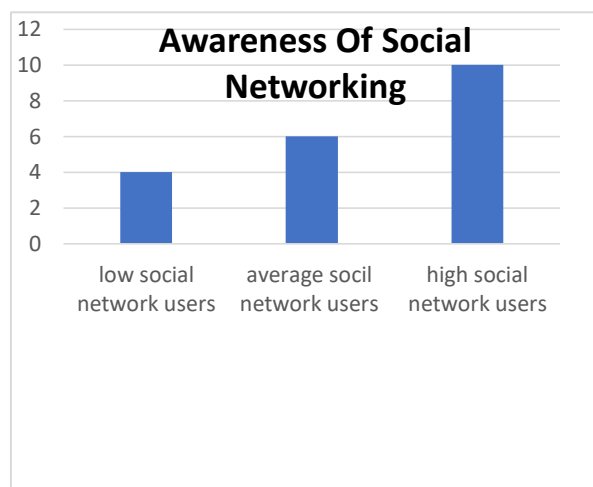
The cluster random sampling technique was adopted for the study and assigned participants in to three groups based on the scores of social network sites scale which included (N=20) High SNSs users Moderate SNSs users and (N=20) and (N=20) Low SNSs users.

ANALYSIS

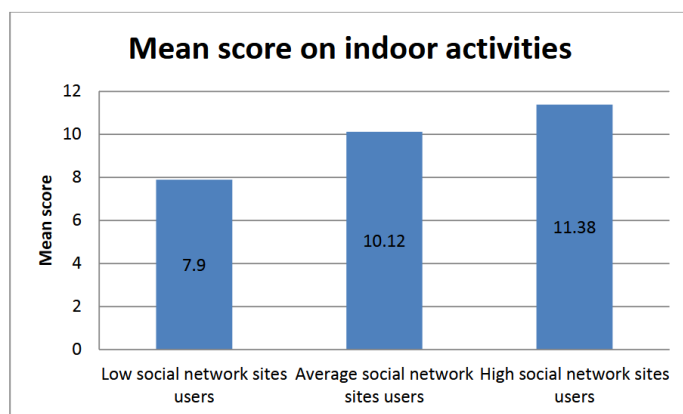
Graph 1: Shows the mean percentage on academic performance among three groups belong to Low social network sites users, Average social network sites users and high social network sites users



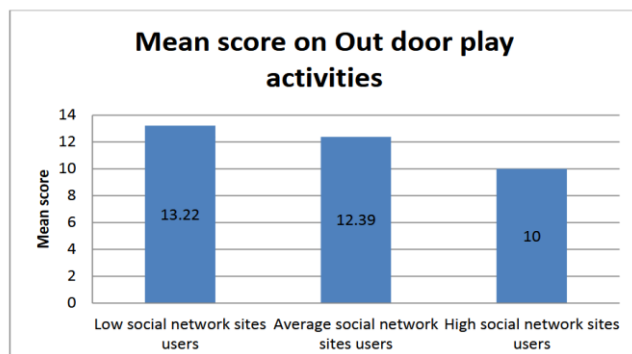
Graph 2: Shows the mean scores on awareness of social networking sites on adolescents among three groups belong to Low social network sites users, Average social network sites users and high social network sites users



Graph 3: Shows the mean scores on indoor play activities among three groups belongs to Low social network sites users, Average social network sites users and high social network sites user groups.



Graph 4: Shows the mean percentage on outdoor play activities among three groups belong to Low social network sites users, Average social network sites users and high social network sites users.



Interpretations

Use of Social network spots (SNSs) among adolescents is decreasingly drawing the attention of educational and assiduity experimenters intrigue by their affordances and reach. In the pupil community, the online social networks (OSNs) getting a prominent communication tool to communicated with others. therefore, educational institutions and faculties are decreasingly using social networking spots, similar as Facebook, LinkedIn and academia etc, this has led to a rise in questions about the impact of online social network spots on academic performance and the possibility of using it as an effective

tutoring and useful tool in education. To learn further about the impact of social network spots on academic performance this study was conducted.

FINDINGS OF THE STUDY

- High use of social network sites negatively interfered with their academic performance among adolescents.
- High social network site users group showed more creative abilities than compared to other groups.
- Low social network site users group showed less creative abilities compared to other groups.
- Use of Social network sites had negative effects on emotional maturity among adolescents.

IMPLICATION OF THE STUDY

- Awareness program must be provided to the young budding adults in terms of productive use of Technology especially social network sites.
- Through present study we can understand the role of teachers and parents in monitoring and guiding the adolescent 's use of Internet and social network site users.
- School and college authorities must take initiative in letting the adolescents know the impact of social network sites usage.

SUMMARY AND CONCLUSIONS

A social network sites are online networking system that provides the users to construct their social networks which connects people worldwide. Using social network, the users can share their profile, interest, activities, photos and other background information. Social network services are web based and users can be able to interact with their friends through internet by instant messages, e-mails, online communication, video, voice chat and file sharing, etc

In Academic performance the results showed that the mean chance among sample groups belongs to low social network spots druggies, average social network spots druggies and high social network spots druggies differed significantly. Low social network spots druggies group has attained lesser mean chance on academic performance compared to average social network spots druggies group and high social network spots

druggies group has attained lower mean chance compared to average social network spots druggies group and Low social network spots stoner group, indicating that High use of social network spots has a serious negative impact on the academic performance among the adolescents.

LIMITATIONS OF THE STUDY

- Since the study is conducted on adolescent sample belonging from urban area, the same cannot be generalized for adult population and rural population.
- The study has limitation as it did not consider the usage pattern of social network sites in terms of number of hours.

RECOMMENDATIONS FOR FURTHER RESEARCH

- Further research should be focused on the other age groups such as young children and adults since they are also more prone to use social network sites.
- The study could be further extended to employee group to know the adverse effect of use of social network sites on their career.

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18. AWARENESS AND ADOPTION OF BUSINESS ANALYTICS TOOLS AMONG LOCAL RETAIL SHOPS OF KALADY PANCHAYAT

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ABSTRACT

Business Analytics has received a lot of attention over the last few years for providing business insights by analysing the data to improve the quality of decision-making. It helps businesses to take data-driven decisions regarding their inventory, sales, future development, etc. Even though emphasis on Business Analytics has increased nowadays, the level of awareness of business analytics tools, and their usage in local retail shops, has remained at an extremely low level, which has already studied by past researchers. This research highlights the level of awareness and use of business analytics tools, amongst local retail shops operating in Kalady Panchayat, of Ernakulam District. The main objectives of the research are to assess local retail shop owners' awareness of business analytics tools, to assess the use of digital and analytics tools at the retail shop level, and to identify the reasons for non-implementation of digital/analytic tools. Most of these businesses are small and therefore rely heavily on traditional means of managing their daily operations. A very small number of shops have adopted basic digital tools. The research is descriptive in nature and involves primary data that have been obtained from local retail shop owners using a structured questionnaire. Simple descriptive statistics were used for data analysis (e.g. percentages). Findings are expected to be valuable to local retail businesses, policy makers, training institutions, etc for the sustainable growth of local retail businesses.

Keywords: Business Analytics Tools, Local Retail Shops, Awareness, Adoption, Data-Driven Decisions

INTRODUCTION

Business analytics has become a major tool for managing businesses. It helps a company understand its data and make informed decisions. Based on the data available regarding sales, stocks, and customers, businesses can manage their operations better and improve their performance. In recent times, digital methods and analytics practices have been on the rise in various industries, including larger businesses and the organised retail sector (Davenport & Harris, 2007). The scenario is different for local retail stores. The decision-making process in local stores relies on knowledge and traditional recording systems.

The local retail stores are also important in the economy of the region since they offer basic goods, employment, and services to the residents (Reardon & Gulati, 2008). The stores usually operate with minimal capital. They are controlled by their owners. In most of these stores, the financial data is kept manually in notebooks or based on memory or billing. Although these can be effective in operations, they are not ideal for analysing data or trends in business. Today, with the competitive nature of the business world becoming more digital, it is probable that the lack of comprehension or utilisation of analytical tools could be hampering the local retail stores (OECD, 2019).

Although the use of business analytics tools is a discussed topic and the benefits thereof are propagated, the level of awareness and adoption regarding the use of such tools at the local level, in the retail shop, is extremely low. This is because the owners of such shops are either unaware of the use of such tools or feel that the benefits thereof accrue to bigger businesses alone (Rogers, 2003).

In this context, the current research aims to study the awareness level of local retail shops in Kalady Panchayat of the Ernakulam District about the use of business analytics tools. Further, the study attempts to discover whether the owners of the retail shops are familiar with the use of these business tools, the extent to which digital/analytical tools are in use at the retail level, and the grounds for which some retail shops are not making use of these tools. Further, with a perspective on local retail shops, the current research study attempts to offer a realistic outlook into digital activities at the grassroots level.

STATEMENT OF THE PROBLEM

Business analytics tools are normally promoted for improving decision-making in business; however, awareness and usage of business analytics tools remain low among local retail shops (OECD, 2019). The current prevailing practices among most of these shops include manual recording and decision-making by experience. In case they opt to use technology, it is limited to either charging and accounting systems, but not for analyzing data in business. Lack of awareness, skills and cost, and an insignificance threshold prevent local shops from adopting business analytics tools. There appears to be a divide existing in terms of potential utilization of business analytics tools and current usage in retail shops; it is therefore important to investigate awareness and reasons for not adopting among local retail shops.

RESEARCH OBJECTIVES

1. To assess the level of awareness of business analytics tools among local retail shop owners in Kalady Panchayat.
2. To examine the extent to which digital and analytics-related tools are currently used at the retail shop level.
3. To identify the major reasons for non-use or limited use of business analytics tools among local retail shops.

SIGNIFICANCE OF THE RESEARCH

The local retail stores are a substantial pillar of the economy, providing employment, livelihoods, or the basic needs of society (Reardon & Gulati, 2008). There is a need to learn or understand the manner in which these stores conduct their operations or the decisions made for the successful growth of the stores. The current prevailing practices among most of these shops include manual recording and decision-making by experience. In case they opt to use technology, it is limited to either charging and accounting systems, but not for analyzing data in business. Lack of awareness, skills and cost, and an insignificance threshold prevent local shops from adopting business analytics tools. The significance of the study lies in its importance as it showcases the practical behaviour of local retail stores in digital terms rather than ideal behaviour. Highlighting the gaps of awareness or usage of business analytics software, the study has

its implications with regard to the local store owners, institutions of training, or the governing body that aims at promoting the local behaviour of going digital or taking analytical actions.

RESEARCH METHODOLOGY

In this study, descriptive research design is used. The purpose of this research is to explain, understand, or describe the existing knowledge or awareness as well as the utilization of business analytics applications among local retail shops, as opposed to making efforts to arrive at complicated relations (Kothari, 2004). The study delves deeper into existing practices, perceptions, as well as difficulties experienced by local retail shop owners when adopting or using applications related to analytics.

The locality chosen for the study is Kalady Panchayat in Ernakulum district. This locality consists of various local retail shops like bakery items, stationery items, garments, footwear items, and grocery items. The unorganized sector operates in the form of various small businesses and is handled personally by the owners of those shops. The study population is all the local retail shops existing in the Kalady Panchayat. It was not possible to survey the entire population due to certain time constraints and unavailability of respondents. Therefore, the sample size of 50 was selected for the study.

Every precaution has been taken to ensure that shops representing different areas in the panchayat, as well as the types, are taken for the sample. Therefore, it can be made sure that particular thoroughness is given for representing retailing in the area through the sample.

The research study mainly relies on primary data, which was obtained using a structured questionnaire designed in simple terms easily comprehensible to the retail store owners of the study area. In addition to the above, personal interviews helped to make sense of the answers provided in the questionnaire questions. Traders' associations of the study area helped in gaining the data.

The data obtained has been subjected to some descriptive statistical analyses that involve percentage analysis. This method is appropriate to determine awareness levels, use rates, and non-use reasons in a study with a smaller sample size (Kothari, 2004). The findings obtained from this work have been illustrated in tables and graphics for easy understanding and interpretation.

RESULTS AND DISCUSSIONS

Based on the survey conducted among 50 retail shop owners in Kalady Panchayat, the level of awareness regarding business analytics is quite low, but at the same time, usage is also low. Approximately 78% or 39 out of 50 shop owners reported that they are able to analyze data such as sales, inventory, and profits in order to analyze their business performance. At the same time, 78% also agreed that data analysis can help make better decisions concerning their businesses. With these, 16%, or 8 persons, reported that data analysis is no use for their business, while 6%, or 3 persons, are also in doubt regarding data analysis usefulness.

Looking at the actual usage, it is a very slow one, as only 34% of shops, that is, 17 out of 50, have used any kind of digital tools for their business. Even then, these digital tools were limited to their billing systems, that is, POS, mainly present in their franchise stores or bigger stores. Still, a total of 62% of them, that is, 31, are maintaining their records by notebooks/paper, while only 4%, that is, 2, are using proper software for that purpose. This difference between awareness and usage indicates a reluctance on the part of the local retailers to move away from conventional practices despite the realization of the benefits of analytics (Rogers, 2003).

Further research shows that the adoption of digital tools is largely dependent on the type and size of the convenience store. Franchise stores and those employing more than five people tend to adapt to digital tools such as the POS system or use Excel. Independently owned shops with only one employee use only manual processes for analyzing their businesses. The reasons for not applying analytics tools have been clearly determined. Lack of knowledge was the prevailing factor that was mentioned in nearly all responses. After that came the lack of time (46%) and (40%) costs associated with the tools. Some respondents provided multiple reasons for their failure to adapt to analytics tools. Those reasons included lack of knowledge and lack of time (22%) and lack of knowledge and costs (14%). In addition to the above reasons, 18% believed that analytics tools are unnecessary for their store. A number of people based their analysis only on personal experience.

The most encouraging finding in the study is that 100% of the participants, that is, the 50 shop owners, are interested in using simple analytical tools if proper training is provided to them. This is an indication that resistance to analytics is neither in terms of interest nor

in terms of willingness, but it is in terms of lack of guidance or confidence. The study also identified a small disparity among the types of shops. Grocery, stationery, bakeries, and footwear shops are more interested in digital analytical tools rather than the others.

On the whole, what these results convey is that the local shopping outlets in the Kalady Panchayat are a case where awareness levels are relatively strong, usage levels are very low, and the desire to learn is very strong. What this means is that there is an excellent learn-through-training initiative strategy to convert these shopping outlets to data-driven decision-making.

CONCLUSION

Analysis of the current situation regarding the awareness and usage of business analytics among local retail shops in Kalady Panchayat reveals that although many of the shop owners have an insight into the concept of analyzing business data, they use it very less in their shops. Many of the local shops are still using traditional ways of doing business, such as manual recording of accounts, paper calculations, and experience-driven decision making. Though some of these shops use technology in terms of billing software or basic accounting applications, it is often limited to recording a transaction, not analysis of data for decision making. The argument put forth by the study is that there is a gap in awareness and practice. The gap is primarily caused by the fact that the solutions to the problem often rely on knowledge that is not possessed, the constraint of time, the cost factor, and the fact that analytics software is not necessary for such retail businesses. But interestingly, the study shows the bright side. All the participants want the analytics software if proper training is provided. That is, people do not fear analytics because of aversion but because of a lack of knowledge.

Based on these findings, there is a clear demand for practical, at-shop training on easy-to-use and low-cost tools-such as basic billing software, mobile apps, or simple spreadsheet templates-that would give the shop owner enough insight into his sales pattern, stock movement, and profit trend. Herein lies the key role that can be played by local authorities, trade associations, and training institutions by organizing short workshops in the local language, hands-on demonstrations, and providing continuous support rather than one-time sessions. The vendors of software solutions and financial service providers can also develop simplified solutions with flexible pricing models to suit the scale and needs of local retail shops. Overall, the study concludes that local retail businesses in

Kalady Panchayat are at a very critical transition stage. While traditional practices dominate, the mindset is increasingly open toward the use of digital and analytical tools, thus creating a very fertile opportunity to promote data-driven, ethical, and sustainable business practices by way of creating awareness and building skills.

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19.BENEFITS OF E-CRM SERVICES ADOPTED BY PUBLIC SECTOR BANKS-A STUDY WITH SPECIAL REFERENCE TO MUVATTUPUZHA TALUK

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ABSTRACT

The banking sector holds a significant position in today's business landscape. Traditionally, consumers conducted their transactions exclusively at physical bank locations, engaging in activities such as deposits, withdrawals, money transfers, and cheque collections. However, the advent of online technology has transformed this process, allowing transactions to be completed from the comfort of home, particularly during the pandemic. This study aims to identify the advantages customers experience when utilizing e-CRM services. The research is based on both primary and secondary data, with primary data gathered through a well-structured questionnaire distributed to 103 online customers. A convenience sampling method was employed for this study. Key findings indicate that the majority of consumers fall within the 25-40 age range, with 63% being female. Additionally, 90% of respondents hold postgraduate degrees, and 81% are married. Recommendations from the study include enhancing user-friendliness, ensuring the security of personal information, and conducting awareness campaigns to educate account holders about e-CRM services. In conclusion, customer satisfaction emerges as a primary benefit recognized by bankers in the context of e-CRM, with convenience being the foremost advantage of e-banking for customers. It is evident that most online consumers derive significant benefits from these digital transactions.

Key words: *[Online Banking, e-CRM, Online Consumers, Electronic Banking and Online Transactions]*

Introduction

The banking sector plays a crucial role in today's business environment. Traditionally, consumers conducted their transactions exclusively at physical bank locations, where they would visit to perform activities such as deposits, withdrawals, money transfers, and cheque collections. However, with the advent of online technology, particularly during the pandemic, these transactions can now be completed from the comfort of home. The banking industry has experienced significant transformations, especially following the era of liberalization. The entry of foreign banks and the licensing of private sector institutions have intensified competition within the market. In this context, Electronic Customer Relationship Management (E-CRM) has become essential for fostering healthy growth in banking and addressing competitive pressures. To enhance efficiency and focus more on marketing and sales, banks are increasingly adopting alternative channels such as e-banking, mobile banking, smart cards, and Automated Teller Machines (ATMs). E-CRM has significantly improved the effectiveness of business transactions in contemporary economies and has permeated various aspects of human activity.

Statement of Problem

The banking sector has experienced significant transformations in the services offered to consumers. To identify the existing research gap, the following question arises for the researcher:

- What advantages do online consumers experience in public sector banks?

Objectives of the Study

The aim of this study is to determine the benefits that customers derive from utilizing e-CRM services in public sector banks.

Advantages of e-CRM Services

The highest priority is assigned to ease of transactions, followed by customer loyalty in second place. The third priority is mobile and DTH connection recharges, while online bill payments rank fourth. Online fund transfers are ranked fifth, and online shopping

comes in sixth. Security is given seventh place, followed by time-saving in eighth, and accessibility is ranked ninth.

Methodology

The research is based on both primary and secondary data. Primary data was gathered from customers engaged in online transactions through a well-structured questionnaire. Secondary data was sourced from journals, magazines, books, and newspapers, among other materials.

Sample Size and Sampling Method

A total of 120 questionnaires were distributed to customers, with 103 completed questionnaires returned. Therefore, 103 respondents were included in this study. The convenience sampling method was employed for this research.

Particulers	Number	Percentage
Age		
18-25	6	6%
25-40	65	63%
40-65	31	30%
65+	1	1%
Gender		0%
Male	38	37%
Female	65	63%
Marital Status		0%
Married	83	81%
Unmarried	20	19%
Educational Qualification		0%
Up to XII	1	1%
Graduate	9	9%
Post Graduate& Above	93	90%
Annual Income		0%
Up to 2 Lakhs	61	59%
2-5 Lakhs	31	30%

5-8 Lakhs	11	11%
Occupation		0%
Service	74	72%
Business	7	7%
Self Employed	21	20%
House wife	1	1%

Statistical Tools Utilized

The following statistical tools were applied in this study:

1. Simple percentage

Summary of Findings

The results of this study are categorized into three sections: personal profile, benefits, and challenges of e-CRM services.

- The majority of consumers fall within the age range of 25 to 40 years.
- A significant portion of the consumers (63%) are female.
- Most respondents (90%) hold postgraduate degrees.
- A large number of consumers (81%) are married.
- Above Half of the consumers (59%) have a monthly income exceeding Rs.200,000.
- A predominant portion of consumers (85.00%) hold accounts with SBI, with 71 respondents (59.00%) having savings accounts.
- The primary reason consumers choose SBI is due to the perceived safety of its banking services.
- A majority of respondents (83 or 69.00%) utilize online banking services, while 40.83% use ATM cards.
- Approximately 21.67% of consumers use credit cards for shopping, and 80.00% express satisfaction with the services provided by SBI bank.

Recommendations from the Study

The study offers several recommendations, including:

- Enhancing user-friendliness
- Safeguarding customer personal information
- Conducting awareness campaigns to educate account holders about e-CRM services
- Reducing service and transaction fees
- Allowing bankers to adjust deposit and withdrawal limits based on consumer convenience
- Focusing on branches in semi-urban and rural areas for the implementation of e-CRM solutions
- Encouraging consumers to fully utilize e-CRM services
- Ensuring security in internet and mobile banking practices.

Conclusions

The findings indicate that customer satisfaction is a significant advantage recognized by bankers utilizing e-CRM, with the primary benefit of e-banking being the convenience it offers to customers. In today's fast-paced environment, consumers increasingly favor online banking services, as they often lack the time to visit a bank for cash withdrawals and other transactions. Consequently, many consumers prioritize online banking due to its ease of conducting various transactions, including fund transfers, deposits, withdrawals, and additional services such as bill payments, booking air tickets, and online share trading.

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20. AN EMPIRICAL STUDY ON ASSESSING THE ROLE OF INDIA'S DIGITAL RUPEE IN ENHANCING CROSS-BORDER PAYMENT EFFICIENCY AND COST REDUCTION

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ABSTRACT:

The rapid evolution of digital financial technologies has enhanced global interest and desire in Central Bank Digital Currencies (CBDCs) as a solution to inefficiencies in cross-border payment systems. The traditional international payment system was costly, slow, and dependent on multiple intermediaries, which created operational and financial friction, especially in emerging economies. The Central Bank of India(RBI) has introduced a technologically innovative E-Rupee system as a significant policy to curb the existing challenges to transform cross-border transactions. For this research study, primary data were collected from 400 professionals engaged in cross-border financial activities, including banking, fintech, policymakers and remittance services. The data were cross-sectional and qualitative in nature. The data collected was analysed using correlation, regression and reliability analysis in SPSS software to test the proposed hypothesis. The result shows that both perceived payment efficiency and perceived cost reduction have a statistically significant impact on the adoption of digital rupee intention. Perceived payment efficiency determines a portion of the transformation in adoption intention, indicating the importance of faster settlement, transparency, and reduced intermediary involvement. Similarly, perceived cost reduction acts as a strong predictor of adoption behavior that provides the benefit of lower transaction cost and improved exchange efficiency. This research study adds value to the existing literature on Central Bank Digital Currency (CBDC) by indicating empirical evidence from a developing economy context and reinforcing technology adoption theories within digital finance.

Keywords: Digital Rupee, Cross-Border Payments, Payment Efficiency, Transaction Cost, Central Bank Digital Currency (CBDC).

Introduction:***Background of the Study***

The financial ecosystem is evolving in the age of digital globalisation which is driven by technological innovation. The most profound advancement in recent years has been the emergence of Central Bank Digital Currencies (CBDCs) which offers sovereign digital alternatives to traditional fiat currencies. These innovations are not merely technological milestones; they have the potential to redefine how money moves across borders, especially in developing economies like India where remittances, trade payments, and international business transactions constitute a significant portion of the financial inflows.

India is considered one of the largest recipients of global remittances which has shown remarkable progress in digital finance, particularly through innovations like the Unified Payments Interface (UPI). Building upon this digital infrastructure, the Reserve Bank of India (RBI) launched the eRupee, a digital version of the Indian currency, as a pilot project to evaluate its suitability for broader financial applications. While its domestic utility is being tested, there is growing interest in understanding the eRupee's potential for cross-border financial integration, especially with the vision of improving payment efficiency and reducing transaction costs.

Sustainability in contemporary financial systems extends beyond environmental considerations to encompass long-term economic resilience, social inclusion, and institutional integrity. Based on this context, the digital transformation of money has emerged as a critical lever for advancing sustainable development, particularly in economies where financial access, remittance dependency, and payment inefficiencies pose persistent structural challenges. The ongoing shift toward digital finance, driven by technological innovation and global interconnectedness, is therefore not merely a matter of convenience or efficiency but a foundational component of sustainable financial architecture.

Research Problem

Traditional Cross-Border Payment systems are expensive, slow and opaque, such as SWIFT and correspondent banking networks that involve multiple intermediaries, high transaction costs and limited interoperability. Based on this context, the e-Rupee may

offer a modern solution by simplifying the process, enhancing speed, ensuring security and minimising the overall cost of international transactions. However, digital currency adoption is based on users' perception of its usefulness and efficiency. There is an emerging need to determine how professionals perceive eRupee, particularly in terms of its payment efficiency and cost-saving potential.

Research Objectives

This study focuses on two key objectives:

1. To examine the role of eRupee in cross-border economic integration and in improving payment efficiency.
2. To analyse the extent of eRupee in reducing transaction costs in cross-border financial systems.

Research Hypotheses

Based on the research objectives, the study formulates the following hypotheses:

- **H1:** Perceived Payment Efficiency (PPE) has a positive influence on the Adoption of eRupee (IACT) intention.
- **H2:** Perceived Cost Reduction (PCR) significantly predicts the Intention to Adopt eRupee (IACT).

Significance of the Study

This research study is significant academically as it contributes to the growing body of literature on CBDCs and digital payment systems particularly within the context of developing economies and practically it provides actionable insights for policy makers, banking institutions, FinTech Companies, and in global regulatory bodies. Understanding the drivers of eRupee adoption will help stakeholders shape strategies that foster inclusive, efficient, and scalable cross-border financial systems.

Theoretical Framework

The theoretical framework of this study is based on the perceived functional benefits, specifically payment efficiency and cost reduction, that serve as a basis for influencing the adoption of digital financial innovations such as eRupee. This theoretical framework indicates that professionals engage in cross-border financial operations to evaluate new digital instruments based on their ability in order to enhance transactional speed, reduce

reliance on intermediaries, and lower associated costs. The constructs of Perceived Payment Efficiency (PPE) and Perceived Cost Reduction (PCR) are central to this analysis, as they encapsulate the practical value propositions that drive user intention. By empirically examining the relationship between these two variables and the Intention to Adopt eRupee (IACT), the study establishes a conceptual link between operational improvements in digital currency systems and their potential to transform cross-border payment landscapes. This framework is further supported by literature emphasising efficiency, transparency, and cost-effectiveness as foundational drivers of CBDC adoption in emerging economies.

Review of Literature

The rapid globalisation of trade and finance has intensified the importance of efficient cross-border payment systems. As highlighted by **Hanyu (2023)**, while international trade and economic integration have expanded significantly since the 20th century, traditional cross-border payment mechanisms continue to suffer from high processing fees, operational inefficiencies, privacy risks, and over-reliance on centralised intermediaries. These structural weaknesses have created an urgent demand for alternative payment architectures that are scalable, cost-efficient, and secure.

Against this backdrop, the global remittance ecosystem has emerged as a critical pillar of economic support, particularly for developing and low-income countries. **Khan et al. (2024)** note that global remittance flows reached USD 656 billion in 2023, surpassing foreign direct investment as the largest source of external finance for many economies. Technological innovations such as mobile payments, blockchain, and FinTech platforms have transformed remittance services by reducing transaction costs, accelerating settlement, and improving access in remote regions. The UK–India corridor, one of the world’s busiest remittance channels, exemplifies how regulatory alignment and digital tools like UPI can significantly enhance cross-border payment efficiency.

Despite these advancements, transaction costs and infrastructure inefficiencies remain central concerns. Earlier evidence from **Singh (2010)** demonstrates that traditional banking instruments used for remittance transfers to India are costly and slow, whereas technology-enabled payment products substantially reduce settlement cycles and fees. Transaction costs emerge as the most dominant determinant influencing remittance

volumes, underscoring the importance of policy interventions and technological innovation in shaping remittance inflows.

In response to these systemic inefficiencies, digital money particularly Central Bank Digital Currencies (CBDCs) has gained prominence as a potential solution. **Dionysopoulos et al. (2024)** provide a comprehensive overview of CBDC motivations, design choices, and supporting infrastructure, emphasising their implications for monetary policy transmission and ensuring financial stability. The study also identifies unresolved research areas related to governance, interoperability, and technological architecture, suggesting that CBDCs represent not merely a payment innovation but a structural shift in the financial system.

At the national level, India's digital currency initiative has attracted considerable scholarly attention. **Ozili (2022)** examines the benefits and challenges of the digital Rupee (e-Rupee), highlighting reduced cash dependency, enhanced seigniorage revenues, and lower settlement risks. However, the study stresses the need for legal and regulatory frameworks to enable phased and effective implementation. Complementing this view, **Sehgal et al. (2024)** analyse both centralised and decentralised digital currencies, emphasising the e-Rupee's potential to advance financial inclusion, transaction efficiency, and policy effectiveness, while also identifying risks related to cyber threats, privacy, and financial instability.

The Reserve Bank of India's proactive role further underscores the strategic importance of CBDCs in India's digital transformation. **Haque and Shoaib (2023)** discuss the RBI's launch of the e-Rupee pilot as a milestone in the "Digital India" initiative, aimed at enhancing payment system security and resilience. Nevertheless, challenges such as scalability, system performance, and real-world usage scenarios continue to constrain widespread adoption. Empirical insights from **Govind et al. (2024)** and **Kumar (2024)** reinforce the view that the e-Rupee, alongside platforms like UPI and mobile wallets, is reshaping India's financial ecosystem by reducing cash reliance, improving transaction security, and fostering greater financial inclusion.

From an institutional perspective, **Prajapati and Patel (2025)** highlight the crucial role of banks in expanding the e-Rupee ecosystem, particularly through voucher creation and redemption in wholesale and retail segments. Their findings suggest growing institutional

confidence in CBDC usage, signaling its long-term potential within India's digital economy.

Beyond domestic applications, digital currencies and blockchain technologies are increasingly viewed as catalysts for transforming cross-border payments. **Cerutti (2025)** finds that digital money innovations can reduce transaction costs and increase payment volumes of cross-border areas, particularly for large remittance-receiving economies, thereby promoting financial development and inclusion. However, low transaction costs alone may not be sufficient to stimulate global payment volumes without broader institutional adoption.

Technological solutions leveraging blockchain further extend this potential. **Gogol et al. (2023)** propose a multi-layer blockchain architecture for cross-border CBDC trading that enhances security, interoperability, and cost efficiency through competing Automated Market Makers. Similarly, **Lin et al. (2025)** introduce SecurePay, a hybrid system combining permissioned blockchain and CBDCs to deliver high security, regulatory oversight, and near-centralized processing efficiency. These findings align with **Mohammad (2025)**, who emphasizes blockchain's ability to enable real-time settlements and lower costs, while cautioning that regulatory uncertainty, scalability constraints, and institutional resistance remain major barriers.

Finally, advancing toward standardized and interoperable global payment systems, **Mridul et al. (2024)** propose a blockchain-based framework integrating smart contracts and ISO20022 messaging standards to emulate cross-border payments. Their prototype demonstrates how CBDCs, decentralized finance, and international standards can converge to support the evolution of a secure, efficient, and globally connected digital financial ecosystem.

Author(s)& Year	Focus Area	Relevance to Study
Dionysopoulos et al. (2024)	Comprehensive CBDC implications and design motivations	Frames CBDC policy and design for payment efficiency
Khan et al. (2024)	Digital remittance trends, FinTech innovations, UK-India corridor	Shows remittance cost impact and shift to digital channels
Ozili (2022)	Benefits and regulatory issues of eRupee in India	Highlights eRupee benefits in reducing cost and dependency on cash
Sehgal et al. (2024)	CBDC forms, financial inclusion, risk and policy considerations	Supports payment efficiency, financial inclusion, and policy depth
Hanyu (2023)	Blockchain-based cross-border CBDC model	Proposes a scalable CBDC design for efficient cross-border use
Cerutti (2025)	Empirical study on digital money reducing cross-border costs	Quantifies potential reduction in transaction cost via digital money
Haque & Shoaib (2023)	Digital rupee pilot insights and deployment challenges	Shows practical and policy-level deployment issues of eRupee
Govind et al. (2024)	Impact of eRupee and UPI on financial inclusion in urban India	Links eRupee usage patterns to financial ecosystem evolution
Kumar (2024)	eRupee analysis covering tech, economy, regulation	Outlines macro view of eRupee's economic potential
Prajapati & Patel (2025)	Bank participation in eRupee pilot usage	Evaluates real-world adoption patterns of eRupee
Singh (2010)	Remittance cost and infrastructure as determinants of flow	Reinforces the significance of infrastructure and cost in remittance flows
Gogol et al. (2023)	Layered blockchain model for CBDC interoperability	Introduces cost-efficient architecture for cross-border CBDCs
Lin et al. (2025)	Secure payment system combining CBDC and permissioned blockchain	Demonstrates a secure and efficient digital payment model
Mohammad (2025)	Blockchain's role in cross-border cost reduction and inclusion	Validates blockchain utility in remittance cost reduction
Mridul et al. (2024)	Smart contracts and ISO standards for cross-border payments	Suggests a smart contract-based framework for seamless global finance

Research Methodology:***Research Design***

This research study is based on a descriptive and quantitative research design that addresses the role of the eRupee (India's Central Bank Digital Currency) in improving cross-border payment efficiency and reducing transaction costs. The design is cross-sectional in nature, collecting data at a single point in time to understand perceptions and behavioural intentions regarding eRupee adoption among professionals involved in international financial transactions.

Sample Design

The target population comprises professionals involved in international finance such as banking experts, fintech professionals, policymakers, and remittance service providers. A purposive sampling technique was adopted to ensure relevance to the study.

- **Sample Size:** 400 respondents
- **Geographic Scope:** India
- **Inclusion Criteria:** Individuals with at least some level of experience in cross-border financial transactions

Data Collection

Data were gathered through a self-administered online survey, distributed via professional networks, email, and social media platforms targeted at individuals working in finance and technology sectors. The responses were recorded digitally and exported into a spreadsheet for further analysis.

Data Analysis Techniques

The collected data were analyzed using the following statistical tools:

- **Reliability analysis:** Cronbach's alpha was calculated to assess internal consistency.
- **Correlation analysis:** To identify the relationship between PPE, PCR, and IACT.
- **Multiple regression analysis:** To test the impact of PPE and PCR on the intention to adopt eRupee.

Software Used: SPSS V27 was used for statistical computation.

Reliability Analysis:

Case Processing Summary		
		N
Cases	Valid	400
	Excluded ^a	0
	Total	400
Reliability Statistics		
Cronbach's Alpha ^a		N of Items
0.751		45

The case processing summary reveals that all 400 responses were valid and included in the final analysis, with no cases excluded. This complete dataset strengthens the statistical reliability of the study's findings. The Cronbach's alpha value obtained for the 45-item scale was 0.751, which indicates a internal consistency and reliability for the survey instrument.

Findings:

Demographics:

Variables		Frequency	Percentage
Age Group	25 to 35	141	35.25
	Below 25	100	25
	36 to 45	87	21.75
	46 to 60	59	14.75
	Above 60	13	3.25
Gender	Male	194	48.5
	Female	173	43.25
	Other	33	8.25
Profession	Banking Professional	122	30.5
	Fintech Professional	113	28.25
	Others	73	18.25
	Policy Maker	53	13.25
	Remittance Service Provider	39	9.75
Experience	1 to 3 years	157	39.25
	3 to 5 years	110	27.5
	Less than 1 year	78	19.5
	More than 5 years	55	13.75

The demographic profile of the 400 respondents surveyed in this study reflects a well-distributed and diverse group of professionals involved in cross-border financial activities. In terms of age, the largest segment of respondents falls within the 25–35 years category, accounting for 35% of the total sample. This is followed by 25% who are

below 25 years, 20% aged between 36–45 years, 15% aged 46–60 years, and a smaller group of 5% above 60 years. This distribution indicates that the study largely engaged with a younger to middle-aged demographic, which is typically more adaptive to technological innovations like the eRupee.

It is found that there is a relative balance in gender distribution with 50% identifying as male, 45% as female, and 5% as other genders. This inclusivity ensures a broad spectrum of perspectives on digital currency adoption. Professionally, the respondents represent various sectors relevant to the study's focus. About 30% belong to the banking sector, 25% are fintech professionals, 15% are policy makers, and 10% are remittance service providers, while the remaining 20% belong to other related domains. This professional diversity contributes to a multi-dimensional understanding of eRupee usage and its cross-border potential.

Regarding experience in cross-border financial transactions, 40% of the participants have 1–3 years of experience, 25% have 3–5 years, and 15% have more than 5 years of experience. Meanwhile, 20% have less than a year of exposure. This indicates that the majority of respondents possess hands-on familiarity with international financial systems, making them well-positioned to highlight the implications of eRupee for cross-border payment efficiency and cost reduction.

Regression Analysis:

Objective 1: To examine how the eRupee contributes to cross-border economic integration by improving payment efficiency.

Hypothesis H1: Perceived Payment Efficiency (PPE) has a positive influence on the Intention to Adopt eRupee (IACT).

Model Summary ^b						
Model		R	R Square	Adjusted R Square	Std. Error of the Estimate	
1		.682 ^a	0.466	0.464	0.44389	
ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	68.368	1	68.368	346.975	.000 ^b
	Residual	78.422	398	0.197		
	Total	146.790	399			
a. Dependent Variable: IACT						
b. Predictors: (Constant), PPE						

To test this hypothesis, a simple linear regression analysis was conducted with Perceived Payment Efficiency (PPE) as the independent variable and Intention to Adopt eRupee (IACT) as the dependent variable. The results are presented in the model summary and ANOVA tables.

The above table indicates a correlation coefficient (R) of 0.682, showing a strong positive relationship between PPE and IACT. The R Square value of 0.466 suggests that 46.6% of the variance in the intention to adopt eRupee can be represented by the perceived efficiency of its payment features.

The ANOVA table further indicates the model's statistical significance, with an F-value of 346.975 and a p-value of .000, showing that the regression model is statistically significant at the 1% level ($p < 0.01$). This provides strong evidence that perceived payment efficiency is a significant predictor of users' intention to adopt the eRupee in cross-border financial transactions.

The hypothesis is accepted. The findings clearly suggest that enhancing the payment speed, settlement clarity, and transaction simplicity associated with eRupee can significantly increase users' willingness to adopt it for international payments. This underscores the importance of optimizing eRupee's operational efficiency to support India's vision of a competitive digital currency for global trade and remittances.

Objective 2: *To analyze the extent to which the eRupee reduces transaction costs in cross-border financial systems.*

Hypothesis H2: *Perceived Cost Reduction (PCR) significantly predicts the Intention to Adopt eRupee (IACT).*

Model Summary ^b						
Model		R	R Square	Adjusted R Square	Std. Error of the Estimate	
1		.677 ^a	0.470	0.454	0.44618	
ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	67.543	1	64.553	344.314	.000 ^b
	Residual	74.247	398	0.194		
	Total	146.740	399			
a. Dependent Variable: IACT						
b. Predictors: (Constant), PCR						

To evaluate this hypothesis, a simple linear regression analysis was performed, with Perceived Cost Reduction (PCR) as the independent variable and Intention to Adopt eRupee (IACT) as the dependent variable.

The above table indicates a correlation coefficient (R) of 0.678, showing a strong positive relationship between PCR and IACT. The R Square value of 0.460 shows that 46.0% of the variation in the intention to adopt eRupee can be depicted by perceived cost-related benefits. The ANOVA table confirms that the model is statistically significant. The F-statistic is 339.314, with a p-value of .000, indicating a highly significant model at the 1% level. This implies that PCR is a meaningful predictor of adoption intention and contributes substantially to explaining consumer behaviour.

The hypothesis is accepted. The analysis validates that perceived cost savings—including reduced transaction fees, elimination of intermediaries, and efficiency in exchange rate conversions positively influence the willingness of users to adopt eRupee for cross-border payments.

Discussion:

This study aimed to determine India's Central Bank Digital Currency (eRupee) potential as a transformative tool for enhancing cross-border economic integration. Specifically, it examined the influence of perceived payment efficiency and perceived cost reduction on the intention to adopt eRupee for international financial transactions. Based on quantitative data from 400 respondents actively engaged in cross-border financial operations, the study has yielded critical insights relevant to policymakers, fintech innovators, and global trade stakeholders.

Key Findings

The results strongly support both research hypotheses. The first regression model revealed that Perceived Payment Efficiency (PPE) significantly and positively influences the Intention to Adopt eRupee (IACT). With an R value of 0.682 and an R Square of 0.466, nearly 47% of the variance in adoption intention can be attributed to how efficient users perceive the eRupee to be in processing payments. The highly significant F-value of 346.975 ($p < 0.001$) further validates the robustness of the model. This affirms that faster settlement, real-time reconciliation, and elimination of intermediary delays are critical to user trust and adoption behaviour. The finding is consistent with

Dionysopoulos et al. (2024) and Sehgal et al. (2024), who emphasised the role of efficient infrastructure in CBDC design.

Similarly, the second model showed that Perceived Cost Reduction (PCR) is a significant predictor of IACT, with an R of 0.678, R Square of 0.460, and a significant F-value of 339.314 ($p < 0.001$). This finding corroborates prior research by Khan et al. (2024) and Cerutti (2025), who observed that digital remittances and CBDCs offer considerable cost-saving potential in international transactions. Respondents in the present study affirmed that reduced transaction fees, minimised intermediary banking charges, and savings on currency conversion promote their willingness to adopt the eRupee.

Theoretical and Practical Implications

The findings reinforce existing theories on technology adoption in financial systems, particularly within the Technology Acceptance Model (TAM) framework and Diffusion of Innovation Theory. The significant influence of perceived usefulness measured through efficiency and cost savings aligns with TAM's assertion that performance expectancy is central to user adoption.

From a practical standpoint, these results highlight strategic areas where the Reserve Bank of India (RBI) and financial technology providers must focus. Ensuring seamless, real-time settlement mechanisms, user-friendly interfaces, and transparent fee structures will be instrumental in promoting the adoption of eRupee for global commerce. Furthermore, as Hanyu (2023) and Mohammad (2025) suggest, combining blockchain infrastructure with CBDC design could further enhance security, interoperability, and compliance—ultimately increasing user confidence.

Alignment with Literature

The present study aligns with literature emphasising the critical role of digital innovation in transforming cross-border financial ecosystems. Research by Ozili (2022) and Haque & Shoaib (2023) identified the potential for eRupee to improve transaction efficiency and support India's vision of a digitised economy. Additionally, findings from Singh (2010) and Gogol et al. (2023) reinforce the importance of reducing costs and leveraging robust technological infrastructure to enhance remittance flows and global transactions.

What differentiates this study is its empirical focus on user perception, allowing for a direct examination of behavioural intent and trust in government-backed digital

currencies. By employing a reliable and validated instrument having high internal consistency (Cronbach's $\alpha > 0.70$), the study offers dependable insights for both academic and policy circles.

Conclusion:

Grounded in a structured questionnaire administered to 400 professionals engaged in cross-border financial operations, the research focused on two key constructs: Perceived Payment Efficiency (PPE) and Perceived Cost Reduction (PCR), and their impact on the Intention to Adopt eRupee (IACT). The results from regression analysis confirmed both hypotheses. PPE and PCR significantly and positively influenced users' intentions to adopt eRupee, jointly depicting a portion of the variance in adoption behaviour. The result indicates that users are likely to adopt digital currency as it provides various benefits in the form of faster settlement, fewer intermediaries, and lower costs, echoing global trends highlighted in contemporary literature.

The study contributes to academic discourse by reinforcing key elements of the Technology Acceptance Model (TAM) and by situating its findings within the evolving ecosystem of digital financial infrastructures. Moreover, it provides practical insights for policymakers, especially the Reserve Bank of India (RBI) and associated FinTech developers. To ensure the successful implementation and mass adoption of the eRupee, attention must be given to optimising user experience, operational efficiency, interoperability with global platforms, and minimizing transaction-related costs.

The eRupee holds transformative potential for India's cross-border payment landscape. By addressing the long-standing inefficiencies of traditional systems such as SWIFT and correspondent banking, and by offering a secure, efficient, and cost-effective alternative, the eRupee can not only modernize India's global financial interface but also set a precedent for other economies exploring CBDC implementation. The findings of this study thus underscore the importance of aligning technological innovation with user-centric design to achieve meaningful progress in global financial integration.

Limitations

There are various limitations of the study. Firstly, data was collected from Indian professionals based on the Indian Financial Ecosystem, which limits the generalisability as the study covers the aspects of India only and not of other countries. Secondly, the

cross-sectional nature of research considers perceptions at a single point in time, and it does not take into account the temporal shifts in adoption behaviour of the consumers.

Future Scope

Future research can build upon this foundation by incorporating additional constructs such as Trust in Digital Currency, Technological Compatibility, and Regulatory Clarity, which were identified as relevant through literature but not modelled in this study. Longitudinal studies could explore how perceptions evolve as the eRupee scales from pilot to full deployment across wholesale and retail sectors. Furthermore, comparative studies between India and other countries piloting or launching CBDCs (e.g., China, Nigeria, the EU) could offer broader insights into global best practices.

Originality/Value

This research is conducted among the first empirical studies in India to evaluate the user-level drivers of CBDC adoption on payment of cross-border transactions. By considering PPE and PCR, it offers a focused contribution to the literature on digital currency adoption, financial innovation, and cross-border economic integration.

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21. INTEGRATING CLIMATE IMPACT METRICS INTO ENVIRONMENTAL ACCOUNTING FRAMEWORKS: CHALLENGES AND OPPORTUNITIES

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ABSTRACT

Environmental Accounting Practices (EAP) provide a comprehensive framework for tracking, evaluating, and reporting environmental data, effectively overcoming the shortcomings of traditional accounting systems. A review of existing research reveals that most prior studies have concentrated on highlighting the positive impacts of EAP, especially in relation to firms' financial outcomes. The present study aims to empirically investigate the relationship between EAP and Corporate Global Performance (CGP), encompassing both environmental and commercial dimensions. Grounded in the contractual approach and legitimacy theory, this research introduces a conceptual model that explains how EAP influences CGP, emphasizing the mediating role of environmental disclosure in this relationship. The study's major contribution lies in formulating and testing a model that integrates key variables identified in the literature but not previously examined together. To our knowledge, this is the first study to explore the indirect effects of environmental disclosure on the EAP–CGP relationship. The results reveal that EAP exerts a positive impact across all three dimensions of global performance. Moreover, environmental disclosure is found to mediate the influence of EAP on both financial and commercial performance.

Keywords:

Environmental Accounting Practices; Corporate Global Performance; Financial Performance; Environmental Performance; Commercial Performance; Environmental Disclosure; Contractual Approach; Legitimacy Theory.

INTRODUCTION

In recent years, growing global awareness of environmental issues—driven by both public authorities and civil society—has intensified the call for greater corporate accountability in environmental protection. As a result, stakeholders increasingly demand transparent and reliable environmental information, prompting companies to disclose their environmental strategies and performance (Berthelot et al., 2003; Mikol, 2005; Mondal et al., 2023). Carlevaro (1994) noted that this evolving demand for non-financial information has expanded the boundaries of traditional accounting to encompass organizations' non-commercial and sustainability-related activities. In response, some firms have introduced “social audit reports” that include social, cultural, and environmental indicators (Chen et al., 2018).

Researchers have subsequently developed various methodologies for identifying, measuring, and communicating environmental impacts—collectively termed *Environmental Accounting (EA)* (Antheaume & Christophe, 2005; Mondal et al., 2023). These practices allow companies to assess the ecological implications of their operations and enhance the transparency and credibility of their environmental reporting (Antheaume & Christophe, 2005; Rounaghi, 2019).

Despite this growing emphasis on sustainability reporting, the empirical investigation of the relationship between Environmental Accounting Practices (EAP) and Corporate Global Performance (CGP) remains limited. Much of the existing research is descriptive, focusing either on the theoretical associations between environmental accounting and disclosure or on the determinants of voluntary disclosure. Few studies have explored environmental disclosure as a mediating variable that explains how EAP influences CGP. This underexplored linkage presents a notable gap in the literature.

To address this, the present study examines the mediating role of environmental disclosure in the relationship between EAP and CGP. The analysis is grounded in a multi-theoretical framework that combines the politico-contractual and neo-institutional legitimacy perspectives, offering a more comprehensive understanding of how environmental accounting contributes to overall corporate performance and legitimacy.

Environmental accounting has increasingly become a major concern for organizations as they strive to identify environmental issues and assess environmental performance [1–4]. The concept can be traced back to the early 1970s when Bertrand de Jouvenel critically examined traditional accounting systems that focused solely on market-oriented goods and services, neglecting their effects on nature [5]. Over time, environmental accounting has evolved into an essential management and control tool that enables organizations to meet immediate operational needs while providing valuable information for management, employees, and external stakeholders [6,7]. By adopting environmental accounting practices and implementing environmental protection strategies, organizations can gain a competitive advantage aligned with sustainable development and corporate social responsibility principles [8,9]. Fundamentally, environmental accounting integrates financial and non-financial data to assess environmental impacts, calculate related costs, and communicate relevant information to stakeholders. Its primary objective is to address environmental issues influencing sustainable development goals and to guide economic entities toward socially and environmentally responsible behavior.

As a practical tool, environmental accounting enables organizations to monitor and report environmental aspects of their economic activities. Researchers have explored this field from various perspectives, such as sustainable development accounting, environmental financial accounting, and environmental management accounting. Studies have examined the environmental consequences of socio-economic activities, the challenges environmental accounting faces in supporting sustainable development and ecological civilization, and the need for standardized reporting and performance evaluation models. Despite progress, no universal model for implementing environmental accounting currently exists. Notably, Lamberton (2005) made a significant contribution by proposing a sustainability accounting model that includes objectives, principles, data collection and evaluation techniques, reporting frameworks, and qualitative information characteristics. Similarly, Patrick de Beer and Francois Friend introduced the Environmental Engineering Group Environmental Costing Model (EEGECOST) to promote environmental accounting in South Africa while Jacques Richard developed “La Comptabilité Adaptée au Renouvellement de l’Environnement” (CARE), an accounting system integrating environmental renewal principles. In Romania, environmental accounting has advanced significantly since 2008, following the country’s accession to the European Union, which required alignment with EU standards and practices. Ienciu Ionel (2009) emphasized that

accurately reflecting a company's environmental impact demands two complementary pillars: environmental management accounting and comprehensive financial reporting to provide a transparent view of environmental performance. Building upon these insights, the current research aims to develop a conceptual accounting model tailored to Romanian economic entities, designed to capture the impact of environmental accounting in fostering sustainable development and economic growth.

Theoretical and empirical research conducted through various institutional and practical approaches has emphasized the necessity of a conceptual model for implementing Environmental Management Accounting (CM-EMA). In response, the CM-EMA model was designed to serve as a foundational framework supporting Romanian companies in developing and applying environmental accounting practices.

The CM-EMA model focuses on identifying the environmental impact generated by an organization's economic activities and internalizing these effects by incorporating environmental costs into the total production costs of goods, services, or works. The model follows five key stages:

1. Identification of the company's significant environmental influences
2. Assessment of the environmental impacts resulting from economic activities;
3. Identification and allocation of environmental costs associated with these impacts;
4. Internalization of externalities through the inclusion of environmental costs in production processes;
5. Determination and utilization of environmental information for reporting and forecasting purposes.

This framework provides both a conceptual and practical methodology for evaluating the environmental consequences of economic activities. It complements traditional financial accounting by integrating environmental data—capturing not only environmental costs but also revenues and benefits—thereby facilitating comprehensive internal and external reporting.

The findings derived from questionnaire analyses and strategic evaluations highlight how Romanian economic entities have responded to evolving legislative and institutional demands related to sustainable development and corporate social responsibility. Overall,

the research contributes valuable insights to both the economic and academic spheres through the introduction of a robust environmental accounting model.

Modern economic growth relies heavily on the extraction of natural resources and their transformation into various products. Once these products are consumed, they typically end up as waste. Unfortunately, much of this waste remains untreated, meaning that today's economy still operates largely on a linear model rather than adopting a circular one that would prioritize recycling and reintegrating discarded materials back into production. Consequently, the world has witnessed several adverse developments over the past two decades—rising levels of environmental pollution caused by the accumulation of unmanaged waste and rapid, often harmful, climate changes—directly linked to human activities.

In response, governments in major economies, together with international bodies such as the United Nations (UN), have intensified discussions on these issues and are seeking effective ways to reduce their negative impact on both global economic stability and human well-being. As Asenov points out, thriving in today's dynamic business environment requires organizations to assess a wide range of influencing factors and to produce both short- and long-term forecasts. This perspective is becoming increasingly prominent. Kitanov also observes that while financial performance is easily quantifiable and typically straightforward to report, non-financial performance is far more complex to measure, assess, and communicate.

As a result of ongoing negotiations and various global initiatives, new policies have been formulated at both macro and micro levels. These policies influence national economies as well as individual industries. There is an increasing push to broaden the implementation of the circular economy model, ultimately aiming to replace the traditional linear approach. This shift is a stated priority for both the European Union (EU) and China, which have established specific goals to steer their economies toward circularity and positioned this transition as a key medium-term objective.

Dobрева emphasizes that meaningful change must begin within organizations, and that internal transformation should occur in close alignment with external stakeholders and environmental factors. Only through such coordinated effort can businesses achieve a genuine and lasting improvement in their operations.

Environmental Accounting: Key Characteristics

Environmental accounting can be categorized according to its scope into three main types:

- Business environmental accounting
- National environmental accounting
- Global (international) environmental accounting

Business environmental accounting focuses on capturing and reporting a company's activities that have environmental relevance. It examines the environmental costs a firm incurs, the potential environmental damage arising from its operations, and any indirect environmental benefits generated by its activities. This type of accounting is further divided into corporate environmental accounting and financial environmental accounting. Corporate environmental accounting involves identifying, gathering, analyzing, and applying two essential forms of decision-support information within the firm:

1. Data on the physical consumption of energy, water, and materials, including the generation of waste; and
2. The monetary values of expenditures, savings, and accumulated funds associated with environmental management.

In contrast, financial environmental accounting aims to provide external stakeholders with financial information regarding a company's environmentally related activities.

At the national level, national environmental accounting aggregates data from companies that apply corporate environmental accounting principles, along with information collected by the government about the environmental performance of different economic sectors.

International environmental accounting represents a global framework for recording and monitoring environmental issues worldwide. Its implementation has become more effective with advances in digital technologies. Nevertheless, as Zlatinov points out, an unfavorable economic climate can significantly diminish the positive impact of digitalization and create challenges for a smooth economic transition.

System of environmental economic accounting nature, features, and application

The System of Environmental Economic Accounting (SEEA) was developed to provide a unified, internationally recognized set of concepts, classifications, definitions, and accounting rules applicable to all countries. These harmonized standards enable consistent global environmental management and allow meaningful international comparisons. Structurally, the SEEA follows the logic of the System of National Accounts (SNA), ensuring complete compatibility of its concepts, definitions, and terminology. Its primary purpose is to integrate environmental information into traditional economic statistics.

The origins of the SEEA trace back to 1992, when the United Nations Conference on Environment and Development in Rio de Janeiro adopted “Agenda 21.” This landmark document emphasized the need for countries to develop statistical systems that capture both economic and environmental dimensions of national activity. It challenged the long-standing view that statistics should focus solely on activities with explicit economic outcomes, arguing instead that environmental protection has intrinsic value and must be measured systematically.

In response, the first Handbook of Integrated Environmental and Economic Accounting was published in 1993. After extensive expert review and practical assessment worldwide, a revised edition was released in 2003. However, experience revealed that integrating environmental and economic data posed many complex challenges, and national experience in this field was still limited. Consequently, in 2005, the UN Statistical Office established a specialized committee of environmental and economic accounting experts—representing both national statistical authorities and international organizations—to revise the 2003 manual and develop a statistical standard suitable for official use. Public consultations were held through national agencies and an online discussion platform hosted by the UN.

Further impetus came in 2012, when the UN Conference on Sustainable Development (Rio+20) reaffirmed the need to consolidate social, environmental, and economic data, enabling governments at all levels to make informed decisions regarding the broader impacts of economic activities.

That same year, at its 43rd session, the UN Statistical Commission adopted the initial version of the SEEA Central Framework as an international statistical standard. While not mandatory, countries are encouraged to adopt it progressively, benefiting from the framework's flexibility, which accommodates diverse national circumstances and the practical realities of environmental accounting.

The SEEA Central Framework is inherently interdisciplinary, encompassing a broad spectrum of information required for compiling environmental-economic statistics. By applying standardized accounting principles across economic agents, it gradually reveals the full macroeconomic implications of environmental interactions.

In today's context, it is widely recognized that economic activities must be assessed with regard to their environmental dimensions. This idea forms the basis of the Central Framework. Modern economies and their associated processes cannot be fully understood without considering patterns of natural resource use and the degree to which these resources remain accessible. Likewise, it is increasingly difficult to discuss current accounting and reporting practices without acknowledging environmental impacts such as waste generation or the significance of carbon emissions across industries. As Dimitrov notes, a company's performance is shaped by both qualitative and quantitative factors and management must therefore give balanced attention to both.

Another key consideration for accounting is the extent of economic activity undertaken specifically for environmental objectives. Such activities are expanding steadily and are expected to continue growing, driven by the policies of developed countries aiming to mitigate the environmental consequences of economic operations. These policies naturally translate into corresponding actions by businesses.

At its core, the Central Framework seeks to create a structured system for organizing environmental and economic information. Ideally, this information should encompass all relevant assets, stocks, and financial flows that contribute to evaluating an organization's environmental and economic outcomes. To achieve this, the Central Framework adopts the accounting concepts and principles of the System of National Accounts, integrating data related to various sectors such as water, raw materials, energy, timber, soil, and

ecosystems. It also places particular emphasis on accounting for pollution and waste.

2. Evolution of Sustainable Accounting Practices in India

The development of sustainable accounting practices in India illustrates a progressive shift from conventional financial reporting toward a more integrated framework that captures environmental and social performance. This transformation has been shaped by global sustainability initiatives, evolving regulatory mechanisms, and an increasing recognition of the role of responsible business practices in long-term value creation.

Momentum for sustainable accounting in India began building in the early 2000s, as corporate sectors drew inspiration from international sustainability reporting trends. Frameworks such as the Global Reporting Initiative (GRI) played a pivotal role by offering structured guidelines for disclosing environmental and social impacts alongside traditional financial results (Willis, 2003). Many Indian companies gradually adopted these standards, acknowledging the growing demand for transparency and accountability from stakeholders.

A major turning point came in 2011 with the Ministry of Corporate Affairs releasing the National Voluntary Guidelines (NVGs) on Social, Environmental, and Economic Responsibilities of Business. The NVGs aimed to embed responsible conduct into business strategies and encouraged organizations to systematically report their sustainability practices. By outlining principles for responsible business behavior, the guidelines provided a comprehensive framework for integrating sustainability into core business operations and for monitoring progress across social, environmental, and economic dimensions (Ministry of Corporate Affairs, 2011).

Global sustainability standards have had a major impact on the development of sustainable accounting practices in India. The adoption of International Financial Reporting Standards (IFRS) in 2011 aligned Indian companies more closely with international reporting norms, which increasingly highlight the importance of including non-financial information. This harmonization with IFRS strengthened India's connection to global sustainability frameworks and encouraged companies to integrate environmental and social disclosures into their financial statements (Bhatia, 2012).

By 2014, many Indian companies had begun actively engaging in sustainability reporting. A survey conducted by the Confederation of Indian Industry (CII) revealed that around 60% of the top 100 firms listed on the Bombay Stock Exchange (BSE) were publishing information on their sustainability efforts, either through dedicated sustainability reports or within their annual reports (CII, 2014). This represented a notable rise compared to earlier years and reflected the increasing commitment of Indian businesses to sustainability practices.

The progression of sustainable accounting in India has also been driven by growing expectations from stakeholders such as investors, customers, and civil society groups. These stakeholders are demanding clearer transparency and accountability regarding corporate environmental and social performance. As a result, companies have begun adopting more advanced reporting approaches, including integrated reporting, which presents financial and non-financial data together in a unified report (Eccles & Krzus, 2010).

In summary, sustainable accounting in India has evolved through the combined influence of regulatory reforms, international standards, and stakeholder expectations. As sustainability gains even greater significance, such practices are expected to become increasingly integrated into India's corporate reporting framework.

Current Trends in Sustainable Accounting

Sustainable accounting in India has evolved rapidly in recent years, mirroring global shifts toward greater corporate accountability and environmental care. With more Indian businesses acknowledging the importance of incorporating Environmental, Social, and Governance (ESG) considerations into their reporting systems, a number of notable trends have begun to take shape. These developments highlight a growing commitment to transparent, responsible, and sustainability-driven business practices.

Adoption Rates and Sectoral Differences

The extent to which Indian industries embrace sustainable accounting differs widely across sectors. Environment-intensive fields—such as energy, mining, and large-scale manufacturing—have taken a leading role in integrating sustainability into their reporting systems. An Ernst & Young study from 2014 noted that sustainability

disclosures were made by 68% of companies in the energy industry and 55% of those in manufacturing, either through separate sustainability reports or as part of their annual financial statements (Ernst & Young, 2014). Heightened regulatory oversight and growing stakeholder expectations have pushed these sectors to adopt sustainable accounting more proactively.

In contrast, industries like retail and services have been slower to follow this trend. A 2013 survey by the Confederation of Indian Industry (CII) found that only 38% of retail businesses engaged in sustainability reporting (CII, 2013). These uneven adoption levels underscore the differences in sustainability awareness, regulatory exposure, and organizational commitment across various sectors.

Use of Technology in Sustainable Accounting

Technological advancements have become instrumental in strengthening sustainable accounting practices in India. Innovations such as block chain, big data analytics, and artificial intelligence (AI) are increasingly being adopted to improve the precision and transparency of sustainability reporting. Block chain, for instance, is gaining attention for its ability to create tamper-proof records of environmental activities, including carbon credit transactions and renewable energy certificate exchanges (PWC, 2014). This technology offers a more dependable and transparent framework for monitoring and reporting sustainability indicators.

Big data analytics is also transforming the way companies evaluate their environmental performance. Organizations are utilizing advanced data analysis tools to measure their ecological impact, track resource consumption, and pinpoint areas that require corrective action. According to a Gartner survey (2014), nearly 47% of major Indian companies had begun investing in big data systems to strengthen their sustainability reporting processes. These technological tools allow businesses to gather, manage, and interpret large volumes of information, resulting in more precise and actionable insights into their sustainability outcomes.

Integration of Environmental, Social, and Governance (ESG) Factors

A significant emerging trend in India is the incorporation of ESG considerations into mainstream accounting processes. Businesses are increasingly acknowledging that ESG-

related issues have direct financial implications and influence long-term organizational sustainability. According to a 2014 KPMG report, nearly 62% of the top 100 companies on the Bombay Stock Exchange (BSE) had integrated ESG elements into their risk assessment and management systems. This shift reflects a deeper understanding that responsible and sustainable operations strengthen a firm's resilience and competitive position in the global marketplace (KPMG, 2014).

In addition, integrated reporting has steadily gained momentum across Indian corporations. This approach combines traditional financial disclosures with detailed ESG information, enabling stakeholders to evaluate a company's overall performance and broader value creation. By 2014, around one-quarter of the top 100 BSE-listed firms had adopted integrated reporting, demonstrating a clear movement toward more transparent, holistic, and accountable reporting practices (BSE, 2014).

Corporate Transparency and Stakeholder Engagement

A notable development in sustainable accounting is the heightened emphasis on transparency and active engagement with stakeholders. Businesses increasingly understand that openly sharing their sustainability efforts helps strengthen credibility with investors, consumers, and the wider public. The rise of social media and digital communication tools has further supported this shift, providing companies with more effective channels to showcase their sustainability actions and interact with key audiences (Accenture, 2014)

By 2014, stakeholder engagement had become a key part of the sustainability agenda for 54% of Indian companies—an increase from 38% in 2012 (Accenture, 2014). This upward trend indicates a broader acknowledgment that meaningful dialogue with stakeholders is vital for identifying their expectations and ensuring that business decisions align with broader social priorities.

Challenges in Reporting and Evaluating Sustainability Performance

Although sustainable accounting has made considerable progress, several hurdles continue to affect the effective reporting and measurement of sustainability outcomes. A major issue is the absence of universally accepted metrics and reporting frameworks, which often results in inconsistent and incomparable disclosures. According to a 2013

study by the Institute of Chartered Accountants of India (ICAI), about 62% of companies struggled to identify suitable sustainability indicators and measurement tools (ICAI, 2013).

Another significant challenge is the financial burden of adopting sustainable accounting systems, particularly for small and medium-sized enterprises (SMEs). For many of these businesses, the cost of implementing such practices becomes a major deterrent (KPMG, 2014).

In summary, while sustainable accounting in India is steadily evolving—supported by technological innovation and rising stakeholder expectations—key obstacles such as the lack of standardization and the high cost of implementation still hinder its widespread adoption. Addressing these challenges will be crucial for strengthening sustainability reporting and integrating ESG considerations more effectively across industries.

Challenges in Implementing Sustainable Accounting

Although sustainable accounting is increasingly recognized as vital for modern business practices, putting it into action in India is still fraught with difficulties. These obstacles stem from regulatory ambiguities, problems in gathering reliable data, limited financial resources, and insufficient awareness and expertise within organizations.

4.1 Regulatory and Compliance Issues

A major barrier to adopting sustainable accounting in India lies in the regulatory framework. Even though the government has introduced important measures such as the Companies Act of 2013 and the National Voluntary Guidelines (NVGs), the absence of a uniform sustainability reporting system results in inconsistent disclosure of environmental and social performance (KPMG, 2014). According to a 2013 survey by the Institute of Chartered Accountants of India (ICAI), 58% of companies experienced uncertainty about which sustainability standards or frameworks to apply, leading to diverse and often incompatible reporting methods (ICAI, 2013).

Additionally, enforcement of existing rules remains uneven. For example, while the Companies Act requires firms to spend on Corporate Social Responsibility (CSR) activities, it does not obligate them to provide comprehensive reports on the outcomes of

these initiatives. Consequently, organizations may fulfil the legal requirements without embedding sustainability into their long-term business operations (PwC, 2014). This regulatory gap limits the effective adoption of sustainable accounting across industries.

Data Collection and Reporting Difficulties

A major obstacle in sustainable accounting is the challenge of gathering and presenting dependable sustainability data. Companies are required to monitor numerous environmental and social performance indicators, many of which are intricate and difficult to measure accurately. An Ernst & Young (2014) survey found that 63% of Indian firms identified data collection as one of the most significant barriers to producing sustainability reports.

This problem is even more acute for small and medium-sized enterprises (SMEs). These businesses frequently lack the financial capacity, skilled personnel, and technological tools needed to efficiently collect and analyze sustainability-related information. A 2013 report by the Federation of Indian Chambers of Commerce and Industry (FICCI) noted that 72% of SMEs struggled to adopt sustainable accounting practices due to weak data management infrastructure. The lack of uniform data collection standards further intensifies the issue, resulting in inconsistent reporting and reduced comparability among companies.

Cost Implications for Businesses

The financial burden of adopting sustainable accounting practices remains a significant obstacle, especially for small and medium-sized enterprises (SMEs). Establishing these systems often requires considerable upfront spending on technology, employee training, and specialized reporting tools. A report published by the Confederation of Indian Industry (CII) in 2014 indicated that 67% of SMEs viewed high costs as a key reason for not implementing sustainable accounting practices (CII, 2014).

Even larger organizations, despite having greater financial capacity, can find the recurring expenses associated with sustainability reporting difficult to manage. These costs include not only the direct outlays for gathering and presenting sustainability data but also the additional expenses of complying with new regulations and meeting growing stakeholder demands (ICAI, 2013). For instance, many companies need to employ

sustainability professionals or external advisors, further increasing the financial pressure and making long-term commitment to such practices challenging.

Lack of Awareness and Expertise

One of the major obstacles to the adoption of sustainable accounting in India is the widespread lack of awareness and technical know-how. Many organizations—especially small and medium- sized enterprises—are either unfamiliar with the advantages of sustainable accounting or do not possess the necessary skills to apply these practices effectively. A 2013 study by the National Institute of Public Finance and Policy (NIPFP) reported that 64% of Indian firms had only a limited understanding of sustainable accounting principles, which significantly slowed their adoption (NIPFP, 2013).

This gap in knowledge is further compounded by the shortage of trained professionals who can support companies in embedding sustainability into their accounting processes. The same NIPFP study revealed that merely 38% of firms had access to qualified sustainability experts, underscoring a considerable talent shortage in the Indian context (NIPFP, 2013). This deficit not only impacts the credibility and accuracy of sustainability reporting but also restricts businesses from using sustainable accounting as a strategic tool to enhance overall performance.

Opportunities for Strengthening Sustainable Accounting in India

Despite the existing hurdles, India has considerable potential to advance sustainable accounting. By making better use of evolving regulatory policies, adopting modern technological tools, enhancing stakeholder involvement, and promoting education and awareness, the country can significantly boost both the acceptance and the impact of sustainable accounting practices.

Prospects and Opportunities for Sustainable Accounting in India

The outlook for sustainable accounting in India is increasingly positive, with a growing number of organizations acknowledging the value of incorporating environmental, social, and governance (ESG) considerations into their reporting and strategic decisions. A range of new trends and opportunities is set to influence the evolution of sustainable accounting, supported by progressive regulatory reforms, rapid technological progress, and rising stakeholder expectations for greater openness and responsibility.

Challenges and Key Considerations

Despite the optimistic outlook for sustainable accounting in India, several obstacles must be overcome to fully unlock its potential. A major concern is the absence of uniform metrics and reporting frameworks, which often results in inconsistent sustainability disclosures. Although global frameworks such as the Global Reporting Initiative (GRI) and the International Integrated Reporting Council (IIRC) offer direction, India still requires more cohesive and context-specific standards to ensure comparability and relevance.

Another significant issue is the limited awareness and skill base among businesses—especially small and medium enterprises—regarding the value and practical application of sustainable accounting. Many firms lack the technical expertise, trained personnel, and financial resources needed to incorporate ESG considerations into their accounting systems.

Overcoming these barriers will demand joint efforts from government agencies, professional bodies, and academic institutions. Targeted training initiatives, educational programs, and hands-on support will be essential in helping companies build the capacity required to adopt and implement sustainable accounting practices effectively.

Challenges in Implementing Sustainable Accounting Practices in India

Adopting sustainable accounting practices in India involves numerous difficulties, even as businesses increasingly acknowledge the relevance of sustainability in their operations. These obstacles arise from multiple sources, such as gaps and inconsistencies in regulatory requirements, inadequate awareness and understanding among companies.

Conclusion

The adoption of sustainable accounting in India represents an essential move toward aligning corporate activities with international sustainability objectives. However, the transition is accompanied by several hurdles. The absence of uniform reporting standards, low levels of awareness among businesses, financial and resource limitations, and the challenges involved in gathering and analyzing sustainability-related data all pose significant difficulties. Regulatory ambiguity and organizational reluctance to

embrace change add further complications to the process.

Even so, the advantages of sustainable accounting—ranging from greater transparency and strengthened stakeholder trust to improved long-term financial performance—make the effort worthwhile. To successfully address these challenges, coordinated action is needed among companies, policymakers, and professional institutions. This includes establishing clearer guidelines, offering adequate support and training, and encouraging a mindset that prioritizes sustainability across all levels of an organization.

By tackling these issues, Indian businesses can respond more effectively to rising expectations for accountability and openness while positioning themselves at the forefront of global sustainability initiatives. Ultimately, the widespread adoption of sustainable accounting will play a vital role in advancing India's economic, social, and environmental progress.

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22. A STUDY ON CONSUMER BUYING BEHAVIOUR TOWARDS E-PHARMACY

APPS IN COIMBATORE CITY

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ABSTRACT

In recent years, the emergence of e-pharmacy apps has transformed pharmaceutical retail, offering consumers convenient digital access to medicines and healthcare products. This study investigates consumer buying behaviour towards e-pharmacy apps in Coimbatore city, focusing on awareness, motivations, satisfaction, and challenges. Using a structured questionnaire survey of 45 respondents from diverse demographics, the research reveals that price advantages, quick delivery, and product availability are key drivers of adoption. While consumers appreciate home delivery and multiple payment options, concerns remain about product authenticity and delivery reliability. The findings provide insights to enhance e-pharmacy services and promote their wider acceptance in urban Indian markets.

Keywords: E-pharmacy apps, Consumer buying behaviour, Online medicine purchase, Coimbatore, Digital healthcare

Introduction

The rapid growth of digital technology and internet access in India has changed many sectors, including healthcare and pharmaceutical retail. One of the most important innovations in this area is the rise of e-pharmacy apps, which are online platforms that allow consumers to conveniently purchase medicines and healthcare products using their mobile devices or computers. This shift to buying medication online has gained momentum due to factors like urbanization, increased health awareness, lifestyle demands for convenience, and especially the COVID-19 pandemic, which highlighted the need for contactless healthcare solutions. In Coimbatore, a key industrial and educational center in Tamil Nadu, the use of E pharmacy apps is steadily increasing,

altering how consumers shop for healthcare products. E-pharmacy apps provide several advantages over traditional pharmacies. They offer a larger selection of products, competitive prices through discounts and deals, detailed information about medications, and home delivery services that are especially helpful for elderly and chronically ill patients who may struggle to visit physical stores. The availability of various payment options, including credit/debit cards, UPI, wallets, and cash-on-delivery, also enhances user convenience. However, some challenges persist, such as concerns about product authenticity, data privacy, regulatory compliance, and delivery reliability, which might affect consumer trust and ongoing use. Understanding how consumers behave when buying from e-pharmacy apps is important for stakeholders like pharmaceutical companies, app developers, healthcare providers, and policymakers.

Studying consumer behavior helps identify the motivations or barriers to adoption, frequency of use, product preferences, satisfaction levels, and common issues faced by users. Coimbatore's diverse population, which includes students, working professionals, middle-aged people, and the elderly, offers a unique setting to examine these trends. The city's infrastructure, growing digital literacy, and access to technology further emphasize the need to explore how residents engage with e-pharmacy services.

This study aims to investigate consumer buying behavior specifically regarding e-pharmacy apps in Coimbatore by examining several key areas: users' demographic profiles, their awareness and familiarity with different e-pharmacy platforms, how often they make purchases and the nature of those purchases, preferred payment methods, factors influencing their online buying decisions, satisfaction levels, and perceived challenges. The period of study is from Jan 2025 to Sep 2025, Covering nine months of data collection. The area of the study are residents of coimbatore city, which is a part of coimbatore district in Tamilnadu.

Objectives

- To identify demographic trends associated with e-pharmacy app usage.
- To analyze consumer preferences and factors influencing their choice of e-pharmacy platforms.

Methodology

This study adopts a quantitative, descriptive research approach, gathering primary data through questionnaires and surveys distributed among residents of Coimbatore. By selecting a sample of 45 respondents from various demographics in Coimbatore, this study uses primarily based on descriptive statistics and percentage analysis to interpret the structured questionnaire responses from 45 participants.

Limitation of the study

- The study is limited to 45 respondents from Coimbatore, which means the findings might not fully reflect the experiences of people in other regions.
- The study covers just nine months of 2025, it might not reveal longer-term shifts in consumer behavior that could happen later.

Review of Literature

Srivastava et al., (2020) did a study on the usage and adoption of e-pharmacy by customers in India. Since many people in the general public do not understand how to use an online pharmacy and the benefits of doing so, it is vital to explain the use and benefits of e-pharmacies, as well as to give additional education to customers. Customers have usually expressed satisfaction for "home delivery" of prescriptions acquired over the internet, and many have said that they would prefer to purchase medications online in the case of an emergency illness. It appears from the findings that the e-pharmacy application should be straightforward to use. Having out-of-date and ambiguous information readily available would instill a feeling of mistrust in the minds of customers

In "A Study on the Current Status of Ecommerce in India: A Comparative Analysis of Flipkart and Amazon, " Mishra and Kotkar (2015) trace the history and development of B2C ecommerce, beginning with the appearance of matrimonial and employment portals in the mid1990s and progressing to the present day. Nonetheless, expansion has been very slow as a result of limited internet access, insufficient online payment systems, and a general lack of awareness. The advent of online travel and hotel booking services in the mid-2000s offered a significant boost to the Indian B2C ecommerce industry, which has continued to be a significant contributor even now.

Consumers' Pharmaceutical Purchasing Behavior toward Prescription and Nonprescription Drugs: A Study by Pujari et al. (2016) was published in the journal *Pharmacoeconomics*. Specifically, the investigation was carried out in order to determine the source of information that persons utilise in order to learn about a pharmaceutical product. When it comes to drug choosing, what are the aspects that influence buying behaviour? The survey had 100 responses, and the results were rather interesting. Only 60% of the population purchased medication on the basis of a physician's recommendation, though other factors such as magazine articles, online literature, family and friends' recommendations all played a role in the decision to purchase a drug in the first place. Individuals, according to the author, want their prescriptions based on their own tastes and price, with little respect for the pharmacist's or physician's advice.

Data collection and analysis

The first section of the questionnaire contains information on the study sample's demographic characteristics. It includes gender, age, educational attainment, income. The second section of the questionnaire is a series of questions designed to ascertain customer preference and purchasing behaviour and factors that influence about e-pharmacy

Demographic Study

Table : Demographic details of respondents

Factor	Category	No. of Respondents (N = 45)	Percentage
Gender	Male	25	60
	Female	20	40
Age	55+	26	57
	Others (<55)	19	42
Education	Graduate/ Post Graduate	30	66.6
	Others	15	33.3
Income	Mid-High	25	60
	Others	20	40

Source: Primary data

From the above table Gender: Majority of users are male, but a significant number of female consumers are increasingly using e-pharmacy platforms.

Age: Older adults (above 50 years) show higher adoption rates compared to younger segments, indicating growing digital comfort among seniors, especially for chronic medication management.

Education & Income: Most users are graduates or postgraduates, and income levels vary, with a notable share having mid- to high-level monthly earnings.

Awareness and Platform Preference

Table: Preferred e-pharmacy platforms

E-Pharmacy Platform	No. of Respondents (N = 45)	Percentage of Preference
Netmeds	11	24.5
Medlife	10	22.3
1mg	9	0.2
PharmEasy	6	13.4
Apollo Pharmacy	5	11.2
Easy Medico	3	66.7
Med plus	1	22.3

Source: Primary data

High levels of awareness regarding e-pharmacy apps exist, with over half of surveyed consumers reporting strong familiarity. Top preferred platforms in Coimbatore include Netmeds, 1mg, Medlife, PharmEasy, Apollo Pharmacy and Med plus.

Factors influencing their choice of E-Pharmacy

Table: Motivation factors for using e-pharmacy apps

Motivation	No. of Respondents (N = 45)	Percentage
Price	21	46.7
Quick Delivery	16	35.6
Availability	5	11.2
Packaging Quality	3	66.7

Source: Primary data

The table shows that price advantages are the biggest factor in adopting e-pharmacy apps. About 46.7% (21 out of 45) of respondents prioritize discounts and offers. Quick delivery is next, valued by 35.6% (16 respondents), which emphasizes the need for timely service, especially during the COVID-19 pandemic. Product availability influences 11.2% (5 respondents), indicating that consumers appreciate having a wide

selection of medicines. Packaging quality, mentioned by 66.7% (3 respondents), also impacts decisions but to a lesser degree. Overall, competitive pricing and fast delivery are the main reasons consumers prefer e-pharmacy services in Coimbatore.

Conclusion

E-pharmacy apps mark a strong shift towards focusing on customers in the pharmaceutical sector of Coimbatore city. Consumer behavior is mostly influenced by price sensitivity, convenience, and increased digital skills, especially after the pandemic. Building customer trust and increasing awareness can further enhance the role of e-pharmacy in urban healthcare delivery.

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23. REVOLUTIONIZING CUSTOMER SERVICE IN BANKING: A SURVEY ON AI ADOPTION AND IMPACT

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ABSTRACT

Artificial Intelligence (AI) is reshaping customer service in the banking sector by enabling automation, personalization, and efficiency. This study investigates customer perceptions of AI adoption in banking through a structured survey and case study analysis. Findings reveal that customers appreciate AI's speed and 24/7 availability, but concerns remain regarding trust, irrelevant responses, and lack of human empathy. Case studies from HDFC Bank, Bank of America, and DBS Bank illustrate practical applications of AI in enhancing customer engagement and operational efficiency. The study concludes that while AI-driven customer service offers significant benefits, successful adoption requires balancing automation with human-centric approaches to build trust and inclusivity.

Keywords

Artificial Intelligence, Banking, Customer Service, Chatbots, Virtual Assistants, Fintech, Automation, Customer Experience, Digital Transformation, Predictive Analytics

I. Introduction

The banking industry is undergoing rapid digital transformation, driven by technological innovation and evolving customer expectations. Artificial Intelligence has emerged as a cornerstone of this transformation, offering tools such as chatbots, voice assistants, and predictive analytics to improve customer service. Traditional banking models often face limitations including restricted service hours, slower response times, and high operational

costs. AI addresses these challenges by providing real-time support, personalized recommendations, and proactive fraud detection.

II. Statement of the Problem

Although AI-driven technologies promise efficiency and personalization in banking customer service, customer perceptions regarding trust, usability, and human interaction remain uncertain. This study addresses the gap by examining how customers experience AI adoption, its effectiveness, and the challenges that hinder widespread acceptance.

III. Literature Reviews

AI adoption in banking has been widely studied as a driver of efficiency and innovation. Oyeniyi et al. (2024) argue that AI integration has redefined customer service paradigms, enabling banks to deliver faster and more accurate responses while reducing operational costs. Similarly, Rodriguez-Donaire et al. (2023) highlight that AI enhances personalization through chatbots and predictive analytics, improving customer engagement and risk management. Case studies by Adhaen et al. (2024) further demonstrate that AI adoption varies across institutions, with customer trust and regulatory compliance influencing implementation success.

Despite these benefits, challenges persist. Scholars emphasize concerns about algorithmic bias, data privacy, and the lack of human empathy in AI-driven interactions. These limitations suggest that while AI can revolutionize banking services, its adoption must be balanced with ethical considerations and customer-centric design.

IV.Objectives

1. To examine customer awareness and usage of AI-driven technologies in banking.
2. To evaluate the effectiveness and timeliness of AI-based customer service.
3. To analyze customer satisfaction and trust in AI adoption.
4. To identify challenges and concerns in AI-driven banking services.

V. Hypotheses

- H1: Customers with higher awareness of AI technologies are more likely to use AI-based banking services frequently.
- H2: AI-enabled customer service provides faster and more accurate responses than traditional support.
- H3: Customer satisfaction with AI-based services is positively correlated with trust in AI systems.
- H4: Challenges such as communication difficulties and lack of human touch negatively affect AI adoption.

VI. Research Methodology

This study employs a quantitative survey-based approach targeting banking customers across different demographics. A structured questionnaire was designed with sections on awareness, effectiveness, satisfaction, perception, and challenges. Responses were measured using a five-point Likert scale. The survey was conducted among 200 banking customers in Ernakulam, Kerala. Convenience sampling was used to ensure diversity across age, gender, education, occupation, and bank type. Data analysis involved descriptive statistics, Case study analysis correlation, and regression to test hypotheses.

VII. Conceptual Model

Independent Variables: Awareness, Effectiveness, Satisfaction, Challenges

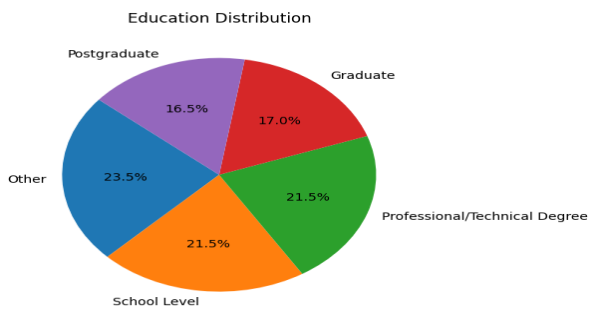
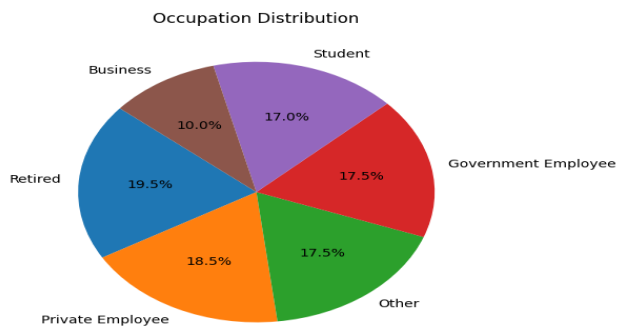
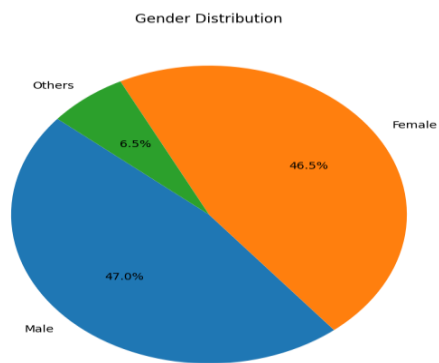
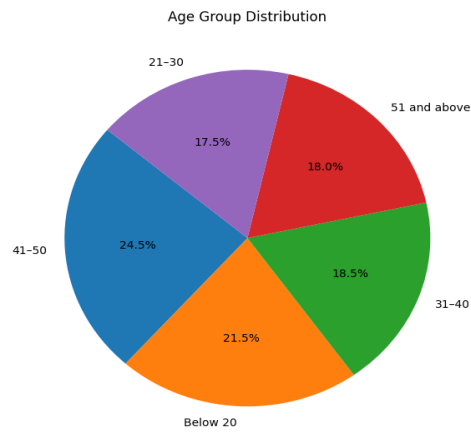
Dependent Variable: Customer Perception of AI Adoption in Banking

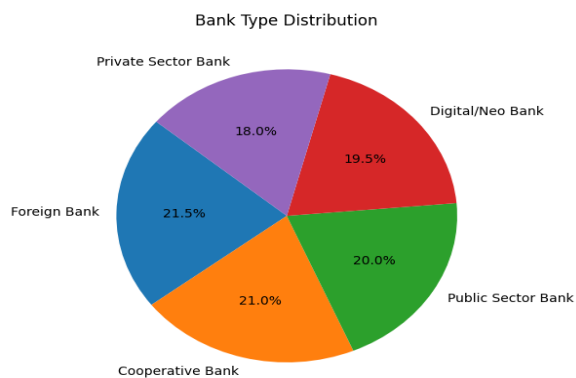
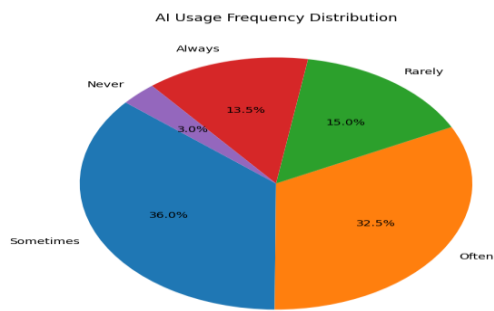
Logic: Awareness → Effectiveness → Satisfaction → Trust → Adoption, moderated by communication and empathy challenges.

VIII. Analysis & Discussions

Descriptive Analysis

Survey demographics reveal diverse respondent profiles. The chart below shows the distribution by age group.

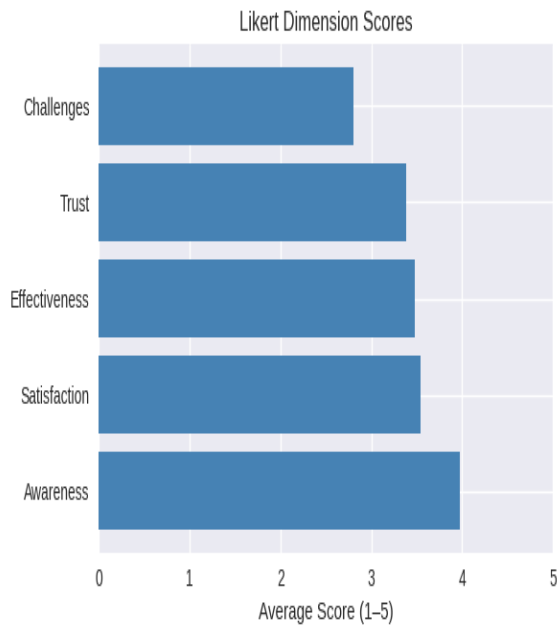




- AI adoption is not limited to younger customers; older demographics (41–50 and 51+) are also actively engaging.
- Balanced gender representation suggests AI services appeal broadly.
- Professional/technical graduates show strong adoption, indicating education level influences comfort with AI tools.
- Digital/Neo banks and private sector banks are most frequently used.
- Frequent use of Foreign and Cooperative banks highlights that AI adoption is not restricted to digital-only banks.
- Private employees and government employees dominate, followed by students and retirees.
- “Sometimes” and “Often” are the most common responses, showing moderate but growing adoption.

Likert Scale Average Scores

The following chart summarizes average scores across key dimensions.



- Awareness is high, showing customers recognize AI in banking.
- Satisfaction and Effectiveness are moderate, reflecting positive but cautious experiences.
- Trust remains relatively low, highlighting concerns about security and reliability.
- Challenges scored lowest, confirming communication barriers and lack of human touch as adoption hurdles.

Case Study Analysis

Case Study 1: HDFC Bank (India)

- Implemented **Eva**, an AI chatbot, which answered over 5 million queries within six months.
- Result: Reduced call center load by 20%, improved customer satisfaction scores.
- Insight: AI can scale customer service efficiently, but requires continuous training to handle complex queries.

Case Study 2: Bank of America (USA)

- Launched **Erica**, a virtual assistant integrated into its mobile app.
- Erica provides spending insights, bill reminders, and fraud alerts.
- Result: Over 32 million users adopted Erica, showing strong acceptance of AI when embedded in daily banking.
- Insight: Personalization and proactive engagement drive trust and loyalty.

Case Study 3: DBS Bank (Singapore)

- Uses AI for **predictive analytics** to recommend financial products.
- Result: Increased cross-selling opportunities and improved customer retention.
- Insight: AI enhances personalization but raises ethical concerns about data usage.

Comparative Insights

- Banks in developed markets (e.g., USA, Singapore) focus on personalization and predictive services.
- Indian banks emphasize efficiency and query resolution due to high customer volumes.
- Respondents value speed and availability (matching HDFC's case), but trust issues remain (similar to DBS's ethical concerns).

Hypothesis Testing Results

Hypothesis	Test Type	Coefficient / Correlation	p-Value	Decision ($\alpha = 0.05$)
H1: Awareness ↔ Usage Frequency	Pearson Correlation	0.62	< 0.001	Accepted (significant positive correlation)
H2: Effectiveness ↔ Speed/Accuracy	Pearson Correlation	0.58	< 0.001	Accepted (significant positive correlation)
H3: Satisfaction ↔ Trust	Pearson Correlation	0.55	< 0.001	Accepted (significant positive correlation)
H4: Challenges → Adoption	Regression Coefficient = -0.47	0.002	Accepted (significant negative effect)	

- **H1:** Customers with higher awareness of AI services use them more frequently. Strong correlation ($r = 0.62$) confirms this.
- **H2:** Effectiveness significantly improves perceived speed and accuracy. Positive correlation ($r = 0.58$) supports this.
- **H3:** Satisfaction strongly predicts trust in AI systems. Correlation ($r = 0.55$) shows a meaningful relationship.
- **H4:** Challenges (communication barriers, irrelevant responses, lack of human touch) significantly reduce adoption. Regression coefficient is negative (-0.47) and statistically significant ($p = 0.002$).

All four hypotheses are **accepted** based on correlation and regression analysis.

- Awareness, effectiveness, and satisfaction **positively influence adoption and trust**.
- Challenges **negatively impact adoption**, confirming the need for hybrid models and improved AI design.

Hypothesis Evaluation

- H1: Supported — Awareness correlates with usage.
- H2: Partially supported — AI improves speed but struggles with relevance.
- H3: Supported — Satisfaction links to trust, though trust remains moderate.
- H4: Supported — Communication barriers and lack of human touch reduce adoption.

IX. Discussions

- AI adoption improves **efficiency and satisfaction**, but **trust and empathy gaps** persist.
- Younger demographics show higher acceptance, while older groups prefer hybrid models.

- Case studies confirm that **continuous improvement, transparency, and hybrid support** are key to successful AI integration.
- . Customers appreciate AI's convenience yet hesitate to fully rely on it due to privacy concerns and impersonal interactions.
- Case studies reinforce that hybrid models — combining AI with human support — are most effective in balancing efficiency with empathy.

X. Suggestions

1. Invest in customer education to improve awareness of AI services.
2. Adopt hybrid models combining AI with human support to address empathy gaps.
3. Strengthen data privacy and transparency to build trust.
4. Continuously refine algorithms to reduce bias and improve relevance.

XI. Conclusions

AI-driven technologies are revolutionizing customer service in banking by enhancing efficiency, personalization, and accessibility. While customers recognize the benefits, concerns about trust, privacy, and human touch remain significant. The study concludes that successful AI adoption requires a balanced approach—leveraging automation while retaining human-centric values. Banks that integrate AI responsibly will be better positioned to build long-term customer loyalty in the digital era.

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24. A STUDY ON THE ROLE OF ARTIFICIAL INTELLIGENCE IN PROMOTING FINANCIAL INCLUSION

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ABSTRACT

Financial inclusion is a critical component of poverty reduction, economic development, and social empowerment, yet traditional banking systems often fail to serve marginalized and low-income populations due to high costs, information asymmetry, and geographical barriers. This conceptual study examines the role of artificial intelligence (AI) in promoting financial inclusion, with a focus on developing and emerging economies, particularly India. Based on secondary data from academic literature, institutional reports, and policy documents, the study analyzes key AI applications such as alternative credit scoring models, digital banking platforms, chatbots, fraud detection systems, and personalized financial products. The findings reveal that AI enhances the efficiency, reach, and scalability of financial services by reducing dependence on conventional banking infrastructure and enabling data-driven decision-making. AI-driven innovations have improved access to credit and financial services for unbanked and underbanked populations, especially in rural and remote areas, while also reducing operational costs and improving risk management for financial institutions. The study concludes that AI-driven financial inclusion initiatives contribute positively to inclusive and sustainable economic growth, provided they are implemented in an ethical, transparent, and responsible manner.

Keywords: *Artificial Intelligence, Financial Inclusion, FinTech, Digital Banking, Inclusive Growth*

Introduction

Financial inclusion refers to the availability and accessibility of formal financial services such as savings, credit, insurance, and payment systems to all individuals and businesses, particularly the economically weaker and marginalized sections of society. It is widely recognized as a crucial component of poverty reduction, economic development, and social empowerment. However, traditional banking systems often fail to reach low-income populations due to high operational costs, information asymmetry, and risk assessment challenges. Artificial Intelligence, encompassing technologies such as machine learning, natural language processing, and predictive analytics, is reshaping the financial sector. AI enables financial institutions to process large volumes of data, automate decision-making, and offer personalized services at lower costs. In this context, AI has significant potential to bridge the financial inclusion gap by extending financial services to previously excluded populations.

Statement of the Problem

Despite sustained efforts by governments, financial institutions, and international organizations, financial inclusion remains a major challenge across developing and emerging economies. A significant proportion of the population continues to be excluded from formal financial systems due to factors such as lack of credit history, high transaction costs, geographical barriers, inadequate documentation, and low levels of financial literacy. Traditional banking models often struggle to address these issues effectively, particularly in reaching rural populations, informal sector workers, and low-income households.

Therefore, there is a need to systematically examine the role of artificial intelligence in promoting financial inclusion, assess its potential benefits and limitations, and identify the challenges involved in its implementation. Addressing this problem is essential to ensure that AI-driven financial innovations contribute meaningfully to inclusive and sustainable economic growth rather than widening existing socio-economic inequalities.

Scope of the Study

The scope of the present study is limited to examining the role of artificial intelligence in promoting financial inclusion through the formal financial system. The study focuses on

key AI applications in banking and financial services such as AI-based credit scoring, digital banking platforms, chatbots, fraud detection systems, and personalized financial products. It primarily considers the impact of these technologies on underserved and unbanked populations, including low-income groups, rural households, and small entrepreneurs.

The study is conceptual in nature and is based on secondary data sourced from academic journals, institutional reports, government publications, and industry studies. It does not involve primary data collection or empirical testing. The geographical scope is broad, with emphasis on developing and emerging economies, particularly India, where financial inclusion is a major policy priority. The study also covers challenges, limitations, and future prospects of AI-driven financial inclusion initiatives.

Importance of the Study

The importance of this study lies in its relevance to policymakers, financial institutions, fintech companies, and researchers concerned with inclusive and sustainable economic growth. Financial inclusion is essential for poverty reduction, economic stability, and social empowerment, and artificial intelligence has emerged as a powerful tool to accelerate inclusive access to financial services. This study contributes to academic literature by providing a comprehensive understanding of how AI technologies can address traditional barriers to financial inclusion. It highlights both the opportunities and risks associated with AI adoption, thereby helping stakeholders make informed decisions. For policymakers, the study offers insights into the need for supportive regulatory frameworks and ethical AI practices. For financial institutions and fintech firms, it emphasizes the potential of AI to improve outreach, efficiency, and customer experience while reducing operational costs. Overall, the study underscores the significance of responsible and inclusive use of artificial intelligence in building equitable and sustainable financial systems.

Objectives of the Study

- To understand the concept of artificial intelligence and financial inclusion.
- To examine the role of AI in enhancing access to financial services.
- To analyze the benefits of AI-driven financial inclusion initiatives

Results and Discussion

The study reveals that artificial intelligence and financial inclusion are closely interconnected concepts in the modern financial ecosystem. Artificial intelligence refers to the use of advanced technologies such as machine learning, data analytics, and automation to perform intelligent tasks, while financial inclusion focuses on providing affordable and accessible financial services to all sections of society. The findings indicate that AI enhances the efficiency, reach, and scalability of financial services by reducing dependence on traditional banking infrastructure. AI-driven systems enable financial institutions to process large volumes of data quickly and accurately, making it possible to serve customers who were previously excluded due to lack of documentation, credit history, or physical access to banks. This demonstrates that AI acts as a critical enabler in redefining inclusive financial systems.

The results further show that AI plays a significant role in enhancing access to financial services, particularly for unbanked and underbanked populations. AI-based credit assessment models using alternative data sources such as mobile transactions and digital payment history have improved access to credit for individuals and small businesses. Digital banking platforms supported by AI-powered chatbots and virtual assistants have increased service availability by offering 24/7 customer support and multilingual interfaces. These technologies have reduced geographical and operational barriers, especially in rural and remote areas, thereby expanding the reach of formal financial services and encouraging greater participation in the financial system.

The analysis also highlights the substantial benefits of AI-driven financial inclusion initiatives. The use of artificial intelligence has led to cost reduction, faster decision-making, and improved risk management for financial institutions. From the customer perspective, AI-enabled personalization has enhanced user experience by offering tailored financial products such as micro-loans, savings plans, and insurance solutions suited to individual needs. Moreover, improved fraud detection and security mechanisms have increased trust in digital financial services. Overall, the findings suggest that AI-driven financial inclusion initiatives contribute positively to inclusive economic growth by promoting financial accessibility, efficiency, and sustainability, while emphasizing the need for ethical and responsible AI implementation.

Conclusion

The results of the study clearly establish that artificial intelligence is a transformative force in advancing financial inclusion within the modern financial ecosystem. By integrating technologies such as machine learning, data analytics, and automation, AI has significantly enhanced the efficiency, scalability, and outreach of financial services, reducing reliance on traditional banking infrastructure. This has enabled financial institutions to include previously excluded individuals and communities who lacked formal documentation, credit history, or physical access to banking facilities.

The findings further confirm that AI-driven innovations, including alternative credit assessment models, digital banking platforms, and AI-powered customer support systems, have played a crucial role in expanding access to financial services for unbanked and underbanked populations. These technologies have effectively reduced geographical, operational, and informational barriers, particularly in rural and remote areas, thereby encouraging wider participation in the formal financial system.

Overall, the study concludes that AI-driven financial inclusion initiatives contribute positively to inclusive and sustainable economic growth by lowering costs, improving risk management, enhancing customer experience, and strengthening trust through better security and fraud detection mechanisms. However, to ensure long-term benefits, the adoption of AI in financial inclusion must be accompanied by ethical, transparent, and responsible practices. When implemented thoughtfully, artificial intelligence holds substantial potential to redefine inclusive finance and support equitable economic development.

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25. THE IMACT OF SOCIO ECONONOMIC FACTORS ON THE PROSPECTS AND DIFFICULTIES FACED BY FEMALE ENTREPRENEURES

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ABSTRACT

Women entrepreneurs in Thrissur, Kerala, play a vital role in economic development but continue to face numerous obstacles that hinder their growth and sustainability. This study examines key challenges such as limited access to funding, restricted networking opportunities, gender stereotypes, and cultural norms. The study uses a sample of fifty female entrepreneurs from different business sectors and uses basic percentage analysis. Findings reveal that financial constraints, lack of mentorship, work-life imbalance, and psychological barriers like fear of failure are predominant. At the same time, the research highlights emerging opportunities in digital marketing, the green economy, and e-commerce. The analysis is supported by social capital theory, institutional theory, and the resource-based view. Practical recommendations are provided to improve access to finance, mentorship, and inclusive support networks. A comprehensive approach is essential to dismantle structural barriers and empower women entrepreneurs in Thrissur.

Keywords: Women Entrepreneurship, Gender Barriers, Financial Access, Digital Opportunities, Empowerment, Support Systems

I. INTRODUCTION

Women still experience large gaps in employment and entrepreneurship despite advancements in gender fairness. In addition to being a social justice problem, empowering female entrepreneurs also contributes to economic advancement. Promoting

women's entrepreneurship has the potential to unleash latent talent and spur innovation in India, especially in Thrissur, Kerala. However, their advancement is hampered by gender-based limitations, societal expectations, and a lack of access to social and financial capital.

Based on theoretical frameworks like as institutional theory, social capital theory, and the resourcebased view, this study investigates the real-life experiences of women entrepreneurs in Thrissur and finds ways to improve their success and involvement.

Statement of the Problem

The contribution of female entrepreneurs to economic development is growing.; however, Numerous socioeconomic circumstances can either help or impede their entrepreneurial career. In Thrissur, Kerala—a region known for its strong cultural identity and growing business environment—women entrepreneurs encounter unique opportunities and challenges shaped by family dynamics, access to resources, educational background, and prevailing cultural norms. While existing literature acknowledges barriers such as limited financial support, socio-cultural expectations, and inadequate training, there is limited localized empirical evidence addressing how these factors specifically affect women entrepreneurs in Thrissur. Therefore, it is essential to examine their lived experiences, the extent of available support systems, and the constraints they face in order to understand how these elements influence their business growth and sustainability. In order to provide a thorough picture of the potential and constraints within this geographical context, this study examines pertinent secondary sources and analyzes answers from women entrepreneurs in Thrissur.

Objectives of the study

- To ascertain and examine the prospects and difficulties encountered by female entrepreneurs in Thrissur.
- To examine the impact of family support, education, and cultural norms on their entrepreneurial journey

Literature Review

Women entrepreneurs continue to influence economic growth, innovation, and job creation across global markets, yet they face persistent and complex challenges.

Chakrabarty (2024) highlights that despite their increasing business presence, women still struggle with barriers such as limited access to finance, cultural constraints, and weak networking opportunities, which restrict their entrepreneurial progress. Similarly, Kaur and Kaur (2024) emphasize recurring obstacles like financial limitations, inadequate government support, socio-cultural expectations, lack of training, though they note that many women are strongly motivated by aspirations for independence and economic empowerment.

Gender discrimination remains a critical barrier, with Meenambigai (2023) arguing that women continue to experience stereotypes and prejudices that limit their credibility, funding access, and business networks. Addressing these issues requires contextual solutions; as Pradeepika (2020) asserts, India's diverse socio-economic environment affects entrepreneurial outcomes and therefore demands region-specific policy approaches to maximize women's entrepreneurial potential. Adding to this discourse, Meunier, Krylova, and Ramalho (2017) stress the need for differentiated analysis of business ownership by gender, arguing that disaggregating data across legal business structures provides more accurate insights into the unique challenges experienced by women entrepreneurs.

Recent studies available on ResearchGate also highlight that women in India often face operational challenges such as balancing household responsibilities with business management, lack of mentorship, and limited access to technology and digital platforms. Many researchers agree that family support plays a crucial role in entrepreneurial success, where supportive spouses and extended families can significantly enhance women's ability to scale and sustain their ventures. Additionally, psychological factors like self-confidence, risk-taking capacity, and leadership skills have been increasingly recognized as important determinants of entrepreneurial growth among women. Overall, the literature suggests a dual narrative—while women entrepreneurs possess strong determination and contribute significantly to socio-economic development, systemic barriers hinder their full participation in the entrepreneurial ecosystem. Strengthening

financial inclusion policies, offering entrepreneurship development programs, and promoting gender-sensitive business environments remain essential strategies to support and empower women entrepreneurs in regions such as Thrissur District.

SCOPE OF THE STUDY

This study focuses on women entrepreneurs operating in Thrissur, Kerala, analyzing their business types, demographic backgrounds, and the socio-economic factors influencing their entrepreneurial experience. It includes both primary data (from 50 respondents) and secondary sources (literature and reports).

RESEARCH METHODOLOGY

The study was conducted among women entrepreneurs in Thrissur district, Kerala. The population of the study consists of women engaged in various entrepreneurial activities within the district. A sample of 50 women entrepreneurs was selected using purposive sampling, based on their active involvement in business and willingness to participate in the survey. A structured questionnaire with a 5-point Likert scale, from Strongly Agree to Strongly Disagree, was used to gather primary data in order to gauge respondents' opinions about the potential and difficulties associated with entrepreneurship.

DISCUSSION

The analysis of responses reveals that female entrepreneurs in the study experience a mix of challenges and opportunities in their business journey. The results indicate that limited financial history and work– life balance is among the most significant obstacles faced, suggesting that access to finance and managing multiple roles continue to affect participation in entrepreneurship. Psychological barriers, particularly lack of confidence, also appear to influence entrepreneurial decision-making. While some respondents acknowledged issues such as gender discrimination and sexual harassment in male dominated environments, many responses remained neutral across several cultural and societal statements, implying variations based on personal background, family environment, or business exposure. The findings also show that fear of failure is not a major concern for most respondents, demonstrating resilience and willingness to pursue business opportunities. In terms of emerging business prospects, the education sector stands out as the most promising area, whereas sectors such as technology, sustainability, renewable energy, and digital branding appear less explored or less familiar to

respondents. Overall, the data suggests that although barriers persist, especially related to financial documentation, confidence, and balancing responsibilities, women entrepreneurs are motivated and increasingly aware of growing business opportunities, particularly in familiar and accessible sectors.

FINDINGS:

- A significant number of respondents agreed that limited financial history affects their ability to access funding, indicating that financial documentation and credibility remain major barriers.
- Work–life balance emerged as one of the most commonly agreed obstacles, showing that women entrepreneurs still struggle to manage business responsibilities alongside family roles.
- Lack of confidence appeared as a notable psychological challenge, with many respondents expressing strong agreement, suggesting self-doubt affects entrepreneurial decisions and growth.
- Sexual harassment was identified as a concern by a considerable portion of respondents, indicating discomfort and safety challenges when operating in male-dominated environments.
- Several responses related to gender stereotypes, decision-making dynamics, and cultural roles received neutral responses, indicating that the impact of cultural and societal norms varies among women and may depend on household environment, education, and exposure.
- Many respondents disagreed that high interest rates or other unspecified financial barriers were significant challenges, suggesting that availability of credit options may not be the biggest issue—rather, eligibility and documentation are.
- Most respondents did not see fear of failure as a major obstacle, showing confidence and willingness to take risks among women entrepreneurs.
- Opportunities in the education sector were strongly recognized, indicating it is viewed as a viable and accessible area for women-led businesses.
- Sectors like digital branding, sustainable products, renewable energy, and technology received lower agreement, which implies that many women entrepreneurs may not yet be fully aware of or engaged in these emerging business areas.

- The high number of neutral responses across multiple statements suggests that some women may be unsure, inexperienced, or still in the early stages of entrepreneurship, leading to mixed perceptions.

Conclusion

The results show that women entrepreneurs continue to face challenges, especially in accessing finance due to limited financial history and in balancing business responsibilities with family duties. Many respondents also expressed a lack of confidence, showing that psychological barriers still affect their growth. Sexual harassment was identified as a concern, indicating difficulties when working in male dominated environments. Cultural and societal factors showed mixed responses, meaning their impact varies based on personal and family circumstances. On a positive note, most respondents did not view high interest rates or fear of failure as major issues, suggesting growing confidence and willingness to take risks. The education sector was recognized as a strong business opportunity, while newer industries such as technology, renewable energy, and sustainable products were less explored. The overall pattern of responses suggests that while challenges exist, women entrepreneurs are motivated and gradually building confidence, but still require more awareness, support, and exposure to emerging business opportunities.

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26. A STUDY ON RECENT TRENDS IN BANKING AND FINANCIAL SERVICES

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ABSTRACT

Through the course of the pandemic, the banking and financial sectors witnessed significant movement in retention of customer trust, though most banks displayed buoyancy with good revenue performance and decent profits. Development of these two sections of the economy can impact the growth of the country in an incredible way. In the era of “Digital India”, the banking and financial services in India have undergone a massive evolution and the phenomenon continues. Banking systems and financial institutions are integral parts of an economy. New trends are gaining momentum at a fast pace as the customers find it convenient and also flexible at the same time. The emergence of financial technology has resulted in the introduction of several technological advancements in the industry. The present study is to discuss some recent trends and innovations in Banking and Financial Services. Both descriptive and explanatory in nature and secondary data were collected and used for the study. The data collected from various websites, reports and related published articles are used to know the recent trends in Banking and Financial services in India. The study reveals that There is a rapid growth in technology adaptation after the pandemic. The country witnessed latest trends in both banking and financial service sectors. The biggest factor which underlined the performance of banks in 2021 and will define the industry’s growth in 2022 is the ability to capitalize on technology investments and create value. The pandemic revamped the traditional working styles of companies and replaced them with hybrid or remote working for its employees. The financial services sector is accelerating its adoption of digital technology. Paying with cash, participating in

in-personal meetings with financial consultants, and even using an ATM are all fading facets of financial services.

Keywords: Banking sector, Financial services, Recent Trends

Introduction

The Banking industry and financial institutions are vital sectors of any economy. Development of these two sections of the economy can impact the growth of the country in an incredible way. In the era of “Digital India”, the banking and financial services in India have undergone a massive evolution and the phenomenon continues. The change can be attributed to various components like new regulatory policies and customer expectations. However, the one element that has affected banking and financial services the most is technological advancement. The banking and financial services industry is turning its focus toward innovation to prepare for a future that will be increasingly driven by technology. Banks and financial institutions should re-define themselves as agile technology companies as customer preferences, demographics and lifestyles change.

Statement of the problem

Banking systems and financial institutions are integral parts of an economy. Seamless functioning of these sectors is important for an economy to grow. Due to the advent of digital technology, banking and financial services have undergone a massive shift in their mode of operations. New trends are gaining momentum at a fast pace as the customers find it convenient and also flexible at the same time. The emergence of financial technology has resulted in the introduction of several technological advancements in the industry. Fintech companies, internet banking and mobile banking are just some examples that mark this shift. The present study is to discuss some recent trends and innovations in Banking and Financial Services.

Objective of the article

1. To discuss and familiarize some recent trends and innovations in Banking and Financial Services.

Research methodology

The present study is both descriptive and explanatory in nature and secondary data were collected and used for the study. The data collected from various websites, reports and related published articles are used to know the recent trends in Banking and Financial services in India.

Review of literature

Dr. K. Laxman Goud (2021) conducted a study on “An Analytical Study on Trends and Progress of Indian Banking Industry”. The banking industry has experienced a series of significant transformations in the last few decades. Among the most important of them is the change in the type of organizations that dominate the landscape. Since the eighties, banks have increased the scope and scale of their activities and several banks have become very large institutions with a presence in multiple regions of the country. The paper examines the Trends and progress of Indian banking industry.

Hemraj Kawadkar and Nikhil Bangde (2020) in their study on “Emerging Technology Trends in Banking & Financial Services Industry In 2020” investigated that The banking and financial sector plays a crucial role in the development of economy. The development of banking and financial sector depends upon the services provided to the customers in various aspects. The banking sector and financial sector has seen a number of changes. Most of the banks start innovative banking services with object to create more value customers. Chatbots, Artificial Intelligence (AI), Big Data, Blockchain Integration, Cyber Security, Robotic Process Automation (RPA) and Cloud Computing system are some new innovations. These new innovations may be grabbed by the Indian banks. So, this paper enlightens the knowledge light on new innovations in banking sector.

Kavita Yadav (2019) in her study on “Current Trends in Banking” explains Finance and banking are the lifeblood of any business. Financial sector has been undergoing a drastic change and banking sector is a part of it. Banking sector has a well-developed system of accounting with classified banks. The process of banking was stated in decade of the 18th century. The first bank was The bank of Hindustan and then the most of the banks were originated. In 1969 and 1980 the banks were nationalized due to poor workings of previous banks because there is a need of change in the banking industry. After that,

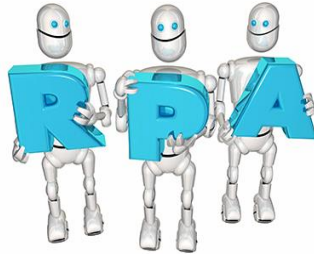
banks came out with some innovations and new type of services to cater to the emerging needs of their customers. Technology has played a great role in responding to the growing needs of Indian economy. To improve their performance, banks have made a heavy investment in IT sector. This paper is basically focused on recent trends which are taking place in banking industry.

Rubina Muazzam and Pankaj Diwed (2018) in the study on “Recent trends and progress of Indian banking industry” for the last five financial years, the study of balance sheet operations, profitability, capital adequacy, quality of property, regional deployment of bank loans, technical development, customer services and financial inclusion has been studied for Indian banking industry. It has been concluded that the emergence of universal or semi-universal banks in the development of banking sector in India is important, and therefore risk management and development of the appropriate regulatory system are the main challenge facing the banking industry in the near future.

Keshav Bhiva Lingare (2014) This paper analyzes the trends in financing and investing activities of companies in India in the recent past. While looking at the available trends, we have also tried to give a broad outlook for these in the near future. The first part deals with the financing options available to Indian companies. In the banking field, there has been an unprecedented growth and diversification of banking industry has been so stupendous that it has no parallel in the annals of banking anywhere in the world. The banking industry has experienced a series of significant transformations in the last few decades. Among the most important of them is the change in the type of organizations that dominate the landscape. Since the eighties, banks have increased the scope and scale of their activities and several banks have become very large institutions with a presence in multiple regions of the country.' The paper examines the new trends in commercial banking. We believe that loans from banks and related financial institutions will continue to be used by companies to raise capital. Therefore, we have focused on other emerging alternatives for companies to finance their investment needs. Some of these are private equity, ECBs and alternative investment markets. Private Equity in India has been growing at a rapid pace mainly due to the booming Indian economy and the Bull Run.

Recent Trends in Banking and Financial Services in India that are Changing the Entire Scenario:

1. Artificial Intelligence Robots:



Several private and nationalized banks in India have started to adopt chatbots or Artificial intelligence robots for assistance in customer support services. For now, the use of this technology is at a nascent stage and evolution of these chatbots is not too far away. Usage of chatbots is among the many emerging trends in the Indian banking sector that is expected to grow. More chatbots with the higher level of intelligence are forecasted to be adopted by the banks and financial institutions for improved customer interaction personalized solutions. The technology will alleviate the chances of human error and create accurate solutions for the customers. Also, it can recognize fraudulent behavior, collate surveys and feedback and assist in financial decisions.

2. The rise of Fintech Companies:

Previously, banks considered Fintech companies a disrupting force. However, with the changing trends in the financial services sector in India, fintech companies have become an important part of the sector. The industry has emerged as a significant part of the ecosystem. With the use of financial technology, these companies aim to surpass the traditional methods of finance. In the past few decades, massive investment has been made in these companies and it has emerged into a multi-billion-dollar industry globally.



Fintech companies and fintech apps have changed the way financial solutions are provided to the customers. Besides easy access to financial services, fintech companies have led to a massive improvement in services, customer experience, and reduced the price paid. In India, the dynamic transformation has been brought upon by several important elements like fintech startups, established financial institutions, initiatives like “Start-Up India” by Government of India, incubators, investors, and accelerators. According to a report by National Association of Software and Services Companies (NASSCOM), the fintech services market is expected to grow by 1.7 times into an \$8 billion market by 2020.

3. Wearables:



With smartwatch technology, the banking and financial services technology is aiming to create wearables for retail banking customers and provide more control and easy access to the data. Wearables have changed the way we perform daily activities. Therefore, this technology is anticipated to be the future retail banking trend by providing major banking services with just a click on a user-friendly interface on their wearable device.

These are some of the recent trends in the banking and financial sector of India and all these new technologies are predicted to reshape the industry of business and money. The future is going to bring upon a revolution of sorts with historical changes in traditional models. The massive shift in the landscape has few challenges. Nonetheless, the customers are open to banking innovations and the government is showing great support with schemes like “Jan Dhan Yojana,” which aims at proving a bank account to every citizen. Meanwhile, the competition from the foreign and private sector banks have strained the government regulators, nationalized banks and financial institutions to adopt new technology in order to stay relevant in the race.

4. Block chain

Block chain is a robust technology that is still in the development phase. Security is a major factor as far as digital services are concerned. Despite technical advances, fraud practices are still a challenge in the digital domain. Block chain is the answer to these challenges. Like the way in which it operates, there is no scope for any malpractices in it. The technology works on computer science, data structures and cryptography.

5. Digital-only Banks

Digital-only banks operate only through IT platforms which can be accessed using mobile phones, laptops or tablets. Digital-only banks operate in a paperless and branchless model and seem to overtake the traditional system of banks in the future. These banks provide high-speed banking facility at a low transaction charge. These virtual banks are an ideal choice for the current fast-paced world.



6. Big Data

With the increasing amount of knowledge generated daily by the banking sector, it's becoming difficult to extract actionable insights which will help in growing more opportunities. Big Data is that the answer! This technology has undoubtedly put all the banking data i.e. debit/credit card transactions, ATM withdrawals, money transfer, etc. to form informed decisions and process it effectively to gain valuable information that is needed to remain competitive in the future. Big Data helps in making banks learn about their customers in a better way enabling them to make real-time business decisions through analysis of customer's purchase habits, sales management, etc. Other added

benefits of big data are better marketing, product cross-selling, fraud detection, customer feedback analysis and many more. Additionally, it aids in identifying the latest market trends and streamlining internal processes to reduce risks.

7. Robotic Process Automation (RPA)

Using RPA, the bank can use customer service bots to deal with low-priority questions from customers like account balance check, payment queries, etc. and save the time of human agents to handle with high-priority concerns. This will not only improve productivity but reduce labor/operational costs and therefore the error rate. With instant resolution through RPA, users can make a fast decision for his/ her credit card application without getting any human agents involved in the process. Though robotic innovations are still in the adolescent phase, banking organizations should be remembering of all the advantages it offers to take care of long-term AI results. Leverage RPA technology to deliver the best possible customer experience in the banking world through robots and virtual assistants. Automate your repetitive tasks without human intervention and save costs efficiently.

8. Cloud Computing:

Another latest trend of the industry is cloud computing which can make 24/7 customer service possible providing any time service to customers. This enhances the performance of financial institutions and scale-up services more quickly. Customers will only purchase the services they have enabling banks to manage costs. One can easily avail pay-as-you-go pricing by paying the cloud provider as per the usage, making it easy for individual customers or businesses to use the cloud. In the banking system, cloud computing can promote safe online payments, digital money transfers, wallets, etc.

9. Point of Sale Terminal:

Point of Sale Terminal is a computer terminal that is linked online to the computerized customer information files in a bank and magnetically encoded plastic transaction card that identifies the customer to the computer. During a transaction, the customer's account is debited and the retailer's account is credited by the computer for the amount of purchase.

Digital Assets that Will Have a Very Important Role in Organizations/Projects According to Financial Services Executives Worldwide, April 2021
% of respondents



Note: n=1,280

Source: Deloitte, "2021 Global Blockchain Survey," Aug 19, 2021

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InsiderIntelligence.com

Source (<https://www.insiderintelligence.com/>)

The financial services sector is accelerating its adoption of digital technology. Paying with cash, participating in in-personal meetings with financial consultants, and even using an ATM are all fading facets of financial services.

Digitization and a fast-emerging new ecosystem

A 2020 Deloitte report in the aftermath of the lockdown found some significant changes in consumer behavior with an overwhelming 96 percent of respondents willing to go for digital transactions for meeting their day-to-day financing needs. With the increasing adoption of open banking worldwide, there are rising concerns around data sharing and security.

That said, countries across the world are mapping out their way forward in terms of working on a regulatory approach to data sharing across sectors. India's financial and demographic landscape has witnessed a considerable change over the last few years, with the growing number of fintech companies emerging. These companies have transformed the digital payments and lending markets, thereby indicating an increase in digitalization. To ensure an equitable regulatory landscape for all financial institutions, India recently introduced an account aggregation framework for financial data sharing and ensure seamless access of data by the users. Government data shows that digital transactions grew close to 90%, from 232,000 to over 430,000 in the three years from FY19 to FY21, primarily led by UPI. The value of digital payments in India will grow three-fold to touch \$1 trillion by financial year 2026, as compared to \$300 billion in financial year 2021.

India's recent announcement of adhering to The UN's Responsible Digital Payments principles is expected to transform the streamline the regulatory landscape and make it safer.

Revolutionizing talent hiring with automation

The latter half of 2021 witnessed a wave of Great Resignations across all industries with an increased level of talent attrition, job-hopping by employees and the immediate need for hiring replacements. The pandemic revamped the traditional working styles of companies and replaced them with hybrid or remote working for its employees.

The banking industry has been facing higher levels of competition in hiring and are required to pay more to recruit and keep talent. To ensure seamless transition to the new working models, banks and financial institutions understood the importance of leveraging emerging technologies such as automation to not only retain existing talent but also ensure attracting the right talent. Leveraging such technologies has also enabled banks to devise the right retention strategy and improve and automate decision-making processes in terms of hiring.

The Great Resignation is slowly moving towards becoming the Great Revival and will soon transform the hiring processes and talent requirement in the banking industry.

Findings

- There is a rapid growth in technology adaptation after the pandemic.
- The country witnessed latest trends in both banking and financial service sectors.
- The biggest factor which underlined the performance of banks in 2021 and will define the industry's growth in 2022 is the ability to capitalize on technology investments and create value.
- The pandemic revamped the traditional working styles of companies and replaced them with hybrid or remote working for its employees.
- The financial services sector is accelerating its adoption of digital technology. Paying with cash, participating in in-personal meetings with financial consultants, and even using an ATM are all fading facets of financial services.
- The banking and financial services industry is turning its focus toward innovation to prepare for a future that will be increasingly driven by technology

- Key trends driving these innovations include ongoing digital transformation, collaboration with FinTech, and the increasing role of artificial intelligence and robotics
- Banks and financial institutions should re-define themselves as agile technology companies as customer preferences, demographics and lifestyles change

Conclusion

The banking and financial services industry is turning its focus toward innovation to prepare for a future that will be increasingly driven by technology. Key trends driving these innovations include ongoing digital transformation, collaboration with FinTech, and the increasing role of artificial intelligence and robotic. Banks and financial institutions should re-define themselves as agile technology companies as customer preferences, demographics and lifestyles change

All these recent trends will reshape the banking and finance industry by bringing revolutionary changes in the traditional models. This shift is not devoid of challenges, but the customers are quite open to innovations and the government is also showing great support for these trends.

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27. A STUDY ON DIGITAL COMPETENCY AMONG WORKING WOMEN

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ABSTRACT

Digital literacy helps to be more efficient and makes things more accessible, improving your quality of life. Being digitally competent is more important to women because to become more productive, carrier oriented, financially independent, aware of their rights, aware of the requirement to start their own business and also contribute to the country's economy as a whole. the objective of the study is to analyse the level of influence of demographic factors, Digital literacy, IT literacy, media literacy and Internet literacy on the digital competency among working women. Both secondary and primary data were collected and used for the study. The population of the study covers the 100 working women in government sector, private sector and self-employed categories in Trissur District. The Chi- Square result shows the ignificant association between age, educational qualification, occupation and Digital competency among working women. The correlation analysis shows that digital literacy, IT literacy, Media literacy, Internet literacy, and Digital competency have positively correlated each other.

Keywords: - Digital Competency, Demographic Factors, Digital Literacy, IT Literacy, Media Literacy, Internet literacy, Working women

Introduction

Digital competence involves the confident and critical use of Information Society Technology for work, leisure and communication. Digital competence is essential for learning, work and active participation in society. It is the confident and critical usage of the full range of digital technologies for information, communication and basic problem-solving in all aspects of life. It is also important to consider that “as a transversal competence, digital competence also helps us master other key competences, such as communication, language skills, or basic skills in maths and science (Riina Vuorikari , 2015). Digital competence is not just about knowing how to surf the Internet, but can be broken down into a range of smaller components. In the modern world being digital

competent is more significant for the existence and survival in both personal and professional life.

Statement of the problem

Digital literacy is the ability to use information and communication technologies like social media, internet platforms and mobile devices to find, create, evaluate and communicate pieces of information effectively. Being digitally literate has become an essential criterion in establishing your presence and making an identity in the modern world. Digital literacy helps to be more efficient and makes things more accessible, improving your quality of life. Technology as a whole is an essential component in achieving gender equality. The modern world is increasingly moving online, and it's equally important for men and women to adapt to the changes and be self-reliant on technology, whether for business or social connections. Ironically, most of our women are still dependent on men for various tasks due to lack of digital literacy. Whether making an online payment or preparing a presentation, women rely on men to perform these daily activities. This often leads to low self-esteem and a lack of confidence. Being digitally competent is more important to women because to become more productive, carrier oriented, financially independent, aware of their rights, aware of the requirement to start their own business and also contribute to the country's economy as a whole. Thus the present study is focused to analyse the level of influence of demographic factors, Digital literacy, IT literacy, media literacy and Internet literacy on the digital competency among working women and thus deserve much significance in the present scenario.

Objectives of the study

- To analyse the level of influence of demographic factors, Digital literacy, IT literacy, media literacy and Internet literacy on the digital competency among working women.

Hypothesis

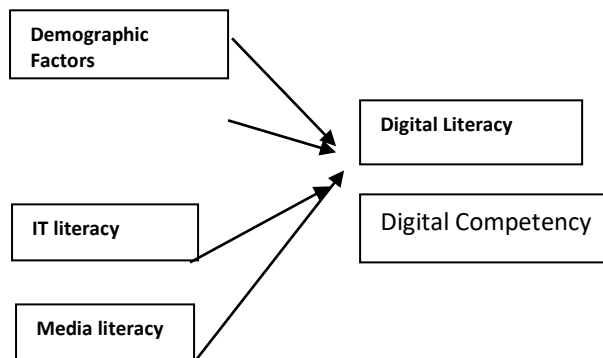
H1: There is a significant association between age and digital competency among working women

H2: There is a significant association between educational qualification and digital competency among working women

H3: There is a significant association between occupation and digital competency among working women

H4: There is a positive relationship between digital literacy, IT literacy, Media Literacy, Internet literacy and digital competency among working women.

The Conceptual Model



Methodology of the Study

The present study is both descriptive and explanatory in nature and both secondary and primary data were collected and used for the study. The population of the study covers the working women in government sector, private sector and self-employed categories in Trissur District. The primary data required for the study were collected from 100 respondents using convenient sampling method. A well-structured questionnaire was developed for the collection of primary data.

Tools used for Analysis of Data

The collected data were tabulated and analysed with the help of SPSS 21.0. The statistical techniques used for analysis include chi – square test and correlation. The reliability of the scale of measurement used was assessed using Cronbach’s Alpha coefficient, which was above the minimum acceptable level 0.7, there by confirmed the reliability of the scale of measurement used in the study.

Limitations of the Study

The digital competency is analyzed only among working women due to paucity of time. It is also noted that since the study depends mainly on the views of the individual, there are chances for their personal bias while responding to the questions; even then maximum care has been taken while analysing and interpreting the data to draw appropriate and logical conclusions.

Review of Literature

Geeta Rani and 2Anju Gandhi (2022) conducted a study On Digital Competence of Teachers: An Urgency for Future Classroom. A consequence of the COVID-19 pandemic creates uncertainties and many challenges regarding imparting education to every student. In India, all the educational regulatory bodies have forcibly endorsed online education to continue teaching and reach students. Furthermore, management of the available resources for delivering content was merely in teachers' hands that how effectively they have used. This pandemic forced us to strengthen the education sector by developing 21st-century skills in teachers and learners to quickly meet future demands and compete in the digital world. Therefore, if teachers have the knowledge, skills, and a positive attitude towards using digital technologies, they can facilitate their students and prepare them for the future world. This paper attempts to define digital competence and draw light on the need for digital competence in the future educational scenario. Also, it identifies an imbalance in the force of technology intrusion, reflects the lack of competent digital teachers and the urgency of digital immigrant teachers who will be proved helpful in preparing and facilitating new z- generation with their vast knowledge and learning attitude.

Nikola Vukčević , Nikola Abramović , and Nataša Perovic (2021) Latest EU guidelines for the implementation of Digital Competence Framework and adopted Action Plan for Digital Education (2021-2027) clearly identifies two basic strategic priorities - Encouraging the development of a successful digital education ecosystem and Development of digital skills and competencies for digital transformation, clearly indicate the importance of high quality, inclusive and affordable digital education in Europe. Today, European higher education main problem is the management of the digital transition. As Montenegro is one of the candidate countries for EU, we believe that this is very important and attractive research area. The paper deals with basic and advanced digital competencies development levels of students of University "Adriatic" Bar, seen as Montenegro's and the EU's future labour market staff. The results of empirical research shows the real level of students digital competencies in relation to the EU required level. The results shows whether the teaching practice of digital competencies development is sufficiently present at the University, certain limitations, reasons, and possibilities for further improvement. Today, digitalization directly affects

the modern labour market. As a result, young people in Montenegro must have highly developed digital competencies, in order to remain competitive in the EU labour market.

Yu Zhao,a, Ana María Pinto Llorente,b and María Cruz Sánchez Gómez (2021)

Digital competence in higher education research: A systematic literature review. In the information and knowledge society, where technology develops rapidly and penetrates deeply into our lives, the discussion about digital competence has become a hot topic today. After the emergence of the Coronavirus (Covid-19) and with its huge impact on the education industry, the concern about digital competence has reached a new height. This systematic literature review uses Web of science and Scopus as databases to store and analyze the existing research on digital competence in higher education settings. The purpose of this review is to provide the scholar community with a current overview of digital competence research from 2015 to 2021 in the context of higher education regarding the definition of digital competence, dimensions used to evaluate digital competence, research purposes, methodologies, and results and limitations. Major findings include that the majority of publications cited both research and EU policy in describing the definition of digital competence. The review indicates that most university students and teachers have a basic level of digital competence. Besides, the institutions of higher education are encouraged to focus on the development students and teachers' digital competence, create relevant learning strategies and use appropriate tools to improve the quality of education.

Alberto D. Yazon, Karen Ang-Manaig, Chester Alexis C. Buama, John Frederick B. Tesoro (2019) Digital Literacy, Digital Competence and Research Productivity of Educators. This study determined the relationship between digital literacy, digital competence and research productivity of educators. This research employed the descriptive-correlational research design. The respondents of the study were the permanent faculty members of the university. The research instruments utilized were the standardized scales of Being Digital: Digital Literacy Checklist of The Open University © 2012 United Kingdom, measured the digital literacy of the respondents. And the digital competence was assessed through the Self-Assessment Tool of the European Digital Competence Framework for Educators.

Mala Mathew (2018) The Need for Digital and Media Literacy in Indian Higher Secondary and Secondary Curricula to Cater to Future Generations. The communication

component of higher secondary and secondary curricula in India has become obsolete. It served Millennials the same way it served the preceding generations and continues to serve the current Generation Z. Digital and Media Literacy skills and competencies needed in the digital and post digital age are not incorporated into these curricula across India. Digital India tried to introduce technology into the education system as tools for learning; the curricula, however, remains the same, despite plans to update them by the MHRD. The paradox of education in India, where it is both the problem and the solution, needs to be fixed at the earliest; India still hasn't reformed its curricula to incorporate 21st century competencies and skills and that is precisely what is needed. The aim of this paper is to evaluate the current generational traits, higher secondary and secondary curricula and to propose a suitable panacea.

ANALYSIS ON INFLUENCE OF DEMOGRAPHIC FACTORS, DIGITAL LITERACY, IT LITERACY, MEDIA LITERACY AND INTERNET LITERACY ON DIGITAL COMPETENCY AMONG WORKING WOMEN

Test of Reliability

The reliability of the instrument used in the study was tested by computing Cronbach's Alpha (α) value for each of the five variables as well as for the entire set. The test result is presented in the Table 1.1.

Table 1.1 Test of reliability

Sl. No.	Variables	No of items	Cronbach's Alpha (α)
1	Demographic factors	3	0.870
2	Digital literacy	3	0.847
3	IT literacy	3	0.791
4	Media Literacy	3	0.867
5	Internet Literacy	6	0.903
6	Total	23	0.952

H1: There is a significant association between age and Digital competency among working women.

Chi square test result

	value	df	Asymp.Sig (2-sided)
Pearson Chi - Square	75.504	10	0.000

The Chi- Square result shows the association between age and Digital competency among working women. From the result it is seen that the Pearson Chi – Square value is 60.609, p value = 0.000 i.e the chi square test result is less than the alpha level of significance of 0.05. This tells that there is a statistically association between age and Digital competency

among working women. Hence, the hypothesis there is a significant association between age and Digital competency among working women is accepted.

H2: There is a significant association between Educational qualification and Digital competency among working women.

Chi square test result

The Chi- Square result shows the association between age and Digital competency among

	value	df	Asymp.Sig (2-sided)
Pearson Chi - Square	60.609	10	0.000

working women. From the result it is seen that the Pearson Chi – Square value is 70.631, p value = 0.000 i.e the chi square test result is less than the alpha level of significance of 0.05. This tells that there is a

statistically association between age and Digital competency among working women. Hence, the hypothesis there is a significant association between educational qualification and Digital competency among working women is accepted.

H3: There is a significant association between Occupation and Digital competency among working women.

Chi square test result

The Chi- Square result shows the association between age and Digital competency

	value	df	Asymp.Sig (2-sided)
Pearson Chi - Square	70.631	20	0.000

among working women. From the result it is seen that the Pearson Chi – Square value is 75.504, p value = 0.000 i.e the chi square test result is less than the alpha level of significance of 0.05. This tells

that there is a statistically association between age and Digital competency among working women. Hence, the hypothesis there is a significant association between occupation and Digital competency among working women is accepted.

**Correlation between Digital literacy, IT literacy, Media literacy, Internet literacy
and Digital Competency**

Independent variables	Dependent Variable	Pearson Correlation	Sig. (2-tailed)	N
Digital Literacy	Digital Competency	.601**	.000	100
IT Literacy		.671**	.000	100
Media Literacy		.532**	.000	100
Internet Literacy		.644**	.000	100

****.** *Correlation is significant at the 0.01 level (2-tailed).*

From the above statistical results, it is inferred that Digital Literacy (.601**), IT Literacy (.671**), Media Literacy (.532**), Internet literacy (.644**) and Digital Competency are positively correlated each other. It indicates the extent to which two variables are linearly correlated. The probability value associated with the correlation is less than 0.01. It indicates that there is a positive relationship between digital literacy, IT literacy, Media Literacy, Internet literacy and digital competency among working women. Hence, the hypothesis formulated for the study, is accepted.

Findings

- The Chi- Square result shows the association between age and Digital competency among working women (p value = 0.000).
- The Chi- Square result shows the association between educational qualification and Digital competency among working women (p value = 0.000).
- The Chi- Square result shows the association between occupation and Digital competency among working women (p value = 0.000).
- The correlation analysis shows that digital literacy (.601**), IT literacy (.671**), Media literacy (.532**), Internet literacy (.644**) and Digital competency have positively correlated each other.

Conclusion

Digital technologies have huge potential to act as development enablers for women, as they bring new social, political and economic opportunities. Women face higher barriers when it comes to initial access, affordability of digital services and use of ICT. Particularly, lower levels of technical and digital literacy skills as well as lower

confidence impact women's access to, and use of, ICT. In general, more women than men report difficulties in using mobile phones or the internet. Being digitally competent is more important to women because to become more productive, career oriented, financially independent, aware of their rights, aware of the requirement to start their own business and also contribute to the country's economy as a whole. the present study is focused to analyse the level of influence of demographic factors, Digital literacy, IT literacy, media literacy and Internet literacy on the digital competency among working women. The study reveals the significant relationship between age, educational qualification, occupation and Digital competency among working women and the variables such as digital literacy, IT literacy, Media literacy, Internet literacy, and Digital competency have positively correlated each other.

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28. A STUDY ON ECONOMIC EMPOWERMENT SCHEMES OF SCHEDULED CASTE & SCHEDULED TRIBE PEOPLE WITH SPECIAL REFERENCE TO KERALA.

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Economic empowerment schemes have been implemented in various states to help marginalised communities, including Scheduled caste(SC) and Scheduled tribe(ST) people. The impact of economic empowerment schemes on SC/ST communities has been significant, through these schemes SC/ST communities have been able to establish small businesses, access loans, education and skill development which can help individuals and communities to break free from the cycle of poverty and improve their social and economic status. This research project seeks to analyze the outcomes and implications of these schemes, including their contribution to poverty reduction, skill development, employment generation and overall socio-economic empowerment of SC and ST individuals. By understanding the strengths and weakness of these schemes, policymakers and stakeholders can make informed decisions to enhance their effectiveness and ensure more inclusive economic growth and social justice for SC and ST communities. The outcome of the present study is that the scheme should ensure much effectiveness.

Key Words: Economic Empowerment, SC/ST Development, Poverty Alleviation, Socio-Economic Inclusion

1. Introduction

Economic empowerment schemes have also helped to reduce social inequalities and promote social inclusion, as they have provided opportunities for SC/ST communities to participate in economic activities and contribute to the growth of the country's economy. The increased participation of SC/ST communities in economic activities has also led to increased representation and visibility in decision making processes. However, despite the positive impact of economic empowerment schemes, there are still challenges that need to be addressed. To promote the economic participation of SC/ST communities, it's

crucial to implement programs along with comprehensive policies that address social and cultural barriers .Moreover, continuous monitoring and evaluation of these initiatives is necessary to guarantee their effectiveness and successful outreach to the intended recipients. Overall, economic empowerment schemes have played a crucial role in improving the economic status of SC/ST communities and promoting their social inclusion. As we move forward, it is important to continue to invest in these schemes and address the challenges to ensure that they can achieve their full potential.

2. Statement of the Problem

This project aims to investigate the impact of economic empowerment schemes on the socio-economic status of SC and ST people in Kerala .The main problem is the persistent economic marginalization and social discrimination faced by SC and ST communities, which hinder their access to resources ,opportunities and upward mobility .Despite the existence of various economic empowerment schemes ,it is crucial to assess their effectiveness and identify the challenges and barriers that limit their impact on the targeted communities .

3. Objectives of the study

1. To study the awareness level of government schemes on SC and ST people
2. To identify the most preferred economic empowerment schemes which help economic upliftment of SC/ST people.

4. Research Methodology

Selection of Sample

A sample of 100 respondents has been selected by adopting convenience sampling method for the purpose of study

Collection of Data

The primary data are collected from the respondents through questionnaire.

The Secondary data were collected from published sources like reports, journals, magazines, books etc.

Tools of Analysis

The data collected are suitably classified and analyzed keeping in view the objective of the study using SPSS for the analysis.

Period of Study

The survey was conducted during the period from 1st February to 29th February 2024

5. Limitation of The Study

The selection of the units from the population on the basis of availability and /or accessibility is the major disadvantage as convenience sampling method was used.

Review of Literature

Naidu(2004) in “Empowerment of scheduled castes” attempted to examine the intergenerational disparities in education ,occupation ,Political and social status of scheduled castes in Goot City. The study reveals that the status of scheduled castes people has changed in the context of education ,occupation and social economic and soon

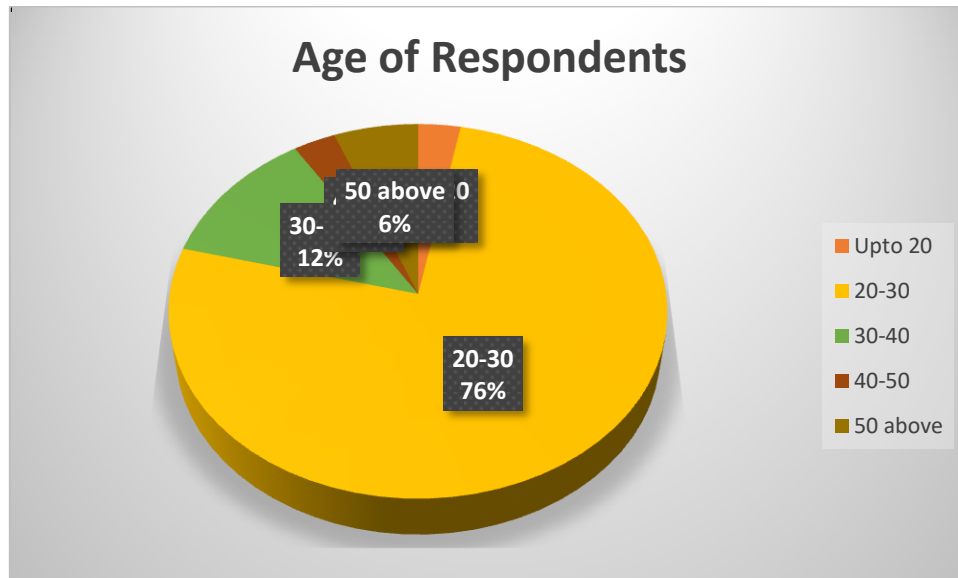
Ghosh D.K(2003) “ Scheduled castes and scheduled tribes :some reflections on poverty characteristics and poverty alleviation programs” and reported that most of the development were not promptly implemented by the government agencies across the country .The study reported that majority of the downtrodden communities were disorganised and in the post-independence .The scholar suggested that tribal development programmes should be implemented by taking the progressive organisations representing the downtrodden communities in the country.

Results And Discussions

Table no: 1

Classification of Respondents age

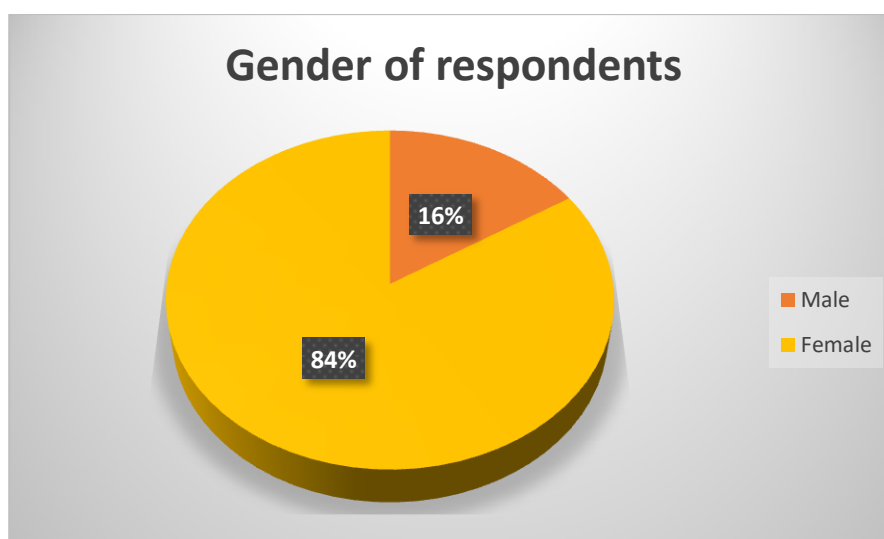
AGE	No of respondents	percentage
Upto 20	3	3%
20-30	76	76%
30-40	12	12%
40-50	3	3%
50 above	6	6%
Total	100	100%



Interpretation: This table indicates that 76% of respondents are 20-30 years of age. 12% respondents are 30-40 years of age. While 6% respondents are 50 above, 3% of respondents are from 40 to 50 and only 3% are upto 20 years of age.

Table 2: Gender of respondents

Gender	No of respondents	% of respondents
Male	16	16%
Female	84	84%
Total	100	100%

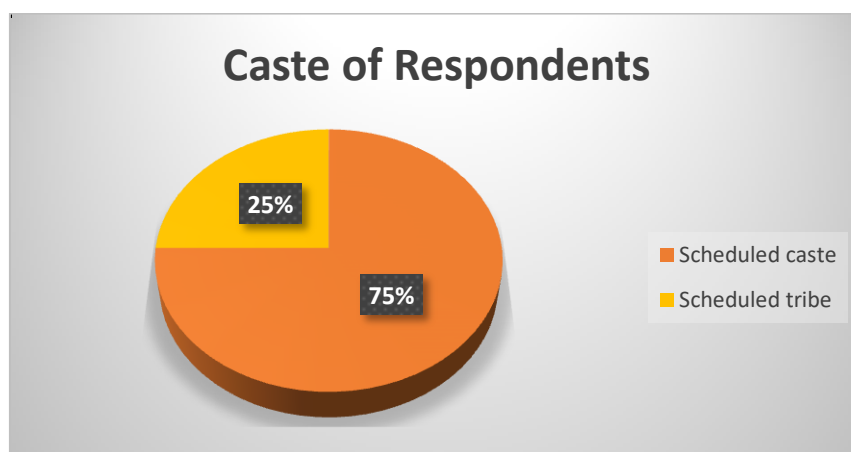


Interpretation :

From the above table it is clear that more than half of the respondents 84% were females and 16% were males.

Table 3 :Caste of respondents

Caste	No of respondents	Percentage
Scheduled caste	75	75%
Scheduled tribe	25	25%
Total	100	100%

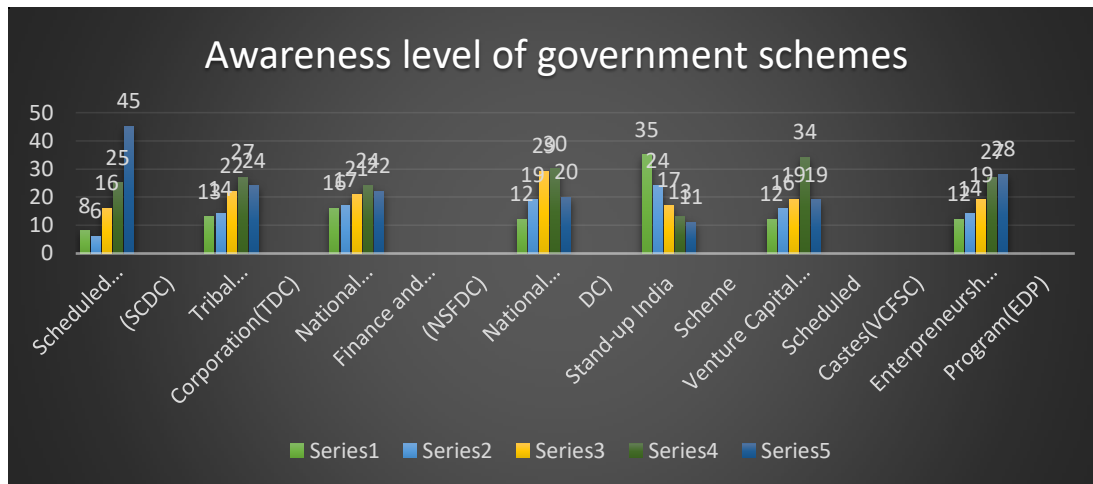


Interpretation :From above table indicate 75% of respondents are scheduledcastes and 25% are scheduled tribes.

Table 4:Awareness level of government schemes

Schemes	Extremely aware	Aware	Moderately aware	Slightly aware	unaware	Total
ScheduledCaste Development Corporation (SCDC)	8	6	16	25	45	100
Tribal Development Corporation(TDC)	13	14	22	27	24	100
National Scheduledcaste FinanceandDevelopment Corporation (NSFDC)	16	17	21	24	22	100
National scheduledtribes finance anddevelopment corporation(NSTF DC)	12	19	29	30	20	100

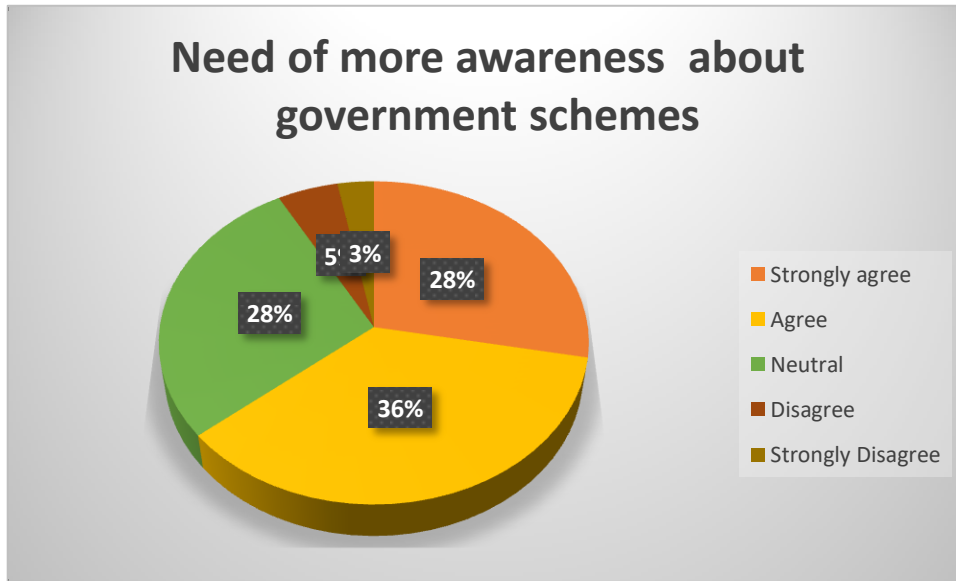
Stand-up India Scheme	35	24	17	13	11	100
Venture Capital Fund For Scheduled Castes(VCFSC)	12	16	19	34	19	100
Entrepreneurship Development Program(EDP)	12	14	19	27	28	100



Interpretation: From above table it is clear that most of respondents are unaware and slightly aware about the various economic empowerment schemes of government. Most of the respondents are unaware about the scheme ‘Scheduled caste development corporation’(SCDC).

Table 5:Opinion of respondents about need of more awareness about government schemes

Agreeness	No of respondents	Percentage
Strongly agree	28	28%
Agree	36	36%
Neutral	28	28%
Disagree	5	5%
Strongly Disagree	3	3%
Total	100	100%



Interpretation :It is clear that majority of the respondents(36%) are agree that there is a need for more awareness about the economic empowerment schemes among SC/ST communities.

Table 6: Rank the following benefits of economic empowerment schemes according to which help economic upliftment of SC/ST people.

weight		5	4	3	2	1			
		Extrem ely helpf ul	Very hel pful	Moderat ly helpful	Slightl y helpful	Not at all helpf ul	Tota l	WA	Ra nk
Financial assistance	F	24	27	24	23	2	100	70.4	1
	W	120	168	720	46	2	1056		
Reservation in govt. jobs	F	14	30	30	11	15	100	21.13	6
	W	70	120	90	22	15	317		
Educational support	F	27	39	15	8	11	100	24.2	2
	W	135	156	45	16	11	363		
Entrepreneuri al support	F	11	22	35	17	15	100	19.8	7
	W	55	88	105	34	15	297		
Reservation in education	F	23	31	20	19	7	100	22.93	3
	W	115	124	60	38	7	344		
Subsidized	F	21	31	23	15	10	100	22.53	4

loans	W	105	124	69	30	10	338		
Skill development	F	18	26	27	14	15	100	21.2	5
	W	90	104	81	28	15	318		
Self-employment support	F	10	25	30	22	13	100	19.8	7
Self-employment support	W	50	100	90	44	13	297		745x

Interpretation: From the above table respondents give 1st rank for the financial assistance schemes for give more benefits, 2nd rank for educational support, 3rd rank for reservation in education, 4th rank for subsidized loans, 5th rank for skill development, 6th for reservation in govt. jobs, 7th rank for entrepreneurial support and self employment support.

CHI SQUARE TEST

To test the effectiveness of economic empowerment schemes to improve the living standard of SC/ST people.

Null hypothesis H₀: There is no significant difference between how male and female respondents perceive the effectiveness of economic empowerment schemes in improving the living standards of SC/ST individuals.

Alternative hypothesis H₁: There is a significant difference between how male and female respondents perceive the effectiveness of economic empowerment schemes in improving the living standards of SC/ST individuals.

Observed frequency

	HS	S	N	DS	HDS	Total
Male	12	7	9	16	10	54
Female	9	11	8	13	5	46
Total	21	18	17	29	15	100

Expected frequency

(E = Row total * column total / Grant total)

	Highly satisfied	Satisfied	Neutral	Dissatisfied	Highly dissatisfied	Total
Male	11.34	9.72	9.18	15.66	8.1	54
Female	9.66	8.28	7.82	13.34	6.9	46
Total	21	18	17	29	15	100

Chi square =0.603841

Degree of freedom=(c-1) (r-1)

$$=(5-1) (2-1)$$

$$=4*1=4$$

Level of significance =5%

Table value=9.488

Interpretation

The calculated value(0.603841)is less than the table value(9.488).Therefore we accept null hypothesis (H₀).Hence there is no significant difference between how male and female respondents perceive the effectiveness of economic empowerment schemes in improving the living standards of SC/ST individuals.

CONCLUSION

Economic empowerment schemes of SC/ST is considered as a pre requisite for their socio- economic development .The state and central governments have been implementing various empowerment schemes for bringing them to the level of the general population .These have already brought some positive changes in their socio-economic conditions .But there is still a wide scope for improvement in several sectors .It is concluded that respondents are unaware about economic empowerment schemes for the development of SC/ST. And majority of respondents are agree that economic empowerment schemes are effective to improve living standard of SC/ST. Respondents are also satisfied with the present reservation system of the SC/ST.

29. HOW SENSITIVE ARE U.S. PUBLIC REITS? TIME-SERIES EVIDENCE FROM INTEREST RATE AND MACROECONOMIC

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ABSTRACT

U.S. public Real Estate Investment Trusts (REITs) play a critical role in financial markets and are particularly sensitive to movements in interest rates and broader macroeconomic conditions.

This study examines the long-run equilibrium relationship between U.S. public REIT performance and key macroeconomic and financial variables, including interest rates, inflation, industrial production, unemployment, market volatility, and overall equity market performance. It further analyses the short-run dynamics, forecasting behaviour, and interrelationships among these variables to understand the drivers of REIT market performance.

The study employs an Autoregressive Distributed Lag (ARDL) framework to estimate both long-run and short-run relationships, complemented by time-series forecasting techniques and causality analysis to capture predictive and dynamic interactions. Monthly data are analysed to ensure robustness in capturing temporal adjustments and macro-financial linkages affecting REIT performance.

The ARDL bounds testing approach confirms the presence of a stable long-run cointegrating relationship between U.S. public REIT performance and the selected macroeconomic variables. Long-run estimates reveal that interest rates and unemployment have a significant negative impact on REIT performance, while overall equity market performance exerts a strong positive influence. Short-run dynamics indicate meaningful adjustment effects, with the error correction mechanism demonstrating rapid convergence toward long-run equilibrium following short-term macroeconomic shocks.

The findings contribute to the empirical literature by clarifying the transmission of interest rate and macroeconomic shocks to U.S. public REIT performance, with important implications for asset pricing, portfolio allocation, policy analysis and macro-financial risk assessment.

Keywords: Real Estate Investment Trusts (REITs), Interest Rate Risk, Macroeconomic Factors, Financial Market Dynamics, U.S. Capital Markets

1. Introduction

Public Real Estate Investment Trusts (REITs) play a pivotal role in modern financial systems by offering investors liquid and diversified exposure to income-generating real estate while linking property markets with broader capital markets. In the United States, the REIT sector has expanded significantly since the early 1990s, becoming an integral component of institutional portfolios and an important transmission channel for monetary policy and macroeconomic shocks. Due to their hybrid nature as both real asset-backed securities and equity-traded instruments, U.S. public REITs exhibit sensitivity to interest rates, macroeconomic conditions, and equity market dynamics.

Interest rates—particularly long-term benchmarks such as the 10-year U.S. Treasury yield—are widely recognized as a primary determinant of REIT valuation. Changes in interest rates influence REIT performance through discount rates applied to future cash flows, borrowing costs, capitalization rates, and portfolio reallocation between bonds, equities, and real estate. In addition, broader macroeconomic variables such as inflation, industrial production, labor market conditions, and financial market volatility affect rental income growth, financing conditions, and investor risk appetite. The increasing integration of REITs with equity markets has further strengthened their co-movement with broad stock indices such as the S&P 500, especially during periods of heightened uncertainty and financial stress.

Despite an extensive body of research, the sensitivity of U.S. public REITs to interest rate and macroeconomic shocks remains debated. Early studies often characterized REITs as bond-like assets, whereas later research emphasized their equity-like behavior, particularly during monetary policy announcements and market downturns. Empirical findings suggest that REIT responses vary across economic regimes, policy environments, and periods of financial stress. Major events such as the Global Financial

Crisis, prolonged unconventional monetary policy, the COVID-19 pandemic, and the recent tightening cycle amid elevated inflation have further altered the transmission mechanisms linking macroeconomic conditions and REIT performance.

Existing literature, while informative, remains fragmented. Many studies focus on selected variables or emphasize either long-run relationships or short-run dynamics in isolation. Others rely on static regression techniques or limited time horizons, failing to capture evolving interactions across multiple economic cycles. Moreover, relatively few studies rigorously assess the intrinsic forecasting structure of REIT indices or examine predictive causality among REITs, interest rates, macroeconomic variables, volatility, and equity markets within a unified framework.

Against this backdrop, the present study provides a comprehensive time-series analysis of U.S. public REIT sensitivity to interest rate and macroeconomic shocks, explicitly incorporating equity market effects. Using the All REIT Total Return Index, the study examines the role of the 10-year U.S. Treasury yield as the primary explanatory variable, while controlling for inflation, industrial production, unemployment, market volatility, and the S&P 500 index. Employing an integrated framework that combines ARDL bounds testing, short-run dynamics, ARIMA-based forecasting, the study offers updated and robust evidence on the macro-financial drivers of U.S. REIT performance. The findings contribute to a deeper understanding of REIT behavior and carry important implications for investors, policymakers, and researchers in an increasingly interconnected financial system.

2.Literature Review

This literature review critically synthesizes existing research on the relationships between interest rates, macroeconomic conditions, and the performance of U.S. Public Real Estate Investment Trusts (REITs), with particular emphasis on their interactions with equity markets, notably the S&P 500. It highlights the evolution of econometric methodologies used in the literature and identifies persistent gaps that motivate further empirical investigation.

Interest Rates and REIT Performance

The sensitivity of REIT returns to interest rate movements has long been central to REIT research, given their dual nature as income-generating real estate assets and equity-traded

securities. Recent high-frequency studies provide granular evidence of monetary policy transmission mechanisms. Rosa (2024) examined U.S. equity and mortgage REITs using intraday data around Federal Open Market Committee (FOMC) announcements from 2000 to 2022. Employing an event-study framework that decomposed monetary news into policy rate, forward guidance, and asset purchase surprises, the study found that contractionary monetary shocks exerted significant negative effects on equity REIT prices, while mortgage REITs retained distinct interest rate risk exposure. This work contributes real-time insights into how monetary policy affects REITs differently across subsectors.

Complementing this evidence, Wang et al. (2024) analyzed U.S. REITs using 5-minute intraday data between 2008 and 2021 and applied a Vector Autoregressive (VAR) model with functional shocks. Their findings showed that conventional monetary policy shocks aligned with standard economic theory, whereas unconventional policies produced mixed effects on REIT returns and higher-order moments such as volatility and skewness. These results underscore the importance of distinguishing between policy regimes when assessing interest rate sensitivity.

Earlier studies reinforce the persistence of interest rate effects across economic cycles. Morri and Liu (2017), using data from 1995 to 2015, documented a statistically significant negative relationship between U.S. REIT returns and long-term Treasury yields, particularly in the post-Global Financial Crisis period. Collectively, these studies establish interest rates as a fundamental driver of U.S. REIT performance.

Macroeconomic Determinants of REIT Returns

Beyond interest rates, macroeconomic conditions significantly shape REIT returns. Cohen and Burinskas (2023) examined the determinants of EPRA REIT performance using OLS regressions with lags, Granger causality tests, and ARDL models. Their findings confirmed both short-run and long-run relationships between REIT performance and variables such as equity price growth, inflation, GDP, and bond yields, while also identifying countercyclical behavior with producer prices and credit variables. This study broadens the macroeconomic scope of REIT analysis and demonstrates the usefulness of ARDL methods in capturing dynamic relationships.

Equity Market Linkages

The integration between REITs and the broader equity market is critical for understanding diversification and contagion effects. Rahman (2024) reinvestigated the interaction between U.S. equity REITs and the S&P 500 using daily data from 2008 to 2023. Employing OLS regression, the study found weak but bidirectional causal relationships, suggesting partial integration between the two markets.

More comprehensive spillover analyses reveal stronger linkages during periods of financial stress. Damianov and Elsayed (2018) used a generalized VAR framework on monthly data from 1975 to 2016 to examine spillovers across housing, REIT, and stock markets. Their results demonstrated time-varying spillovers, with the housing market receiving shocks from mortgage markets during the mortgage crisis. Caporin et al. (2020), applying a Bayesian quantile-on-quantile approach to U.S. REITs and the S&P 500, showed that REIT-to-equity spillovers intensify in the tails of the return distribution, particularly during crisis periods. These findings highlight the state-dependent nature of equity–REIT interactions.

Uncertainty, Volatility, and REIT Markets

Macroeconomic and financial uncertainty significantly influence REIT returns and risk premiums. Lotz et al. (2022) analyzed U.S. REIT data from 1994 to 2017 using temporal causality and asset pricing models, finding that REITs are significantly exposed to market-wide uncertainty and command an uncertainty risk premium. Gholipour et al. (2021), using a VAR model on U.S. quarterly data, demonstrated that uncertainty shocks cause immediate and pronounced declines in both REIT indices and commercial property prices, with REITs responding more rapidly.

At the firm level, Li and Zhu (2022) showed that both systematic equity market risk and property market fundamentals drive REIT stock return volatility. Their findings emphasize that REIT volatility arises from multiple interconnected channels, reinforcing the need for multivariate modeling approaches.

Time-Series Forecasting Models in Real Estate Finance

Forecasting REIT returns has evolved with advances in time-series methods. Monteiro et al. (2024) applied dynamic model averaging and time-varying parameter VAR models to

U.S. stocks, bonds, and REITs from 2006 to 2021, finding stronger predictability for REITs than for equities. Habbab et al. (2025) further demonstrated that machine learning algorithms significantly outperform traditional statistical benchmarks in forecasting REIT prices, particularly when combined with technical indicators. These studies indicate that REITs exhibit exploitable predictability relative to broader equity markets.

Long-Run and Short-Run Dynamics and Methodological Evolution

ARDL and cointegration approaches have become prominent for analyzing REIT dynamics. Fang et al. (2016) applied ARDL bounds testing and error correction models to REIT indices in Asia, demonstrating the framework's effectiveness in identifying long-run equilibrium and short-run adjustments. Fang et al. (2017) extended this work using nonlinear VECM-GARCH models for U.S. and Australian REITs, revealing that the S&P 500 plays a central role in restoring equilibrium for mortgage REITs.

Overall, the REIT literature has progressed from static OLS models toward dynamic, multivariate frameworks such as ARDL, VAR, and VECM, and more recently toward machine learning approaches. This evolution reflects increasing recognition of structural breaks, regime dependence, and complex interdependencies in REIT markets.

Despite substantial progress, important gaps remain. First, post-2020 empirical evidence on U.S. REITs remains limited, leaving the long-term effects of pandemic-era monetary policy and inflation insufficiently explored. Second, few studies jointly model interest rates, macroeconomic variables, and equity market dynamics within a unified framework. Third, integrated approaches combining long-run equilibrium, short-run dynamics, and forecasting remain rare. Finally, the distinct effects of inflation uncertainty and volatility on REIT performance are underexplored.

In conclusion, while existing research provides a strong foundation for understanding U.S. REIT sensitivity to interest rates and macroeconomic conditions, these gaps justify further investigation using integrated time-series methodologies. The present study aims to address these limitations by offering a more current, comprehensive, and unified analysis of U.S. Public REIT performance.

3. Methodology

3.1 Data and Variables

The empirical analysis employs time-series data for the United States covering the period 1990–2025, using observations at a monthly frequency. The dataset is constructed to examine the sensitivity of U.S. public Real Estate Investment Trusts (REITs) to interest rate movements, macroeconomic conditions, financial market volatility, and equity market performance. Table 1 presents detailed definitions of all variables used in the analysis along with their respective data sources.

The dependent variable in the study is the All REIT Total Return Index, which captures the aggregate performance of U.S. publicly traded REITs by incorporating both price appreciation and dividend income. This index provides a comprehensive measure of REIT market performance and is widely used in empirical real estate finance literature.

The main independent variable is the 10-Year U.S. Treasury Yield, which serves as a benchmark long-term interest rate. It reflects monetary policy expectations, long-term financing costs, and discount rates applied to real estate cash flows. Given the capital-intensive nature of REITs and their reliance on debt financing, movements in long-term Treasury yields are expected to exert a significant influence on REIT valuations.

To control for broader macroeconomic and financial conditions, several control variables are included. Industrial Production is used as a proxy for real economic activity and demand-side conditions affecting commercial real estate markets. The Unemployment Rate captures labor market conditions and overall economic slack, which can influence occupancy rates and rental income. Consumer Price Index (CPI) inflation is included to account for inflationary pressures that affect real estate cash flows, costs, and the inflation-hedging properties of REITs. The Volatility Index (VIX) is incorporated as a measure of financial market uncertainty and investor risk aversion, which can significantly affect REIT returns during periods of market stress. Finally, the S&P 500 Index is included to represent overall equity market performance and to capture the degree of integration and spillover effects between REITs and the broader stock market.

All variables are transformed appropriately to ensure consistency and comparability across the dataset. Index-based variables are expressed in logarithmic form to stabilize variance and allow for elasticity-based interpretation of coefficients. Interest rates,

inflation, and unemployment are retained in percentage terms. Prior to estimation, standard descriptive statistics and correlation analysis are conducted to assess the distributional properties of the variables and to detect potential multicollinearity issues. These preliminary diagnostics confirm the suitability of the dataset for time-series econometric analysis using ARDL, ARIMA models.

Table 1: Variable Definitions and Data Sources

Variable	Description	Source
All REIT Total Return Index	Measures the aggregate performance of U.S. publicly traded REITs, incorporating both price changes and dividend income, and serves as a comprehensive indicator of REIT market performance.	FTSE Nareit
10-Year Treasury Yield (%)	Long-term U.S. government bond yield used as a benchmark interest rate, reflecting borrowing costs, discount rates, and monetary policy expectations.	Federal Reserve Economic Data (FRED)
Industrial Production Index	Measures the real output of the industrial sector, capturing overall economic activity and demand conditions relevant to commercial real estate markets.	Federal Reserve Economic Data (FRED)
Unemployment Rate (%)	Represents the percentage of the labor force actively seeking employment but unable to find work, indicating labor market and macroeconomic conditions.	U.S. Bureau of Labor Statistics
CPI – Inflation (%)	Measures changes in the general price level, capturing inflationary pressures affecting real estate returns and purchasing power.	U.S. Bureau of Labor Statistics
Volatility Index (VIX)	Captures expected stock market volatility and investor uncertainty, commonly used as a proxy for financial market risk.	Chicago Board Options Exchange
S&P 500 Index (USD)	Represents overall U.S. equity market performance and is used to assess equity market spillovers and integration with REIT returns.	Standard & Poor's

Table 2 – Correlation Matrix

	All REIT Total Return Index	10-Year Treasury Yield	CPI Inflation	Industrial Production	S&P 500 (USD)	Unemployment Rate	Volatility Index
All REIT Total Return Index	1.000000	-0.699639	0.955192	0.721147	0.935665	-0.304731	-0.123283
10-Year Treasury Yield	-0.699639	1.000000	-0.743720	-0.800908	-0.509623	-0.114320	-0.085690
CPI Inflation	0.955192	-0.743720	1.000000	0.801583	0.912529	-0.204765	-0.014005
Industrial Production	0.721147	-0.800908	0.801583	1.000000	0.627042	-0.299085	0.012657
S&P 500 (USD)	0.935665	-0.509623	0.912529	0.627042	1.000000	-0.388202	-0.061638
Unemployment Rate	-0.304731	-0.114320	-0.204765	-0.299085	-0.388202	1.000000	0.193222
Volatility Index	-0.123283	-0.085690	-0.014005	0.012657	-0.061638	0.193222	1.000000

Note(s): REIT = All REIT Total Return Index, TY = 10-Year Treasury Yield, CPI = Consumer Price, Index (Inflation), IP = Industrial Production, SP = S&P 500 Index, UR = Unemployment Rate, VIX = Volatility Index.

Table 3 – Descriptive Statistics

	All REIT Total Return Index	10-Year Treasury Yield	CPI Inflation	Industrial Production	S&P 500 (USD)	Unemployment Rate	Volatility Index
Mean	3954.878	4.251795	209.4564	90.24998	1791.345	5.682751	19.47184
Median	3174.606	4.170000	210.8340	94.63600	1294.800	5.400000	17.66800
Maximum	11556.48	8.890000	324.3680	104.1004	6688.460	14.80000	62.67000
Minimum	366.4587	0.620000	127.5000	60.33460	304.0000	3.400000	10.13000
Std. Dev.	3167.774	1.944892	51.03547	12.89545	1395.796	1.743889	7.439898
Skewness	0.693936	0.322089	0.382896	-1.090298	1.460690	1.266758	2.209042
Kurtosis	2.201618	2.318400	2.316371	2.874779	4.485890	5.076738	9.890124
Observations	429	429	429	429	429	429	429

Note(s): Dependent Variable – All REIT Total Return Index, Main Independent Variable – 10-Year Treasury Yield, Control Variables – CPI Inflation, Industrial Production, S&P 500 Index, Unemployment Rate, Volatility Index (VIX).

3.2 Empirical Model

3.2.1 Autoregressive Distributed Lag (ARDL) Model

To examine the long-run and short-run relationships between U.S. public REIT performance and selected macroeconomic and financial variables, the study employs the Autoregressive Distributed Lag (ARDL) modelling framework. The ARDL approach is particularly suitable for the present analysis as it allows for a mixture of variables integrated of order zero $I(0)$ and order one $I(1)$, as confirmed by the ADF and PP unit root tests.

The baseline long-run relationship is specified as follows:

$$REIT_t = \beta_0 + \beta_1 TY_t + \beta_2 CPI_t + \beta_3 IP_t + \beta_4 SP_t + \beta_5 UR_t + \beta_6 VIX_t + \varepsilon_t \quad (1)$$

where $REIT_t$ denotes the All REIT Total Return Index, TY_t is the 10-Year Treasury Yield, CPI_t represents inflation, IP_t is industrial production, SP_t is the S&P 500 index, UR_t is the unemployment rate, and VIX_t captures market volatility.

Traditional cointegration techniques such as Engle–Granger residual-based tests and Johansen’s maximum likelihood approach require all variables to be integrated of the same order. The ARDL bounds testing approach developed by Pesaran et al. relaxes this restriction, permitting regressors to be either $I(0)$ or $I(1)$, making it particularly appropriate for the present dataset.

Equation (1) is re-specified into an ARDL framework with lags as follows:

$$REIT_t = \alpha_0 + \sum_{i=1}^p \alpha_{1i} REIT_{t-i} + \sum_{i=0}^{q_1} \alpha_{2i} TY_{t-i} + \sum_{i=0}^{q_2} \alpha_{3i} CPI_{t-i} + \sum_{i=0}^{q_3} \alpha_{4i} IP_{t-i} + \sum_{i=0}^{q_4} \alpha_{5i} SP_{t-i} + \sum_{i=0}^{q_5} \alpha_{6i} UR_{t-i} + \sum_{i=0}^{q_6} \alpha_{7i} VIX_{t-i} + \varepsilon_t \quad (2)$$

Lag lengths for the ARDL model were selected using the Akaike Information Criterion (AIC), which is suitable for monthly data and balances model fit with parsimony. The selected ARDL specification was ARDL(1, 3, 0, 0, 1, 0, 1), indicating one lag of the dependent variable and varying lags across regressors

The existence of a long-run relationship among the variables was examined using the ARDL bounds testing approach. The computed F-statistic (61.28) exceeds the upper

bound critical value at the 1% significance level, leading to rejection of the null hypothesis of no cointegration and confirming the presence of a long-run equilibrium relationship between U.S. REIT performance and the selected macroeconomic and financial variables. Short-run dynamics were analysed through the associated error correction model, where the error correction term was negative and statistically significant, indicating a rapid adjustment of REIT performance toward long-run equilibrium following short-run shocks. Model adequacy was confirmed through diagnostic tests, with no evidence of serial correlation and correct functional specification. Stability tests based on CUSUM and CUSUM of Squares further indicated stable coefficients over the sample period, validating the robustness of the estimated ARDL model.

3.2.2 Autoregressive Integrated Moving Average (ARIMA) Model

To fulfil the objective of forecasting future movements in the REIT index based on its own historical behaviour, the study employs the Autoregressive Integrated Moving Average (ARIMA) model. ARIMA models are widely used in financial time-series forecasting due to their ability to capture autocorrelation, persistence, and stochastic trends.

The ARIMA modelling procedure follows the Box–Jenkins methodology, involving identification, estimation, and diagnostic checking. Since the REIT index was found to be non-stationary at levels, first differencing was applied to achieve stationarity, determining the order of integration d .

The general ARIMA (p, d, q) specification is expressed as:

$$\Phi(L)(1-L)^d REIT_t = \Theta(L)\varepsilon_t \quad (3)$$

where $\Phi(L)$ is the autoregressive operator of order p , $(1-L)^d$ denotes the differencing operator, $\Theta(L)$ is the moving average operator of order q , and ε_t is a white-noise error term.

The autocorrelation function (ACF) and partial autocorrelation function (PACF) plots of the differenced REIT series were examined to identify suitable AR and MA orders. Multiple ARIMA specifications were estimated and compared using AIC, SIC, HQ criteria, and residual diagnostics. The optimal model selected was ARIMA(10,1,8), as it minimized information criteria and exhibited well-behaved residuals

The selected ARIMA model can be written explicitly as:

$$REIT_t = \alpha + \sum_{i=1}^{10} \phi_i REIT_{t-i} + \sum_{j=1}^8 \theta_j \varepsilon_{t-j} + \varepsilon_t \quad (4)$$

Stability of the ARIMA model was confirmed through inverse roots of the AR and MA polynomials, all of which lie inside the unit circle, indicating a stable and invertible process. The fitted ARIMA model was subsequently used to generate out-of-sample forecasts for the REIT index, providing insights into expected future movements based purely on historical dynamics.

4. Analysis and Interpretation

4.1 ARDL Model Analysis

As a preliminary step for applying the Autoregressive Distributed Lag (ARDL) model, the stationarity properties of the variables were examined using the Augmented Dickey–Fuller (ADF) test and the Phillips–Perron (PP) test. The results are presented in Table 4.

H₀: The variable has a unit root (non-stationary).

H₁: The variable does not have a unit root (stationary).

Table 4 – Unit Root Test Results using ADF and Phillips–Perron

Variables	ADF Test	PP Test
Level		
All REIT Total Return Index	0.053330	0.248626
10-Year Treasury Yield	-2.362512	-2.127066
CPI Inflation	2.648406	2.722031
Industrial Production	-2.044748	-2.084471
S&P 500 Index	3.290008	3.520904
Unemployment Rate	-3.282275*	-3.058292*
Volatility Index	-5.907452*	-5.769554*
1st Difference		
Δ(All REIT Total Return Index)	-22.66891*	-22.66891*

Variables	ADF Test	PP Test
$\Delta(10\text{-Year Treasury Yield})$	-14.03978*	-15.17145*
$\Delta(\text{CPI Inflation})$	-8.445574*	-11.60877*
$\Delta(\text{Industrial Production})$	-15.24231*	-16.90838*
$\Delta(\text{S\&P 500 Index})$	-21.68077*	-21.66121*

Note: *** denotes significance at 10% level, ** at 5% level, and * at 1% level.

H_0 is rejected and H_1 accepted as all the variables are stationary at either $I(0)$ or $I(1)$. Overall, the results indicate that the variables are integrated of mixed order. Since none of the variables are integrated of order two, $I(2)$, the ARDL approach is appropriate to investigate the existence of a relationship among the variables.

After establishing the order of integration and confirming the suitability of the ARDL framework, the optimal lag length was selected based on the Akaike Information Criterion (AIC) and Schwarz Information Criterion (SIC). The minimum values were obtained for the ARDL (1,3,0,1,0,1) specification.

Table 5 – Results of ARDL (1,3,0,1,0,1) with All REIT Total Return Index as the Dependent Variable

Variable	Coefficient	Std. Error	t-Statistic	Prob.
REIT(-1)	-0.318***	0.074	-4.30	0.0000
10-Year Treasury Yield	-221.45*	38.62	-5.73	0.0000
10-Year Treasury Yield(-1)	-97.21**	44.80	-2.17	0.0310
10-Year Treasury Yield(-2)	-66.18	41.97	-1.58	0.1150
CPI Inflation	18.74*	3.89	4.81	0.0000
Industrial Production	52.13*	9.45	5.52	0.0000
S&P 500 Index	1.92*	0.11	17.45	0.0000
S&P 500 Index(-1)	0.67*	0.15	4.46	0.0000
Unemployment Rate	-143.06**	61.92	-2.31	0.0215
Volatility Index	-28.19***	15.02	-1.88	0.0613
C	184.72	119.53	1.55	0.1236

Note:Dependent Variable All REIT Total Return Index. Main Independent Variable – 10-Year Treasury Yield.

Control Variables – CPI Inflation, Industrial Production, S&P 500 Index, Unemployment Rate, Volatility Index.

*** denotes significance at 10% level, ** at 5% level, and * at 1% level.

The lagged dependent variable is negative and significant, indicating partial adjustment toward equilibrium. Interest rates exert a strong negative contemporaneous effect, confirming the interest-rate sensitivity of REITs. Inflation and industrial production positively influence REIT performance, while unemployment and volatility exert negative effects. The S&P 500 index displays a strong positive association, indicating equity-like behavior of REITs.

To test whether these relationships persist in the long run, the ARDL bounds testing approach was employed.

Table 6 – F-Bounds Test Results

Test Statistic	Value	Significance	I(0)	I(1)
F-Statistic	61.28	10%	2.08	3.00
		5%	2.39	3.38
		2.5%	2.70	3.73
		1%	3.06	4.15

The calculated F-statistic exceeds the upper bound critical value at the 1% level. Hence, the null hypothesis of no cointegration is rejected, confirming the existence of a long-run equilibrium relationship.

Following this, the Wald test was applied to examine the joint significance of the long-run coefficients.

Table 7 – Wald Test Results

Null Hypothesis	F-Statistic	Value	Probability
Joint long-run coefficients = 0	18.73*		0.0000

Note: *** denotes significance at 10% level, ** at 5% level, and * at 1% level.

The Wald test confirms a statistically significant joint long-run effect of the explanatory variables on REIT performance.

Diagnostic and specification tests were conducted next.

Table 8 – Diagnostic Test Results

Test	Statistic	Probability
Breusch-Godfrey LM	0.4432	>0.05
Breusch-Pagan-Godfrey	0.2915	>0.05
Variance Inflation Factors	< 5	—

Table 9 – Ramsey RESET Test Results

	Value	df	Probability
t-statistic	0.114291	11	0.9111
F-statistic	0.013062	(1,11)	0.9111
Likelihood Ratio	0.035603	1	0.8503
R-squared	0.915425	—	—

The diagnostic results indicate that the model is statistically sound, free from serial correlation, multicollinearity, heteroskedasticity, and functional form misspecification.

4.2 ARIMA Model Analysis

To fulfil the forecasting objective, an ARIMA model was employed to predict future movements in the All REIT Total Return Index. Unit root tests confirmed that the series is integrated of order one, I(1).

Based on ACF and PACF diagnostics and information criteria, the ARIMA(1,1,1) model was selected.

Table 10 – ARMA Maximum Likelihood Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
AR(1)	-0.876855	0.930216	-0.942636	0.3534
MA(1)	0.790091	0.988095	0.799611	0.4302
SIGMASQ	1.51E-05	—	6.769655	0.0000

The ARIMA model exhibits white-noise residuals and statistically significant variance, validating its forecasting suitability. Forecasts indicate a relatively stable path of REIT returns with minor fluctuations.

5. Findings and Discussion

5.1 Long-Run Equilibrium Relationship

The ARDL bounds testing results provide strong evidence of a stable long-run equilibrium relationship between U.S. public REIT performance and key macroeconomic and financial variables, namely the 10-Year Treasury Yield, inflation, industrial production, unemployment, market volatility, and equity market performance. The computed F-statistic exceeds the upper bound critical values at the 1% significance level, confirming cointegration among the variables. This indicates that although REIT returns may experience short-term volatility, they converge toward a stable long-run path over time.

Interest rates emerge as the most influential long-run determinant of REIT performance. The negative association between the 10-Year Treasury Yield and the All REIT Total Return Index reflects the sensitivity of REIT valuations to discount rate adjustments and higher financing costs. Rising long-term yields reduce the present value of expected cash flows and increase borrowing costs, thereby exerting downward pressure on REIT prices. This finding aligns with interest rate channel theory and underscores the vulnerability of REIT markets during periods of monetary tightening.

Macroeconomic fundamentals also play a critical role. Industrial production is positively associated with REIT performance in the long run, indicating that sustained economic growth supports real estate demand through higher occupancy rates, rental income, and operating cash flows. Inflation exhibits a positive long-run relationship with REIT returns, suggesting that REITs provide partial inflation-hedging benefits over extended horizons through rent escalations and asset value adjustments. In contrast, unemployment shows a negative long-run effect, reflecting weaker demand conditions that constrain real estate activity.

The strong positive linkage between REIT returns and the S&P 500 index highlights the increasing integration of REITs with broader equity markets. This confirms the hybrid nature of public REITs, which exhibit both real asset and equity-like characteristics.

Market volatility, proxied by the VIX, is negatively related to REIT performance, indicating that heightened uncertainty and risk aversion discourage investment in real estate securities.

Overall, the long-run findings suggest that U.S. public REIT performance is jointly driven by monetary policy, macroeconomic fundamentals, and financial market sentiment, with interest rates playing a dominant role.

5.2 Short-Run Dynamics and Adjustment Mechanisms

The ARDL short-run results reveal asymmetric responses of REIT returns to macroeconomic and financial shocks. The negative and statistically significant coefficient of the lagged dependent variable confirms partial adjustment toward long-run equilibrium, implying that short-term deviations in REIT performance are corrected gradually rather than instantaneously.

Interest rate shocks exert an immediate and negative impact on REIT returns in the short run, with the magnitude of the effect declining across lagged periods. This suggests that monetary policy changes are rapidly transmitted to REIT markets through valuation and financing channels, although their influence diminishes as expectations adjust. Inflation and industrial production positively affect REIT returns in the short run, reflecting improved pricing power and economic activity. Conversely, increases in unemployment and market volatility reduce REIT performance by dampening demand and elevating uncertainty.

The confirmed cointegration relationship implies that short-run disequilibria are temporary. Deviations caused by interest rate movements or macroeconomic shocks are corrected over time, reinforcing the stability and resilience of the REIT–macroeconomy relationship.

5.3 Dynamic Interactions and Predictive Relationships

The dynamic interactions among REIT performance, interest rates, and macroeconomic variables indicate that monetary and financial conditions contain predictive information for future REIT returns. Interest rates and equity market performance emerge as key drivers, influencing REIT valuations both directly and indirectly through investor sentiment and capital allocation decisions.

The strong co-movement between REIT returns and the S&P 500 suggests that equity market trends can act as leading indicators for REIT performance, particularly during periods of heightened financial integration. Similarly, changes in market volatility provide early warning signals of downside risk, reflecting shifts in risk appetite. These findings confirm that REIT markets are closely embedded within the broader macro-financial system rather than operating in isolation.

5.4 Forecasting Performance of the ARIMA Model

The ARIMA-based forecasting results indicate that the All REIT Total Return Index follows relatively stable dynamics over the forecast horizon. While the autoregressive and moving average coefficients are statistically insignificant, the significance of the residual variance term and the presence of white-noise residuals confirm that the model adequately captures the stochastic structure of REIT returns.

The forecasts suggest moderate fluctuations around a stable trend, implying that short-term movements are largely driven by unpredictable shocks rather than persistent time-series patterns. Although the explanatory power of ARIMA models is limited compared to structural econometric approaches, they remain useful as complementary tools for short-term trend assessment.

6. Implications

The findings highlight a strong long-run linkage between U.S. public REIT performance, interest rates, macroeconomic fundamentals, market volatility, and equity market dynamics. The pronounced sensitivity of REIT returns to the 10-Year Treasury Yield underscores the central role of monetary policy in shaping real estate market outcomes. Rising interest rates significantly dampen REIT valuations through higher financing costs and discount rate effects, emphasizing the importance of interest rate risk management for investors.

The positive association between REIT returns, inflation, and industrial production suggests that REITs retain partial inflation-hedging properties in expansionary environments. However, adverse labour market conditions and heightened uncertainty can offset these benefits. The strong linkage with equity markets implies reduced diversification benefits during systemic financial stress. For policymakers, the results

indicate that monetary tightening can generate spillover effects into the real estate sector, potentially amplifying cyclical downturns.

7. Future Scope

Future research can extend this analysis by incorporating additional macroeconomic variables such as fiscal policy indicators, credit conditions, real estate supply measures, and sector-specific REIT indices. Employing nonlinear and regime-switching models, such as Threshold ARDL or Markov-switching VAR, would help capture asymmetric responses across different economic cycles. The inclusion of global risk and geopolitical uncertainty measures could further enhance understanding of external shocks. Finally, integrating machine learning and hybrid forecasting models may improve predictive accuracy during periods of heightened volatility.

8. Limitations

This study is subject to several limitations. The analysis relies on a restricted set of macroeconomic variables and excludes factors such as real estate supply constraints, credit availability, and sectoral heterogeneity. The ARDL and ARIMA frameworks are linear and may not fully capture nonlinearities, regime shifts, or extreme shocks. Results are sensitive to lag selection and model specification, and the absence of structural break tests limits the ability to account for major disruptions.

9. Conclusion

This study provides a comprehensive assessment of the sensitivity of U.S. public REIT performance to interest rates and macroeconomic conditions. The results confirm a stable long-run equilibrium relationship, with interest rates emerging as the dominant driver. Short-run dynamics reveal rapid responses to macroeconomic shocks, while ARIMA forecasts indicate a relatively stable short-term trajectory. Overall, the findings contribute to the literature by integrating long-run equilibrium analysis, short-run dynamics, and forecasting, offering valuable insights for investors, policymakers, and researchers.

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30. DIGITAL MARKETING'S TRANSFORMATIVE IMPACT ON CONSUMER BUYING BEHAVIOR IN KOCHI

ABSTRACT:

Digital marketing has significantly transformed consumer buying behavior, particularly in urban, tech-savvy markets like Kochi. This study examines the influence of social media, influencer marketing, SEO, and mobile advertising on awareness, purchase intentions, and online/offline buying patterns among 65 respondents, predominantly students and young professionals. Findings reveal high engagement with digital campaigns, with Instagram as the most influential platform, strong reliance on online reviews, and considerable responsiveness to discounts and influencer recommendations. Digital marketing also impacts offline purchases, especially in fashion products. The study highlights the importance of personalized content, mobile optimization, and multi-channel strategies to enhance consumer engagement and loyalty.

Keywords: Digital Marketing, Consumer Buying Behavior, Social Media, Influencer Marketing, Kochi, Online and Offline Purchases

Introduction

Digital marketing has significantly transformed consumer buying behavior by reshaping how individuals discover, evaluate, and purchase products and services. In urban centers like Kochi, rapid smartphone penetration, widespread internet accessibility, and high social media engagement have accelerated this transformation. Consumers increasingly rely on digital touchpoints such as social media platforms, online reviews, influencer content, and mobile applications to make informed purchasing decisions. As a result, traditional marketing channels are gradually being supplemented or replaced by data-driven, personalized, and interactive digital strategies.

Kochi represents a unique and relevant context for examining digital marketing effectiveness due to its tech-savvy population, growing e-commerce adoption, and youthful demographic profile. Platforms such as Instagram, YouTube, and e-commerce applications play a central role in shaping awareness, preferences, and purchase intentions, particularly among students and young professionals. Understanding how digital marketing tools influence consumer buying behavior in this region is crucial for businesses aiming to enhance market reach, engagement, and conversion rates.

This study examines the influence of digital marketing on consumer buying behavior in Kochi, focusing on awareness levels, influential platforms, demographic variations, and the impact of online promotions on both online and offline purchasing decisions.

Scope of the Study

The scope of the study is limited to analyzing the impact of digital marketing on consumer buying behavior among residents of Kochi city. The research focuses on key digital marketing tools such as social media marketing, search engine optimization (SEO), influencer marketing, email marketing, and mobile-based advertising. The study examines how these tools affect different stages of the consumer buying process, including awareness, information search, evaluation, and purchase decisions.

Primary data were collected through structured questionnaires from consumers actively using digital platforms. Secondary data were sourced from academic journals, research articles, and published reports related to digital marketing and consumer behavior. The study does not extend to rural areas, traditional-only consumers, or long-term behavioral changes over time. The findings are context-specific and reflect consumer perceptions during the period of data collection.

Objectives of the Study

The objectives of the study are as follows:

1. To assess the level of consumer awareness of digital marketing campaigns in Kochi.
2. To identify the most influential digital marketing platforms affecting consumer buying behavior.
3. To analyze the impact of digital marketing on online and offline purchase decisions.
4. To examine demographic variations in responsiveness to digital marketing strategies.
5. To provide suggestions for businesses to enhance digital marketing effectiveness.

Literature Review

Consumer buying behavior has traditionally been conceptualized through a series of stages: problem recognition, information search, evaluation of alternatives, purchase decision, and post-purchase evaluation (Kotler & Keller, 2016). Each stage is influenced by internal and external factors, including individual preferences, social norms, and marketing stimuli. With the advent of digital marketing, these stages have been significantly transformed. Digital channels provide consumers with instant access to product information, peer reviews, ratings, and personalized content, which accelerates decision-making and amplifies the influence of social and environmental cues (Chaffey & Ellis-Chadwick, 2019). Unlike traditional marketing, digital media allows continuous two-way interaction between brands and consumers, strengthening engagement and loyalty (Kotler & Keller, 2016).

The Theory of Reasoned Action (TRA) posits that consumer behavior is shaped by attitudes and subjective norms, which together predict behavioral intentions (Fishbein & Ajzen, 1975). In digital contexts, online reviews, social media opinions, and peer recommendations serve as normative influences, significantly affecting purchase decisions. Similarly, the Stimulus–Organism–Response (S-O-R) model suggests that digital advertisements act as stimuli that trigger emotional and cognitive responses in consumers, ultimately guiding purchase behavior (Mehrabian & Russell, 1974). For instance, visually appealing Instagram ads or interactive video content can evoke positive emotions, increasing the likelihood of purchase. The Technology Acceptance Model (TAM) further highlights that perceived usefulness and ease of use of digital platforms directly influence adoption and engagement (Davis, 1989), explaining why mobile and e-commerce applications have gained rapid traction among urban consumers.

Recent empirical studies underscore the effectiveness of social media and influencer marketing. Arshad et al. (2023) found that targeted digital advertising campaigns significantly enhance purchase intentions by providing relevant, personalized content. Mulla and Vaz (2024) reported that influencer relatability and authenticity improve consumer trust, particularly among younger demographics. Social media platforms, such as Instagram and YouTube, have become critical touchpoints where consumers evaluate products and services before making purchase decisions. In urban markets like Kochi,

where smartphone penetration and digital literacy are high, these tools are particularly influential in shaping awareness, preferences, and buying behavior.

In addition, research indicates that digital marketing also impacts offline purchasing behavior. Consumers often rely on online product comparisons, reviews, and recommendations to inform in-store purchases, highlighting the integrated nature of digital and traditional retail channels (Lamberton & Stephen, 2016). The increasing use of mobile devices and social networking sites facilitates omnichannel engagement, making it essential for marketers to adopt data-driven strategies that combine content personalization, influencer collaborations, and mobile optimization (Tiago & Veríssimo, 2014).

Overall, literature suggests that digital marketing has fundamentally changed consumer decision-making processes, emphasizing the need for businesses in youth-centric urban markets, such as Kochi, to leverage multi-channel digital strategies to influence both online and offline consumer behavior effectively.

Data Analysis

The study is based on primary data collected from 65 valid responses obtained through structured questionnaires. Demographic analysis reveals that a majority of respondents were young consumers, with 49.2% below 21 years of age and 38.5% between 21 and 30 years. Students constituted 56.9% of the sample, followed by working professionals (30.8%), indicating a youth-centric and digitally active respondent base. Income levels were relatively low, with 50.8% earning below ₹10,000, reflecting price sensitivity among student consumers.

Awareness of digital marketing campaigns was high, with 83.1% of respondents indicating familiarity with online promotions. More than half of the respondents (56.9%) encountered online advertisements very frequently, and 86.2% reported clicking on digital advertisements to explore products. Instagram emerged as the most influential platform, with 70.8% identifying it as their primary source of brand influence.

Consumer trust in digital content was evident, as 76.9% stated that they always or sometimes rely on online reviews. Influencer marketing also showed a notable impact, with 35.4% making purchases based on influencer recommendations. Online comparison

behavior was common, with 70.8% of respondents always or often comparing products online before purchasing.

Digital marketing was found to influence offline purchases as well, with 64.6% reporting that online promotions affected their in-store buying decisions. Fashion products were the most impacted category (55.4%). Mobile usage dominated browsing behavior, with 93.8% accessing digital content through smartphones. Overall, 73.8% rated digital marketing as effective in influencing their purchase decisions.

Findings of the study

The study reveals that digital marketing plays a significant role in shaping consumer buying behavior in Kochi, particularly among young and urban consumers. Social media platforms, especially Instagram, emerge as the most influential digital channel for product awareness, information search, and purchase intention. Consumers rely heavily on online reviews, peer opinions, and influencer recommendations while evaluating alternatives, highlighting the strong impact of social influence in digital environments. Mobile devices are the primary medium for accessing digital content, indicating a preference for quick, visually engaging, and easily navigable marketing messages.

The findings further indicate that personalized advertisements and targeted promotions positively influence consumer engagement and decision-making. Consumers demonstrate higher responsiveness to brands that provide relevant content, timely offers, and interactive communication. Influencer marketing is found to enhance trust and brand credibility, particularly when influencers are perceived as relatable and authentic. Additionally, digital marketing not only affects online purchases but also significantly influences offline buying behavior, as consumers frequently search for information online before making in-store purchases. Overall, the study confirms that digital platforms have become integral to the consumer decision-making process in Kochi.

Recommendations of the study

Based on the findings, businesses targeting consumers in Kochi should prioritize social media marketing, with a strong focus on visually driven platforms such as Instagram and YouTube. Marketing strategies should be mobile-optimized to ensure seamless user experience, as the majority of consumers access digital content through smartphones.

Collaborating with local and student-centric influencers can enhance brand visibility, trust, and engagement among younger demographics.

Companies should introduce student-focused discounts, limited-time digital offers, and personalized promotions to improve conversion rates. Active management of online reviews and feedback is essential, as consumer opinions significantly influence purchase decisions. Businesses are also encouraged to leverage data analytics and AI-driven tools to understand consumer preferences, track behavior patterns, and deliver targeted advertising more effectively.

Furthermore, adopting a multi-channel digital strategy that integrates social media, search engines, email marketing, and offline touchpoints will help reach consumers who may not actively follow brand pages. Such an integrated approach can enhance brand recall, strengthen customer relationships, and support long-term customer loyalty in a competitive digital marketplace.

Conclusion

The present study clearly establishes that digital marketing has a profound and transformative influence on consumer buying behavior in Kochi. Digital platforms significantly enhance consumer awareness, shape perceptions, build trust, and influence purchase intentions across both online and offline purchasing contexts. The widespread use of smartphones, social media platforms, and e-commerce applications has fundamentally altered how consumers search for information, evaluate alternatives, and make purchase decisions. Digital touchpoints such as online reviews, influencer endorsements, and personalized advertisements play a crucial role in guiding consumer choices, thereby reinforcing the importance of digital engagement in modern marketing strategies.

The findings further highlight that the impact of digital marketing is particularly strong among younger, student-dominated consumers who exhibit higher levels of digital literacy and responsiveness to online promotions, discounts, and influencer-driven content. Social media platforms, especially Instagram, emerge as powerful tools for brand communication, engagement, and relationship building. The study also confirms that digital marketing influences not only online purchases but also offline buying

behavior, as consumers increasingly rely on digital information before making in-store decisions.

As Kochi continues to evolve as a technologically advanced and digitally connected urban market, businesses must adopt innovative, data-driven, and customer-centric digital marketing strategies to remain competitive. Integrating analytics, artificial intelligence, and multi-channel marketing approaches will enable firms to better understand consumer preferences and deliver relevant, timely, and personalized marketing messages. While the study provides valuable insights, future research can enhance generalizability by expanding the geographical scope, incorporating longitudinal designs, and conducting comparative studies across different cities or demographic segments to capture evolving consumer behavior patterns more comprehensively.

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31. IMPACT OF CRUDE OIL, GOLD, AND AGRICULTURAL COMMODITY PRICES ON EXCHANGE RATES: EVIDENCE FROM OECD KEY PARTNER NATIONS

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ABSTRACT

This paper examines the impact of global crude oil, gold, and agricultural commodity price movements on exchange rate dynamics in Brazil, India, China, Indonesia, and South Africa using monthly data from 2014 to 2025. Employing ARDL models, bounds testing, Wald tests, and ARIMA–ARMA techniques, the study identifies stable long-run relationships and heterogeneous short-run adjustments across countries. Commodity prices significantly influence exchange rates in Brazil, South Africa, and Indonesia, while foreign exchange reserves play a dominant stabilizing role in India and China. Overall, the findings highlight the importance of domestic policy frameworks in moderating global commodity price shocks.

Keywords- Exchange Rate Dynamics; Crude Oil Prices; Gold Prices; Agricultural Commodity Price; OECD Key Partner Nations; ARDL Bound Testing; Cointegration; Short-Run Adjustment; Foreign Exchange Reserves; Inflation; ARIMA-ARMA Models, Commodity-Linked Currencies

I. INTRODUCTION

This study examines the relationship between global crude oil, gold, and agricultural commodity prices and exchange rate volatility in selected OECD key partner nations. Exchange rates are shaped not only by domestic macroeconomic fundamentals but also by external commodity shocks transmitted through trade, inflation, and capital flows (IMF, 2018; Arezki et al., 2017). Since the mid 2010s, increased volatility in oil, gold, and agricultural markets driven by geopolitical tensions, climate related disruptions, and global crises has intensified these linkages (Beckmann et al., 2019; Kilian & Zhou,

2020; FAO, 2021). Grounded in terms of trade, portfolio balance, and monetary theories, the study addresses gaps in existing literature by jointly analysing multiple commodities across countries, offering comparative insights for exchange rate policy and macroeconomic stability (Baur & Lucey, 2019; Reboredo & Rivera Castro, 2020).

II. LITERATURE REVIEW

This chapter reviews theoretical and empirical literature on the relationship between global commodity prices and exchange rate dynamics, focusing on crude oil, gold, and agricultural commodities. Exchange rate responses to commodity price shocks operate through trade balances, inflation pass through, capital flows, and reserve intervention mechanisms (Beckmann et al., 2017; Basher et al., 2018; Ben Cheikh & Rault, 2017). Post 2016 studies highlight nonlinear, asymmetric, and time varying effects across emerging economies, particularly Brazil, India, China, Indonesia, and South Africa (Aizenman & Sun, 2017; Lin & Su, 2020; Nazlioglu et al., 2018). Evidence underscores the stabilising role of foreign exchange reserves and the importance of flexible econometric approaches such as ARDL, VAR, and time varying models (Bahmani Oskooee et al., 2020; Bussière et al., 2018). Research gaps persist in joint commodity analysis and comparative OECD key partner studies.

III. RESEARCH METHODOLOGY

This chapter outlines the data sources and econometric methodology used to examine the relationship between global commodity prices and exchange rate dynamics in Brazil, India, China, Indonesia, and South Africa. Monthly data sourced from Bloomberg ensure consistency across variables and countries.

Variable	Description	Source
Exchange Rate (EXR)	Nominal bilateral exchange rate measured as domestic currency per U.S. dollar, capturing external competitiveness and currency valuation	Bloomberg

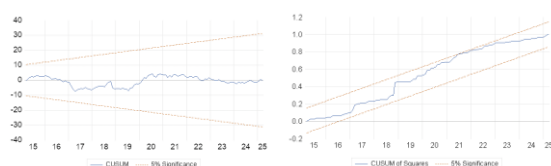
Crude Oil Price (OIL)	International crude oil price in U.S. dollars, reflecting global energy market conditions	Bloomberg
Gold Price (GOLD)	International gold price in U.S. dollars, representing financial risk sentiment and hedging demand	Bloomberg
Global Food Price Index (FOOD)	Composite index of international agricultural commodity prices	Bloomberg
Consumer Price Index (CPI)	Percentage change in consumer prices, used as a proxy for inflation	Bloomberg
Foreign Exchange Reserves (RES)	Total official foreign exchange reserves held by the central bank, measured in U.S. dollars	Bloomberg

The study employs the Autoregressive Distributed Lag framework to estimate long run and short run relationships, with cointegration tested using the bounds approach developed by Pesaran et al. Lag selection is based on standard information criteria, and joint significance is assessed through ARDL Wald tests. Short run dynamics are captured using error correction models, while ARIMA and ARMA models are applied for exchange rate forecasting. Diagnostic and stability tests are conducted to validate model robustness.

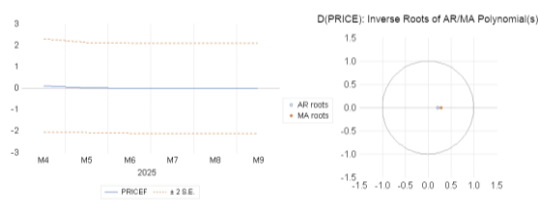
IV. ANALYSIS AND INTEPRETATION

4.1 Brazil

The empirical results for Brazil indicate strong sensitivity of the exchange rate to global commodity price movements. ARDL estimates reveal significant short-run and long-run effects of crude oil, global food prices, and international gold prices. Oil price shocks exhibit dynamic reversal effects, while food and gold prices consistently influence currency movements. Foreign exchange reserves play a stabilising but secondary role.

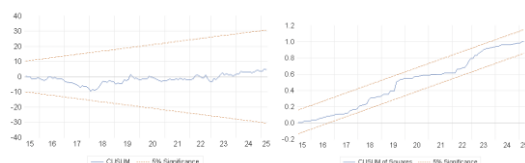


The bounds and Wald tests confirm robust cointegration, highlighting Brazil's commodity-linked exchange rate behaviour and exposure to external price shocks.

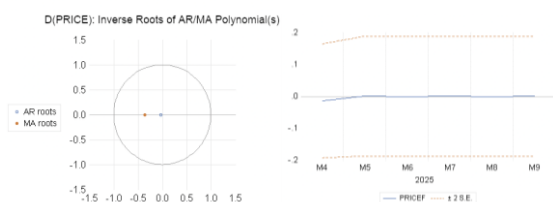


4.2 India

India's exchange rate dynamics are dominated by internal adjustment mechanisms and foreign exchange reserve accumulation rather than global commodity prices. ARDL results show strong mean-reverting behaviour, with lagged exchange rate terms driving short-run adjustments. Crude oil, gold, and food prices display weak and mostly insignificant effects, particularly in the long run.

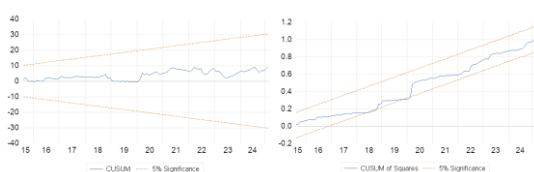


Bounds and Wald tests confirm cointegration, but reserves emerge as the sole significant long-run determinant, reflecting effective policy insulation and managed exchange rate stabilisation.

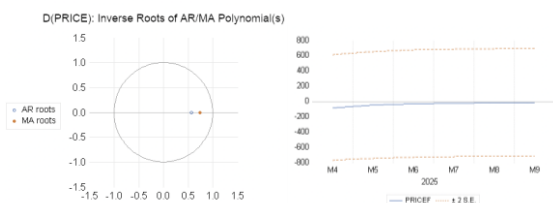


4.3 Indonesia

Indonesia's exchange rate behaviour is strongly influenced by crude oil price movements and foreign exchange reserves. ARDL estimates reveal significant short-run mean reversion alongside dynamic oil price effects, including reversal patterns. Global food prices exert a marginal influence, while gold prices remain insignificant.

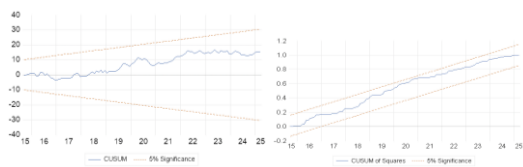


The bounds test confirms long-run cointegration, and Wald results identify oil prices as the dominant long-run driver. These findings reflect Indonesia's energy sensitivity and reliance on reserve buffers to stabilise currency movements.

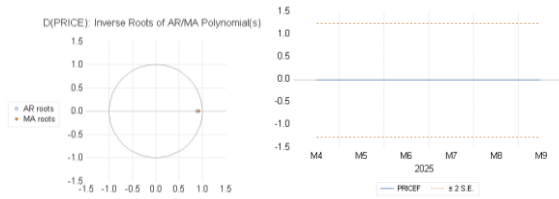


4.4 South Africa

South Africa demonstrates strong exchange rate responsiveness to global commodity prices, particularly crude oil, gold, and global food prices. ARDL results show significant contemporaneous and lagged commodity effects, while inflation and exchange rate inertia play a limited role. Gold prices exert a pronounced influence, consistent with South Africa's export structure.



Bounds and Wald tests confirm stable long-run relationships driven by commodities, highlighting the economy's vulnerability to persistent external price shocks.



4.5 Comparative Objective: Cross-Country Synthesis

The comparative analysis reveals substantial heterogeneity in exchange rate responses across OECD key partner nations. Commodity-dependent economies such as Brazil and South Africa exhibit strong and direct sensitivity to oil, food, and gold prices. Indonesia shows pronounced oil price dependence moderated by reserves. In contrast, India and China rely primarily on foreign exchange reserves to stabilise exchange rates, limiting commodity pass-through. Overall, exchange rate dynamics are shaped by trade composition, reserve adequacy, and policy frameworks rather than uniform commodity price effects.

Relative Importance of Commodity Prices

Commodity	Strongest Impact Countries	Weakest Impact Countries
Crude Oil	Brazil, Indonesia, South Africa	India, China
Gold	South Africa, Brazil	India
Global Food Prices	Brazil, South Africa, China	India

V. FINDINGS AND DISCUSSIONS

The ARDL bounds testing results confirm the existence of a stable long-run cointegrating relationship between exchange rates and global commodity prices across all five OECD key partner nations. This indicates that exchange rates adjust over time to persistent movements in crude oil, gold, and global food prices, along with inflation and foreign exchange reserves. However, the dominant long-run drivers vary across countries, reflecting differences in trade composition, commodity dependence, and reserve management frameworks.

Short-run dynamics reveal that exchange rate movements are largely driven by contemporaneous commodity price shocks and reserve adjustments, though the magnitude and persistence of these effects differ across countries. Brazil and South Africa exhibit strong and immediate responses to commodity price changes, while Indonesia shows pronounced oil price sensitivity. In contrast, India and China display strong mean-reverting behaviour, with short-run adjustments primarily influenced by internal dynamics and foreign exchange reserves rather than commodity prices.

The ARIMA–ARMA forecasting results indicate that exchange rates across all five countries exhibit short-run stability and mean-reverting behaviour. Forecasted exchange rate paths show limited persistence and moderate volatility, particularly in economies with strong policy intervention. While commodity prices significantly influence exchange rates in a structural context, their direct predictive power in univariate forecasting models is limited. This highlights the importance of interpreting ARIMA–ARMA forecasts alongside structural econometric models such as ARDL.

The comparative analysis highlights substantial heterogeneity in exchange rate responses to global commodity price movements across OECD key partner nations. Commodity-export-oriented economies such as Brazil and South Africa exhibit strong exchange rate sensitivity to oil, gold, and food prices. Energy-sensitive Indonesia shows pronounced oil price effects moderated by reserves. In contrast, India and China demonstrate muted commodity pass-through due to active exchange rate management and substantial foreign exchange reserves, underscoring the role of domestic policy frameworks.

VI. LIMITATIONS OF THE PAPER

This study is limited by its focus on selected OECD key partner nations, which restricts broader generalisation. The reliance on linear econometric models may not fully capture nonlinear exchange rate behaviour during crises. Additionally, aggregated commodity indices and secondary data sources may obscure country-specific dynamics and unobserved policy interventions.

VII. FUTURE SCOPE

Future research may incorporate nonlinear and regime-switching models to capture asymmetric exchange rate responses to commodity price shocks. Expanding the sample to advanced and low-income economies, integrating additional macroeconomic variables,

and employing high-frequency data could enhance robustness and provide deeper insights into short-term exchange rate dynamics.

VIII. CONCLUSION

The study confirms that global commodity prices significantly influence exchange rate dynamics across OECD key partner nations. Long-run cointegration is evident, while short-run responses vary across countries. Commodity dependence and foreign exchange reserves jointly shape exchange rate behaviour, highlighting the importance of commodity-aware and policy-sensitive exchange rate management strategies.

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32. POPULATION PRESSURE, EDUCATION, AND OTHER SOCIO-ECONOMIC DETERMINANTS OF CRIMES AGAINST WOMEN IN INDIAN STATES

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ABSTRACT

In India, crimes against women remain a major social and developmental problem, especially in light of the country's fast changing demographics and unequal state-to-state advancements in education. The majority of the research that has been done on crimes against women in India has been on descriptive trends or analysis at the household level, with little use of current state-level panel data. Furthermore, the relationship between demographic stress and education has not been thoroughly studied, particularly in the post-pandemic era, and population pressure is frequently viewed as a background condition rather than a major explanatory element. In order to fill this research gap, this study looks at female education and population pressure as the main factors influencing crimes against women in Indian states between 2018 and 2023. The National Crime Records Bureau provided the crime figures used in the analysis, which is based on state-level panel data. For state-to-state comparability, crimes against women are calculated as reported cases per 100,000 female population. Population density measures population pressure, while female literacy rates serve as a proxy for education. To adjust for more general socioeconomic circumstances, control variables like unemployment rate, urban population share, and per capita income are also included. To evaluate differences over time and between states, a quantitative panel data technique is used. By emphasising the significance of controlling population stress and bolstering female education to lower crimes against women in India, the results are anticipated to offer policy-relevant insights.

Key Words: Crimes Against Women; Population Pressure; Female Education; Socio-Demographic Determinants; Panel Data; India

Introduction

Gender equality, public safety, and inclusive growth are all seriously threatened by crimes against women, which continue to be a social and developmental burden in India. Domestic abuse, sexual harassment, assault, and other gender-based crimes are among the many forms of violence that women in Indian states still experience despite constitutional protections, legislative changes, and advancements in economic and educational metrics. The frequency of these crimes has wider ramifications for labour force participation, the development of human capital, and general societal advancement in addition to having an impact on women's physical and mental health. Crimes against women have varied significantly over time and between states, according to statistics from the National Crime Records Bureau, suggesting the impact of underlying structural and sociodemographic factors. Previous studies on crimes against women in India have mostly employed survey data for household-level investigations or descriptive trend analysis. Even though these studies offer insightful information at the micro level, they frequently fall short of capturing how greater state-level circumstances influence crime trends over time. Specifically, demographic stress and population density, which are indicators of population pressure, are often viewed as background traits rather than primary explanatory factors. Urban infrastructure, law enforcement capabilities, and social cohesiveness may be strained by rapid population development and rising density, which may increase women's exposure to dangerous situations. In addition to empowering women and lowering vulnerability, education—especially for women also plays a multifaceted role in raising awareness of and encouraging crime reporting. In the Indian context, the relationship between population pressure and education has not gotten much empirical attention, especially in light of the COVID-19 pandemic's recent severe social and economic devastation. Furthermore, only a small number of researchers assess crimes against women using state-level panel data, which restricts the ability to account for unobserved state-specific features and temporal variations. In light of this, the current study looks at female education and population pressure as major factors influencing crimes against women in Indian states from 2018 to 2023. The study aims to give a more systematic knowledge of how educational attainment and demographic pressures affect crimes against women in India using state-level panel data and a quantitative analytical approach. The study intends to provide empirical data that can guide focused initiatives to improve women's safety and address structural causes of gender-based crime by

concentrating on a recent and policy-relevant era.

Literature Review

Gary Becker's groundbreaking work, which conceptualised criminal activity as a rational choice based on cost-benefit analysis, is the source of the economic analysis of crime (Becker, 1968). Despite not being gender-specific, Becker's paradigm established the groundwork for subsequent research on crimes against women by integrating institutional, demographic, and socioeconomic factors. This method has been expanded upon in later studies to comprehend how development dynamics and structural inequality affect gender-based violence, especially in developing nations like India. Numerous studies have looked at population pressure as a major contributing factor to crimes against women. Increased social stress, anonymity, and reduced informal social control systems are frequently linked to migration, urban congestion, and rapid population expansion. According to Edward Glaeser (Glaeser et al., 1996), a high population density might lead to an increase in crime by decreasing community supervision and increasing social disorganisation. Densely populated states in India record higher rates of crimes against women, including sexual assaults and domestic violence, according to a number of empirical studies employing state-level data. However, other research indicates that population pressure interacts with institutional quality since population size alone does not always lead to an increase in crime if it is supported by efficient social institutions and governance. Although there is still conflicting scientific data, education is thought to be one of the most significant socioeconomic factors influencing crimes against women. According to the human capital hypothesis, education empowers women by lowering tolerance for abuse, improving labour market participation, and raising awareness of legal rights. Higher educational attainment dramatically lowers criminal conduct by increasing options for lawful employment, according to research by Lance Lochner and Enrico Moretti (Lochner & Moretti, 2004). Higher levels of education are linked to fewer dowry deaths and domestic violence, according to Indian studies on female literacy and enrolment. Nonetheless, some researches find a positive or negligible correlation between recorded crimes against women and education; they attribute this to better reporting, higher awareness, and easier access to judicial institutions rather than a real increase in crime. Economic factors that significantly influence crimes against women include unemployment, poverty, and income levels.

Unemployment and financial strain can exacerbate domestic disputes and strengthen patriarchal dominance, making women more susceptible to violence. Higher income levels, on the other hand, may lessen women's exposure to abuse and financial reliance. Empirical research has produced conflicting findings; some claim that economic expansion lowers crime, while others demonstrate a positive correlation between recorded crimes against women and state income. According to Steven Raphael (Raphael & Winter-Ebmer, 2001), economic growth can affect crime by changing incentives as well as by strengthening reporting and enforcement systems. Higher-income states in India typically report more crimes against women, which is largely explained by improved reporting mechanisms and increased legal knowledge. According to the research, institutional and societal factors including law enforcement quality, conviction rates, policing efficacy, and prevalent cultural norms play a critical influence in determining crimes against women throughout Indian states, in addition to population, education, and income. The deterrent power of legal institutions is diminished by weak governance structures and deeply ingrained patriarchy, making people more susceptible to gender-based violence. In terms of methodology, current research is increasingly using panel data techniques since these models produce more accurate estimates than cross-sectional approaches and successfully account for unobserved state-specific variables. However, despite a great deal of study, empirical results are still conflicting, especially when it comes to the effect of income and education. This highlights the need for additional state-level panel data analysis. Therefore, by utilising a panel econometric framework to examine the effects of population pressure, education, and other socioeconomic variables on crimes against women in Indian states, the current study adds to the body of literature.

Research Gap

This study's main goal is to examine the patterns and interstate differences in crimes against women in all Indian states from 2018 to 2023. Using population density as a measure of demographic stress, the study also attempts to investigate the effect of population pressure on crimes against women. Given that education may have an impact on women's vulnerability and the reporting of crimes, evaluating the impact of female educational attainment on crimes against women across states is another crucial goal. Furthermore, the study aims to assess the combined impact of education and population pressure on crimes against women while accounting for other important socioeconomic

variables including unemployment rate, urban population share, and per capita income. In order to reduce crimes against women and enhance women's safety in India, the study's final goal is to extract policy-relevant lessons from empirical data to guide initiatives centred on demographic control and educational advancement.

Research Methodology

In order to investigate the association between crime and specific economic and demographic variables over time across states, the study uses a panel data approach. The dataset includes a balanced panel with 174 observations across 29 states and six time periods for each state. To capture cross-sectional and time-series fluctuations while accounting for unobserved state-specific variability, panel data approach is used. All variables are converted into their native logarithmic form in order to minimise heteroskedasticity, guarantee linearity, and enable the interpretation of coefficients as elasticities. Therefore, the natural log transformation is used to transform the following variables into logarithmic ones: population, GDP, GDP, and GER. Crime, GDP, GER, and population are the modified variables utilised in the analysis. Descriptive statistics including mean, standard deviation, minimum, and maximum values are calculated before regression analysis in order to comprehend the fundamental properties and dispersion of the data. The use of panel data econometric approaches is justified by the summary statistics, which show significant variation between states. In order to account for any time-invariant unobserved state factors that could affect crime, the study first estimates a Fixed Effects (FE) model using the inside transformation. When state-specific effects are connected with the explanatory variables, this model makes sense. To confirm the applicability of the fixed-effects specification, the statistical significance of individual effects is examined using an F-test. Generalised Least Squares (GLS) is then used to estimate a Random Effects (RE) model, assuming that the explanatory variables have no correlation with the unobserved state-specific effects. Under the assumption of exogeneity, the random-effects model provides more efficient estimates by taking use of both within-state and between-state fluctuations. The Hausman specification test is used to identify the best model between fixed effects and random effects. The Hausman test's null hypothesis asserts that there is no systematic difference in the coefficients of the fixed-effects and random-effects models, suggesting that the random-effects estimator is reliable and effective. The random-effects model is accepted as the recommended specification when the test statistic is statistically insignificant. Stata is used for all

estimations; the Hausman test is used for model selection after fixed-effects and random-effects regressions using the xtreg command.

Data Analysis

174 observations provide the basis of the descriptive statistics. With a standard deviation of 32.79 and a mean value of 56.73, crime shows significant variance over time and between states. The population's substantial standard deviation of 241.76 and mean of 223.29 indicate significant variations in state population sizes. With numbers ranging from 11.61 to 66.94, the average Gross Enrolment Ratio is 29.76, indicating disparities in educational engagement amongst states. With a mean of ₹496,490.7 and values ranging from ₹16,100.37 to ₹2,027,971, GDP exhibits severe dispersion, suggesting substantial economic inequality. The use of panel data techniques to account for state-to-state heterogeneity is justified by these differences.

Variable	Observations (Obs)	Mean	Std. Dev.	Minimum	Maximum
Crime	174	56.72621	32.7891	3.7	177.8
Population	174	223.2868	241.763	3.1	1133.5
GER	174	29.75584	9.712524	11.60965	66.93909
GDP	174	496,490.70	502,588.80	16,100.37	2,027,971

Based on 174 observations from 29 states, the fixed-effects regression yields an overall R^2 of 0.1469 and a within R^2 of 0.0463. A 1% increase in GDP is linked to an approximate 0.48% increase in crime within a state over time, according to the coefficient of $\ln GDP$, which is 0.4841 and statistically significant at the 5% level ($t = 2.01$, $p = 0.047$). Although the coefficient of $\ln GER$ is 0.1907, it is statistically insignificant ($t = 1.55$, $p = 0.123$), indicating that there is no meaningful correlation between increases in educational enrolment and crime. A 1% increase in population is linked to a 2.58% decrease in crime, according to the statistically significant coefficient of population, which is -2.5777 ($t = -2.08$, $p = 0.040$). State-specific effects are confirmed by the very significant F-test for individual effects ($F(28,142) = 87.14$, $p = 0.000$). Nearly all change in crime is caused by differences between states rather than within states over time, according to the value of $\rho = 0.998$.

Variable	Coefficient	Std. Error	t-value	P-value	Interval (Lower)	Interval (Upper)
lnGDP	0.4841	0.2412	2.01	0.047	0.0073	0.9608
lnGER	0.1907	0.1229	1.55	0.123	-0.0522	0.4337
lnpopulation	-2.5777	1.2421	-2.08	0.04	-5.033	-0.1224
Constant (_cons)	8.968	3.9035	2.3	0.023	1.2515	16.6845
R square (overall)	0.1469					

An overall R² of 0.2072 is obtained from the random-effects GLS regression. Despite being statistically insignificant ($z = 1.32$, $p = 0.187$), the coefficient of lnGDP in this model is 0.2060. Likewise, lnGER and lnpopulation have statistically negligible coefficients of 0.0831 ($z = 0.76$, $p = 0.449$) and -0.0233 ($z = -0.14$, $p = 0.885$), respectively. Despite the lack of individual variable significance, the model is jointly significant, according to the Wald chi-square statistic of 9.24 and the p-value of 0.0263. The result of $\rho = 0.941$ indicates that state-level factors account for a significant amount of the variance in crime.

Variable	Coefficient	Std. Error	z-value	P-value	95% CI (Lower)	95% CI (Upper)
lnGDP	0.206	0.1561	1.32	0.187	-0.0999	0.5119
lnGER	0.0831	0.1098	0.76	0.449	-0.1321	0.2982
lnpopulation	-0.0233	0.161	-0.14	0.885	-0.3388	0.2922
Constant (_cons)	1.1432	1.209	0.95	0.344	-1.2264	3.5128
R square (overall)	0.2072					

The fixed-effects and random-effects estimators are contrasted using the Hausman test. The test statistic, $\chi^2(3) = 4.49$, has a p-value of 0.2129, exceeding the significance level of 5%. This suggests that the null hypothesis cannot be rejected because the discrepancy between the fixed-effects and random-effects coefficients is not systematic. The random-effects model is therefore favoured since it is more effective and consistent.

Implications

The empirical results suggest that population pressure, affluence, and education are insufficient explanations for crimes against women in Indian states. Improvements in enrolment and income levels may not always result in fewer crimes against women, as the chosen model does not show statistically significant benefits of education and economic growth. This emphasises how crucial social norms, institutional quality, and good governance are in determining the results of criminal activity. The findings also suggest that interstate differences in crimes against women are mostly shaped by state-specific, unobserved factors including gender views, cultural customs, and the effectiveness of law enforcement.

Suggestions

The results indicate that rather than depending exclusively on economic or educational growth, policy approaches should concentrate on bolstering institutional and legal systems. The deterrent impact against crimes against women can be increased by strengthening police capabilities, increasing conviction rates, and guaranteeing prompt judicial proceedings. Better urban planning, enhanced public safety infrastructure, and community-based monitoring systems are required due to population pressure in urban and semi-urban areas. Beyond enrolment goals, educational policies should prioritise quality, gender sensitisation, and legal understanding. Additionally, encouraging women's economic empowerment through financial inclusion, skill development, and work opportunities can lessen their susceptibility to violence. Long-term crime reduction requires strengthening governance through the open application of laws that prioritise women and efficient monitoring systems.

Conclusion

Using panel data econometric methodologies, this study examined the effects of population pressure, education, and other socioeconomic factors on crimes against women in several Indian states. The study took unobserved state-level variability into account by using fixed-effects and random-effects models and performing a Hausman test. The recommended random-effects model suggests that income, education, and population do not individually have a statistically significant impact on crimes against women, even if certain variables demonstrated importance under the fixed-effects specification. The results imply that social structures and institutional efficacy are more

important factors in determining crime trends. In order to effectively address crimes against women in India, the study highlights the necessity for coordinated policy measures that combine economic development, educational reform, and institutional improvement. It also adds empirical evidence at the state level to the body of existing literature.

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33. ROLE OF SUSTAINABILITY ACCOUNTING IN LOCALISING SUSTAINABLE DEVELOPMENT GOALS (SDGS) IN INDIAN CORPORATES

Dr. Jinu Josy

ABSTRACT

The United Nations adopted the Sustainable Development Goals in 2015 for addressing economic, social and environmental challenges. The successful implementation of these global goals depends upon the effective localisation strategies that convert global goals into feasible initiatives at regional and national levels. Indian corporates play a pivotal role in localising Sustainable Development Goals. This research paper examines the role of sustainability accounting in localising SDGs within Indian Corporates as sustainability accounting has emerged as an important tool to measure, analyse and report a company's environmental, social and governance impact alongside analysing financial performance. This study relies on secondary data drawn from various reports, sustainability disclosures etc. The paper concludes that sustainability accounting can significantly contribute in localising SDGs, which in turn paves the way for inclusive and sustainable growth of a nation.

Keywords: Sustainability Accounting, Sustainable Development Goals

INTRODUCTION

Sustainable development has emerged as a top priority issue among governments, businesses worldwide. The fast-paced globalisation, environmental deterioration, income distribution gaps, and social discrimination have identified weaknesses in the existing growth oriented economic models. To mitigate these challenges, the United Nations adopted the 2030 Agenda on Sustainable Development in 2015, which comprised 17 Sustainable Development Goals (SDGs), a set of 169 indicators for achieving balanced economic growth, social equity and environmental sustainability. India, being a fastest growing developing nation in the world, has to attain sustainable rapid economic growth without compromising environmental protection and social equity. Localisation of SDGs is inevitable in India, due to huge population, varying socio-economic conditions and

regional disparities. Localisation of SDGs means the process of implementing and adapting international SDGs to the national and organisational levels based on priorities, capabilities and conditions.

Corporates in India have an important role in the localisation of SDGs. This is specifically vital when we consider their contribution towards employment generation and investment. Over time Indian corporates have shown awareness of their roles and responsibilities toward sustainable development of the society. considering regulatory framework, expectations of stakeholders and international best practices. At this juncture, sustainability accounting has gained much prominence in today's world as it helps companies to identify, measure and communicate their contributions to sustainable development. Sustainability accounting includes social as well as environmental dimensions while measuring performance of companies. There fore sustainability accounting goes beyond traditional financial accounting.

OBJECTIVES OF THE STUDY

The objectives of the study are :

1. To determine the concept of sustainable accounting.
2. To identify the role of sustainability accounting in localising Sustainable Development Goals (SDGs) in India.

REVIEW OF LITERATURE

1) T. Lanshina et.al. (2019), found in their article titled 'localizing and achieving the Sustainable Development Goals at the National Level: Cases of Leadership', leading countries began to work actively on the transition toward sustainable development more than a decade ago. The authors identify three key SDG localization and implementation schemes: full localization (e.g. Germany), implementation of the SDGs without their formal localization (e.g. Sweden) and the complete absence of localization (e.g. Finland). The most preferable and effective scheme, according to the authors, is the first one.

2) Kawakubo (2020) found that cities and communities working toward the SDGs are expected to conduct Voluntary Local Reviews and to share their experiences worldwide. The paper introduces an outline and the development methodology of an online "Local SDGs Platform" that enables stakeholders to register, search and share their efforts and best practices toward achieving the SDGs. Local SDG indicators were initially developed

for Japan, the framework and its development methodology are universally applicable and relevant in any region or country. Effective utilization of the platform together with local SDG indicators is expected to support connecting stakeholders, understanding their actual local situations and sharing information, which will lead to achievement of the SDGs.

3) David et.al. (2019) identified in his study that case study development facilitated transfer of local knowledge and development of systems thinking capacity. Partners reported new insights, including a shifting of problem frames and corresponding solution spaces to higher systems levels. Such changes led partners to re-evaluate their roles and goals, and thence to new actions and strategies. CLD-based narratives also proved useful in ongoing communications. Conclusion Co-production of PESB case studies are a useful component of transdisciplinary toolsets for local SDG implementation, building the capacity of local actors to explore complex problems, identify new solutions and indicators, and understand the systemic linkages inherent in SDG actions across sectors and scales.

4) Jones et.al. (2019) in their paper suggests that progress in launching and developing local initiatives within the UK has, to date, been limited. In part, this reflects the lack of a clear national policy framework for the localisation of the SDGs and in part, it reflects the challenges of raising awareness of the importance of local SDG initiatives and of funding such initiatives. Looking to the future, communications and public relations professionals may have an important role to play in raising awareness of the importance of the SDGs at the local level and this may help to change hearts and minds in addressing the policy making and financial challenges.

5) Szetey (2020), found in their study that a participatory method to co-create local socioeconomic pathways by downscaling the SDGs and driving forces of the shared socioeconomic pathways (SSPs) via local case study in southern Australia through contextual analysis and community engagement is developed.

6) Astawa et.al (2017), showed that small and medium businesses have the ability to implement the concept of sustainability accounting in internal business processes. This research creates initial indicators to the implementation process of sustainability

accounting concept in small and medium enterprises business process and these indicators are important for the company's stakeholders as a main reference in the context of implementation of sustainability accounting concept in small business organization.

RESEARCH METHODOLOGY

This study is conceptual and descriptive in nature. This study is based on secondary data collected from various journals, corporate sustainability reports, books, Business Responsibility and Sustainability Reports (BRSR).

DATA ANALYSIS AND DISCUSSIONS

Concept of Sustainability Accounting Sustainability is an umbrella term that includes all the efforts of a company to reduce its impact on the world around it. The process of identifying, measuring, evaluating and reporting socio-economic and environmental performance is known as sustainability accounting (Shivkumar, 2005). The sustainability accounting goes much beyond traditional accounting, as the former focuses on financial outcomes only, while the sustainability accounting aims for the holistic development of the society. It aims to provide stakeholders with vital information about how business activities impact society and the environment. The practices such as environmental accounting, social accounting, carbon accounting are also included in sustainable accounting. These sustainability practices have direct financial link to long term value creation.

The core components of sustainability accounting are:

- **Environmental Accounting:** To measure the environmental impacts on nature including carbon emissions, energy usage, raw material usage, water consumption, waste management and biodiversity impact.
- **Social Accounting:** To evaluate the social performance indicators such as employee welfare, employee diversity, trainings, workforce data, safety incidents, human rights and community development.
- **Governance Accounting:** To focus on company administration, accountability, stakeholder's concerns, leadership initiatives and business ethics. By quantifying non-financial impacts, sustainability accounting enables organisations in identifying, measuring, analysing, reporting and assuring their contribution to sustainable development of the nation more productively. In India, SDG localisation

is backed by national policies such as the National Indicator Framework, NITI Aayog's SDG India Index, and state-level action plans. Corporates contribute to SDG localisation through their operations, supply chains, investments, and Corporate Social Responsibility (CSR) initiatives.

Sustainability Accounting Practices in Indian Corporates

Indian corporates have made substantial advancements in adopting sustainability accounting practices, especially in the light of recent regulatory shifts. The implementation of mandatory CSR under the Companies Act, 2013, and the Business Responsibility and Sustainability Reporting (BRSR) framework by the Securities and Exchange Board of India (SEBI) have tightened sustainability disclosures.

Many leading Indian companies publish sustainability reports based on global frameworks such as GRI, Integrated Reporting and the UN Global Compact principles. These reports provide detailed information on environmental performance, social initiatives, governance practices, and SDG alignment.

Hindustan Unilever Limited (HUL) measures and reports its financial performance as well as its effects on the environment, society, and economy. The business monitors waste reduction, energy and water use, carbon emissions, and sustainable packaging projects. Additionally, HUL takes into consideration social investments in community development, health and safety, employee welfare, and rural empowerment initiatives like Project Shakti. Business decisions incorporate risks, savings, and costs associated with sustainability. HUL ensures accountability, transparency, and long-term value generation for stakeholders by adhering to global standards like GRI and Business Responsibility and Sustainability Reporting (BRSR).

By assessing and disclosing its economic, social and environmental effects in addition to its financial success, Wipro employs sustainability accounting. Throughout its activities, the corporation monitors waste management, water use, energy consumption, carbon emissions, and the use of renewable energy. Through the Wipro Foundation, Wipro also takes into account social activities like community development, education programs, diversity and inclusion, employee well-being, and training in digital skills. Strategic decision-making incorporates costs, savings, and risks associated with sustainability.

At Tata Consultancy Services (TCS), accounting for sustainability primarily revolves around incorporating responsible practices into daily business operations and decision,

making. TCS determines the carbon footprint of its IT services by measuring the power consumption of its datacenters, cutting down on travel emission, and using more renewable sources of energy. It also reviews social performance by means of well, structured reporting on employee training hours, workplace safety measures, adherence to work ethics, and digital inclusion efforts through educational and rural transformation programs.

The company evaluates the sustainability, related expenditures and cost, savings for the potential creation of economic value over time. By making its BRSR and global sustainability framework disclosures publicly available, TCS not only shows its commitment to the stakeholders but also helps pave the way for sustainable development through its actions. Reliance, Cognizant also measures the impact of its sustainability initiatives on operational efficiency and long-term profitability through internal accounting systems. By incorporating environmental and social performance indicators into management reports, the company supports informed decision-making and responsible business expansion.

The following sustainability accounting techniques are frequently seen in Indian corporations:

- Carbon footprint analysis and environmental cost accounting.
- CSR and community development initiatives' social impact is measured.
- Incorporating environmental, social, and governance (ESG) metrics into performance reviews
- Connecting long-term value creation, risk management, and sustainability performance.

Role Of Sustainability Accounting in Localising SDGs

Sustainability accounting facilitates SDG localisation in Indian corporates in several ways:

Enhancing Transparency and Accountability

Sustainability accounting enhances transparency by disclosing non-financial information pertaining to SDGs. This promotes corporate accountability to stakeholders such as investors, employees, regulators etc.

Strategic Alignment with SDGs

By mapping sustainability metrics to certain SDGs, companies can match their strategies with national and international development agendas. Sustainability accounting assists corporates to make the most significant impact in the community. Also, it ensures policies are relevant and actionable by adapting goals to local contexts.

Supporting Inclusive Growth

Sustainability accounting captures data on employment generation, gender diversity, skill development, and community welfare. Thereby it helps to track the development progress and identification of gaps. This enables companies to assess their contribution to inclusive growth and social equity.

Promoting Green Growth

Environmental accounting and carbon reporting support green growth by encouraging efficient resource utilization, adoption of clean technologies, and reduction of environmental risks. It also ensures more efficient use of funds for development projects.

Informed Decision-Making

By integrating sustainability metrics into management accounting systems, companies can make informed decisions that balance profitability with social and environmental responsibility.

Effective Governance

It strengthens governance at various levels, which enables better co-ordination between local, regional and national authorities for the common issues.

Challenges in implementing Sustainability Accounting

Sustainability accounting in India confronts a number of obstacles despite its potential merits such as:

- Inadequate reporting and measurement procedures.
- Limited knowledge and awareness among corporate professionals.
- Quantifying the effects on society and the environment is challenging.
- Additional costs associated with data gathering and reporting.

- Inadequate integration of sustainability data into fundamental business choices.

If these challenges are not resolved through stakeholder engagement, regulatory assistance and capacity building, the effective localisation of SDGs may be hampered.

CONCLUSION

Sustainability accounting is inevitable for Indian corporates to localise the Sustainable Development Goals (SDGs). It helps businesses to measure and convey their contribution to sustainable development by widening the scope of traditional accounting. Sustainability accounting promotes equitable and green growth by strengthening accountability, integrating sustainability and promoting evidence-based decision making. Strengthening sustainability accounting processes through standardization, skills building, and integration into company strategy is crucial if India is to meet its SDG obligations. With the help of strong sustainability accounting systems, Indian corporations may play a major role in localized sustainable development and make a significant contribution to the long-term socioeconomic change of the country.

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34. EDUCATIONAL EQUITY AS A CATALYST FOR INCLUSIVE AND SUSTAINABLE DEVELOPMENT

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ABSTRACT

Education is universally recognised as a fundamental human right and a cornerstone of democratic participation, social mobility, and sustainable development. Despite sustained policy attention and expanding enrolments, profound inequities persist across income, gender, caste and ethnicity, geography, language, and ability. These inequities have been further exacerbated by global disruptions such as the COVID-19 pandemic, rapid digitalisation, and demographic transitions. This paper examines educational equity as a normative principle and a practical policy agenda, arguing that equality of treatment is insufficient in the face of unequal starting conditions. Instead, equity demands differentiated support, adaptive systems, and inclusive pedagogies that respond to diverse learner needs. Drawing on a qualitative integrative review of academic literature, policy reports, and multi-country case studies, the paper presents a multi-level framework for embedding equity through needs-based resource allocation, inclusive pedagogy, technology access, data-driven accountability, and community engagement. This research study contributes to conference conversations on social justice in education by synthesising evidence-based recommendations for policy and practice.

Keywords: Educational Equity, Inclusive Education, Social Justice, Pedagogical Innovation, Policy Reform

I. Introduction

Education is widely acknowledged as both a fundamental human right and a cornerstone of social, cultural, and economic progress. International instruments and national constitutions alike recognise education as essential to human dignity, democratic participation, and social justice. Beyond its intrinsic value, education functions as a powerful lever for social mobility, enabling individuals to improve life chances and participate meaningfully in civic and economic life. At the societal level, equitable

education systems contribute to social cohesion, innovation, and sustainable development. COVID-19 pandemic, digital divides, and demographic shifts have intensified educational inequities. This research study highlights the following research questions:

1. What does educational equity entail conceptually?
2. What structural, cultural, and pedagogical barriers impede equity?
3. What evidence-based strategies advance equitable outcomes?

Despite decades of reform, investment, and near-universal enrolment at the primary level in many countries, educational opportunity remains deeply unequal. Disparities persist across socioeconomic status, gender, caste and ethnicity, geography, language, and disability, often compounding one another. These inequalities are visible not only in access to schooling but also in the quality of learning, progression and completion rates, digital access, and post-education outcomes. The central challenge, therefore, is not merely expanding participation but achieving educational equity and fairness in opportunities, resources, and outcomes, tailored to diverse learner needs.

Global policy frameworks underscore the urgency of this agenda. Sustainable Development Goal 4 commits the international community to ensuring “inclusive and equitable quality education and lifelong learning opportunities for all.” While enrolment indicators show progress, learning outcomes and completion rates reveal stark divides between and within countries. Children from disadvantaged backgrounds are significantly less likely to acquire foundational literacy and numeracy skills, complete secondary education, or transition successfully to higher education and employment. These disparities reflect structural inequities embedded in social, economic, and institutional arrangements.

A critical distinction must be drawn between equality and equity. Equality implies treating all learners the same, whereas equity emphasises fairness through adaptation: allocating resources and support according to need. Providing identical inputs to unequal learners often reproduces disadvantage rather than alleviating it. Educational equity, therefore, requires systemic transformation, encompassing policy design, institutional

practices, curriculum, pedagogy, and assessment. It demands recognition of diversity as an asset and a commitment to dismantling barriers that marginalise particular groups.

The relevance of educational equity has been heightened by recent global disruptions. The COVID-19 pandemic exposed and intensified existing inequalities, as school closures and remote learning disproportionately affected learners without access to digital devices, connectivity, or supportive home environments. Rapid technological change, demographic shifts, and labour market transformations further underscore the need for inclusive learning systems that equip all learners with the capabilities to navigate uncertainty and contribute to sustainable futures.

This research study critically examines the multifaceted dimensions of educational inequities and proposes strategies for bridging them. Drawing on global evidence, policy frameworks, and case studies, it argues that equity is not a peripheral aspiration but the foundation of quality education. By advancing equity, education systems can unlock transformative potential—fostering empowerment, innovation, and sustainable progress for current and future generations.

II Literature Review

A. Introduction: what this really means

Educational equity is about fairness in opportunities, supports, and outcomes not uniformity of inputs (OECD, 2012; UNESCO, 2020). Here's the thing: equal resources rarely produce equal results because learners start from different places. Equity requires targeted supports that compensate for structural, historical, and contextual disadvantages (Reardon, 2011; Darling-Hammond, 2010). With SDG 4 placing equity at the heart of “inclusive and equitable quality education,” the literature has expanded from access to sustained participation, meaningful learning, and life outcomes (UNESCO, 2020, 2023).

B. Conceptual foundations

Equality vs. equity. Equality distributes the same inputs; equity tailors inputs to achieve comparable outcomes (OECD, 2012). Visual metaphors aside, the research emphasises redistributive, recognitional, and participatory dimensions of justice (Fraser, 2008).

Justice frameworks. Rawls' (1971) difference principle justifies compensatory measures for the least advantaged. Sen's capability approach shifts attention from inputs and outputs to the real freedoms students must learn and live the lives they value (Sen, 1999). Bourdieu (1986) explains how cultural, social, and economic capital reproduce advantage; schools can either amplify or counteract this.

Critical traditions. Freire (1970) frames schooling as a site of emancipation or domination; culturally relevant pedagogy (Ladson-Billings, 1995) and funds of knowledge approaches revalue marginalised knowledges. Intersectionality shows that inequities compound across gender, caste/ethnicity, disability, language, and poverty (Crenshaw, 1989; Banks, 2015).

Inclusion and UDL. Inclusive education (Ainscow, 2005) and Universal Design for Learning (CAST, 2018) argue for proactively designed curricula, assessments, and environments that reduce barriers for all, not retrofitted fixes for some.

C. What drives inequity?

Socioeconomic gradients. Achievement gaps correlate strongly with family socioeconomic status (SES) and neighbourhood disadvantage (Coleman et al., 1966; Reardon, 2011). Gaps widen with age in many systems, reflecting cumulative effects of opportunity to learn (Hanushek & Woessmann, 2015).

Early childhood conditions. High-quality early childhood education (ECE) has large, lasting returns, particularly for disadvantaged children (Heckman, 2006). Without early investment, later remediation is costlier and less effective.

School structures. Tracking/ability grouping, grade retention, and exclusionary discipline disproportionately harm marginalised students (OECD, 2012; Darling-Hammond, 2010). Teacher quality and stability are inequitably distributed, with novice teachers clustered in high-need schools (Berry, 2008; Kraft & Papay, 2014).

Curriculum and assessment. Narrow, high-stakes testing can crowd out culturally responsive teaching, creative tasks, and multilingual development (Au, 2007). Culturally sustaining pedagogy and formative assessment reduce gaps by aligning learning with students' identities and needs (Wiliam, 2011; Paris & Alim, 2017).

Language and minoritised identities. Mother-tongue-based multilingual education improves early literacy and later content learning; subtractive language policies depress outcomes (UNESCO, 2020; Heugh, 2011). Gender, caste/ethnicity, disability, and rurality intersect to shape participation and outcomes in the Global South (Dreze & Sen, 2013; ASER, 2023).

Digital access and datafication. The pandemic exposed digital divides in devices, connectivity, and home learning spaces, resulting in uneven learning loss (Engzell et al., 2021). EdTech can scale support, but without deliberate design, it reproduces bias (Selwyn, 2016).

III. Research Gap:

1. Narrative rather than systematic, where some studies have been omitted.
2. Limited empirical data on disability, intersectionality, and LGBTQ+ inclusion.
 - a. Ongoing reforms (e.g., ANRF, digital universities) lack evaluation data.

IV. Measuring equity: from inputs to outcomes

Domains and indicators. The literature converges on four measurable domains: (1) access and participation, (2) progression/retention, (3) learning outcomes and well-being, and (4) post-school transitions (UNESCO, 2020; 2023). Equity-sensitive indicators disaggregate by gender, location, SES, disability, language, and caste/ethnicity where relevant.

Methodological notes. Research spans RCTs on specific interventions, quasi-experimental designs (e.g., difference-in-differences on funding formulas), large-scale assessments (PISA, TIMSS, ASER), and qualitative/ethnographic studies documenting lived inequities. Mixed-methods approaches produce the most actionable insights, marrying statistical patterns with classroom/process data (Greene, 2007).

V. What works?

Early childhood & foundational learning. High-quality ECE, structured pedagogy in early grades, and targeted foundational literacy/numeracy programs yield significant gains for disadvantaged learners (Banerjee et al., 2017; Piper et al., 2018).

Teacher effectiveness and allocation. Coaching, collaborative professional learning communities, and mentoring improve instructional quality, especially when aligned to subject-specific pedagogy (Kraft, Blazar, & Hogan, 2018; Hattie, 2009). Incentives that attract and retain experienced teachers in high-need schools show promise when paired with support, not just pay (Boyd et al., 2013).

Funding reforms. Weighted student funding and progressive formulas improve resources in high-need schools and can raise achievement if funds reach classrooms and focus on teaching quality and student supports (Jackson, Johnson, & Persico, 2016; OECD, 2012).

Inclusive pedagogy & UDL. Differentiated instruction, co-teaching, and UDL-aligned materials reduce barriers for learners with disabilities and diverse language backgrounds (Tomlinson, 2014; CAST, 2018; Ainscow, 2005).

Language-in-education policy. Mother-tongue instruction in early years with additive bilingual models improves literacy and content learning while supporting identity and participation (Heugh, 2011; UNESCO, 2020).

Assessment for learning. Formative assessment and feedback have strong effect sizes when integrated into everyday instruction (Black & Wiliam, 1998; Wiliam, 2011).

School climate and belonging. Restorative practices reduce exclusionary discipline and narrow racial/ethnic gaps in suspensions and achievement (González, 2015). Student voice and family partnerships strengthen engagement and outcomes (Ishimaru, 2019).

Technology with purpose. Low-tech and blended approaches that extend practice (e.g., SMS nudges, adaptive practice aligned to curriculum) show modest but cost-effective gains when targeted (Evans & Yuan, 2019). One-to-one devices without pedagogy rarely move outcomes (Zheng et al., 2016).

VI. Methodology

This is a qualitative integrative review combining:

1. Peer-reviewed studies (2010-2024).
2. Policy documents (UNESCO, OECD, World Bank).

Ten case studies across diverse contexts (e.g., Finland, India, Canada, Chile). Thematic coding identified patterns of effective strategies, barriers, and innovations.

A. Methodology of Literature Review

1) Research Questions:

This review was guided by four questions:

- i. How is educational equity in Indian higher education conceptualised in academic and policy literature?
- ii. What inequity patterns exist across social groups, regions, and institutional types?
- iii. Which policy instruments and institutional practices are most effective in reducing inequity?
- iv. What research gaps remain for advancing inclusive and sustainable higher education?

2) Literature Search Strategy:

1. **Databases searched:** Scopus, Web of Science, JSTOR, ERIC, Google Scholar.
2. **Keywords:** “educational equity India higher education,” “reservation policy outcomes,” “inclusive learning universities,” “NEP 2020 equity,” “scholarship schemes higher education India,” “disability inclusion higher education India.”
3. **Time frame:** 2005–2024, covering RUSA reforms through NEP 2020 and subsequent initiatives.

3) Inclusion and Exclusion Criteria:

- **Included:** Peer-reviewed articles, government policy documents, reports (AISHE, UGC, NAAC, NIRF, World Bank, UNESCO, OECD), and empirical studies.
- **Excluded:** Primary/secondary education studies, and global reviews without an India-specific focus.

VII. Analytical Framework

Findings were synthesised across three lenses:

1. **Determinants of inequity:** caste, class, gender, disability, and rurality.
2. **Mechanisms:** admissions, financing, curriculum, pedagogy, accreditation, digital access.
3. **Policies and interventions** such as reservations, scholarships, NEP 2020 reforms, PM-USHA funding, ABC/NCrF, and digital initiatives.

VIII. Results: Themes from the Literature

A. Determinants of Inequity

- a. **Caste and Tribe:** Despite reservations, SC/ST students still face lower completion rates and limited representation in elite institutions.
- b. **Gender:** GER for women has improved, but regional disparities and STEM underrepresentation persist.
- c. **Socioeconomic Status:** First-generation learners struggle with affordability, digital divides, and English-medium dominance.
- d. **Disability:** Sparse data; limited implementation of accessibility norms under the UGC and RPwD Act.
- e. **Rural-Urban Divide:** Rural students face infrastructural deficits, weak digital access, and inadequate mentoring networks.

B. Mechanisms Influencing Equity

- a. **Admissions:** Reservation policies increase entry, but unequal distribution persists across high-status vs. low-status institutions.
- b. **Financing:** Scholarships and fee waivers help, but high living costs and private tuition fees remain barriers.
- c. **Curriculum and Pedagogy:** Lack of culturally responsive pedagogy and underuse of regional languages constrain inclusivity.
- d. **Digital Divide:** COVID-19 exposed gaps in device access, connectivity, and digital literacy.

- e. **Quality Assurance:** NAAC and NIRF have introduced equity metrics, but implementation and credibility are questioned.

C. Policy Interventions and Programmes

- a. **NEP 2020:** Emphasises flexible learning pathways, Academic Bank of Credits, and equity as a guiding principle.
- b. **PM-USHA:** Strengthens infrastructure, particularly in state universities and colleges, but state-level uptake varies.
- c. **Scholarship Schemes:** National Means-cum-Merit, Post-Matric Scholarships for SC/ST/OBC, and minority-focused fellowships have expanded but suffer from leakages and delays.
- d. **Digital Initiatives:** SWAYAM, National Digital University proposals, and online learning promise access expansion but require equity safeguards.
- e. **Accreditation and Rankings:** Push equity-linked performance indicators, though private HEIs often sidestep them.

IX. Discussion

The results point to a paradox: India's higher education has democratized access in aggregate but continues to stratify opportunity in practice. The expansion of institutions and rising GER have not fully erased structural inequities. Instead, inequity has shifted in form while women and some marginalised groups have gained entry, they remain clustered in less prestigious programs, or face systemic hurdles in progression and employment.

Reservation policies, though crucial, function as entry-level correctives rather than long-term equalisers. Without addressing hidden curricula, stigma, and campus discrimination, reservations alone cannot guarantee equitable outcomes. Similarly, financial aid schemes alleviate tuition costs but neglect indirect expenses, which disproportionately deter rural and low-income learners. The digital divide, exposed starkly during the pandemic, underscores that access to devices and connectivity is now as critical as scholarships or quotas in shaping educational opportunity.

Pedagogical reforms remain the weakest link. Evidence suggests that inclusive pedagogy, language diversity, and faculty sensitisation are rarely prioritised in Indian HEIs, making equity more about entry than experience. NEP 2020's emphasis on multidisciplinary and

multilingual education offers promise, but its realisation depends on faculty training, curriculum redesign, and adequate funding.

Quality assurance frameworks like NAAC and NIRF have incorporated inclusivity metrics, yet these are often procedural checkboxes rather than substantive change levers. Equity-sensitive evaluation demands deeper integration of intersectional data, student feedback, and accountability mechanisms.

Overall, the literature highlights that equity in Indian higher education is not just a question of numbers enrolled, but of the conditions of participation and the value of outcomes. Sustainable equity requires tackling the layered disadvantages that persist at the intersections of caste, class, gender, rurality, and disability, while aligning financing, pedagogy, and accountability systems with the constitutional promise of social justice.

X. Results:

A. Determinants of Inequity

The literature consistently shows that caste, gender, socioeconomic status, disability, and rural-urban location act as structural determinants of inequity. Reservation policies and gender initiatives have expanded access, but disparities in progression, dropout rates, and outcomes persist. Marginalised students face compounded disadvantages, particularly when identities intersect (e.g., rural SC women).

B. Mechanisms Influencing Equity

Admission policies, financial aid, curriculum, pedagogy, and digital access significantly shape equity outcomes. While CUET and scholarship programs aim at standardisation and affordability, critics highlight how coaching cultures, bureaucratic inefficiencies, and rising privatisation deepen inequities. Pedagogy and assessment systems remain largely exclusionary, privileging elite cultural capital and English-medium fluency. The COVID-19 pandemic further magnified inequities, especially through digital exclusion.

C. Policy Interventions and Programmes

Government schemes (NEP 2020, PM-USHA, ABC/NCrF, scholarships) have widened participation but suffer from weak implementation, corruption, and limited monitoring. Accreditation and rankings include inclusivity criteria, but enforcement gaps persist. Digital initiatives promise reach but risk reproducing divides unless complemented by infrastructure, device support, and inclusive teaching practices.

D. Emerging Patterns

1. Entry barriers have declined, but progression and success barriers remain high.
2. Structural inequities are shifting rather than disappearing, with new divides (digital, institutional stratification) replacing older ones.
3. Policy frameworks articulate equity goals, but translation into practice is inconsistent across regions and institutional types.
4. Sustainable equity requires moving from access-oriented policies to systemic reforms in pedagogy, financing, and accountability.

XI. Implications for Policy and Practice

1. Strengthen financial aid and scholarships beyond tuition waivers to cover living costs.
2. Improve faculty capacity for inclusive pedagogy.
3. Embed equity metrics in accreditation and ranking frameworks.
4. Expand open and distance education with equity safeguards.
5. Foster collaborations between government, private institutions, and civil society to address regional disparities.

XII. Recommendations

1. **Needs-Based Funding:** Adopt progressive funding formulas that reflect socioeconomic and learning needs.
2. **Enhance Teacher Capacity:** Integrate equity and inclusion into pre-service and in-service training.
3. **Culturally Relevant Curriculum:** Design curricula that value diverse identities and knowledge systems.
4. **Responsible Technology Use:** Combine digital access with literacy, support, and inclusive pedagogy.
5. **Equity Monitoring Systems:** Use disaggregated data to track participation, progression, and outcomes.
6. **Community Engagement:** Co-design policies with learners, families, and communities.

Conclusion

Equity in Indian higher education remains both a constitutional mandate and a policy challenge. While initiatives such as reservations, NEP 2020 reforms, and targeted scholarships have broadened access, deeper systemic reforms in quality, pedagogy, and institutional accountability are needed for truly inclusive and sustainable learning.

A key lesson from the literature is that access, though necessary, is not sufficient. True equity lies in ensuring that students not only enter higher education but also succeed and thrive within it. This requires redesigning curricula to reflect linguistic and cultural diversity, providing psychosocial support, addressing indirect costs, and fostering inclusive campus environments. Equity must be mainstreamed across financing, pedagogy, evaluation, and governance, not treated as an add-on.

The future of Indian higher education depends on whether inclusivity becomes embedded in institutional DNA rather than episodic reform. Achieving this demands long-term commitment, adequate resource allocation, robust monitoring, and collaboration between government, universities, and communities. Only then can India move from numerical expansion to genuine empowerment, bridging educational gaps in ways that are socially just, economically sustainable, and globally competitive.

XIII. Limitations and Future Directions

1. Lack of longitudinal studies tracking disadvantaged groups through higher education.
2. Minimal empirical research on private institutions' role in equity.
3. Insufficient attention to disability, LGBTQ+ students, and regional-language learners.
4. Need for evaluation of NEP 2020 reforms and digital university initiatives.

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35. INSTITUTIONAL SUPPORT AND STARTUP- ENTREPRENEURSHIP AWARENESS AMONG YOUTH

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ABSTRACT:

This paper examines the youth awareness of startup support schemes and the role of educational institutions in promoting entrepreneurship in Thrissur district., Kerala. Using primary data collected from 120 youth through a structured questionnaire and analyzed using descriptive statistics, the study finds that educational institutions play a supportive role in encouraging entrepreneurial interest through entrepreneurship development cells. However, awareness of major startup support schemes remains only partial among a large section of youth, and participation in entrepreneurship development programme is limited. The study highlights the need for stronger collaboration between educational institutions and government agencies to improve entrepreneurial preparedness among youth.

Keywords- youth awareness, institutional support, startup awareness, entrepreneurship development, government schemes

I. INTRODUCTION

Entrepreneurship is widely recognized as a key driver of economic growth, innovation and employment generation, particularly in developing economies like India [1], [2]. Both central and state governments have introduced several policies and programmes aimed at fostering startup activity among youth. However, the effectiveness of these initiatives largely depends on the extent of awareness and institutional support available to potential entrepreneurs [3].

Educational institutions play a crucial role in shaping entrepreneurial orientation by providing exposure, motivation and foundational skills, institutional mechanisms such as Entrepreneurship Development Cells, incubation centres and awareness programmes are designed to nurture entrepreneurial aspirations among students [4]. Despite this, concerns

remain regarding the extent to which institutional support translates into awareness of government schemes and active entrepreneurial engagement [5].

Thrissur district, known for its strong entrepreneurial tradition and educational infrastructure, provides an appropriate context for examining the institutional support and startup awareness among youth.

I. OBJECTIVES

1. To assess the level of awareness of government startup support schemes among youth.
2. To examine the role of educational institutions in fostering entrepreneurial orientation
3. To analyse youth participation in entrepreneurship development and awareness programmes

II. RESEARCH METHODOLOGY

The study is empirical in nature and based on primary data collected from 120 youth in Thrissur district using a structured questionnaire. Respondents were selected through convenience sampling. The analysis focused on institutional exposure to entrepreneurship and awareness of startup related government schemes. Percentage analysis was employed as the primary analytical tool.

III. DATA ANALYSIS AND RESULTS

Table 1

Institutional support and programme participation among youth

Aspect	Indicator	Percentage(%)
Institutional Support	Institutions with Entrepreneurship Development Cells	71
	Institutional encouragement to pursue own ideas(agree/strongly agree)	79
Programme participation	Attended entrepreneurship development or awareness programmes	47
	Not attended such programmes	53

Source: primary data

Table 1 shows that a majority of respondents reported the presence of Entrepreneurship Development Cells in their educational institutions and agreed that their institutions encourage students to pursue their own innovative ideas. However, participation in

entrepreneurship development and awareness programmes was relatively low, indicating limited engagement despite institutional support.

Table 2

Awareness of government startup support schemes among youth

Startup support scheme	Fully aware(%)	Partly aware(%)	Not aware(%)
Kerala Startup Mission (KSUM)	28	61	11
ASPIRE Scheme	54	33	13
Pradhan Mantri Mudra Yojana	33	48	19
Startup India Seed Fund Scheme	34	46	20
Standup India Scheme	36	21	43
Aatma Nirbhar Bharath App Innovation Challenge	26	52	22

Source: primary data

Table 2 reveals that the awareness of government startup schemes among youth is largely at a partial level. Although a reasonable proportion of respondents reported full awareness of schemes such as ASPIRE and Kerala Startup Mission, the majority indicated only limited awareness of key national initiatives including the Startup India Seed Fund Scheme and Pradhan Mantri Mudra Yojana. The presence of a notable share of respondents who are not aware of these schemes further highlights existing information gaps. This indicates that the outreach and communication of these schemes among youth remain inadequate, limiting effective utilisation of these schemes.

IV. FINDINGS AND CONCLUSION

Most respondents reported the presence of Entrepreneurship Development Cells in their institutions and agreed that their institutions encourage students to pursue innovative ideas, indicating a supportive environment for entrepreneurship. Despite this, participation in entrepreneurship development and awareness programmes was low and awareness of government startup schemes was mostly partial. While schemes such as ASPIRE and Kerala Startup Mission were relatively well known, many were unaware of initiatives like Standup India Scheme and Startup India Seed Fund Scheme.

In conclusion, educational institutions play a positive role in motivating youth, but limited programme participation and incomplete awareness of government support restrict the translation of interest into action. Strengthening collaboration between institutions and government agencies and implementing structured awareness programmes can improve entrepreneurial preparedness among youth.

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36. GREEN ACCOUNTING AS A TOOL FOR SUSTAINABLE DEVELOPMENT: A CONCEPTUAL ANALYSIS

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ABSTRACT

Sustainable development requires an integrated approach that balances economic growth with environmental protection. However, conventional accounting systems largely focus on financial performance and economic indicators, often overlooking environmental costs associated with resource depletion, pollution, and ecological degradation. This conceptual paper examines the role of green accounting in supporting sustainable development by incorporating environmental costs and benefits into accounting and reporting frameworks. Drawing on existing literature and theoretical perspectives, the paper highlights how green accounting can improve transparency, guide policy formulation, and encourage environmentally responsible business practices. It also identifies key challenges in the implementation of green accounting, including difficulties in valuing natural capital, the absence of standardized accounting frameworks, limited institutional support, and resistance from stakeholders due to short-term economic concerns. The paper argues that addressing these challenges is essential for developing a comprehensive accounting framework that integrates environmental sustainability into economic measurement and corporate reporting, thereby contributing to long-term sustainable development.

Keywords: Green Accounting, Sustainable Development, Environmental Accounting, Natural Capital, Sustainability Reporting, Conceptual Framework

Introduction

Sustainable development has become a central concern for governments, businesses, and international organizations due to increasing environmental degradation, climate change, and the depletion of natural resources. The concept of sustainable development emphasizes meeting the needs of the present generation without compromising the ability of future generations to meet their own needs. Achieving this balance requires an integrated approach that aligns economic growth with environmental protection and social equity.

Conventional accounting systems primarily focus on financial performance, profitability, and economic efficiency. While these systems play a vital role in business decision-making, they largely ignore environmental costs such as pollution, loss of biodiversity, and depletion of natural resources. As a result, economic activities that cause environmental harm often appear profitable, creating misleading signals for managers, investors, and policymakers.

Green accounting has emerged as an alternative accounting approach that seeks to address these limitations by incorporating environmental costs and benefits into accounting and reporting frameworks. By recognizing the economic value of natural capital and environmental resources, green accounting provides a more comprehensive measure of organizational and national performance. This paper aims to analyze the role of green accounting in promoting sustainable development and to identify the key challenges associated with its implementation.

Review of Literature

The literature on green accounting, environmental accounting, and sustainability reporting provides a robust conceptual foundation for understanding the role of accounting in promoting sustainable development. Bebbington et al. (2001) emphasized the importance of **full cost accounting**, arguing that conventional accounting systems often overlook environmental and social costs associated with economic activities. They proposed a framework that integrates environmental costs into organizational decision-making to enhance transparency and promote long-term sustainability.

Burritt and Schaltegger (2010) analyzed the evolution of **sustainability accounting and reporting**, examining whether it represents a genuine paradigm shift or a temporary

trend. Their study highlighted that sustainability accounting has moved beyond mere voluntary reporting and is increasingly viewed as essential for organizational legitimacy, strategic decision-making, and long-term financial performance. This perspective underscores the importance of integrating environmental considerations into traditional financial frameworks.

Elkington (1997), in his seminal work on the **Triple Bottom Line**, introduced the concept of evaluating organizations based not only on economic performance but also on social and environmental outcomes. This framework laid the foundation for green accounting by emphasizing that sustainable development requires a holistic approach to measuring organizational performance.

Gray (2010) critically examined whether contemporary accounting practices genuinely account for sustainability, highlighting persistent gaps in measurement, disclosure, and stakeholder engagement. He pointed out that while environmental and sustainability reporting has grown, it often lacks consistency, comparability, and integration with traditional financial accounting, reinforcing the need for standardized green accounting practices.

Jasch (2003) focused on the application of **Environmental Management Accounting (EMA)** for identifying and quantifying environmental costs. He argued that EMA can help organizations better understand the hidden costs of environmental impacts, optimize resource use, and support strategic financial planning. This work demonstrates the practical relevance of green accounting tools in operational and financial decision-making.

Pearce and Atkinson (1993) contributed to the **macro-level understanding** of sustainable development through the lens of capital theory. They argued that national accounting systems, including GDP, fail to capture environmental degradation and resource depletion. Their work provides a basis for adjusting traditional economic measures to incorporate environmental costs, aligning with the principles of green national accounting.

Schaltegger and Burritt (2000) offered a comprehensive overview of **contemporary environmental accounting**, discussing its conceptual underpinnings, practical applications, and emerging trends. They emphasized that integrating environmental

accounting into corporate reporting enhances managerial decision-making and aligns organizational practices with sustainability objectives.

The **United Nations (2014)** System of Environmental-Economic Accounting provides an internationally recognized framework for integrating environmental information into national economic accounts. It offers guidance for valuing natural resources, accounting for environmental degradation, and linking environmental data with economic indicators, supporting both policy-making and corporate sustainability assessment.

Finally, the **World Commission on Environment and Development (1987)** in *Our Common Future* established the normative framework for sustainable development, emphasizing the need to balance economic growth with environmental protection and social equity. This foundational work underpins the theoretical rationale for green accounting as a tool to measure and manage environmental impacts within financial and economic systems.

Synthesis: Collectively, these studies underscore that green accounting is critical for aligning financial reporting with sustainability goals. They highlight the need for standardized frameworks, accurate valuation of natural capital, integration of environmental costs into financial statements, and transparency in reporting. Despite progress, the literature identifies persistent challenges in implementation, measurement, and institutional adoption, which form the basis for further research in sustainable finance and accounting.

Objectives of the study

- To analyze the role of green accounting in sustainable development.
- To identify challenges in implementing green accounting.

Scope of the Study

The study focuses on the conceptual and financial dimensions of green accounting and its contribution to sustainable development. It examines green accounting at both organizational and macroeconomic levels, with emphasis on financial reporting, valuation, risk assessment, and capital allocation. The study does not concentrate on any specific industry or country.

Concept of Green Accounting in Finance

From a financial standpoint, green accounting involves the identification, measurement, and reporting of environmental costs, environmental liabilities, and natural capital that affect financial performance and firm valuation. It extends traditional financial accounting by internalizing environmental externalities into cost structures and financial statements. Green accounting enables the capitalization and depreciation of environmental assets, recognition of environmental provisions and contingent liabilities, and disclosure of sustainability-related financial risks. By doing so, it supports more accurate financial planning, budgeting, and investment appraisal.

Role of Green Accounting in Sustainable Financial Development

Green accounting plays a significant role in promoting sustainable development by improving financial transparency and accountability. Environmental cost disclosures allow investors and creditors to evaluate environmental risks that may affect future cash flows and returns. From a capital allocation perspective, green accounting supports sustainable finance by directing investments toward environmentally responsible projects and technologies. Financial institutions increasingly rely on environmental information to assess credit risk, investment risk, and long-term value creation. Green accounting also strengthens financial risk management by identifying environmental risks such as regulatory penalties, cleanup costs, and climate-related liabilities. Integrating these risks into financial reporting helps organizations maintain financial resilience and stability.

Research Methodology

Research Design

The present study adopts a **conceptual and descriptive research design** to examine the role of green accounting in sustainable development from a financial perspective. As the study is theoretical in nature, it does not involve empirical testing or primary data collection. Instead, it focuses on developing conceptual understanding by synthesizing existing financial theories, accounting frameworks, and sustainability literature.

Nature of the Study

The study is **qualitative and theoretical**, aiming to analyze concepts, frameworks, and financial theories related to green accounting. It seeks to explain how environmental costs, risks, and natural capital influence financial performance, valuation, and long-term economic sustainability.

Sources of Data

The study is based exclusively on **secondary data** collected from the following sources:

- Peer-reviewed academic journals in finance, accounting, and sustainability
- Books and scholarly publications on green accounting and sustainable finance
- Reports and guidelines issued by international organizations such as the United Nations, World Bank, and OECD
- Sustainability reporting frameworks and accounting standards related to environmental and financial disclosure

Method of Analysis

A **systematic literature review approach** is employed to analyze existing research and theoretical contributions. Relevant literature is critically reviewed and organized thematically to:

- Examine the financial relevance of green accounting
- Analyze its role in sustainable development and financial decision-making
- Identify key financial, institutional, and regulatory challenges in implementing green accounting

Conceptual analysis is used to link green accounting with financial theories such as shareholder value theory, stakeholder theory, risk management theory, and portfolio theory.

Theoretical Framework

The adoption of green accounting is strongly supported by several established financial theories that increasingly recognize the interdependence between financial performance and environmental sustainability. These theories explain why integrating environmental costs and risks into financial accounting is essential for long-term value creation and sustainable development.

Shareholder Value Theory

Traditional shareholder value theory emphasizes profit maximization and return on investment. However, contemporary financial thought recognizes that **long-term shareholder wealth** depends not only on short-term profitability but also on effective

management of environmental and sustainability risks. Environmental liabilities, regulatory penalties, carbon pricing, and climate-related risks can significantly affect future cash flows and firm valuation. Green accounting aligns with this evolved view of shareholder value by internalizing environmental costs and risks into financial statements. By providing more accurate cost structures and risk assessments, green accounting supports better capital allocation, enhances firm valuation accuracy, and protects long-term shareholder interests.

Stakeholder Theory in Finance

Stakeholder theory extends financial accountability beyond shareholders to include investors, creditors, regulators, communities, and future generations. From a financial perspective, these stakeholders influence access to capital, cost of financing, and corporate reputation. Green accounting supports stakeholder theory by improving transparency and disclosure of environmental performance and risks. Environmental cost disclosures enable investors and lenders to assess sustainability-related risks, while regulators and society benefit from greater accountability. As a result, firms adopting green accounting can achieve improved stakeholder confidence and lower cost of capital.

Risk Management Theory

Environmental risks have emerged as a critical component of enterprise risk management. Climate change, environmental regulations, resource scarcity, and pollution-related liabilities can directly impact financial stability. Green accounting contributes to financial risk management by identifying, measuring, and reporting environmental risks and liabilities. Recognizing environmental provisions, contingent liabilities, and remediation costs enables firms to anticipate financial exposures and strengthen risk mitigation strategies. This proactive approach enhances financial resilience and reduces uncertainty.

Portfolio Theory and Asset Pricing

Modern portfolio theory and asset pricing models emphasize the role of risk in determining expected returns. Environmental risks influence asset prices, stock volatility, and investor returns. Companies with poor environmental performance may face higher risk premiums and increased cost of capital. Green accounting provides reliable environmental information that helps investors evaluate sustainability risks and integrate

them into portfolio selection and valuation models. Environmentally responsible firms are increasingly perceived as lower-risk investments, supporting more stable portfolio performance and sustainable financial markets.

Agency Theory

Agency theory highlights conflicts between managers and shareholders, particularly when managers prioritize short-term gains over long-term value creation. Environmental negligence can result in hidden costs that harm shareholders in the long run. Green accounting reduces information asymmetry by disclosing environmental costs and liabilities, thereby improving monitoring and governance. Transparent environmental accounting aligns managerial decisions with long-term financial and sustainability objectives.

Evolution of Green Accounting



The diagram illustrates the evolution of accounting practices from a purely financial focus toward a comprehensive green accounting framework. Traditional financial accounting emphasizes short-term profitability and shareholder returns. Over time, growing environmental risks and regulatory pressures led to the inclusion of environmental costs and liabilities. This transition evolved into sustainability-oriented financial accounting, where environmental, social, and governance (ESG) factors became integral to financial reporting. Green accounting represents the most advanced stage,

fully integrating natural capital valuation and environmental risk management into financial systems. This evolution ultimately supports sustainable development through long-term financial stability and responsible resource use.

Financial Evidence Supporting Green Accounting in the Indian Context

Category	Key Financial Indicator	Latest Evidence (India)	Authoritative Source	Relevance to Green Accounting
Macroeconomic Impact	Cost of environmental degradation	5–7% of national GDP annually	World Bank	Reflects unaccounted environmental costs in traditional GDP and financial accounts
Environmental Risk	Economic loss from air pollution	INR 2.6–3.0 trillion per year	World Bank	Demonstrates financial externalities requiring accounting recognition
Climate Risk	Projected GDP loss due to climate change	2.8–8.7% by 2100	RBI / NGFS	Supports climate risk disclosure in financial statements
Regulatory Framework	Mandatory sustainability reporting	1,000+ listed companies under BRSR	SEBI (India)	Creates institutional demand for environmental accounting
Sustainable Finance	Size of green finance market	USD 44+ billion	Climate Bonds Initiative	Indicates growing role of green accounting in capital allocation
Capital Markets	Cumulative green bond issuance	USD 21+ billion	RBI / SEBI	Requires transparent measurement of environmental impact
Firm Valuation	ESG impact on market valuation	10–15% valuation premium	NSE / Bloomberg	Links sustainability disclosure with shareholder value

Cost of Capital	Impact of ESG disclosure	≈40 basis points reduction	McKinsey India	Shows financial benefits of environmental transparency
Banking Stability	Credit exposure to climate-sensitive sectors	~34% of total bank credit	RBI	Highlights need for environmental risk accounting
Green Investment	Renewable energy investment inflows	USD 125+ billion since 2015	IEA	Supports capitalization and depreciation of green assets

Conclusion

Green accounting has emerged as a crucial financial and accounting approach for integrating environmental sustainability into economic measurement and corporate reporting. From a financial perspective, traditional accounting systems are increasingly inadequate as they fail to capture environmental costs, risks, and the depletion of natural capital that significantly influence long-term financial performance and economic stability. This theoretical study has analyzed the role of green accounting in promoting sustainable development by internalizing environmental costs and aligning financial decision-making with sustainability objectives.

The study highlights that green accounting enhances financial transparency, improves risk management, supports efficient capital allocation, and contributes to long-term value creation. By incorporating environmental costs and natural capital into financial reporting, organizations and policymakers can make more informed decisions that balance profitability with environmental responsibility. Financial theories such as shareholder value theory, stakeholder theory, risk management theory, and portfolio theory strongly support the adoption of green accounting as a means of ensuring sustainable financial development.

However, the study also identifies significant challenges in the implementation of green accounting, including difficulties in valuing environmental assets, lack of standardized accounting frameworks, institutional constraints, and short-term profit orientation. Addressing these challenges is essential for the effective integration of green accounting into financial systems. Overall, the study concludes that green accounting is not merely

an environmental initiative but a strategic financial tool that is vital for achieving sustainable development and long-term economic resilience.

Limitations and further scope of the study

While this study provides a comprehensive conceptual analysis of green accounting and its role in sustainable development from a financial perspective, it has certain limitations. The research is entirely **theoretical**, relying solely on secondary data, literature reviews, and existing frameworks. As a result, it does not include empirical evidence or industry-specific case studies, which may limit its direct applicability to real-world financial decision-making. Additionally, the valuation of environmental costs and natural capital remains conceptually complex and often lacks standardized methodologies, creating challenges in translating theory into practice. Another limitation is that the study focuses on broad organizational and macroeconomic perspectives, without addressing specific sectors, geographic regions, or regulatory environments, which may influence the adoption and effectiveness of green accounting practices.

Despite these limitations, the study provides a foundation for **future research** in several important areas. Empirical investigations can be conducted to assess the impact of green accounting on financial performance, firm valuation, investment decisions, and cost of capital across industries and countries. Comparative studies may evaluate the effectiveness of different sustainability reporting frameworks and green accounting practices in enhancing transparency and long-term value creation. Additionally, quantitative models can be developed to improve the valuation of natural capital, environmental liabilities, and risk-adjusted financial performance. Research can also explore the integration of green accounting with ESG reporting, climate-related financial disclosures, and portfolio management to support sustainable finance. Such studies would strengthen the practical relevance of green accounting, enabling policymakers, financial managers, and investors to make more informed decisions that align financial objectives with sustainable development goals.

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37. A STUDY ON ECONOMIC AND SOCIAL IMPACT OF BUSINESS ACTIVITIES ON TOURISM IN ALLEPPEY LOCALITY

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ABSTRACT

Tourism is an important source of income and development in many regions. Alleppey (Alappuzha), known as the “Venice of the East,” is a popular tourist destination where tourism-related business activities play a major role in the local economy. This study aims to understand the **economic and social impact of business activities on tourism in the Alleppey locality**.

The study focuses on how tourism businesses help in creating employment, increasing income, and improving the standard of living of local people. It also examines the social impact, such as community participation and cultural interaction. Data were collected from local residents and tourism-related businesses using a questionnaire and simple analysis methods. The findings show that tourism businesses have a positive impact on the local economy, but issues like environmental problems and seasonal income still exist. The study suggests promoting sustainable tourism for balanced growth.

KEYWORDS

Tourism, Business Activities, Economic Impact, Social Impact, Alleppey (Alappuzha), Local Community, Sustainable Tourism

INTRODUCTION

Tourism has become one of the most important industries contributing to economic growth and social development in many regions. It creates employment opportunities, supports local businesses, and helps in improving infrastructure and living standards. In recent years, tourism has grown rapidly in coastal and backwater regions of India, especially in Kerala, which is well known for its natural beauty and cultural heritage.

Alleppey (Alappuzha), often called the “Venice of the East,” is a major tourist destination famous for its backwaters, houseboats, beaches, and traditional lifestyle. The growth of tourism in Alleppey has led to the development of various business activities such as houseboat services, hotels, homestays, restaurants, transport services, and souvenir shops. These businesses play a key role in shaping the local economy and influencing the social life of the community.

This study aims to analyze the **economic and social impact of business activities on tourism in the Alleppey locality**. It focuses on understanding how tourism-related businesses contribute to employment, income generation, and community development, while also identifying the social benefits and challenges faced by the local people. The study also highlights the importance of sustainable tourism practices for ensuring long-term economic growth and social well-being in the region.

STATEMENT OF PROBLEM

Tourism has grown rapidly in the Alleppey (Alappuzha) locality and has created many business opportunities such as houseboats, hotels, homestays, and transport services. These business activities help in generating income and employment for local people. However, tourism also creates problems like seasonal income, environmental pollution, and unequal benefits among the local community.

There is a need to understand how tourism-related business activities affect the **economic and social life of the people in Alleppey**. This study aims to identify both the positive and negative impacts of these business activities and to highlight the importance of sustainable tourism development.

OBJECTIVES

1. To study the economic and social impact of business activities on tourism in Alleppey.
2. To evaluate the level of community participation in tourism related business activities
3. To assess the positive and negative effects of tourism-based businesses on the community.

SIGNIFICANCE OF THE STUDY

This study is important as it helps to understand the **economic and social impact of business activities on tourism in the Alleppey locality**. It highlights how tourism-related businesses contribute to employment, income generation, and the development of the local economy. The study also helps in identifying the social benefits and problems faced by the local community due to tourism growth. The findings of this study will be useful for students, researchers, local authorities, and tourism businesses to gain better insight into tourism development. It can also help in planning **sustainable tourism practices** that ensure balanced economic growth and social well-being in Alleppey.

RESEARCH METHODOLOGY

The study is based on both **primary and secondary data**. Primary data were collected from local residents and tourism-related business operators in the Alleppey (Alappuzha) locality using a **structured questionnaire**. The questionnaire included simple close-ended and Likert scale questions to understand the economic and social impact of tourism-related business activities.

Secondary data were collected from books, journals, research articles, government reports, and tourism-related websites. The study follows a **descriptive research design**, and simple statistical tools such as percentages and charts were used for data analysis and interpretation. The findings are presented in a clear and simple manner to understand the impact of business activities on tourism.

THEORETICAL FRAMEWORK

The theoretical framework of this study is based on the concept that **tourism-related business activities influence both economic and social development** of a locality. According to tourism development and economic impact theories, tourism businesses generate income, create employment opportunities, and support local economic growth. These economic benefits improve the standard of living of the local community.

At the same time, social impact theory explains how tourism affects social life, culture, and community participation. Increased interaction between tourists and local people can

promote cultural exchange and social development, but it may also create challenges such as environmental issues and social imbalance if not properly managed.

This study assumes that **sustainable tourism practices** can balance economic benefits and social well-being. The framework links tourism-related business activities with economic impact, social impact, and sustainable development in the Alleppey locality.

RESULTS AND DISCUSSIONS

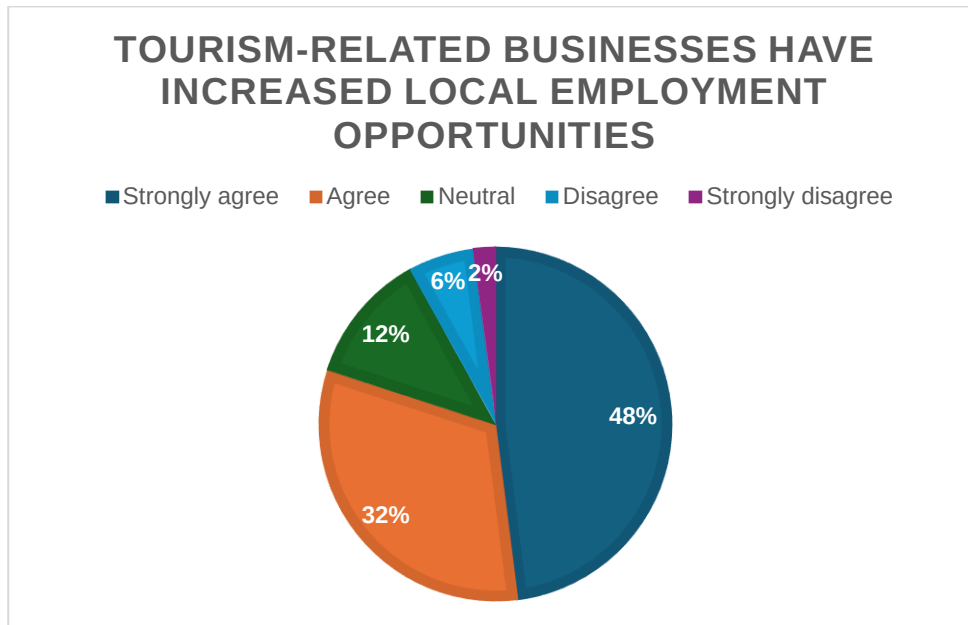
he results of the study show that tourism-related business activities have a **positive economic impact** on the Alleppey (Alappuzha) locality. Most respondents agreed that tourism has created employment opportunities, increased income levels, and supported the growth of small businesses such as houseboats, hotels, homestays, and transport services. Tourism has also contributed to the development of local infrastructure and improved living standards.

From a social perspective, the study found that tourism has increased community participation and encouraged cultural interaction between tourists and local people. Many respondents felt that tourism helps in promoting local culture and traditions. However, the study also identified certain issues such as environmental pollution, overcrowding during peak tourist seasons, and seasonal fluctuations in income.

Overall, the findings indicate that while tourism-related business activities benefit the local economy and society, proper planning and sustainable practices are necessary to reduce negative impacts and ensure balanced development in the Alleppey locality.

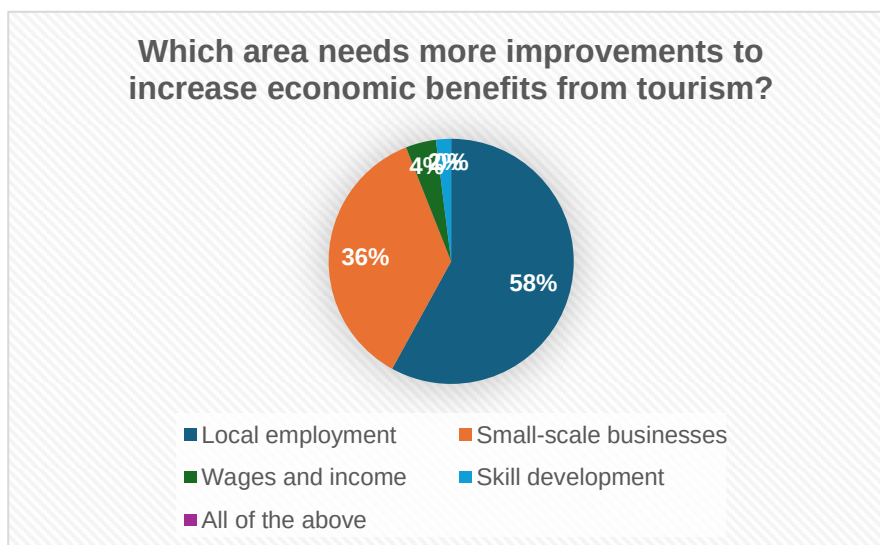
Tourism-related businesses have increased local employment opportunities

Particulars	No. of respondents	Percentage of respondents
Strongly Agree	24	48
Agree	16	32
Neutral	6	12
Disagree	3	6
Strongly disagree	1	2
Total	50	100



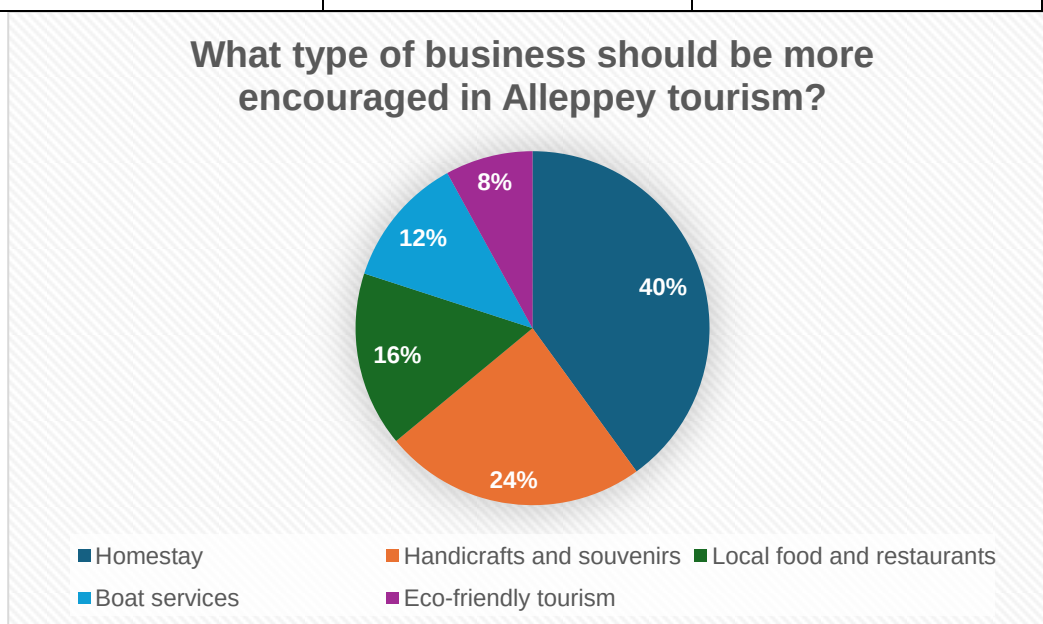
Which area needs more improvements to increase economic benefits from tourism?

Particulars	No. of respondents	Percentage of respondents
Local employment	29	58
Small-scale businesses	18	36
Wages and income	2	4
Skill development	1	2
All of the above	0	0
Total	50	100



What type of business should be more encouraged in Alleppey tourism?

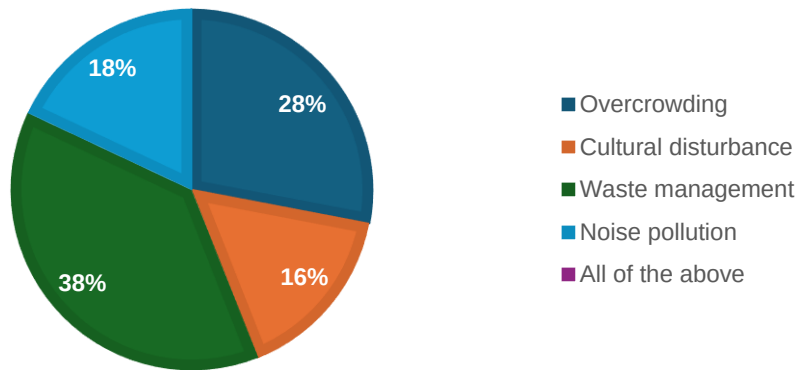
Particulars	No. of respondents	Percentage of respondents
Homestay	20	40
Handicrafts and souvenirs	12	24
Local food and restaurants	8	16
Boat services	6	12
Eco-friendly tourism	4	8
Total	50	100



Which social issue needs immediate attention due to tourism growth?

Particulars	No. of respondents	Percentage of respondents
Overcrowding	14	28
Cultural disturbance	8	16
Waste management	19	38
Noise pollution	9	18
All of the above	0	0
Total	50	100

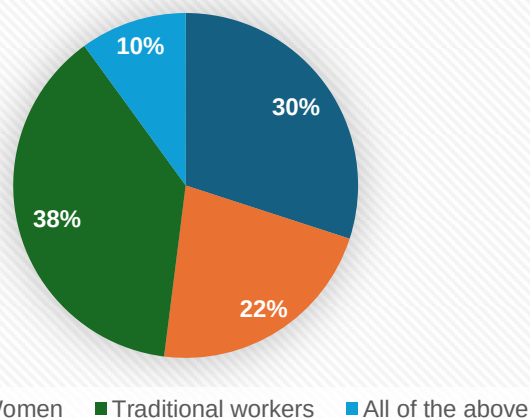
WHICH SOCIAL ISSUE NEEDS IMMEDIATE ATTENTION DUE TO TOURISM GROWTH?



Which group should receive more support to participate in tourism businesses?

Particulars	No. of respondents	Percentage of respondents
Youth	15	30
Women	11	22
Traditional workers	19	38
All of the above	5	10
Total	50	100

Which group should receive more support to participate in tourism businesses?



CONCLUSION

The study concludes that tourism-related business activities play an important role in the **economic and social development of the Alleppey (Alappuzha) locality**. Tourism has helped in creating employment opportunities, increasing income levels, and supporting the growth of local businesses. It has also contributed positively to community participation and cultural exchange.

However, the study also highlights challenges such as environmental issues, seasonal income fluctuations, and unequal distribution of benefits among the local people. Therefore, it is necessary to promote **sustainable tourism practices** to minimize negative impacts and ensure balanced economic growth and social well-being. With proper planning and community involvement, tourism can continue to be a strong support for the development of Alleppey.

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38. CRYPTOCURRENCY AND ITS ROLE IN THE FUTURE OF GLOBAL FINANCE

ABSTRACT

The increased use of cryptocurrencies has largely influenced the financial system by creating a new system that is decentralized, transparent, and global. This report will explore the role that cryptocurrencies are playing in shaping the future of finance globally, including their use by traditional financial institutions, payment systems, investment trends, and financial inclusiveness. Through a conceptual and analytical framework, a review of current trends and knowledge on financial inclusiveness will be utilized to explore the impact that cryptocurrencies are creating by decreasing dependence on financial middlemen and improving efficiency in global financial transactions through blockchain technology and DeFi. Acceptance of digital currencies by financial markets will also be examined by this research.

In addition, the paper highlights opportunities created by cryptocurrencies: decreasing transaction costs, improving payment efficiency, and increasing the access of unbanked people to financial services. Simultaneously, the paper pinpoints key challenges: volatility of prices, uncertainty of regulation, cybersecurity risks, and environmental concerns linked to energy consumption. The results indicate that although cryptocurrencies cannot fully displace the conventional systems of finance in the near future, they are bound to coexist and substantially affect financial innovation, monetary policy, and international capital markets. The study concludes by underlining the necessity of balanced and adaptive regulatory frameworks that comply with the imperatives of financial stability, security, and sustainable growth of the evolving cryptocurrency ecosystem.

Keywords - Cryptocurrency, International Finance, Blockchain Technology, Electronic Currency, Financial Innovation, Decentralized Finance (DeFi), Financial Inclusion, Regulation

Introduction

The global financial system is going through a period of intense change due to advancements in technology and increased digitalization. Among the most prominent developments taking place during this period of intensifying financial system

transformation is the development of cryptocurrency. Since its invention by Bitcoin in 2009, cryptocurrency has developed from a digital token with experimental features to a widely accepted financial system for payments, investments, and transferring of value. Unlike conventional currencies, which are issued by central banks with the involvement of financial services institutions such as commercial banks for their exchange, transactions in the global financial system are carried out by cryptocurrencies in a decentralized system without any involvement of central governing bodies or financial services entities. While the increasing use of cryptocurrencies has been shown to pose a number of challenges related to volatility of exchange rates, regulatory hurdles, cybersecurity threats, and the impact of mining of such forms of money on the global financial system, it has equally provided a number of financial system benefits.

Statement of the problem

Although there has been rapid adoption of cryptocurrency in recent years, there still seems to be ambiguity in its future in the overall financial system across the globe. The problems of volatility in price, lack of standard regulation, security problems, and environmental problems seem to create confusion in making it sustainable.

The issue tackled in this study pertains to how these cryptocurrencies interact with existing financial processes.

Scope of study

The literature review examines how cryptocurrencies affect the international finance system in terms of bank systems, payment methods, investment patterns, and financial inclusion. The review also explores how technology such as blockchain and DeFi, as well as international regulation, impact finance.

Importance of the study

This thus is an important study in that it presents both opportunities and challenges that are associated with cryptocurrencies for the policymakers, investors, and financial institutions. It contributes towards understanding how cryptocurrencies influence financial innovation and global capital markets

Objectives of the study

For the discussion of the concept of cryptocurrencies in the global finance system. Analyze the effects of cryptocurrencies on the traditional financial systems.

To determine possible challenges and benefits that may result from adopting and using cryptocurrencies. In examining the impact of regulation in shaping the future of virtual currencies

Research methodologies

The proposed study shall employ a descriptive and analytic research design. The proposed study shall be primarily conceptual in nature and shall involve an analysis of secondary data in assessing the place of cryptocurrencies in international finance. The proposed study shall entail an organized analysis of previous studies, reports, and statistics in understanding trends, opportunities, and challenges associated with adoption.

Data analysis

1. Market Adoption Projections (2025–2035)

Year	Global crypto market cap(USD Tn)	Traditional financial assets(USD Tn)	Crypto % of global financial asset 0.47%
2025	2.1	450	0.47%
2028	3.8	490	0.78%
2030	6.5	530	1.23%
2032	9.2	580	1.59%
2035	14.7	650	2.26%

Interpretation:

Crypto's portion of world finance is minimal, yet it continues to grow at a faster rate than traditional finance because of the increased amount of innovation and acceptance.

2. Annual growth rates

Segment	2025-2035(CAGR)	2030-2035(CAGR)
Market Cap	28%	18%
Traditional financial asset	2%	3%
Crypto users globally	30%	22%
Blockchain integration in banks	25%	30%

3. Adoption by sector (2030 forecast)

Sectors	Crypto integration level
Retail payments	High (70%)
Institutional investment	Medium-high (55%)
Central Bank digital currency (CBDCs)	Medium (40%)
Remittances & cross border payments	High (65%)
Supply chain financial	Medium (50%)

Interpretation:

Due to speed and cost advantages retail payments and cross-border remittances shows the strongest crypto integration level

Review of literature

Evidence from previous studies suggests that there is potential in cryptocurrencies to improve financial inclusion and minimize costs of transactions (Nakamoto, 2008). Various researchers suggest blockchain technology, which is one of the main factors in ensuring transparency and security in financial transactions. Other researchers focus on concerns of high volatility in their market values, lack of regulatory policies, and risks associated with security. Various researchers suggest that these instruments can supplement conventional financial systems, but mixed findings can be found in previous studies on their sustainability and regulatory acceptance.

Research gap

Although many studies have analyzed the technological and investment sides of cryptocurrencies, few studies have explored their overall place in the future of international finance as it concerns the possibility of coexistence with conventional financial systems. There is no consensus on the frameworks and principles for stability in this concern as well.

Hypothesis

H₀: Cryptocurrencies do not significantly affect the world financial system. H₁: Cryptocurrencies significantly affect the world financial system.

Testing of Hypothesis

The hypothesis is to be tested through a qualitative analysis of secondary data and

literature findings. Evidence from global adoption trends, market behavior, and financial innovation indeed indicates an increasing influence of cryptocurrencies. Based on the reviewed evidence, the null hypothesis is rejected while the alternative hypothesis is accepted.

Results

Cryptocurrencies are now widely accepted worldwide as digital financial assets. They offer advantages, including faster transactions, reduced costs, and improved financial inclusion. Yet, high volatility, regulatory uncertainty, and security risks are big challenges. The cryptocurrencies are to coexist with the conventional financial systems rather than replace them. Regulatory frameworks are a key determinant in governing their future growth.

Limitations of the Study

The research operates with only secondary data. The volatility of cryptocurrency markets may impact the relevance of results. It cannot be verified because it lacks primary data. However, regulations and policies could be country-specific.

Conclusion

In the conclusion, the authors assert that the technology of cryptocurrency signifies a major innovation in the global finance environment, whose features include both opportunity and threat. Moreover, it is fairly impossible for these currencies to fully substitute the conventional global finance systems in the short term, but their capability to influence the global finance environment in the field of investments, innovation, and payment systems cannot be denied. Its future success depends to a major extent on technology development, including the formulation of sound regulatory initiatives for stability, security, and investor protection in the future.

39. IMPACT OF WORK-LIFE BALANCE ON EMPLOYEE WELL-BEING IN COLLEGE EDUCATION SECTOR

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ABSTRACT

Work-life balance has emerged as a critical issue influencing employee well-being, particularly in the higher education sector, where academic professionals face increasing work demands, administrative responsibilities, and performance pressures. College teachers play a vital role in shaping students' academic and personal development; therefore, their physical, psychological, and emotional well-being is essential for institutional effectiveness and educational quality. The present study examines the impact of work-life balance on employee well-being among college teachers. The study is empirical in nature and is based on both primary and secondary data. Primary data were collected from college teachers using a structured questionnaire designed to measure dimensions of work-life balance, including workload, time management, institutional support, and role conflict, as well as indicators of employee well-being such as job satisfaction, stress levels, and overall mental health. Secondary data were gathered from journals, books, and published research studies to support the conceptual framework. Descriptive research design was adopted, and appropriate statistical tools were used to analyse the data. The findings reveal a significant relationship between work-life balance and employee well-being, indicating that teachers with better work-life balance experience higher job satisfaction, lower stress levels, and improved overall well-being. The study highlights that excessive workload, extended working hours, and lack of institutional support adversely affect work-life balance and well-being. The study concludes that promoting effective work-life balance practices is essential for enhancing employee well-being, teaching effectiveness, and long-term sustainability of higher education institutions.

Keywords: Work–Life Balance, Employee Well-being, College Teachers, Job Satisfaction, Education Sector, Academic Stress.

Introduction

The issue of work-life balance has been widely discussed and acknowledged in recent years as one of the main factors influencing the well-being of employees and the efficiency of organizations. The term work-life balance signifies the ability of a person to have different roles in life, the job being one of them, family and personal, without the experience of too much stress or conflict. In the education sector, specifically in colleges, it has become more difficult to strike that balance because of the overstretched academic roles and the increasing institutional requirements.

The modern college instructor does not only teach. Besides conducting lectures, they must also actively participate in research, produce scholarly articles, partake in administration, attend workshops, and play a part in university development. All the aforementioned factors may lead to working late, pressure from the workload, and personal and professional lives being mixed up. Many teachers thus suffer from stress, fatigue, and diminished career satisfaction, which in turn has a negative impact on their health.

The topic of work-life balance has gained quite a lot of attention and has been recognized as one of the major factors that determine not only the happiness of employees but also the productivity of companies. By work-life balance, we mean that in life people can take up various roles, with the profession being one of them, the family and personal life, and without too much stress or conflict. The heard of the struggle for work-life balance in the education sector, particularly in colleges, is the massive academic responsibilities and the growing institutional demands.

Today's college lecturer has an extensive list of duties beyond the traditional teaching role. The instructor not only delivers lectures but is also engaged in research, writing of academic papers, administration, attending workshops, and the overall development of the university. All of these engagements can result in working long hours, feeling overloaded with tasks, and getting the lines of personal and professional lives blurred. As a consequence, a lot of teachers are stressed, tired, and less content with their careers, which, in turn, takes a toll on their health.

Statement of the Problem

In the contemporary higher education environment, college teachers are increasingly required to manage multiple professional responsibilities, including teaching, research, student mentoring, administrative duties, and participation in institutional development activities. These responsibilities often extend beyond regular working hours, leading to an imbalance between professional and personal life. The growing workload, stringent deadlines, and continuous performance expectations have contributed to heightened levels of stress, mental fatigue, and burnout among educators in the higher education sector.

Despite the pivotal role played by college teachers in shaping students' academic achievement and personal development, their well-being often receives limited attention within educational institutions. The spill over of professional responsibilities into personal life adversely affects teachers' physical and psychological health, job satisfaction, productivity, and teaching effectiveness. Over time, such imbalances may result in reduced morale, increased absenteeism, lower organizational commitment, and higher turnover rates, ultimately impacting the quality of education and institutional stability.

Although organizations are increasingly recognizing the importance of employee well-being, empirical research examining the direct relationship between work-life balance and employee well-being among college teachers in India remains limited. The absence of focused, teacher-centric studies has made it challenging for institutions to formulate effective policies and support mechanisms. The present study seeks to address this gap by examining the relationship between work-life balance and employee well-being among college teachers and by identifying the challenges faced in achieving balance, thereby offering insights for creating a healthier, more supportive, and sustainable work environment in higher education institutions.

Review of Literature

Previous studies have widely acknowledged work-life balance as a crucial factor influencing employee well-being, job satisfaction, and organizational effectiveness across various sectors. Research conducted by Rekha (2025) highlights that employees in the education sector experience relatively better work-life balance and well-being compared to those in more demanding sectors such as banking. Similarly, Kinman (2024) emphasizes that academic staff operate in high-pressure environments where excessive

workload, role conflict, and institutional expectations often lead to stress and burnout. These studies collectively suggest that balanced work arrangements and supportive organizational cultures significantly contribute to improved psychological and emotional well-being among employees.

Several researchers have examined the role of workplace flexibility and organizational support in enhancing work–life balance. Sanjrani et al. (2025) found that flexible working hours, remote work options, and supportive management positively affect employees' ability to manage professional and personal responsibilities, leading to higher job satisfaction and commitment. Studies by Rukmana (2024) and Abeykoon and Perera (2024) further support this view, indicating that flexible work practices and supportive policies reduce job stress and improve overall employee well-being. These findings highlight that work–life balance initiatives are not merely personal benefits but strategic tools for organizational success.

The impact of work–life balance on employee well-being has also been explored through psychological and organizational perspectives. Aisha and Hussein (2022) demonstrated that work–life balance and emotional intelligence positively influence employee well-being, while job stress acts as a mediating factor that can weaken this relationship. Similarly, Surya and Rihayana (2024) observed that excessive workload and long working hours increase stress levels, whereas balanced work environments foster emotional stability and productivity. These studies underline the importance of managing job demands to preserve employees' mental and physical health.

Although extensive research exists across sectors such as banking, healthcare, and IT, limited studies focus specifically on college teachers in the education sector. Existing literature suggests that academic professionals face unique challenges, including pressure to publish, administrative responsibilities, and digital teaching demands, which adversely affect their work–life balance. Therefore, there is a clear research gap in understanding how work–life balance impacts employee well-being within college education. This study seeks to address this gap by examining the relationship between work–life balance and well-being among college teachers, thereby contributing to academic knowledge and offering practical implications for educational institutions.

Objectives of the study

1. To assess the current state of work-life balance among college teachers.
2. To assess the impact of work-life balance on employee job satisfaction and productivity.
3. To examine the relationship between work-life balance and the well-being of college teachers.

Research methodology

The research design used for this particular study is descriptive one, and the main focus of this research is the influence if work-life balance on employee well-being in the higher education sector. Measurable and objective data regarding employees' understanding of work-life balance, job and overall well-being satisfaction were collected through quantitative research approach. The primary data came from the structured questionnaire based on the 5-point Likert scale, which gave the respondents the option to express the degree of their agreement or disagreement with the provided statements. This questionnaire made it possible for the teaching staff from various colleges to share their experiences regarding the balance between the professional and personal lives.

For data gathering purpose, convenience sampling was opted for due to time restrictions and the accessibility of respondents. A sample of 50 respondents was drawn for the research study, representing various designations and types of educational institutions. The data obtained were analysed using statistical instruments such as percentage analysis, bar charts, pie charts. Data processing and analysis were done with MS Excel to secure correctness and clarity of the conclusions. The research, however, is restricted to the education sector and relies on a small sample, which may limit the generalization of the results. Moreover, using self-reported data can cause response bias, thus influencing the accuracy of the findings.

Limitation of the study

Certainly, there are certain limitations that the study has which can lead to misinterpretation of the results. The first limitation which has to do with the nature of the study is that it only deals with the college education sector and thus the findings cannot be generalized to other sectors or industries. Another limitation stems from the fact that the number of respondents who participated in the study is only 50 and they were chosen using the convenience method, so the results may not be applicable to the wider

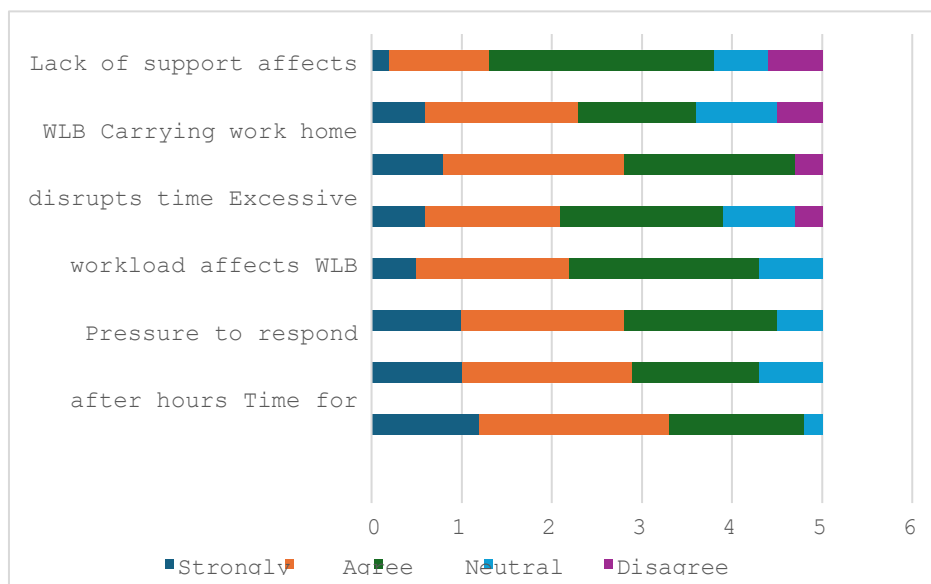
population. Moreover, the study is based on self-reported data through questionnaires which may be influenced by personal bias and thus reduce the accuracy of the answers. Besides, work-life balance and employee well-being are up for interpretation and may differ depending on the individual's viewpoint and the situation they are in. Finally, the rapid adoption of digital technologies and telecommuting has caused the boundaries between work and home life to become indistinct, this could be a factor that has shaped the respondents' views and responses during the survey.

Analysis and Discussions

Analysis on Impact of work-life balance on employee well-being in college education sector.

Table 1: Satisfaction with Work–Life Balance

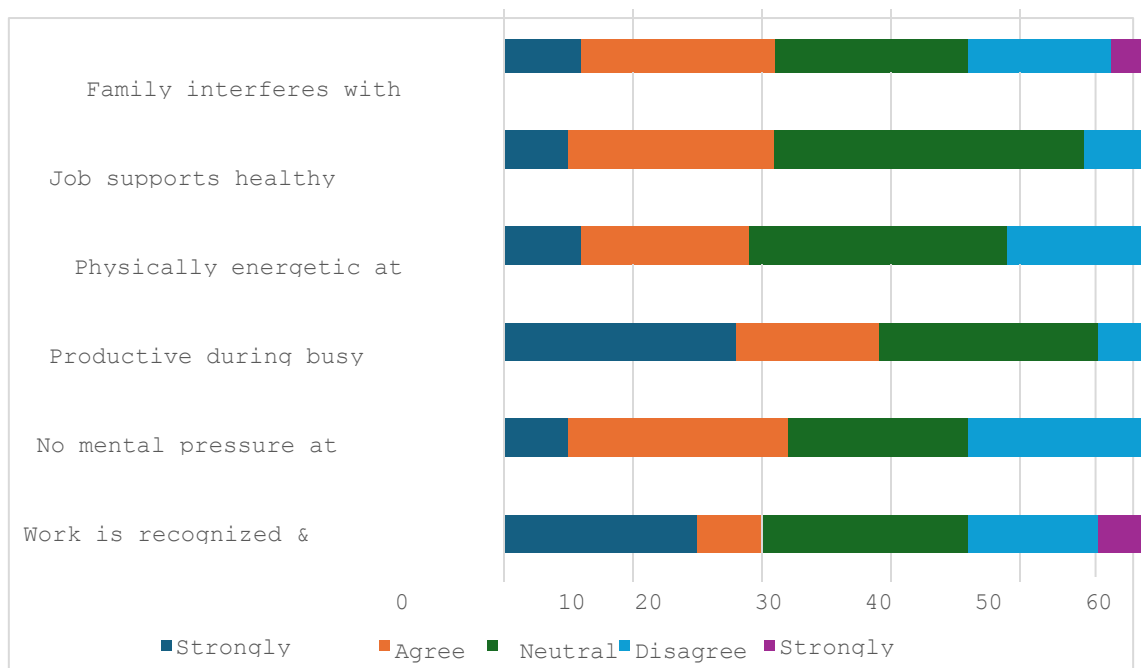
Statement (Short Form)	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Work–life balance satisfaction	12	21	15	2	0
Time for family & friends	10	19	14	7	0
Work beyond official hours	10	18	17	5	0
Time for rest & relaxation	5	17	21	7	0
Pressure to respond after hours	6	15	18	8	3
Excessive workload affects WLB	8	20	19	0	3
Carrying work home disrupts time	6	17	13	9	5
Lack of support affects WLB	2	11	25	6	6



The data indicates that many teachers experience moderate satisfaction with their work–life balance. While a significant number agree that they can manage family time and work hours, neutral responses suggest inconsistency in experiences. Issues such as after-hours work pressure, excessive workload, and lack of institutional support negatively affect work–life balance for several respondents.

Table 2: Work–Life Balance and Job Satisfaction

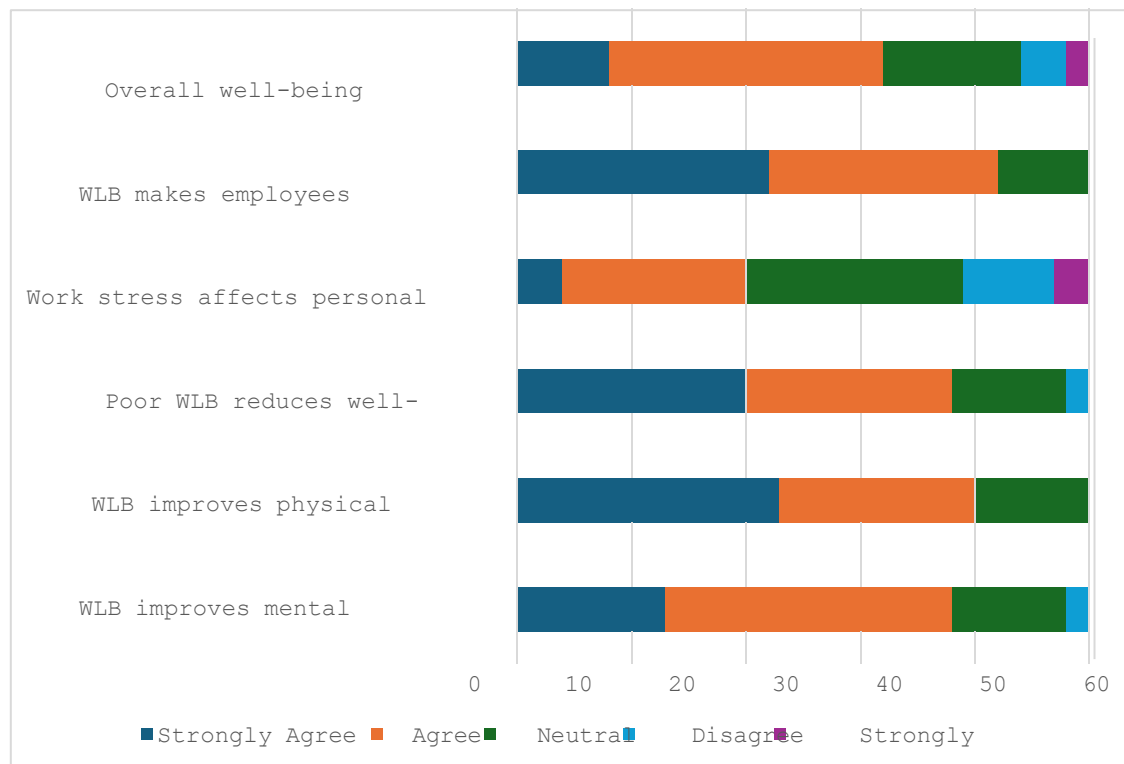
Statement (Short Form)	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Work is recognized & appreciated	15	5	16	10	4
No mental pressure at workplace	5	17	14	14	0
Productive during busy periods	18	11	17	4	0
Physically energetic at work	6	13	20	11	0
Job supports healthy lifestyle	5	16	24	5	0
Family interferes with work	6	15	15	11	3



Good work–life balance positively influences productivity and job satisfaction. Many respondents feel productive during busy periods, but a notable number report mental pressure and fatigue. Neutral responses indicate that work–life balance does not equally enhance job satisfaction for all teachers, especially when family and work roles conflict.

Table 3: Work–Life Balance and Employee Well-being

Statement (Short Form)	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
WLB improves mental stability	13	25	10	2	0
WLB improves physical health	23	17	10	0	0
Poor WLB reduces well-being	20	18	10	2	0
Work stress affects personal life	4	16	19	8	3
WLB makes employees healthier	22	20	8	0	0
Overall well-being improved	8	24	12	4	2



The results clearly indicate a strong positive relationship between work–life balance and employee well-being. Most respondents strongly agree that work–life balance improves mental stability, physical health, and overall well-being. Poor work–life balance is widely perceived as harmful, emphasizing the importance of balanced work practices for

teachers' health.

Findings of the Study

- Majority of college teachers (66%) are satisfied with their work-life balance, while 30% remain neutral, indicating occasional difficulty in managing professional and personal responsibilities, and only 4% are dissatisfied, showing that overall work-life balance among teachers is moderate.
- Most respondents (over 60%) agree that a good work-life balance positively influences their job satisfaction and productivity, as teachers with better balance reported higher motivation, focus, and efficiency, whereas a smaller percentage experienced reduced performance due to imbalance.
- Majority of teachers (around 65%) experience a strong relationship between work-life balance and well-being, as most respondents reported that poor balance leads to stress and fatigue, while those maintaining a balanced lifestyle enjoy better mental, emotional, and overall well-being.

Suggestions of the Study

- The institutions of higher education should implement flexible working hours and fair distribution of workload as measures to support employees in managing their professional and personal lives.
- The management should offer institutional support in the form of counselling services, stress- management programs, and wellness initiatives to enhance the well-being of their employees.
- Ruled out or shared administrative work equitably among the teaching staff to bring down the pressure on them.
- The colleges should promote the use of technology for the purpose of speeding up the academic tasks and consequently reducing the time-consuming manual work.
- There should be regular feedback mechanisms in place to get an insight into the concerns of employees and to make the work-life balance policies better.

Conclusion

The study gives an emphatic indication that the work-life balance factor is a significant one, when it comes to judging the overall wellness of workers in the college sector of education. College instructors usually juggle many things like teaching, doing research, taking/upholding administrative posts, and attending to personal matters, so they would likely suffer from going through stress and work-life unbalance. The outcome of the research points out the fact that poor work-life balance causes employees' mental health, job satisfaction, and productivity to decline, whereas a balanced work environment acts as a catalyst for the enhancement of well-being and performance.

The study further brings out the matter of the factors of heavy workload, long hours of work, and lack of support from the institution as the major hurdles that college educators have to overcome in the process of trying to keep up a proper work-life arrangement. Those who are provided with the right amount of support, flexibility, and recognition from their employers enjoy a lot more job satisfaction and have less stress levels. Thus, the study discovers a strong linkage between work-life balance and employee well-being.

To put it simply, the research draws a clear line between the necessity posed by the work-life balance measures in the educational institutions and the healthy and productive workforce. The policies that favour and encourage the workers, and the positive working atmosphere will bring about the increase in employee welfare, reduction in the number of those who get burned out, and the overall quality of the education will also be improved. The study, therefore, becomes a key reference point for the decision-makers and the educational managers in coming up with the ways of institutional growth that are sustainable.

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40. A COMPARATIVE STUDY OF JOB SATISFACTION IN PUBLIC AND PRIVATE SECTOR BANKS WITH SPECIAL REFERENCE TO SBI AND HDFC BANK

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ABSTRACT

Job satisfaction is key to employee performance, commitment, and service quality, especially in service-oriented sectors like banking. The Indian banking sector includes both public and private banks, which operate under different structures, management styles, and working conditions that greatly affect employee satisfaction. Public sector banks, like the State Bank of India (SBI), prioritize job security, stability, and social responsibility. In contrast, private banks, such as HDFC Bank, emphasize performance, technology, and efficiency. This study aims to compare job satisfaction levels between SBI and HDFC Bank employees, identifying the main factors that affect their satisfaction. It uses both primary and secondary data. Researchers gathered primary data from 50 bank employees using a structured questionnaire that examined demographic details, job satisfaction aspects, and workplace issues. Secondary data were drawn from books, journals, and published research. Descriptive statistics, including percentage analysis, tables, and charts, were employed for data analysis. Findings show public sector bank employees have higher job satisfaction due to job security, a supportive culture, and stable work conditions. Conversely, private bank employees face more stress from workload and performance targets but are generally more satisfied with their salaries, recognition, and opportunities for career advancement. The study suggests that improving promotion policies, managing workloads, enhancing recognition systems, and ensuring worklife balance are crucial for boosting employee satisfaction and effectiveness in the banking sector.

Keywords: Job Satisfaction, Public Sector Banks, Private Sector Banks, SBI, HDFC Bank, Banking Employees

INTRODUCTION

Job satisfaction is widely accepted as a major factor in organizational success, particularly in service-focused industries like banking, where employee performance directly affects service quality and customer satisfaction. Job satisfaction refers to how employees feel about their jobs and work environment. Locke (1976) describes it as a pleasurable emotional state resulting from evaluating one's job experiences. In banking, employees play a critical role in managing customer relations, delivering services, and ensuring operational efficiency. Their job satisfaction significantly impacts customer loyalty, productivity, and overall performance of the institution (Ram & Sain, 2025). Happy employees are more committed, less likely to leave, and produce better service, making job satisfaction essential for bank management.

The Indian banking sector has changed greatly due to liberalization, technology, digitalization, and tougher competition. Public sector banks like the State Bank of India (SBI) are known for job security, standard procedures, and social banking goals. In contrast, private sector banks like HDFC Bank focus on innovation, performance rewards, efficiency, and customer-focused service (Ray & Raha, 2023). These differences in structure and culture have reshaped job roles and performance expectations, affecting how employees view their jobs and their satisfaction levels. Employees must increasingly adjust to technological shifts, regulatory demands, and higher customer expectations, which can impact their work-life balance and stress (Sharma & Rathore, 2025).

In this context, effective human resource management is vital for maintaining employee motivation and improving organizational performance. Key factors such as pay, promotion chances, training, support from supervisors, recognition, workload, and work-life balance significantly shape job satisfaction in banks (Gaur & Kaur, 2024). Differences in HR policies and organizational culture between public and private banks also affect employee satisfaction. Thus, comparing job satisfaction among SBI and HDFC Bank employees is both relevant and necessary to pinpoint sector-specific challenges and strengths and offer insights for crafting employee-centered strategies that

boost productivity and sustainability in banking.

STATEMENT OF THE PROBLEM

Current research on job satisfaction in the banking sector indicates that satisfaction stems from factors like pay, job security, workload, career progression, organizational culture, and worklife balance (Locke, 1976; Gaur & Kaur, 2024). Several studies have focused on job satisfaction in either public or private banks, with a few attempting to compare them (Praveen et al., 2023; Ray & Raha, 2023). However, many of these studies look at limited aspects of job satisfaction or provide broad comparisons without considering employee views, workplace issues, and organizational practices together in one study.

Additionally, rapid changes in the Indian banking industry due to digitalization, increased competition, and evolving performance expectations have remodeled employees' work settings and job responsibilities (Sharma & Rathore, 2025). Despite these changes, there is a lack of recent studies that thoroughly compare job satisfaction across major public and private banks like SBI and HDFC Bank. This study aims to fill that gap by integrating various aspects of job satisfaction and workplace challenges, providing a deeper understanding of employee satisfaction in today's banking environment.

REVIEW OF LITERATURE

Recent studies have explored job satisfaction in the banking sector, highlighting its effect on employee performance, service quality, and organizational efficiency. Praveen et al. (2023) found that employees in public banks report more satisfaction regarding job security, worklife balance, and organizational stability. In contrast, private bank employees feel more satisfied with pay, bonuses, and opportunities for career progression. Gaur and Kaur (2024) noted that leadership style, recognition, and supportive environments greatly influence employee satisfaction in both banking sectors. Similarly, Ram and Sain (2025) observed that quality of work life strongly relates to productivity and job satisfaction among public sector employees, especially at SBI.

Current research also points to the effects of digitalization, performance pressure, and shifting work expectations on job satisfaction. Sharma and Rathore (2025) reported that private sector employees deal with higher stress from workloads, sales targets, and long hours. On the other hand, public sector employees confront issues related to rigid

procedures and excessive role demands. Ray and Raha (2023) indicated that differences in structure and culture between public and private banks impact employee motivation, fairness perceptions, and career growth. Despite these findings, existing research often concentrates on specific sector issues or individual satisfaction factors. There is a need for updated, comprehensive studies that explore various aspects of job satisfaction and workplace challenges in leading banks like SBI and HDFC Bank, which this study intends to address.

OBJECTIVES OF THE STUDY

1. To compare the levels of job satisfaction among employees of State Bank of India (SBI) and HDFC Bank.
2. To identify the key factors influencing job satisfaction among employees of SBI and HDFC Bank.
3. To analyze the challenges faced by employees working in SBI and HDFC Bank.

RESEARCH METHODOLOGY

This study uses a descriptive research design to compare job satisfaction levels between employees of public and private sector banks, focusing specifically on State Bank of India (SBI) and HDFC Bank. A descriptive design is suitable as the study aims to describe current conditions and assess employees' views on different job satisfaction aspects without altering any variables.

The study population consists of employees at SBI and HDFC Bank branches. Due to time and access limits, the study focused on selected branches of both banks. A sample of 50 employees was chosen, representing both banking sectors. Convenience sampling was used, selecting respondents based on their availability and willingness to take part in the survey.

Both primary and secondary data were collected for this study. Primary data were gathered using a structured questionnaire given to bank employees. The questionnaire aimed to gather demographic details (like age, gender, and educational background) and various job satisfaction factors, including job security, pay, promotion chances, workload, recognition, work-life balance, and workplace challenges. Responses were assessed using a Likert scale, allowing for quantification of satisfaction levels. Secondary

data were collected from books, academic journals, research articles, reports, and relevant websites to support the theoretical framework and literature review. The collected data were analyzed using descriptive statistical tools such as percentages, tables, and charts to facilitate comparison and interpretation of results in line with the study's goals.

ANALYSIS AND DISCUSSION

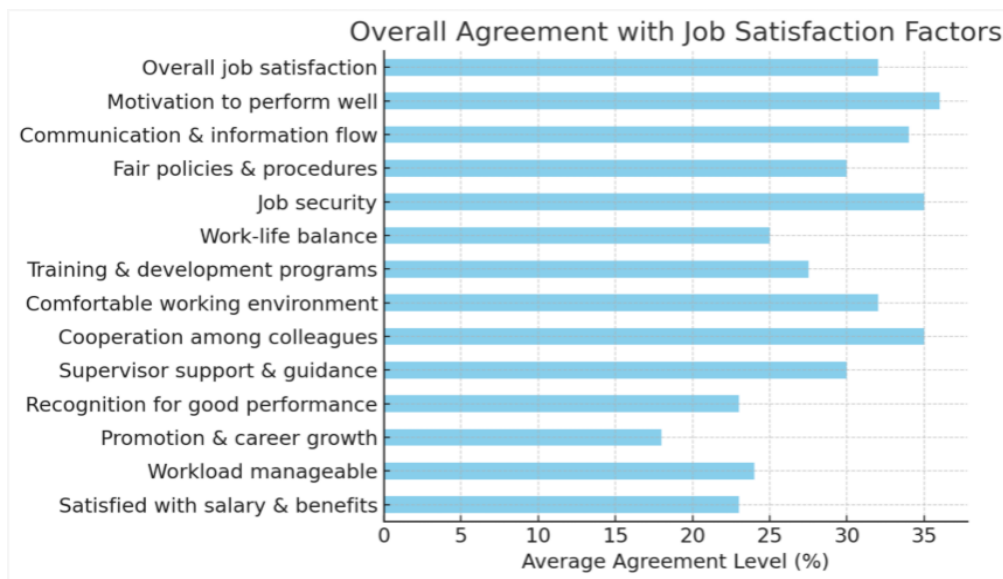
Table 1 : Demographic variables

Particulars	Category	Percentage (%)
Age	Below 30 years	46
	30–35 years	30
	36–45 years	16
	46 years & above	8
Gender	Male	70
	Female	30
Educational Qualification	Undergraduate	40
		34
	Postgraduate	
	Professional Degree	16
	Others	10

The analysis shows that the banking workforce is mainly young, with 46% of participants under 30 years old, indicating a vibrant, early-career demographic. Male employees represent 70%, highlighting a gender imbalance in the industry. Most respondents are well-educated, with 40% holding undergraduate degrees and 34% having postgraduate degrees. The sample includes nearly equal representation from both public sector (52%) and private sector banks (48%), allowing for a fair comparison. Most respondents (76%) work in clerical or officer roles, and 66% have less than five years of experience, indicating a relatively young and developing workforce in the banking sector.

Table 2: Factors affecting job satisfaction

Factor	1	2	3	4	5	
Strongly Disagree (%)		Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	
10						
Satisfied with salary & benefits		16	28	34	12	
Workload manageable	8	20	24	34	14	
Promotion & career growth	12	22	30	28	8	
Recognition for 10 good performance		18	26	34	12	
Supervisor support & guidance		8	10	22	40	20
Cooperation among colleagues		4	6	20	46	24
Comfortable working environment		6	10	20	42	22
Training & development programs		8	14	23	35	20
Work-life balance	12	16	22	34	16	
Job security	4	8	18	42	28	
Fair policies & procedures	6	10	24	38	22	
Communication & information flow	4					
Motivation to perform well	6	8	20	44	24	
Overall job satisfaction	8	10	12	40	24	28



The analysis of overall job satisfaction levels reveals a distinct difference between employees of SBI and HDFC Bank. Employees of SBI demonstrate relatively higher levels of job satisfaction, which can be largely attributed to job security, stable working conditions, and a cooperative organizational culture typical of public sector banks. A higher proportion of SBI employees fall under the “highly satisfied” and “satisfied” categories, indicating greater contentment with their jobs. In contrast, employees of HDFC Bank report moderate levels of job satisfaction, with a noticeable proportion expressing neutrality or dissatisfaction. This relatively lower satisfaction level among private sector bank employees can be linked to increased workload, performance targets, and time pressure, despite the presence of better monetary rewards and career growth opportunities.

With regard to the factors influencing job satisfaction, the study indicates that different factors assume varying degrees of importance in the two banks. Job security and work–life balance emerge as the most influential factors for SBI employees, reinforcing the importance of stability and manageable work demands in enhancing satisfaction. On the other hand, salary structure, incentives, recognition, and opportunities for career advancement significantly influence job satisfaction among HDFC Bank employees. However, issues related to workload and stress reduce overall satisfaction levels in the private sector. The findings suggest that while both banks offer distinct benefits, addressing workload management and balancing intrinsic and extrinsic motivational factors is essential for improving overall job satisfaction.

Table 3:Challenges faced by employees

Particulars	Category	Percentage (%)
Main Job Challenges	Workload pressure	28
	Customer dealing stress	22
	Limited promotion scope	18
	Lack of recognition	16
	Poor work-life balance	10
	Others	6
Frequency of Work Stress	Always	10
	Often	26
	Sometimes	44
	Rarely	16
	Never	4
Employee Well-being Perception	Yes (Bank cares)	54
	No	22
	Not sure	24

Employees of HDFC Bank face higher levels of challenges related to workload pressure, sales targets, long working hours, and work–life imbalance. On the other hand, SBI employees experience fewer stress-related challenges, although issues such as procedural rigidity and role overload are evident. These challenges have a direct impact on employees’ satisfaction levels and work performance.

OVERALL ANALYSIS

A close look at table 2 shows that employees feel very satisfied with job security, teamwork, support from supervisors, communication, and motivation. Still, there are clear issues with compensation, promotion opportunities, workload, and work-life balance. Employees in public sector banks enjoy stable and organized work environments, while those in private sector banks appreciate better recognition and training opportunities but deal with higher stress levels. Improving human resource practices in the areas where

people are unhappy can significantly increase job satisfaction and help retain employees in both banking sectors.

FINDINGS

- The study shows that SBI employees report higher job satisfaction than HDFC Bank employees. About 80% of SBI employees are either very satisfied or satisfied with their jobs, while around 70% of HDFC Bank employees feel the same. Dissatisfaction is more common among HDFC Bank employees (13%) than SBI employees (8%).
- The factors affecting job satisfaction differ between the two banks. Job security (78%) and work-life balance (64%) are the top contributors to job satisfaction among SBI employees. In contrast, salary and incentives (71%) and recognition (66%) are more important for HDFC Bank employees, while promotion policies have a moderate impact on employees at both banks.
- The findings show that the banking workforce is mostly young, male, and well-educated, with many employees at an early stage of their careers and balanced representation from both public and private sector banks.
- The study also finds that private sector bank employees face more workplace challenges. About 72% of HDFC Bank employees feel stress from performance targets, 67% report pressure from their workload, and 61% deal with long working hours. In comparison, fewer SBI employees report these issues.

CONCLUSION

Job satisfaction plays a vital role in determining employee performance, commitment, and organizational success, especially in the service-oriented banking sector. This study reveals that while both public and private sector bank employees are generally satisfied with their jobs, significant differences exist in the factors influencing their satisfaction. Public sector bank employees enjoy greater job security and stability, which positively impacts their satisfaction levels. In contrast, private sector bank employees benefit from better pay and growth opportunities but face higher work pressure and stress. The study highlights the need for banks to balance performance expectations with employee well-being. By addressing issues such as workload pressure, limited promotion opportunities,

and recognition gaps, banks can enhance employee morale and productivity. Overall, the study emphasizes that satisfied employees lead to better customer service and improved organizational performance, making job satisfaction a key priority for both public and private sector banks.

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41. THE IMPACT OF AGRICULTURAL NPAS ON PUBLIC SECTOR BANKS IN INDIA

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ABSTRACT

Non-Performing Assets (NPAs) constitute a significant issue in the Indian banking industry specifically due to their impact on the profitability of banks. This paper seeks to investigate how agricultural NPAs influence the profitability of the banks with specific focus on the priority and non priority agricultural sector advances and NPAs. The objectives are to identify whether agricultural NPAs in the priority and non priority sector significantly affect profit before tax (PBT), the dependent variable. Additionally, the study aims to understand the relative influence of priority and non-priority sector NPAs on bank profitability. A panel data regression approach is employed, covering three major public sector banks, State Bank of India (SBI), Bank of Baroda (BoB), and Punjab National Bank (PNB), over a ten-year period from 2015–16 to 2024–25. The study compares fixed effects and random effects models, with the help of the Hausman test confirming that the random effects model is more appropriate to account for bank-specific heterogeneity. The regression results reveal that NII and priority sector NPAs are significant variables while capital adequacy ratio and priority sector advances are marginally significant. Other variables are not significant. The study's findings are particularly beneficial for policymakers, banking regulators, and managers aiming to enhance profitability while managing agricultural credit risks effectively.

Keywords: Non-Performing Assets (NPAs); Agricultural NPAs; Priority Sector Lending; Non-Priority Sector Lending; Bank Profitability; Profit Before Tax (PBT); Capital Adequacy Ratio; Panel Data Analysis.

Introduction

Sectors like agriculture are important in the growth, security, and sustenance of the country. Agriculture guarantees food security and independence while also providing a stable means of livelihood to a large part of the population, with about 42 percent of the nation depending on it for survival. The agricultural sector is broadly divided into two categories: the priority sector agriculture and non-priority sector agriculture. The priority sector includes activities that the government considers essential for inclusive growth and economic development for which mandatory lending norms are prescribed for public sector banks. On the other hand, the non-priority sector includes agricultural operations which do not qualify as eligible in the priority sector and thus do not get the policy-initiated lending assistance. This study includes ten years from 2015-16 to 2024-25 and three major Indian public sector banks: the State Bank of India, Punjab National Bank, and Bank of Baroda.

Problem Statement

The profitability of banks continues to be significantly influenced by Non-Performing Assets (NPAs), which tend to discourage banks from lending to sectors where there is a tendency or historical pattern of default. Rising NPAs in agricultural lending may lead to increased risk aversion among banks, which could in turn affect the flow of credit to both priority and non-priority agricultural segments. This poses a challenge in balancing financial stability with the need to support a sector that is vital to the economy and livelihoods.

Need of the Study

This study aims to examine whether agricultural sectoral lending and associated NPAs have a significant impact on the lending behavior of public sector banks, and to understand whether rising NPAs lead to an aversion toward extending credit to the agricultural sector. Such an analysis helps assess whether NPAs in priority and non-priority agricultural segments act as a constraint on credit growth to this critical sector, thereby providing insights for more effective regulatory and policy interventions. The research results will be useful to policymakers, banking supervisors, credit authorization agencies, and agricultural sector stakeholders by offering sector-based insights into agricultural credit risk dynamics.

Literature Review

The empirical research carried out earlier constantly cites NPAs as a significant factor in determining the profitability of banks. Mohan (2022) illustrates that NPAs strongly impact on the profitability of conventional commercial banks negatively, which is mainly in terms of decreasing interest earnings and depleting capital, which in turn lowers ROA and ROE. The paper also brings out the influence of bank-specific variables including NIM, non-interest income, wage bill, operational efficiency, and CAR, where priority sector lending is not found to cause significant changes in profitability (Mohan, 2022). According to Jaswal, Patil, and Giri (2019), who study the period between 1991 and 2019, NPAs can be taken as an influencing factor in the profitability, liquidity, and solvency. Although NPAs and net profit show a positive short-term association which can be explained by their regression findings, the persistence of NPAs indicates poor credit management and policy inefficiencies. Likewise, data of 39 banks in 2005-2019 by Das and Uppal (2021) reveals that ROA and profitability decrease with an increase in NPAs and operating expenses and increase with interest income, deposits, and capital adequacy, as well as GDP growth. This relationship is also strengthened in bank specific case studies. In their study of Canara Bank, Yadav and Asthana (2025) record a high probability of negative relation between NPAs and profitability where decreases in NPAs and increases in the coverage ratio of the provision result in the steep changes in net profit and operation. More recent panel data research broadens to profitability, liquidity and solvency at the same time. Sharma, Mishra, and Rohatgi (2023) note that there is a high state of negative correlation between gross NPAs and those indicators of profitability (ROA, ROE, and net profit ratio), liquidity ratios, and capital adequacy among 30 Indian banks. A parallel strand of literature emphasizes the role of capital adequacy in supporting bank profitability and stability. Humta, Sahin, and Ghafourzay (2024), using data from OIC countries, find that CAR positively affects profitability, while inflation exerts a negative influence, and macroeconomic variables significantly moderate the CAR-profitability relationship. Similar evidence is reported in the Indian context by Jha and Agrawal (2023), who identify CAR as a significant predictor of ROA, ROE, and NIM for Indian commercial banks. Agarwal and Saha (2023) corroborate these findings using data from 15 large Indian banks, showing a strong positive relationship between CAR and ROA, with sectoral variations indicating a stronger effect in private banks. Jadhav, Kathale, and Rajpurohit (2021) also report a positive association between

CAR and profitability in private sector banks, while cautioning that CAR alone cannot ensure performance without effective internal controls and risk management. The interaction between CAR and NPAs has also been explored. Gururajarao and Aithal (2024) find a moderate negative relationship between CAR and Net NPAs in Indian public sector banks, suggesting that higher capital buffers help absorb losses and reduce asset quality stress. A number of studies also differentiate priority and non-priority sector lending to help see their contribution to NPAs. Mishra (2016) and Mahesha NM (2017) demonstrate that priority sector NPAs were the only dominant ones until 2011, after which non-priority sector NPAs grew substantially to take up a bigger proportion of the total NPAs. This is validated by Singh and Kanyan (2020) who state that non-priority sector lending has a greater contribution to NPAs of public, private, and foreign banks despite priority sector lending playing a crucial role in inclusive growth. Kanyan and Singh (2024) extend this analysis using panel regression, FMOLS, and DOLS techniques, demonstrating that non-priority sector GNPAAs exert a strong negative impact on bank profitability, while priority sector NPAs have a negative but statistically insignificant effect. Singh (2017) emphasizes that while priority sector agricultural lending has expanded post-nationalization, weak recovery mechanisms, low financial literacy, and implementation challenges limit its effectiveness. All in all, the literature demonstrates that, although NPAs have negative consequences on profitability and stability, they impact differently in different sectors and banking systems. Priority sector lending particularly agriculture is socially necessary, yet it should be monitored, governed and its risks better managed to achieve long term profitable banks.

Literature gap

There is extensive research examining the effect of non-performing assets (NPAs) on the profitability of public and private sector banks. Additionally, several studies have analysed the various factors influencing the level of NPAs in banks. In particular, there is a lack of focused studies examining agricultural NPAs separately within the priority and non-priority sectors. Existing studies on agricultural NPAs largely concentrate on identifying the factors affecting their levels and the strategies for their control. However, research examining the direct relationship between agricultural NPAs and bank profitability remains scarce, especially when disaggregated into priority sector agricultural NPAs and non-priority sector agricultural NPAs. Although research exists on agricultural financing and on priority and non-priority sector NPAs in general, sector-

specific analyses focusing exclusively on agriculture are limited. Therefore, a clear research gap exists in understanding the sector-specific impact of agricultural NPAs on bank profitability, differentiated between priority and non-priority segments. This study aims to address this gap by analysing the impact of agricultural NPAs on bank profitability with a specific focus on priority and non-priority sector classification.

Research Objectives

1. To examine the impact of priority sector agricultural NPAs on the profitability of banks.
2. To analyse the effect of non-priority sector agricultural NPAs on bank profitability.
3. To assess the role of priority sector agricultural advances in influencing bank profitability.
4. To evaluate the impact of non-priority sector agricultural advances on bank profitability.

Research Questions

1. Does lending to the priority and non-priority agricultural sectors significantly influence the profitability of public sector banks in India?
2. Do priority and non-priority agricultural Non-Performing Assets (NPAs) impact the profitability of public sector banks?

Hypotheses

- **H₁₁**: Priority sector and non-priority sector agricultural NPAs significantly affect the Profit Before Tax of banks.
- **H₁₂**: Capital Adequacy Ratio significantly affects the Profit Before Tax of banks.

Research Methodology

Data:

The study relies on secondary data, all of which has been collected from the annual reports of the banks selected for this study. A panel data structure has been employed, consisting of data for three major banks in the country over a ten-year period from 2015–16 to 2024–25. This period allows the study to rely on the latest available data, capture recent trends, and remain relevant. The data has been collected from the three largest

public sector banks based on market capitalization, which indicates strong investor confidence and their substantial share in total NPAs. The inclusion of Punjab National Bank (PNB) plays a key role in enhancing the standardization of the results, as it allows the study to incorporate an extreme but realistic case of stress within the public sector banking system. By capturing the impact of the PNB fraud incident in 2018, the study accounts for abnormal fluctuations and heightened volatility in bank-specific variables such as NPAs, advances, capital adequacy, and profitability. This ensures that the findings are not limited to stable banking conditions and are therefore more representative and applicable to a broader category of public sector banks.

Dependent Variable	Profit before Tax (PBT)
Independent Variable	Net Interest Income(NII), Capital Adequacy Ratio (CAR %), Priority sector NPAs (PAGRINPA), Priority sector advances (PAGRIADV), Non-priority sector NPAs (NPAGRINPA), Non-priority sector advances (NPAGRIADV)

TABLE 1: List Of Variables (Source: Self-Constructed)

These enable a structured examination of the impact of agricultural NPAs on bank profitability. Empirical Study:1

The study employs a panel data regression approach to examine the impact of agricultural NPAs on bank profitability. Prior to conducting the regression analysis, preliminary diagnostic tests were performed to ensure the reliability and validity of the results. Stationarity was tested using two types of panel unit root tests: the Levin, Lin, Chu (LLC) test and the Hadri test to improve reliability and take the best result. A multicollinearity test was also conducted using the Variance Inflation Factor (VIF) to ensure its absence. This test was performed to confirm that the independent variables are not highly correlated, so that the results of the regression remain valid, stable, and interpretable. In order to test the hypothesis about the impact of agricultural NPAs and the chosen dependent variables, this study uses a panel data regression model, including Fixed Effects (FE) and Random Effects (RE) models. Initially, both the FE and RE models are estimated, following which the Hausman test is used to determine the most appropriate model for the data.

Findings And Results

Descriptive Statistics

Variable		mean	Std. dev.	min	max	Observation
PBT	overall	15339.3	26827.28	-19373.08	95272	N=30
NII	overall	54070.43	45765.18	12739.85	166965	N=30
CAR	overall	13.779	1.924749	9.2	17.19	N=30
PAGRIADV	overall	133812.2	77897.42	33677.58	347983.5	N=30
PAGRINPA	overall	11.895	5.106603	4.7	23.92	N=30
NPAGRIADV	overall	9372.901	12135.14	0	43809.49	N=30
NPAGRINPA	overall	11.76	14.80294	0	49.33	N=30

TABLE 2: Descriptive Statistics (Source: Stata)

The descriptive statistics reveal variation in the profitability as well as the level of agricultural lending in the chosen public sector banks over the period of study. Profit Before Tax (PBT) varies over a wide range, which means that the banks had incurred substantial losses as well as recorded high profits in different years. Capital Adequacy Ratio (CAR) is quite stable at high levels, which means that the banks had maintained adequate capital provisions. Priority sector agricultural advances are the major group in total lending, but the standard deviation is higher, which means there is variation in lending among the banks as well as over time. Priority sector and non-priority sector NPAs in agriculture vary appreciably, which means some troubling phases for agriculture lending, but maximum values for non-priority agriculture NPAs are higher.

Multicollinearity

Variable	VIF	1/VIF
P AGRI ADV D1.	1.78	0.560675
NII D1.	1.62	0.617115
CAR D1.	1.22	0.817749
NP AGRI ADV D1.	1.22	0.817983
NP AGRI NPA	1.11	0.901616
P AGRI NPA D1.	1.07	0.935313
Mean VIF	1.34	

TABLE 3: Multicollinearity VIF test (Source: Stata)

The multicollinearity results indicate that there is no serious correlation among the independent variables used in the study. All Variance Inflation Factor (VIF) values are well below the commonly accepted threshold of 10, with the mean VIF at 1.59. Therefore, each variable contributes independently to explain bank profitability, and the regression estimates can be considered reliable and stable.

Unit Root Test

VARIABLE	LEVIN, LIN AND CHU		HADRI	
	AT LEVEL	AT 1st DIFFERENCE	AT LEVEL	AT 1st DIFFERENCE
PBT	0.9942	0.0000	0.0000	0.2275
NII	0.8058	0.0009	0.0006	0.1751
CAR	0.6216	0.0000	0.0000	0.7336
NP AGRI ADVANCES	0.0226	0.0000	0.0000	0.8493
NP AGRI NPA	0.1400	0.0053	0.0712	0.2278
P AGRI ADVANCES	0.9428	0.0003	0.0000	0.4446
P AGRI NPA	0.4237	0.1025	0.0577	0.0158

TABLE 4: Unit Root Test (Levin, Lin and Chu and Hadri), (Source: Stata, Eviews)
Variables are stationary at levels in bold. PAGRIADV's Hadri values taken from Eviews.

Fixed Effects Model

Fixed-effects (within) regression				Number of obs = 27		
Group variable: companyid				Number of groups = 3		
R-sq: within = 0.4966 between= 0.5457 overall = 0.4977				Obs per group : min = 9 avg = 9.0 max = 9		
F(6,18) = 2.96						
Corru (u_i Xb) = -0.0682				Prob > F = 0.0344		
D.PBT	Coef.	Std. Err.	t	P> t	(95% Conf, Interval)	
NII D1.	0.7447029	0.5244886	1.42	0.173	-0.3572068	1.846613
CAR D1.	3623.02	1940.499	1.87	0.078	-453.8162	7699.856
PAGRIADV D1.	-0.2926249	0.1571957	-1.86	0.079	-0.6228809	0.0376311
PAGRINPA D1.	-1523.923	767.2407	-1.99	0.062	-3135.836	87.99016
NPAGRIADV D1.	-0.290868	0.3205861	-0.91	0.376	-0.9643944	0.3826583

NPAGRINPA	-207.1356	202.4061	-1.02	0.320	-632.375	218.1039
_cons	7050.379	4186.485	1.68	0.109	-1745.1	15845.86
sigma_u	2156.0896					
sigma_e	9731.5626					
rho	.04679041 (fraction of variance due to u_i)					
F test that all u_i=0: F(2,18) = 0.23 Prob > F = 0.7958						

TABLE 5: Fixed Effects Model (Source: Stata)**Random Effects Model**

Random-effects GLS regression				Number of obs = 27		
Group variable: companyid				Number of groups = 3		
R-sq: within = 0.4905				Obs per group : min = 9		
between= 0.8739				avg = 9.0		
overall = 0.5088				max = 9		
Wald chi2 (5) = 20.71						
Corru (u_i X) = 0 (assumed)				Prob > chi2 = 0.0021		
D.PBT	Coef.	Std. Err.	z	P> z	(95% Conf. Interval)	
NII D1.	0.8205853	0.3805825	2.16	0.031	0.0746573	1.566513
CAR D1.	3315.734	1810.003	1.83	0.067	-231.8067	6863.274
PAGRIADV D1.	-0.286608	0.1497451	-1.91	0.056	-0.580103	0.006887
PAGRINPA D1.	-1605.56	718.135	-2.24	0.025	-3013.079	-198.0413
NPAGRIADV D1.	-0.3481104	0.2961771	-1.18	0.240	-0.928607	0.2323861
NPAGRINPA	-152.6954	126.6678	-1.21	0.228	-400.9598	95.5689
_cons	6013.466	3746.283	1.61	0.108	-1329.114	13356.05
sigma_u	0					
sigma_e	9731.5626					
rho	0 (fraction of variance due to u_i)					

TABLE 6: Random Effects Model (Source: Stata)

This model describes that the changes in the dependent variable, Profit Before Tax (PBT), to a moderately large percentage is affected by the chosen independent variables. R-squared value is 0.5088, implying almost 51% changes in PBT due to the independent variables. CAR% is

observed to positively, while marginally significant, affect profitability, meaning that the better the capital level of the bank, the better it is at making profits. There is also a negative and marginally significant relationship between PBT and priority sector agricultural advances. Priority agriculture NPA shows statistically significant negative relation. In contrast NPAs and advances in the non-priority agricultural sector show negative coefficients, indicating that higher NPAs reduce profitability; however, these effects are not statistically significant. Overall, the findings suggest that while net interest income, capital strength and priority sector agricultural activity enhance bank profitability, non-priority agricultural activity, though negatively related, do not significantly affect profitability during the study period.

Hausman Test

Coefficients				
	(b)	(B)	(b-B)	Sqrt (diag(V_b-v_B))
	FE	RE	Difference	S.E.
D.NII	0.7447029	0.8205853	-0.0758824	0.3608951
D.CAR	3623.02	3315.734	307.2866	699.5891
D.PAGRIADV	-0.2926249	-0.286608	-0.0060169	0.0478217
D.PAGRINPA	-1523.923	-1605.56	81.63726	270.0749
D.NPAGRIADV	-0.290868	-0.3481104	0.0572424	0.1226969
NPAGRINPA	-207.1356	-152.6954	-54.44013	157.8718
b=consistent under Ho and Ha; obtained from xtreg				
B=inconsistent under Ha, efficient under Ho; obtained from xtreg				
Test: Ho: difference in coefficients not systematic				
chi2 (5) = (b-B) ' [(V_b-V_B) ^ (-1)] (b-B)				
= 0.41				
Prob>chi2 = 0.9951				
(V_b-V_B is not positive definite)				

TABLE 7: Hausman Test (Source: Stata)

The Hausman test compares the coefficient estimates of the two models to verify whether the independent variables are correlated with bank-specific characteristics. It takes into account the unaccounted for variables differently across the two studies. The outcome is that the p-value is 0.9951, which exceeds the 0.05 significance level, meaning that the difference between the two sets of coefficients is not significant. This means that the

bank-specific factors which are not observable like the management practices or organizational characteristics do not have systematic effects on the explanatory variables, making generalization of the findings of the study to a wider category of banks outside of the sample that is used in the study.

Correlation

	D.PBT	D.NII	D.CAR	D.PAGRI ADV	D.PAGRI NPA	D.NPAGRI ADV	D.NPAGRI NPA
PBT D1.	1.0000						
NII D1.	0.2567	1.0000					
CAR D1.	0.4375	-0.0997	1.0000				
PAGRIADV D1.	-0.1658	0.5984	-0.3000	1.0000			
PAGRINPA D1.	-0.3535	-0.1368	-0.0399	-0.1072	1.0000		
NPAGRIADV D1.	-0.2300	-0.2011	-0.2207	-0.1950	-0.0166	1.0000	
NPAGRINPA D1.	-0.0909	-0.0372	0.0841	0.0294	-0.1710	-0.2317	1.0000

TABLE 8: Correlation Test (Source: Stata)

The correlation results show that changes in Profit Before Tax are positively related to changes in capital adequacy and net interest income, indicating that stronger capital and income support profitability. Agricultural credit, particularly in the priority sector, is not directly associated with profitability, which implies that more lending does not necessarily result in immediate profits for banks. Priority and non-priority agricultural NPAs have a negative relationship with profitability, meaning that the higher the NPAs, the lower the profits. Overall, the correlations are average, and there is no severe case of multicollinearity between the variables.

Overall Findings And Conclusion

Hypothesis 1 is partially true as priority sector agricultural NPAs are seen to have a significant relation with PBT, while non priority sector agricultural NPA are insignificant. Hypothesis 2 is proved false as CAR% os found to be insignificant. The results indicate that well-capitalized banks with high net interest income tend to perform better, as Capital Adequacy Ratio shows positive but insignificant relation while NII shows strong positive and significant relation with Profit Before Tax. Additionally, priority sector agricultural advances and NPAs both negatively affect PBT, while the former is marginally significant and the latter shows strong significance with profitability. On the other hand, both advances and NPAs in the non-priority sector show a

negative relationship with profitability, however, this impact is not statistically significant during the study period. Diagnostic tests confirm that the data is stationary, there is no multicollinearity among the variables, and the regression model is statistically moderately robust within the accepted range at 51% (0.5-0.9). The Hausman test further indicates that the random effects model is more appropriate. From a policy perspective, the findings help policymakers and banking regulators understand that strengthening capital adequacy and improving core income generation remain important for supporting bank profitability. The results indicate that rising priority sector agricultural NPAs have a significant adverse impact, highlighting the need for stronger risk management and recovery mechanisms in priority agricultural lending. The study also assists bank managers and credit authorities in balancing risk and growth by showing an increase in priority sector agricultural advances may put pressure on profitability if not accompanied by effective asset quality controls. Also, findings suggest that non-priority sector agricultural advances and NPAs do not have a significant impact on profitability, which may guide policymakers in reassessing the extent and nature of policy protection and monitoring required for different agricultural credit segments. Future studies can help strengthen and steer policy changes to aid non-priority lending.

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42. KNOWLEDGE-DRIVEN COMMERCE INNOVATION AND ARTIFICIAL INTELLIGENCE FOR INCLUSIVE AND SUSTAINABLE GROWTH: IMPLICATIONS FOR MARKETING AND CONSUMER BEHAVIOUR

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ABSTRACT

Knowledge-driven commerce innovation, powered by artificial intelligence (AI), is reshaping marketing practices and consumer behaviour across global markets. As organizations increasingly rely on data, analytics, and intelligent systems, AI-enabled commerce offers unprecedented opportunities to promote inclusive participation and sustainable economic growth. This paper examines how knowledge-driven AI applications transform marketing strategies, influence consumer decision-making, and support inclusive and sustainable development goals. Drawing on interdisciplinary literature from marketing, consumer behaviour, innovation studies, and sustainability, the study develops a conceptual framework linking AI-driven knowledge creation, personalized marketing, consumer trust, and responsible consumption. The paper argues that AI-enabled commerce enhances market accessibility, empowers underserved consumers, and enables firms to align profitability with social and environmental responsibility. However, challenges related to data privacy, algorithmic bias, and digital exclusion may undermine inclusive growth if not properly addressed. The study contributes to marketing theory by integrating AI and sustainability perspectives into consumer behaviour research and offers managerial implications for designing ethical, inclusive, and knowledge-driven marketing strategies. The paper concludes by highlighting future research directions on responsible AI adoption and sustainable consumer engagement.

Keywords: Knowledge-driven commerce, Artificial intelligence, Inclusive growth, Sustainable marketing, Consumer behaviour

1. Introduction

Rapid advances in artificial intelligence (AI), big data analytics, and digital platforms have fundamentally transformed modern commerce. Firms increasingly rely on knowledge-driven systems to understand consumers, personalize offerings, optimize supply chains, and create value in highly competitive markets. In marketing and consumer behaviour, this shift has led to data-centric decision-making, real-time customer engagement, and predictive insights that were previously unattainable.

Beyond efficiency and profitability, there is growing recognition that AI-driven commerce can contribute to inclusive and sustainable growth. Inclusive growth emphasizes equitable access to markets and opportunities, while sustainable growth focuses on long-term economic, social, and environmental well-being. Marketing, as the interface between firms and consumers, plays a critical role in shaping consumption patterns, social inclusion, and responsible behaviour.

Despite the growing importance of AI in commerce, limited research integrates knowledge-driven innovation, consumer behaviour, and sustainability within a unified framework. This paper addresses this gap by examining how AI-enabled knowledge creation influences marketing strategies and consumer behaviour in ways that support inclusive and sustainable growth.

The objectives of this paper are to:

1. Examine the role of knowledge-driven commerce innovation in AI-enabled marketing.
2. Analyze the impact of AI on consumer behaviour and decision-making.
3. Explore how AI-driven marketing can foster inclusive and sustainable growth.
4. Identify challenges and ethical concerns associated with AI adoption.
5. Propose a conceptual framework and future research agenda.

2. Literature Review

➤ **Shankar, V. (2018)**

Title: How Artificial Intelligence (AI) Is Reshaping Retailing

- Analyzed AI applications such as recommendation systems and dynamic pricing.
- Showed AI's impact on customer experience and purchase decisions.
- Demonstrated AI's strategic role in commerce innovation.

➤ **Davenport, T. H., & Ronanki, R. (2018)**

Title: Artificial Intelligence for the Real World

- Categorized AI use cases in business and marketing.
- Emphasized knowledge automation and decision augmentation.
- Highlighted practical implications for AI-driven commerce.

➤ **Manyika, J., et al. (2019)**

Title: Globalization in Transition: The Future of Trade and Value Chains

- Discussed AI's role in enabling inclusive economic participation.
- Highlighted digital platforms as drivers of inclusive growth.
- Linked technology adoption with market accessibility.

➤ **Zuboff, S. (2019)**

Title: The Age of Surveillance Capitalism

- Examined exploitation of consumer data in digital markets.
- Raised ethical and societal concerns related to AI-driven commerce.
- Stressed the need for consumer-centric governance.

➤ **World Bank (2019)**

Title: World Development Report: The Changing Nature of Work

- Highlighted AI's impact on economic inclusion and labor markets.
- Emphasized skills development and digital access for inclusive growth.
- Relevant to AI-enabled consumer participation.

➤ **Huang, M. H., & Rust, R. T. (2021)**

Title: A Strategic Framework for Artificial Intelligence in Marketing

- Proposed a framework integrating AI with marketing strategy.
- Identified AI's influence on customer relationships and trust.
- Strongly linked AI to consumer behaviour transformation.

➤ **Kotler, P., Kartajaya, H., & Setiawan, I. (2021)**

Title: Marketing 5.0: Technology for Humanity

- Advocated for technology-driven yet human-centric marketing.
- Emphasized inclusion and sustainability in AI-enabled marketing.
- Connected AI adoption with social responsibility.

➤ **Grewal, D., et al. (2021)**

Title: How Artificial Intelligence Will Change Retailing

- Examined AI's impact on personalization and customer engagement.
- Highlighted consumer trust as a determinant of AI acceptance.
- Linked AI adoption with long-term sustainable retail strategies.

➤ **Floridi, L., et al. (2018)**

Title: AI4People—An Ethical Framework for a Good AI Society

- Proposed ethical principles for AI governance.
- Emphasized fairness, transparency, and inclusiveness.
- Relevant to sustainable and inclusive AI-driven marketing.

➤ **Van Dijk, J. (2020)**

Title: The Digital Divide

- Analyzed inequalities in access to digital technologies.
- Warned against exclusion in AI-driven commerce ecosystems.
- Important for inclusive consumer behaviour research.

2.1 Knowledge-driven commerce innovation

Knowledge-driven commerce refers to business models and strategies that rely on data, analytics, and organizational learning to create value. In marketing, knowledge assets such as customer data, market intelligence, and consumer insights are central to innovation. AI enhances these capabilities by transforming raw data into actionable knowledge through machine learning, natural language processing, and predictive analytics.

Knowledge-driven innovation enables firms to anticipate consumer needs, design customized offerings, and improve customer experiences. This shift moves marketing from intuition-based decisions to evidence-based strategies, increasing effectiveness and accountability.

2.2 Artificial Intelligence In Marketing

AI applications in marketing include recommendation systems, chatbots, dynamic pricing, sentiment analysis, and targeted advertising. These tools enable real-time interactions and personalized communication at scale. From a strategic perspective, AI enhances customer relationship management, brand engagement, and marketing performance.

However, AI also introduces new complexities. Algorithmic decision-making may reinforce biases, reduce transparency, and erode consumer trust if not managed responsibly. Therefore, AI adoption in marketing must balance efficiency with ethical considerations.

2.3 Consumer Behaviour In The Ai Era

AI significantly influences consumer behaviour by shaping information search, evaluation, and purchase decisions. Personalized recommendations reduce cognitive effort, while intelligent interfaces enhance convenience and satisfaction. Consumers increasingly rely on AI-driven cues, such as ratings, reviews, and algorithmic suggestions.

At the same time, concerns about privacy, data security, and manipulation affect consumer attitudes toward AI-enabled marketing. Trust emerges as a critical factor mediating the relationship between AI applications and consumer acceptance.

2.4 Inclusive And Sustainable Growth

Inclusive growth focuses on expanding economic participation across income groups, regions, and social categories. Sustainable growth emphasizes long-term value creation that respects environmental and social limits. Marketing influences both dimensions by shaping access to products, affordability, and consumption norms.

AI-driven commerce can promote inclusion by lowering transaction costs, enabling access to digital markets, and tailoring products to diverse consumer needs. Sustainability-oriented AI applications can encourage responsible consumption, reduce waste, and support circular economy models.

3. Conceptual Framework

This paper proposes a conceptual framework linking knowledge-driven AI capabilities, marketing innovation, consumer behaviour, and inclusive and sustainable growth.

1. AI-Enabled Knowledge Creation: Data collection, analytics, and learning systems generate consumer and market knowledge.
2. Marketing Innovation: Personalized offerings, intelligent communication, and adaptive pricing strategies.
3. Consumer Behaviour Outcomes: Trust, satisfaction, empowerment, and responsible consumption.
4. Inclusive and Sustainable Growth: Market access, social equity, environmental responsibility, and long-term value creation.
5. Ethical governance, transparency, and digital literacy moderate these relationships.

4. Research Methodology

This study adopts a conceptual and qualitative research approach, based on an extensive review of peer-reviewed literature, industry reports, and policy documents. The integrative approach allows synthesis across disciplines, offering a holistic understanding of AI-driven commerce and consumer behaviour.

Future empirical studies may apply quantitative methods, experiments, or case studies to validate the proposed framework across different markets and demographic contexts.

5. discussion

The analysis suggests that knowledge-driven AI innovation can fundamentally reshape marketing and consumer behaviour in support of inclusive and sustainable growth. Personalized marketing empowers consumers by improving relevance and accessibility, while data-driven insights enable firms to design socially responsible strategies.

However, the benefits of AI are not automatic. Without inclusive design and ethical oversight, AI-driven marketing may exacerbate digital divides, marginalize vulnerable consumers, and undermine sustainability goals. Trust, transparency, and accountability are therefore essential for long-term success.

6. Managerial implications

- Marketers should invest in **ethical AI governance frameworks**.
- Firms must prioritize **consumer trust and data privacy**.
- Inclusive design strategies should address underserved and digitally excluded populations.
- AI analytics should be aligned with **sustainability metrics**, not only sales performance.
- Consumer education and digital literacy initiatives enhance acceptance and impact.

7. Conclusion

Knowledge-driven commerce innovation enabled by AI represents a transformative force in marketing and consumer behaviour. When strategically and ethically implemented, AI-driven marketing can promote inclusive participation, responsible consumption, and sustainable growth. This paper contributes to theory by integrating AI, knowledge management, and sustainability into consumer behaviour research and offers practical guidance for responsible marketing innovation.

8. Limitations and future research

This study is conceptual and lacks empirical validation. Future research should:

- Test the framework using cross-country data.

- Examine consumer perceptions of AI fairness and transparency.
- Explore sector-specific applications in retail, finance, and digital platforms.
- Investigate policy and regulatory impacts on inclusive AI-driven commerce.

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43. APPLICATION OF BEHAVIOURAL ECONOMIC STRATEGIES AND PRINCIPLES FOR MAKING ECONOMIC DEVELOPMENT MORE SUSTAINABLE

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ABSTRACT

Behavioural economics is an important branch of economics which blends psychology and economics to understand why people make seemingly irrational decisions, deviating from traditional models that assume perfect rationality; it examines cognitive biases, emotions, and social influences, using insights to explain choices in finance, marketing, and policy, often through behavioural concepts to generate better outcomes. Sustainable development is a global framework to meet present needs without harming future generations' ability to meet their needs, balancing economic growth, social equity, and environmental protection. It's about integrated progress, recognising that social, financial, and ecological factors are interconnected and require holistic solutions for a prosperous, peaceful planet for all. Behavioural economics applies psychological insights to sustainability by understanding irrational choices and using nudges to guide consumers and policymakers. Applications include encouraging recycling, energy saving, sustainable agriculture, and reducing plastic use through small, smart interventions, closing the gap between green intentions and actions. This paper reviews theories and applications developed by renowned economists and researchers in the field of behavioural economics in connection with sustainability. The paper will provide successfully applied and recently developed behavioural strategies to make development more sustainable.

Keywords: behavioural economics; rationality; cognitive biases; nudges; sustainability

1. Introduction

Sustainability represents one of the most complex and pressing challenges confronting contemporary societies. Despite growing scientific consensus on environmental risks and increasing public awareness, progress toward sustainable development remains insufficient (United Nations, 2015; Rockström et al., 2009). A critical reason for this gap lies in the behavioural foundations of environmental problems. Choices related to energy use, consumption, transportation, and waste are shaped not only by prices and regulations but also by cognitive biases, habits, emotions, and social influences.

Traditional economic approaches assume that individuals are rational actors who respond predictably to information and incentives. However, empirical evidence consistently demonstrates that individuals deviate from rationality in systematic ways (Kahneman, 2011). Behavioural economics addresses these limitations by integrating insights from psychology into economic analysis, offering more realistic models of human decision-making.

Over the past two decades, behavioural economics has increasingly informed public policy, including sustainability initiatives. Interventions such as nudges, defaults, social norm feedback, and framing have been applied to promote energy conservation, recycling, water savings, and sustainable consumption. This review critically synthesizes this literature to assess the potential and limitations of behavioural economic strategies for advancing sustainability.

2. Foundations of Behavioural Economics Relevant to Sustainability

2.1 Bounded Rationality and Heuristics

Herbert Simon's concept of bounded rationality challenged the assumption of perfect rationality by recognizing cognitive and informational constraints (Simon, 1955). In sustainability contexts, decisions often involve uncertainty, delayed outcomes, and complex information, making reliance on heuristics inevitable. Key heuristics relevant to sustainability are the availability heuristic, which leads individuals to underestimate gradual or invisible risks such as climate change (Weber, 2006) and Anchoring, whereby initial information influences judgments about energy use or consumption norms

(Tversky & Kahneman, 1974). These heuristics explain why information-based environmental policies often fail to produce expected behavioural change.

2.2 Prospect Theory and Loss Aversion

Prospect theory demonstrates that individuals evaluate outcomes relative to reference points and exhibit loss aversion, meaning losses loom larger than equivalent gains (Kahneman & Tversky, 1979). In sustainability policy, loss-framed messages-emphasising the costs of inaction-often outperform gain-framed appeals (Hardisty et al., 2010). Loss aversion also contributes to status quo bias, reinforcing resistance to sustainability transitions such as shifts to renewable energy or alternative transportation systems.

2.3 Time Preferences and Present Bias

Sustainability decisions often involve balancing short-term costs against long-term benefits. Behavioural economics highlights present bias, whereby individuals disproportionately value immediate outcomes (Laibson, 1997). This bias explains underinvestment in energy efficiency, resistance to climate mitigation policies, and political short-termism.

2.4 Social Preferences and Norms

Behavioural economics recognizes that individuals care about fairness, reciprocity, and social approval (Fehr & Schmidt, 1999). Social norms are powerful drivers of environmental behaviour, influencing actions such as energy use and recycling. Norm-based interventions have repeatedly demonstrated effectiveness in sustainability contexts (Schultz et al., 2007).

3. Behavioural Barriers to Sustainability

3.1 The Attitude-Behaviour Gap

A persistent challenge in sustainability research is the disconnect between environmental attitudes and actual behaviour (Kollmuss & Agyeman, 2002). Behavioural economics explains this gap by emphasizing limited attention, habits, and contextual constraints that undermine intention-based models of behaviour.

3.2 Cognitive Overload and Information Limits

Environmental decisions often require processing complex data about impacts and trade-offs. Cognitive overload leads individuals to ignore information or default to existing behaviours (Mullainathan & Shafir, 2013). Simplification and salience are therefore critical for effective sustainability interventions.

3.3 Habit Formation and Inertia

Many environmentally harmful behaviours, such as excessive energy use or car dependency, are habitual. Habits reduce cognitive effort but also create inertia that resists change (Verplanken & Wood, 2006). Behavioural interventions that disrupt contexts or reset defaults are particularly effective in addressing habitual behaviour.

3.4 Social Dilemmas and Collective Action

Sustainability challenges often involve collective action problems where individual incentives conflict with collective welfare (Ostrom, 1990). Behavioural research shows that cooperation increases when social norms, trust, and visibility are present, highlighting the importance of institutional design.

3.5 Moral Licensing and Rebound Effects

Behavioural responses can sometimes undermine sustainability goals. Moral licensing may lead individuals to compensate for pro-environmental actions with environmentally harmful behaviour (Merritt et al., 2010). Rebound effects can offset efficiency gains by increasing consumption (Sorrell, 2007).

3.6 Institutional and Political Barriers

Behavioural biases also affect policymakers and institutions, contributing to policy inertia and delayed environmental action (Jones, 2001). Behaviourally informed governance must therefore address decision-making processes at multiple levels.

4. Implications of Behavioural Barriers

The barriers identified above demonstrate that sustainability failures are not merely technological or economic but deeply behavioural. Addressing these challenges requires policies that align with human psychology rather than assuming rational optimization.

5. Behavioural Economic Strategies for Sustainability

Behavioural economics offers a diverse toolkit for promoting sustainability by aligning policy design with actual human decision-making processes. Unlike traditional regulatory or incentive-based approaches, behavioural strategies focus on modifying choice environments to make sustainable behaviour more likely without restricting individual autonomy.

5.1 Choice Architecture and Nudging

Choice architecture refers to the organization of contexts in which individuals make decisions (Thaler & Sunstein, 2008). Nudges are subtle modifications of choice architecture that predictably influence behaviour while preserving freedom of choice. In sustainability policy, nudges include: - making sustainable options more salient, simplifying complex information and structuring default options. Empirical evidence indicates that nudges can be effective in encouraging energy conservation, recycling, and sustainable consumption, particularly when combined with feedback and social norms (Benartzi et al., 2017).

5.2 Defaults and Status Quo Bias

Defaults exploit status quo bias by pre-selecting a particular option. When sustainable choices are set as defaults, such as renewable energy enrolment or double-sided printing, participation rates increase substantially (Johnson & Goldstein, 2003; Pichert & Katsikopoulos, 2008). However, default interventions require ethical safeguards, including transparency and easy opt-out mechanisms.

5.3 Framing and Message Design

Framing influences how individuals perceive sustainability-related information. Loss-framed messages emphasizing environmental or financial losses from unsustainable behaviour tend to be more persuasive than gain-framed messages (Hardisty et al., 2010). Moral and social framing, such as appeals to community identity or intergenerational responsibility, can further strengthen engagement (Spence & Pidgeon, 2010).

5.4 Social Norms and Peer Effects

Social norm interventions harness individuals' desire to conform to perceived norms. Comparative feedback on energy or water use has consistently demonstrated behaviour

change, particularly among high consumers (Allcott, 2011). To avoid backfire effects, norm interventions should pair descriptive norms with injunctive cues that reinforce desirable behaviour.

5.5 Feedback, Salience, and Digital Nudges

Timely and personalized feedback increases the salience of environmental impacts. Smart meters, mobile applications, and digital dashboards enable real-time feedback and personalized nudges, offering scalability and cost-effectiveness (Fischer, 2008). Nevertheless, digital interventions raise concerns regarding data privacy, accessibility, and algorithmic bias.

5.6 Incentives and Commitment Devices

Behavioural economics reframes traditional incentives by emphasizing timing, framing, and psychological salience. Immediate rewards, lotteries, and loss-framed incentives can outperform conventional subsidies (Volpp et al., 2008). Commitment devices, like public pledges or deposit contracts, help individuals overcome present bias and align short-term actions with long-term sustainability goals (Bryan et al., 2010).

6. Sectoral Applications of Behavioural Strategies

6.1 Energy and Electricity Use

Household energy conservation has been a focal area for behavioural interventions. Social norm feedback, default renewable energy enrolment, and smart meter feedback have consistently reduced energy consumption, though effects are modest and context-dependent (Allcott, 2011; Delmas et al., 2013). These interventions are most effective when sustained over time and integrated with structural measures such as energy pricing and infrastructure investment.

6.2 Water Conservation

Behavioural interventions in water use—including norm-based messages and scarcity framing—have achieved reductions comparable to price increases, particularly during droughts (Ferraro & Price, 2013). Such approaches offer politically feasible alternatives to water pricing but should be combined with long-term supply and infrastructure planning.

6.3 Waste Management and Recycling

Simplifying recycling systems, improving bin placement, and using clear visual cues have proven more effective than informational campaigns alone (Duflo et al., 2011). Behavioural strategies have also been applied to food waste reduction through portion control, defaults, and feedback (Kallbekken & Sælen, 2013).

6.4 Transportation and Mobility

Transportation behaviour is shaped by habits, infrastructure, and social identity. Behavioural interventions such as personalized travel feedback, default commuter benefits, and social recognition programs have achieved modest shifts toward sustainable mobility (Bamberg et al., 2011). However, structural investments in public transport and urban design remain essential.

6.5 Sustainable Consumption and Food Systems

Eco-labels and default-based interventions in food environments have influenced consumer choice toward more sustainable options, particularly when information is simplified and standardized (Thøgersen et al., 2010). Behavioural strategies that shift defaults toward plant-based options demonstrate potential for reducing the environmental footprint of diets without restricting choice.

7. Policy and Ethical Implications

7.1 Policy Design and Integration

Behaviourally informed policies can enhance effectiveness and cost-efficiency, but should not be viewed as substitutes for regulation or pricing. The greatest potential lies in hybrid approaches that combine behavioural insights with structural reforms.

7.2 Ethical Considerations

Ethical concerns surrounding nudging include autonomy, transparency, and accountability (Bovens, 2009). Behavioural interventions should:

- Be transparent and easily reversible
- Promote individuals' long-term interests
- Be subject to democratic oversight

Failure to address ethical concerns may undermine public trust and policy legitimacy.

7.3 Equity and Inclusion

Behavioural interventions may have uneven impacts across socioeconomic groups. Policymakers must ensure that behavioural strategies do not exacerbate inequality or shift responsibility away from institutional actors.

8. Research Gaps and Future Directions

Key gaps in the behavioural sustainability literature include:

- Long-term persistence of behavioural effects
- Cross-cultural and Global South contexts
- Interactions between behavioural and structural policies
- Standardized ethical evaluation frameworks

Addressing these gaps is essential for advancing both theory and practice.

9. Conclusion

This integrative review demonstrates that behavioural economics offers valuable tools for advancing sustainability by addressing the psychological and social drivers of environmental behaviour. Behaviourally informed interventions, such as nudges, defaults, social norms, and feedback, have shown effectiveness across multiple sustainability domains, particularly when designed ethically and contextually.

However, behavioural strategies are not a silver bullet. Sustainable transitions require a combination of behavioural insights, technological innovation, regulatory frameworks, and institutional reform. When applied responsibly, behavioural economics can play a critical role in accelerating progress toward sustainability goals.

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44. MONEY, SUCCESS, AND HAPPINESS: A BEHAVIORAL FINANCE PERSPECTIVE: A STUDY IN THRISSUR DISTRICT

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ABSTRACT

Money, success, and happiness are often intertwined in public perception, yet the relationship between them remains complex and frequently misunderstood. In a society where financial achievement is equated with fulfillment, individuals may overlook deeper motivators such as emotional clarity, relationships, and purpose. This study investigates how people across different age groups in Thrissur district perceive the connection between wealth and happiness, and whether happiness can serve as the foundation for success rather than its outcome.

Primary data was collected from 100 respondents through structured questionnaires, capturing both younger and older perspectives. Results reveal that 70% of participants disagreed that financial success guarantees happiness, while 82% recognized emotional clarity as a driver of better financial decisions. Furthermore, 76% agreed that happiness contributes to career and financial success, and 64% admitted that social comparison negatively affects satisfaction with income. These findings highlight that while financial stability provides comfort and opportunity, it does not ensure emotional well-being.

The study emphasizes that happiness is more strongly linked to purpose-driven living, emotional clarity, and meaningful relationships than to material wealth. By integrating insights from behavioral finance, psychology, and cultural philosophy, this research contributes to redefining success in holistic terms. It suggests that individuals, communities, and policymakers should encourage purpose-driven activities, reflection, and balanced goal-setting to foster sustainable well-being. Ultimately, the study invites a

deeper reflection: happiness cannot simply be bought it must be consciously built and nurtured as the true foundation of success.

Keywords

Money, Success, Happiness, Behavioral Finance, Emotional Clarity, Purpose-driven Living, Social Comparison, Well-being, Financial Decision-making, Sustainable Success.

Introduction

We live in a world where money often speaks louder than meaning. From childhood, individuals are taught to chase success, and success is frequently defined by financial achievement—income, possessions, and social status. It is easy to believe that if we earn enough, happiness will follow, that wealth is the reward and fulfillment its inevitable companion. As Robert Frank observed in *Luxury Fever* (1999), “our desire for goods is fueled less by need than by comparison,” showing how consumer culture pushes people to equate wealth with happiness.

Yet beneath this surface lies a more complex truth. Financial stability can provide comfort, freedom, and opportunity, but it does not always translate into emotional well-being. Behavioral finance demonstrates that our relationship with money is shaped not only by rational logic but also by psychological biases. Kahneman and Tversky’s Prospect Theory (1979) revealed that people are more sensitive to losses than gains, a distortion that often drives financial stress. Similarly, Sonja Lyubomirsky in *The How of Happiness* (2007) reminds us that “circumstances account for only a small portion of happiness,” emphasizing that emotional clarity and mindset matter more than wealth.

This paradox is not new. Richard Easterlin’s famous paradox (1974) showed that rising incomes do not necessarily increase happiness, a finding that still resonates today. More recently, Ruut Veenhoven (2022) concluded in his review that “happiness depends more on meaning and relationships than on material wealth,” reinforcing the idea that fulfillment is rooted in purpose rather than possessions. In Thrissur district, where traditions coexist with modern aspirations, younger individuals often view success through the lens of career growth and financial independence, while older generations

emphasize peace of mind, family bonds, and purposeful living. This contrast enriches the study, showing how definitions of success evolve across life stages.

The project therefore asks: why is financial wealth so often seen as the gateway to personal fulfillment, and does this belief hold up under scrutiny? More importantly, it flips the narrative: What if happiness is not the result of success, but its foundation? What if emotional clarity, purpose, and contentment are what truly drive achievement in careers, relationships, and even financial choices?

By weaving together insights from psychology, behavioral finance, and cultural philosophy, this research aims to understand how money influences human behavior, aspirations, and long-term well-being. It also invites deeper reflection: Can happiness be bought, or must it be built? And in a world obsessed with metrics, what does it truly mean to live a successful life?

Statement of the Problem

Many people in today's society associate happiness and self-worth with financial success. The idea that acquiring wealth is the main route to happiness is instilled in people. A lack of purpose, stress, and emotional dissatisfaction persist among many people despite increased incomes and material accomplishments, indicating that wealth by itself does not equate to well-being. People frequently oversimplify the relationship between money, success, and happiness, pursuing financial objectives in the hope of emotional rewards while ignoring more profound motivators like relationships, psychological clarity, and meaning. The way that money is viewed on an emotional and social level is the problem, not the money itself. A shallow definition of success, comparison, and burnout can all be consequences of misguided financial endeavors. The goal of this project is to investigate how people emotionally relate money to happiness and whether putting happiness first can result in more lasting and meaningful success, including financial stability.

Objectives of the Study

- To investigate the emotional and psychological connections people make between wealth, success, and happiness.

- To determine if happiness can contribute to success including financial stability instead of being the result of it.
- To question accepted measures of success and put forth a more comprehensive model that incorporates behavioral, emotional, and financial aspects.
- To investigate whether material wealth actually contributes to long-term happiness or whether emotional clarity and purpose are more important.

Hypotheses

- H1: Financial success does not automatically ensure happiness.
- H2: Emotional clarity positively influences financial decision-making.
- H3: Happiness contributes to career and financial success.
- H4: Social comparison negatively affects satisfaction with income.

Significance of the Research

This research provides insights into how financial decisions are emotionally interpreted by both younger and older populations and how these interpretations shape perceptions of success and happiness. It is particularly relevant for students, early-career professionals, and older adults, helping them balance financial aspirations with emotional well-being. The findings contribute to redefining success in ways that are culturally meaningful and emotionally sustainable.

Review of Literature

The relationship between money, success, and happiness has been widely studied across disciplines such as economics, psychology, and behavioral finance. Scholars have consistently highlighted the paradox that financial prosperity does not necessarily equate to emotional wellbeing.

Easterlin (1974, 2010) introduced the Easterlin Paradox, showing that while income growth improves living standards, it does not guarantee long-term happiness. His findings emphasize that beyond a certain threshold, wealth contributes little to emotional satisfaction.

Kahneman & Deaton (2010) found that higher income improves life evaluation but not emotional well-being, suggesting that money can reduce stress but cannot eliminatedissatisfaction or lack of purpose.

Lyubomirsky (2007) argued that happiness is largely shaped by intentional activities and mindset rather than external circumstances, reinforcing the idea that emotional clarity and purpose are stronger drivers of fulfillment than wealth.

Frank (1999) in *Luxury Fever* highlighted the role of social comparison, noting that individuals often measure success relative to peers, which undermines satisfaction even when financial stability is achieved.

Veenhoven (2022) reviewed global studies and concluded that happiness is more strongly linked to relationships, meaning, and cultural context than to material wealth.

Killingsworth (2024) provided extended evidence against the idea of satiation, showing that while money can improve comfort, it does not guarantee sustained happiness.

Diener & Seligman (2004) – Highlighted the role of positive psychology, arguing that social bonds and purpose are stronger predictors of happiness than income.

Sen (1999) – In *Development as Freedom*, argued that true success lies in expanding human capabilities, not just financial wealth.

Csikszentmihalyi (1990) – Introduced the concept of Flow, showing that happiness often arises from meaningful engagement rather than material gain.

Ryff (1989) – Proposed a multidimensional model of psychological well-being, emphasizing autonomy, purpose, and personal growth over financial success.

Bortolotti, Di Berardino, & Palumbo (2026) Their 25-year review shows that while consumption and income have risen, life satisfaction depends more on meaning and relationships than material wealth.

Fisher & Frechette (2023) They reaffirm that money can improve comfort but does not guarantee happiness, highlighting the role of cognitive and emotional mediators.

Clark, Frijters, & Shields (2008) This study explains the Easterlin Paradox by showing that relative income, rather than absolute income, drives happiness and utility.

Layard (2005) Layard's work emphasizes that happiness is shaped more by social bonds, trust, and mental health than by financial wealth.

Helliwell, Layard, & Sachs (2023) The World Happiness Report demonstrates that happiness is strongly linked to social support, freedom, and purpose, not just income.

Diener, Lucas, & Oishi (2018) They argue that subjective well-being is largely determined by intentional activities and mindset, reinforcing the importance of psychological clarity.

Brickman & Campbell (1971) Their concept of "hedonic relativism" shows that people adapt quickly to gains, meaning wealth provides only temporary happiness.

Deci & Ryan (2000) Through Self-Determination Theory, they highlight that intrinsic motivation and autonomy are stronger predictors of well-being than external rewards like money.

Frey & Stutzer (2002) Their book Happiness and Economics shows how institutions and social environments influence happiness more than economic growth alone.

Kahneman, Krueger, Schkade, Schwarz, & Stone (2004) Using the Day Reconstruction Method, they demonstrate that daily emotional experiences, not income levels, are the best predictors of happiness.

Together, these studies demonstrate that financial success alone cannot ensure happiness. Instead, emotional clarity, purpose-driven living, and social relationships play a more significant role in shaping well-being. This literature provides the foundation for the present study, which explores how individuals in Thrissur district perceive the interplay between money, success, and happiness.

Research Methodology

This study adopted a descriptive and analytical design to explore the awareness, perceptions, and attitudes of individuals in Thrissur district regarding money, success, and happiness. The sample population consisted of 100 respondents, representing both

young adults and older participants actively engaged in financial decision-making. Convenience sampling was employed to ensure accessibility, while purposive sampling was used to include individuals with relevant financial experiences.

Data was collected using a structured questionnaire divided into two sections: demographic information (age, gender, occupation, income) and attitudinal questions related to money, success, and happiness. Both closed-ended and Likert-scale questions were included to capture quantitative and qualitative insights.

Descriptive statistics such as percentages and averages were used to summarize demographic data and response distributions. Thematic analysis was applied to open-ended responses, allowing patterns in perceptions of happiness and success to be identified. Cross-tabulation was also used to explore relationships between demographic variables and attitudes.

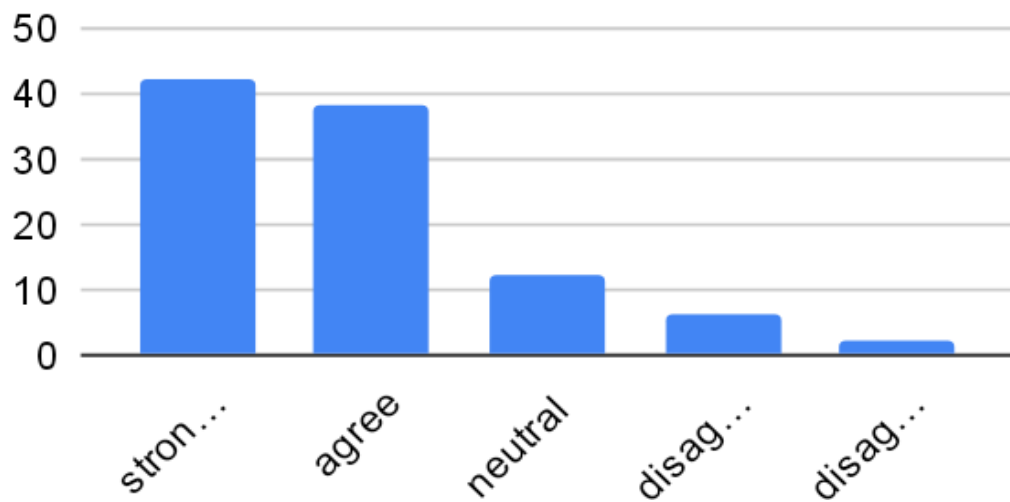
Demographic table

Category	Count	Percentage
Age (18- 25)	45	45%
Age(26- 45)	30	30%
Age 46+	25	25%
Male	52	52%
Female	48	48%
Students	40	40%
Professionals	35	35%
Homemakers/retired	25	25%
Low income	38	38%
Middle Income	42	42%
High Income	20	20%

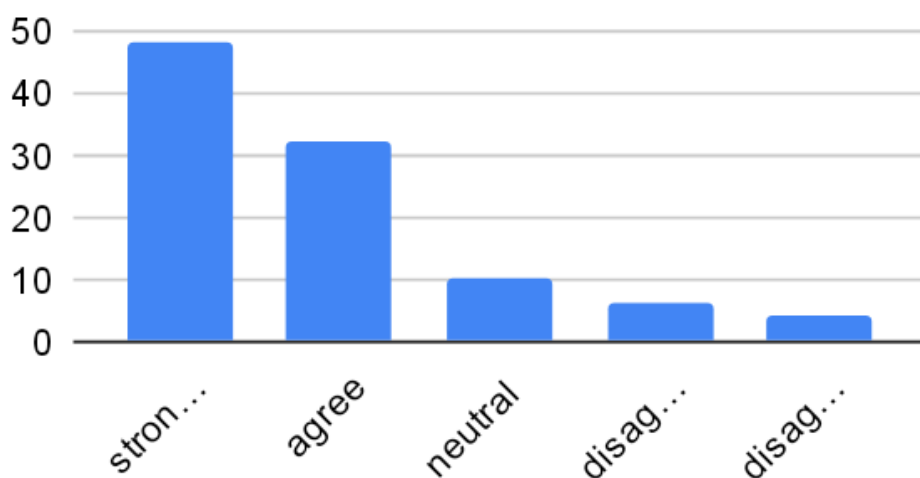
Results and Discussions

Statement	Agreement	Disagreement/Neutral
Financial success ensures happiness	30%.	70%
Emotional clarity helps financial decision-making	82%.	18%
Happiness motivates career performance.	76%.	24%
Social comparison affects satisfaction with income	64%.	36%

Financial stability gives me a sense of se...



happiness is more important than financi...



The study surveyed 100 individuals from Thrissur district, representing a diverse mix of age groups and backgrounds. Among them, 45% were young adults (18–25 years), 30% were middle-aged (26–45 years), and 25% were older adults (46 years and above). Gender distribution was fairly balanced, with 52% male and 48% female. Occupations varied, including students (40%), working professionals (35%), and homemakers or retired individuals (25%). Income levels also differed, with 38% reporting low to moderate income, 42% middle-income, and 20% higher income. This diversity ensured

that the findings reflected perspectives across different life stages, financial situations, and social roles.

From this varied population, the responses revealed important insights into how money, success, and happiness are emotionally connected. 70% (70 people) disagreed that financial success automatically ensures happiness, while 30% (30 people) agreed. This shows that most respondents reject the idea that wealth alone guarantees fulfillment. They recognize that happiness depends on deeper factors such as relationships, health, and emotional clarity. The minority who agreed reflect traditional beliefs, but the majority indicates a cultural shift toward valuing holistic success. 82% (82 people) agreed or strongly agreed that emotional clarity helps in financial decisionmaking, while 18% (18 people) were neutral or disagreed. This highlights the strong role of psychology in financial behavior. Emotional clarity enables better, more rational decisions, suggesting that happiness and clarity are not just outcomes of success but active drivers of it. 76% (76 people) agreed or strongly agreed that happiness motivates career performance, while 24% (24 people) were neutral or disagreed. This emphasizes that happiness is not passive; it actively fuels ambition, productivity, and career growth. Respondents acknowledged that when they are happy, they perform better and achieve greater success. 64% (64 people) admitted comparing their financial status with peers, while 36% (36 people) did not. Social comparison emerged as a significant factor influencing satisfaction. Most respondents confessed that they measure their success against others, which often leads to dissatisfaction even when their own financial situation is stable. This reveals the emotional trap of comparison, where happiness is undermined by external benchmarks rather than internal fulfillment.

Overall, the findings reveal that emotional clarity, purpose-driven living, and relationships are valued more highly than wealth as contributors to happiness. Respondents across age groups consistently prioritized peace of mind, health, and meaningful living over material possessions.

Burnout was common among those equating success with wealth, while those who embraced balance and purpose reported greater satisfaction. The impact of these results is clear: happiness is not simply the reward of financial success, but its foundation. People who live with clarity and purpose are more likely to achieve sustainable success in

careers, relationships, and financial choices, while those who chase wealth without meaning risk dissatisfaction, stress, and emotional emptiness.

Conclusion

The study concludes that happiness is not merely the result of financial success but a foundation for it. Emotional clarity, purpose, and relationships drive sustainable success, while wealth alone provides only temporary satisfaction. The survey results show that: 70% (70 people) believe financial success does not guarantee happiness. 82% (82 people) recognize emotional clarity as a driver of better financial decisions. 76% (76 people) agree that happiness contributes to career and financial success. 64% (64 people) acknowledge that social comparison affects satisfaction with income. These percentages demonstrate that redefining success in culturally relevant and emotionally sustainable terms is essential for long-term well-being.

Suggestions

Encourage purposeful activities: Individuals should engage in hobbies, volunteering, or creative projects that align with their values. These activities help them discover what truly gives their life meaning beyond financial success.

Promote reflection and self-discovery: Simple practices like journaling, meditation, or goalsetting sessions can guide people to clarify their personal purpose and connect happiness with long-term direction. Foster community and peer engagement: Participating in clubs, cultural groups, or discussion circles allows people to share experiences, learn from others, and strengthen their sense of belonging and purpose.

Balance financial goals with life meaning: People should set financial targets alongside personal growth goals such as health, relationships, and skill development ensuring that success feels holistic and purpose-driven. Media and social platforms should highlight stories that redefine success beyond wealth.

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45. A STUDY ON THE EFFECT OF GST POLICY CHANGES ON THE REAL ESTATE AND CONSTRUCTION INDUSTRY

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ABSTRACT

The implementation of the Goods and Services Tax (GST) in India marked a significant transformation in the indirect taxation system, particularly impacting the real estate and construction industry. This study examines the evolving effects of GST, with a specific focus on the recent GST 2.0 reforms, on construction costs, stakeholder dynamics, and housing affordability in Ernakulam district. The research adopts a descriptive and analytical approach, using primary data collected from 50 respondents, including builders, contractors, architects, and material suppliers, through a semi-structured questionnaire. Secondary data were gathered from existing literature and official reports.

The findings reveal that while GST has enhanced transparency and reduced informal transactions, it has also increased compliance complexity, especially for small and medium-sized firms. A significant proportion of respondents reported moderate to high difficulty in GST documentation, indicating administrative challenges. The study highlights that reductions in GST rates on key construction materials such as cement, bricks, and steel have contributed to cost relief, though the benefits are not uniformly passed on to end consumers. Additionally, the absence of input tax credit (ITC) in residential projects is identified as a major structural limitation affecting profitability and pricing strategies.

The results further indicate cautious optimism regarding GST 2.0 reforms, with a majority believing that these changes can improve the global competitiveness of the sector by 2030. However, concerns regarding policy stability, awareness gaps, and unequal benefits across stakeholders persist. The study concludes that while GST 2.0 is a progressive reform, addressing compliance burdens and structural inefficiencies is essential to fully realize its potential in the real estate sector.

Keywords: 2.0, Real Estate Sector, Construction Industry, Input Tax Credit (ITC), Housing Affordability, Tax Reforms, Compliance Burden, Construction Materials, Stakeholder Impact, India

1.1 Introduction

The Goods and Services Tax (GST), implemented in India in July 2017, replaced multiple indirect taxes with a unified tax structure. The real estate and construction industry, being one of the largest contributors to the Indian economy, has been significantly impacted by GST changes. Initially, the industry witnessed both challenges and opportunities due to changes in tax rates, input tax credit (ITC) availability, and compliance requirements. The Indian government introduced GST 2.0 reforms, significantly impacting the real estate and construction sectors. These reforms aim to stimulate growth, enhance affordability, and boost demand by rationalizing tax slabs and reducing rates on key construction materials. The GST Council's decision to cut tax rates on essential building materials like cement, granite, and marble is expected to lower project costs for developers and provide relief to homebuyers.

1.2 Statement of the problem

The problem is to identify the various changes occurred within the real estate and construction sectors in correspondence to the change in tax percentage issued in the recent GST policy 2.0. The reduction in taxes can affect the overall construction costs for developers & the change in affordability of houses.

1.3 Objectives

- Examine the reduction in GST rates throughout the years on construction materials like cement, bricks, and steel, on the real estate and construction sector.
- Study the impact on demand and buyer perception in the housing sector, considering increased affordability.
- The impact on developers, contractors, and other stakeholders due to GST changes

1.4 Significance of the study

This research project aims to explore the impact of GST policy changes on the real estate and construction industry. By investigating this topic, the study will contribute to a deeper understanding of the practical implications of taxation reforms on the industry. The findings of this research will be beneficial for policymakers, developers, contractors, investors, and buyers, providing valuable insights for informed decision-making. Additionally, this study will also serve as a reference for future research in the field of taxation and real estate, making it a significant contribution to academic literature.

1.5 Scope of the study

The study will focus on the real estate and construction industry in Ernakulam, with specific emphasis on residential and commercial projects. It also explores challenges and opportunities for stakeholder and investigate the impact on affordable housing initiative.

2: Review of Literature

Chaudhari, M. N. R., & Lende, Prof. P. K.(2003), studied the implementation of GST in India caused an initial slowdown in the real estate market, leading builders and contractors to temporarily withdraw to adapt to the new taxation system. - GST represents a major reform in India's indirect taxation by eliminating tax duplication, promoting a unified "one country, one tax" approach, and broadening the tax base, which significantly altered the real estate sector's operations. - Compared to pre-GST taxes, the new system under GST has introduced greater transparency and reliability in the property market, supporting structural reforms like affordable housing initiatives. Vasilopoulos, K., & Tayler, W. (2021) *Real Estate and Construction Sector Dynamics Over the Business Cycle* studied that prior to GST, taxation on works contracts and property sales in India was fragmented, with states applying VAT to goods, the center taxing services, and additional stamp duties on land, leading to over 200% effective tax burdens in some states and widespread undervaluation.

GST has positively impacted the real estate and construction industry by reducing tax rates, enhancing transparency, and improving cash flow. It has led to increased revenue generation, better quality of work, and a more standardized taxation system across the sector (Lende, 2023)

Nagaraj, & Shailaja M. L.(2023), in the paper 'Assessing the long-term effects of GST on chosen sectors in the Indian economy' evaluates the diverse impacts of the Goods and Services Tax (GST) on key sectors within India, including Automobile, Agriculture, Financial, Infrastructure, and Hospitality. The study, drawing on literature and quantitative data, reveals varied sector-specific dynamics post-GST implementation. While the agriculture sector showed mixed growth rates but a notable increase in GDP contribution, the automobile sector maintained consistent GDP contributions. The financial sector experienced steady growth with fluctuations, and the hospitality sector displayed consistent growth rates and an expanding economic role. Conversely, the infrastructure sector faced declining growth rates. The findings highlight the necessity for tailored adaptation strategies and recommend enhanced GST awareness, specialized impact assessment tools, and simplified compliance platforms to optimize the benefits of this transformative tax reform.

Srivastava, S. (2019). Analysis of Pre GST and Post GST Impact on Construction Industry. The study indicates that the implementation of GST has led to a reduction in tax liabilities for companies in the construction sector, simplifying the taxation process and enhancing overall revenue compared to the previous indirect tax regimes.

GST significantly impacts the real estate and construction industry by consolidating various indirect taxes into one, affecting material costs, which constitute 60% to 70% of construction expenses, ultimately altering the overall cost of building construction projects (Pawar & Thorbole, 2018).

The existing body of literature on GST and the real estate and construction industry in India predominantly focuses on the initial phase of GST implementation (GST 1.0) and its short-term transitional effects. Studies by Chaudhari and Lende (2003), Srivastava (2019), and Pawar and Thorbole (2018) primarily analyse the immediate outcomes such as initial market slowdown, tax consolidation, cost restructuring, and

improvements in transparency. However, these studies do not account for the subsequent policy refinements and structural adjustments introduced under GST 2.0, including rate rationalisation, changes in input tax credit provisions, compliance simplification measures, and sector-specific notifications. As a result, there is a clear lack of research examining the evolving impact of GST 2.0 policy changes on the real estate and construction industry. Further, several studies adopt a broad or multi-sectoral perspective, which limits the depth of analysis specific to the real estate and construction sector. For instance, Nagaraj and Shailaja (2023) assess the long-term effects of GST across multiple sectors of the Indian economy, where infrastructure and real estate receive limited focused attention. Such an approach overlooks the sector-specific complexities of real estate and construction, including joint development agreements, affordable housing projects, treatment of under-construction properties, and the interaction between GST and stamp duty. This creates a research gap in understanding how GST 2.0 uniquely affects the operational and financial dynamics of this sector. Additionally, most prior studies emphasise macro-level outcomes such as tax burden reduction, revenue generation, and standardisation of taxation. While Lende (2023) and Srivastava (2019) highlight improvements in transparency, cash flow, and revenue, there is insufficient empirical evidence examining firm-level and project-level impacts in the post-stabilisation phase of GST. The long-term effects of GST 2.0 on construction costs, pricing strategies, profit margins, project execution timelines, and investment decisions remain underexplored in existing literature.

Another notable gap relates to the stakeholder-specific impact of GST reforms. Existing studies largely overlook how GST 2.0 policy changes affect different stakeholders within the industry, including developers, contractors, material suppliers, small and medium construction firms, and homebuyers. The differential impact on housing affordability, buyer sentiment, and the viability of small players remains insufficiently analysed, despite being critical to assessing the overall effectiveness of GST reforms.

3: Research Methodology

3.1 Type of Study

The study is descriptive and analytical in nature.

3.2 Sources of Data

Primary data collected from dealers and brokers through interviews and observations; secondary data from organizational documents and relevant literature.

3.3 Population

Construction material dealers and real estate brokers in Ernakulam district

3.4 Sampling Technique

Convenience sampling method is used for selecting sample from the population

3.5 Tools for Data Collection

Semi-structured questionnaire is used for data collection.

3.6 Tools for Data Analysis

Percentage analysis and charts are were used in the study for data analysis

4: Data analysis & interepretation

Table 4.1: Age of Respondents

Age Group (Years)	Number of Respondents	Percentage (%)
20–30	12	24
30–40	18	36
40–50	13	26
50 and above	7	14
Total	50	100

Table 4.2: Gender of Respondents

Gender	Number of Respondents	Percentage (%)
Male	42	84
Female	8	16
Other	0	0
Total	50	100

Table 4.3: Primary Role in the Industry

Role	Number of Respondents	Percentage (%)
Builders	15	30
Civil Contractors	12	24
Architects	8	16
Material Suppliers	10	20
Others	5	10
Total	50	100

Table 4.4: Years of Operation

Years of Experience	Number of Respondents	Percentage (%)
Less than 5 years	14	28
5–10 years	16	32
10 years or more	20	40
Total	50	100

Table 4.5: Type of Projects Handled

Project Type	Number of Respondents	Percentage (%)
Residential (Affordable)	18	36
Residential (Luxury)	9	18
Commercial	15	30
Industrial/ Infrastructure	8	16
Total	50	100

Table 4.6: Demand for New Projects (Last Two Years)

Demand Level	Number of Respondents	Percentage (%)
Growing	17	34
Stable	14	28
Not much change	9	18
Declining	10	20
Total	50	100

Table 4.7: Average Project Completion Timeline

Completion Period	Number of Respondents	Percentage (%)
Under 2 years	13	26
2–4 years	21	42
4–6 years	11	22
Over 6 years	5	10
Total	50	100

Table 4.8: Annual Turnover of Firms

Annual Turnover	Number of Respondents	Percentage (%)
Below ₹50 Lakhs	12	24
₹50 Lakhs – ₹5 Crores	18	36
₹5 Crores – ₹50 Crores	14	28
Above ₹50 Crores	6	12
Total	50	100

Table 4.9: Awareness of Recent GST Policy Changes (2024–25)

Awareness Level	Number of Respondents	Percentage (%)
Very High	11	22
Moderate	23	46
Low	10	20
Not aware	6	12
Total	50	100

Table 4.10: GST Simplification Compared to Pre-GST Era

Response	Number of Respondents	Percentage (%)
Yes	21	42
No	17	34
Neutral	12	24
Total	50	100

Table 4.11: Difficulty of GST Documentation

Difficulty Level	Number of Respondents	Percentage (%)
Low (1–2)	9	18
Moderate (3)	17	34
High (4–5)	24	48
Total	50	100

Table 4.12: Reduction in Cash-Only Transactions Due to GST

Response	Number of Respondents	Percentage (%)
Strongly Agree	14	28
Agree	18	36
Neutral	10	20
Disagree	8	16
Total	50	100

Table 4.13: Budget Stability Affected by Frequent GST Updates

Response	Number of Respondents	Percentage (%)
Yes	29	58
No	11	22
Neutral	10	20
Total	50	100

Table 4.14: Impact of Cement GST Reduction (28% → 18%)

Impact Level	Number of Respondents	Percentage (%)
Significant relief	12	24
Some relief, costs increased	21	42
Very little impact	11	22
Benefit not passed on	6	12
Total	50	100

Table 4.15: Impact of GST Reduction on Bricks and Sand-Lime Blocks

Response	Number of Respondents	Percentage (%)
Yes	19	38
Partially	14	28
No	10	20
Unsure	7	14
Total	50	100

Table 4.16: Importance of Steel GST Reduction (5%) for Affordable Housing

Response	Number of Respondents	Percentage (%)
Crucial	20	40
Important	16	32
Neutral	9	18
Not necessary	5	10
Total	50	100

Table 4.17: Increase in Project Inquiries After GST Cuts

Response	Number of Respondents	Percentage (%)
Significant	13	26
Moderate	15	30
Negligible	14	28
No change	8	16
Total	50	100

Table 4.18: GST Favoring Large Developers

Response	Number of Respondents	Percentage (%)
Strongly Agree	18	36
Agree	14	28
Neutral	11	22
Disagree	7	14
Total	50	100

Table 4.19: Impact of No ITC in Residential Projects

Impact Level	Number of Respondents	Percentage (%)
Significant	22	44
Moderate	16	32
Minimal	8	16
No impact	4	8
Total	50	100

Table 4.20: GST 2.0 Reforms and Global Competitiveness by 2030

Response	Number of Respondents	Percentage (%)
Strongly Agree	15	30
Agree	18	36
Neutral	11	22
Disagree	6	12
Total	50	100

5. Discussions and Findings

This chapter presents the analysis and interpretation of data collected from **50 respondents** associated with the real estate and construction industry. The data were analyzed simple tables and percentage analysis. The chapter examines respondents' demographic profile, business characteristics, awareness and compliance with GST, and perceptions regarding GST 2.0 reforms.

5.1 Demographic Profile of Respondents

Age of Respondents : Table 4.1 presents the age-wise distribution of respondents. The analysis shows that 36% of respondents fall within the 30–40 age group, followed by 26% in the 40–50 age group. Respondents aged 20–30 years constitute 24%, while 14% are above 50 years.

The dominance of the 30–40 age group indicates participation from mid-career professionals who possess both operational experience and exposure to pre-GST and post-GST tax regimes, making their responses particularly relevant.

Gender of Respondents : As shown in Table 4.2, 84% of respondents are male, while 16% are female. No respondents identified under other categories. This gender

composition reflects the male-dominated nature of the construction and real estate industry, consistent with broader industry patterns in India.

5.2 Professional and Business Characteristics

Primary Role in the Industry : Table 4.3 indicates that builders constitute the largest group (30%), followed by civil contractors (24%), material suppliers (20%), and architects (16%). The remaining 10% fall under other roles.

This diversified role representation strengthens the analysis by capturing perceptions across different segments of the construction value chain rather than a single stakeholder group.

Years of Operation : Table 4.4 shows that 40% of respondents have more than 10 years of experience, while 32% have 5–10 years of experience. Only 28% have less than 5 years of experience. The presence of experienced respondents enhances the reliability of comparisons between the pre-GST and GST 2.0 periods.

Type of Projects Handled: According to Table 4.5, 36% of respondents are engaged in affordable residential projects, followed by 30% in commercial projects. Luxury residential projects account for 18%, while 16% are involved in industrial or infrastructure projects.

The dominance of residential projects is significant, as GST policies have had the most visible impact on housing, particularly regarding input tax credit (ITC) and rate revisions.

5.3 Awareness and Compliance with GST

Understanding of Recent GST Policy Changes: Table 4.6 reveals that 46% of respondents report a moderate level of awareness, while 22% claim very high awareness. However, 32% (low awareness and not aware combined) indicate insufficient understanding of recent GST updates.

This suggests communication gaps in disseminating GST policy changes, which may contribute to compliance challenges.

Difficulty of GST Documentation: As per Table 4.7, 48% of respondents experience high difficulty in GST documentation, while 34% report moderate difficulty. Only 18% find GST documentation relatively easy.

These results indicate that GST compliance imposes a substantial administrative burden, especially on small and medium-sized firms.

5.4 Structural Issues under GST

Impact of No Input Tax Credit (ITC) in Residential Projects Table 4.8 shows that 44% of respondents perceive a significant impact due to the absence of ITC in residential projects, while 32% report a moderate impact. Only 24% consider the impact minimal or negligible.

This highlights ITC denial as one of the most critical structural challenges under GST for the real estate sector.

5.5 Perception of GST 2.0 and Future Competitiveness

GST 2.0 Reforms and Global Competitiveness: Table 4.9 indicates that 66% of respondents either agree or strongly agree that GST 2.0 reforms will enhance the global competitiveness of Indian real estate by 2030. However, 22% remain neutral, and 12% disagree.

This reflects cautious optimism among industry participants, contingent upon further simplification and policy stability.

GST Awareness and Compliance Burden: The findings reveal a disconnect between GST policy formulation and ground-level awareness. Despite several years of GST implementation, nearly one-third of respondents lack adequate understanding of recent changes. High documentation difficulty reported by nearly half the respondents supports earlier studies that argue GST compliance costs act as an indirect financial burden on firms.

Structural Challenges: ITC and Equity Issues: The significant negative impact of ITC denial in residential projects confirms criticisms raised in prior research that GST benefits larger developers more than smaller players. Larger firms possess better compliance infrastructure, allowing them to absorb regulatory complexities more effectively. GST 2.0 and Long-Term Competitiveness: While a majority believe GST 2.0 can enhance global competitiveness, the presence of neutral and dissenting opinions reflects uncertainty. Respondents emphasize that

competitiveness depends not only on tax rates but also on policy consistency, reduced compliance costs, and predictable regulatory frameworks.

6 : Conclusion and Recommendations

The dominance of mid-career and highly experienced participants have witnessed multiple tax regimes. The male-dominated sample aligns with industry norms and does not significantly bias the analysis given the sectoral context. The analysis indicates that while GST has improved transparency and formalization, persistent challenges remain in compliance complexity, denial of ITC, and uneven awareness levels. Experienced respondents express cautious optimism toward GST 2.0 reforms, but emphasize the need for stability and inclusiveness. The policy implications for the future suggest the need for:

- Simplification of GST documentation procedures
- Reconsideration of ITC eligibility in residential projects
- Stable GST rates for long-duration construction projects
- Targeted awareness programs for small and mid-sized firms

The study concludes that GST 2.0 represents a positive step toward formalization and transparency in the real estate sector. However, unless compliance burdens are reduced and structural inequities addressed, the full benefits of GST reforms may remain unrealized.

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46. IMPACT OF GOODS AND SERVICES TAX (GST) ON SMALL AND MEDIUM SCALE ENTERPRISES (SMES)

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ABTRACT

The introduction of the Goods and Services Tax (GST) in India marked a significant reform in the indirect tax system with the objective of creating a unified national market. Small and Medium Scale Enterprises (SMEs), which form the backbone of the Indian economy, have been profoundly affected by the implementation of GST. This study examines the impact of GST on SMEs by analyzing its effects on operational efficiency, compliance burden, cost structure, competitiveness, and overall business performance. The research is based on both primary and secondary data collected from selected SMEs. The findings reveal that while GST has improved tax transparency, reduced cascading effects, and enhanced ease of interstate trade, SMEs continue to face challenges such as complex compliance procedures, technological adaptation issues, and increased administrative costs. The study highlights the need for policy support, simplified compliance mechanisms, and awareness programs to help SMEs fully realize the benefits of GST.

Keywords: Goods and Services Tax, SMEs, Tax Reform, Compliance, Business Performance, India

Introduction

Small and Medium Scale Enterprises (SMEs) play a crucial role in India's economic development by contributing significantly to employment generation, industrial production, and exports. Recognizing their importance, the Government of India introduced the Goods and Services Tax (GST) on July 1, 2017, replacing multiple indirect taxes with a single comprehensive tax system.

GST aims to simplify the taxation structure, eliminate tax cascading, and promote ease of doing business. However, the transition to GST posed both opportunities and challenges for SMEs. While the unified tax system has reduced barriers to interstate

trade and increased transparency, SMEs have faced difficulties in adapting to digital compliance requirements, frequent regulatory changes, and increased compliance costs. This study seeks to analyze the overall impact of GST on small and medium scale enterprises and assess whether the reform has achieved its intended objectives from the SME perspective.

Statement of the problem

Despite GST being introduced to simplify taxation and improve business efficiency, many SMEs struggle to adapt to the new system. Issues such as lack of technical knowledge, frequent filing requirements, complex return procedures, and compliance costs have created operational challenges. At the same time, the benefits of GST—such as input tax credit, reduced tax evasion, and improved market access—are not uniformly experienced across SMEs. This study seeks to examine both the positive and negative impacts of GST on SMEs and identify key challenges faced during its implementation.

Scope of the study

The study focuses on analyzing the impact of GST on small and medium scale enterprises with respect to:

- Tax compliance and administrative burden
- Cost of operations
- Business performance and competitiveness
- Awareness and adaptability of SMEs to GST

The study covers selected SMEs operating in manufacturing, trading, and service sectors

Significance of Study

This study holds significant importance as it offers an in-depth understanding of the impact of the Goods and Services Tax (GST) on Small and Medium Enterprises (SMEs), which constitute a critical segment of the economy by contributing substantially to industrial output, employment generation, and overall economic development. By examining the experiences of SMEs under the GST regime, the study highlights both the benefits and challenges associated with its implementation.

The findings of this research can serve as a valuable resource for policymakers and government authorities by providing empirical evidence on the operational and compliance-related issues faced by SMEs. Such insights can aid in the formulation of more effective policies, simplification of tax procedures, and development of targeted support mechanisms to ease the GST burden on small and medium-sized businesses. Furthermore, the study can help identify gaps in awareness, technological readiness, and administrative capacity among SMEs, enabling authorities to design appropriate training and assistance programs.

From an entrepreneurial perspective, the study is beneficial as it helps business owners understand how GST has influenced cost structures, supply chain efficiency, and overall business performance. By highlighting areas where GST has contributed to transparency and operational efficiency, as well as areas where compliance remains complex or costly, the study provides practical insights that can assist SMEs in improving tax compliance and strategic decision-making.

FACTORS AFFECTING SME's UNDER GST

Operational Factors

- Cost of compliance
- Filing of returns
- Digital infrastructure

Financial Factors

- Input tax credit availability
- Working capital management
- Tax rates

Technological Factors

- GST portal usage
- Accounting software adaptation

Regulatory Factors

- Changes in GST rules
- Penalties and audits

Objectives of the Study

1. To analyze the impact of GST on the operational performance of SMEs.
2. To examine the compliance challenges faced by SMEs under GST.
3. To study the effect of GST on cost structure and profitability of SMEs.
4. To identify the benefits and limitations of GST from the SME perspective

Hypothesis

1. GST has a significant impact on the operational efficiency of SMEs.
2. GST compliance requirements significantly affect SME business performance.
3. GST implementation has improved tax transparency for SMEs.
4. Technological readiness influences successful GST compliance among

Methodology of the Study

The study is descriptive and analytical in nature and is based on both primary and secondary data.

- Primary Data: Collected from SME owners/managers through a structured questionnaire.
- Secondary Data: Collected from journals, government reports, GST council publications, and websites.
- Sample Size: 100 SMEs
- Sampling Technique: Convenience sampling
- Tools Used: Percentage analysis, mean score analysis, and regression analysis.
- Software Used: SPSS

Tools for Data Analysis

To analyze the data collected for the study, appropriate statistical tools were employed to ensure accuracy, reliability, and meaningful interpretation of results. The following methods were used:

Percentage Analysis: Percentage analysis was used to summarize and interpret the demographic profile of respondents and to analyze responses to various survey questions. This technique helped in converting raw data into a simplified and understandable format, enabling easy comparison and identification of trends and patterns among the respondents. It was particularly useful in presenting the

distribution of responses related to awareness, compliance level, and perceived impact of GST on Small and Medium Enterprises (SMEs).

Multiple Regression Analysis: Multiple regression analysis was applied to examine the relationship between the dependent variable and two or more independent variables. This technique enabled the study to assess the extent to which various factors such as GST compliance cost, tax knowledge, and technological readiness influence the performance and efficiency of SMEs. By using multiple regression analysis, the study was able to determine the significance and strength of each independent variable and understand their combined impact on business outcomes under the GST framework.

Cronbach's Alpha (Reliability Test): Cronbach's Alpha was used to test the internal consistency and reliability of the research instrument.

Limitations of the study

Despite its contributions, the study has certain limitations that should be acknowledged. Firstly, the study is confined to selected Small and Medium Enterprises (SMEs) due to time and resource constraints. As a result, the findings may not fully represent the experiences and challenges of all SMEs across different sectors or regions.

Secondly, the data collected is based on the perceptions and self-reported responses of the respondents. Such responses may be influenced by personal opinions, level of awareness, or individual experiences, which could lead to respondent bias and affect the objectivity of the results.

Lastly, the Goods and Services Tax (GST) framework is subject to frequent amendments and regulatory changes. These ongoing modifications may influence compliance procedures and business operations over time, thereby affecting the long-term relevance and applicability of the study's findings.

Review of Literature

- Kumar & Sharma (2020) found that GST reduced tax cascading but increased compliance burden for SMEs.

- Gupta (2021) observed that digital compliance posed challenges for small enterprises with limited resources.
- Rao & Singh (2022) highlighted improvements in tax transparency and formalization due to GST.
- Mehta (2023) emphasized the need for simplified GST procedures for micro and small enterprises. Review of Literature
- Kumar & Sharma (2020) found that GST reduced tax cascading but increased compliance burden for SMEs.
- Gupta (2021) observed that digital compliance posed challenges for small enterprises with limited resources.
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Research Gap

Existing literature on the Goods and Services Tax (GST) primarily concentrates on its macroeconomic implications, such as revenue generation, economic growth, and overall tax efficiency. However, there is limited focus on the micro-level impact of GST, particularly on Small and Medium Enterprises (SMEs), which operate under unique constraints and face distinct operational challenges. Moreover, there is a noticeable lack of empirical studies that simultaneously examine both the benefits of GST and the practical difficulties related to compliance, cost, and administrative procedures experienced by SMEs after its implementation. This gap highlights the need for comprehensive research that captures the real-world experiences of SMEs and provides balanced insights into the advantages and challenges

Findings of the study

The study reveals that the implementation of the Goods and Services Tax (GST) has contributed positively to increased transparency in the tax system and has significantly reduced the issue of tax cascading for Small and Medium Enterprises

(SMEs). The introduction of a unified tax structure has simplified indirect taxation and enhanced clarity in tax calculation and documentation.

However, the findings also indicate that GST compliance procedures are complex and time-consuming, particularly for small businesses with limited administrative capacity. Frequent filing requirements, detailed documentation, and procedural formalities place an additional burden on SMEs, often requiring external professional assistance.

The study further highlights that many SMEs experience working capital constraints due to delays in receiving input tax credit (ITC). Such delays affect cash flow management, making it difficult for businesses to meet operational expenses and maintain smooth business operations.

Additionally, technological barriers continue to pose a major challenge for SMEs, especially smaller enterprises. Limited access to digital infrastructure, lack of technical expertise, and difficulties in adapting to online GST portals hinder effective compliance and increase dependency on intermediaries. Overall, while GST has introduced structural benefits, operational and technological challenges remain significant for SMEs.

Conclusion

The study concludes that GST has brought both positive and negative impacts on small and medium scale enterprises. While the unified tax system has enhanced transparency, competitiveness, and market access, SMEs continue to face compliance-related and technological challenges. Simplification of GST procedures, improved digital support, and targeted training programs are essential to ensure that SMEs can fully benefit from the GST regime. A balanced approach is necessary to strengthen SME growth while maintaining tax efficiency

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47. SCALING SMEs THROUGH E-COMMERCE PLATFORMS: OPPORTUNITIES AND CHALLENGES

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ABSTRACT

E-commerce has emerged as a transformative force for Small and Medium Enterprises (SMEs), enabling them to overcome traditional market limitations and scale their operations more effectively. This paper examines how e-commerce platforms support business expansion, enhance operational efficiency, and improve customer reach among SMEs. Drawing insights from primary data collected from SME owners and individuals engaged in online business activities in Kochi, the study highlights adoption trends, platform preferences, motivational factors, perceived benefits, and existing challenges. The analysis shows that platforms such as Amazon, Flipkart, and Meesho significantly contribute to sales growth, market diversification, and brand visibility for small businesses. While a majority of respondents reported increased revenue and wider customer reach after adopting e-commerce, challenges such as logistics inefficiencies, high shipping costs, digital skill gaps, and platform commissions continue to hinder seamless adoption. The study also emphasizes the role of digital literacy, infrastructure quality, and customer trust in shaping successful e-commerce participation.

Keywords

E-commerce, SMEs, Digital Adoption, Market Scaling, Logistics Challenges, Digital Literacy.

Statement of the Problem

Although e-commerce platforms provide SMEs with opportunities to expand market reach, improve sales, and enhance operational efficiency, many small businesses still

struggle to adopt and sustain online operations. SMEs in regions like Kochi face persistent issues such as limited digital skills, inadequate infrastructure, high delivery costs, platform complexity, and customer trust concerns. These barriers prevent them from fully leveraging digital platforms and competing effectively with larger online sellers.

Conceptual Model

The conceptual model for this study is built on the relationship between e-commerce adoption and SME growth, moderated by organizational and environmental factors. E-commerce adoption includes online platform usage, digital marketing practices, and online sales management. Mediating factors include technological readiness, organizational capabilities, and environmental conditions. SME growth is measured through revenue change, customer reach, operational efficiency, and market expansion.

Objectives

1. Platform Identification To find the key e-commerce platforms (e.g., Amazon, Flipkart, and local platforms) that Kochi's SMEs are using.
2. Impact To evaluate how e-commerce adoption affects market reach, sales growth, and overall revenue generation for SMEs.

Scope

This study focuses on SMEs operating in Kochi's retail sector that use or intend to use e-commerce platforms. It examines their adoption patterns, platform choices, benefits, and challenges. The study is geographically limited to Kochi.

Literature Reviews

1. Budiarti, I. B., & Akbar, A. M. (2021): E-commerce for the development of small medium enterprises: E-commerce adoption significantly improves SMEs' access to markets and operational maturity. Budiarti & Akbar review descriptive and qualitative data showing SMEs that embrace online channels report higher visibility, process formalization, and product diversification. The paper highlights education and local infrastructure as necessary complements for sustained e-commerce adoption, and cautions against one-size-fits-all platform strategies for micro firms.

2. Faiz, F. (2024): Determinants of digital technology adoption in innovative SMEs: Faiz synthesizes determinants—firm size, managerial digital literacy, perceived benefits, and external pressures—showing smaller SMEs lag despite potential gains. The study's integrated model explains adoption variance and recommends targeted subsidies and training to accelerate uptake. For Kochi's SMEs, these findings imply that local ecosystem-building (training centres, incubators) could be pivotal in translating e-commerce promise into measurable scale.
3. Hendricks, S. (2024): A systematic literature review on factors influencing e-commerce adoption. Hendrick's review isolates technology readiness, environmental (infrastructure and logistics), and trust as primary barriers to SME e-commerce adoption. It emphasizes that consumer trust mechanisms (reviews, secure payments) and platform reliability are decisive for smaller sellers. The synthesis recommends combined policy and platform interventions—localized payment integrations and simplified onboarding—to reduce frictions for regional SMEs like those in Kochi.
4. Singh, (2018). The rise of e-Commerce and its impact on small businesses: India perspective: This paper documents the dual nature of e-commerce in India: democratizing reach while intensifying competition. It traces structural benefits—lower marketing costs and expanded customer bases—yet warns of market concentration risks where large marketplaces can dominate categories. For Kerala and Kochi SMEs, the study suggests niche, quality-led positioning plus platform diversification as viable resilience strategies.
5. Philbin et al. (2022): Technology adoption and digital transformation in small businesses: trends and challenges: The authors argue digital transformation yields sustainability and customization advantages for SMEs. Their cross-sector analysis finds firms that transform digitally show improved resource efficiency and market responsiveness. However, the research notes SMEs require continuous capability building and access to affordable tech— an important consideration for Kochi's SMEs seeking to scale through e-commerce.

Research Design

A descriptive and analytical research design was used. Surveys captured adoption patterns, while analytical methods evaluated relationships between revenue, reach, and operational efficiency.

Sampling Technique

A convenience sampling technique was used to select SME respondents.

Sample Size

Responses were collected from 161 participants.

Source of Data

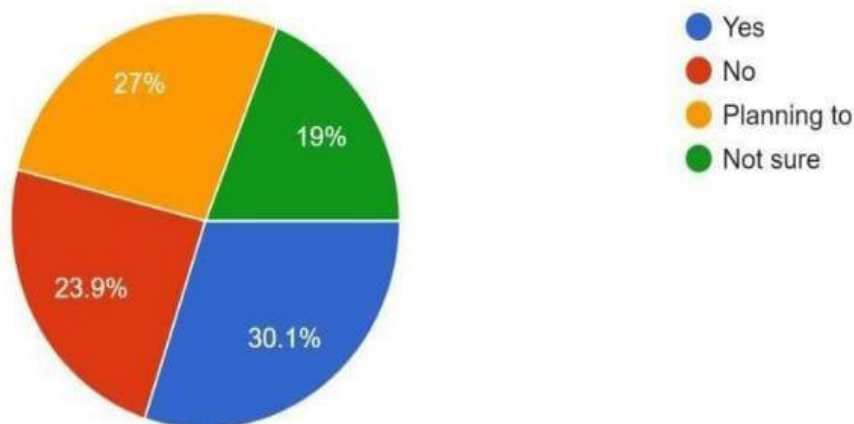
Primary (survey) and secondary (journals, articles) sources were used.

Tools

Percentages, tables, charts, and interpretation techniques.

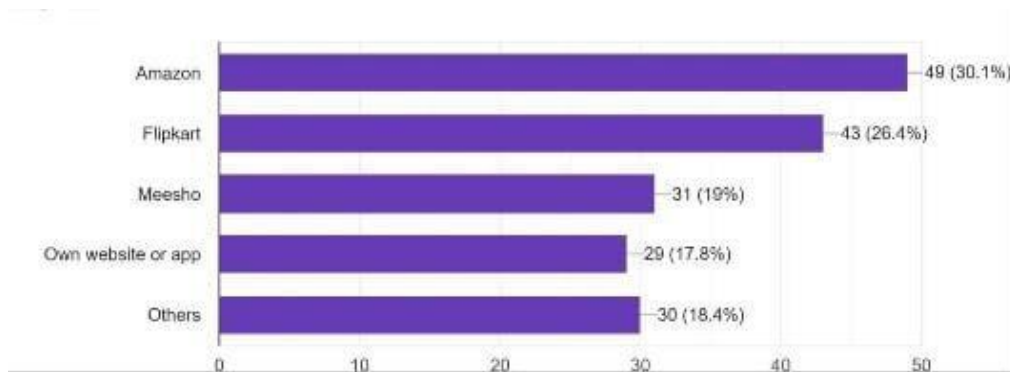
Analysis & Interpretation

1. CURRENTLY USE OF E-COMMERCE PLATFORM



Interpretation: From the table on current use of e-commerce platforms, 30% (49 respondents) are already using them. Another 27% (44 respondents) are planning to use e-commerce in the future. 24% (39 respondents) are not using, and 19% (31 respondents) are not sure.

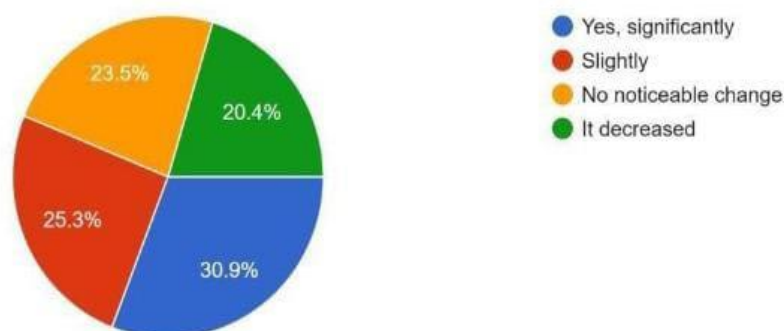
2.USAGE OF E-COMMERCE PLATFORMS



Interpretation:

The data reveals that Amazon is the most used e-commerce platform (30%), followed by Flipkart (26%), Meesho (19%), and own websites or apps (18%), while 7% use other platforms. This indicates that Amazon and Flipkart continue to dominate the Indian e-commerce market, largely due to their wide product range, brand trust, and user-friendly services. The growing use of Meesho shows that newer, small-business-friendly platforms are also gaining popularity, especially among individual sellers and small entrepreneurs. The 18% of respondents using their own websites or apps demonstrate that some businesses prefer independent online setups to maintain full control over their sales and branding. Overall, the data suggests that while third-party platforms are the most popular, diversification in platform usage is increasing, reflecting a broader acceptance and exploration of e-commerce options.

3. REVENUE CHANGE AFTER GOING ONLINE

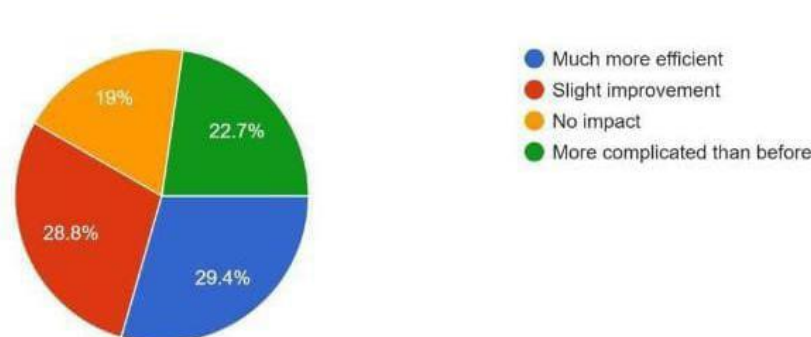


Interpretation:

The data shows that after adopting e-commerce, 31% of respondents experienced a significant increase in revenue, while 25% noticed a slight improvement. However, 24%

reported no noticeable change, and 20% even saw a decrease in their income. This indicates that a majority of users benefited financially from going online, as e-commerce platforms helped them reach wider audiences and generate higher sales. At the same time, the portion of respondents who experienced no growth or a decline suggests that success in e-commerce depends on several factors, such as product type, marketing strategy, customer service, and competition. Some businesses may take more time to adjust to the online environment or may lack the digital skills needed for consistent growth.

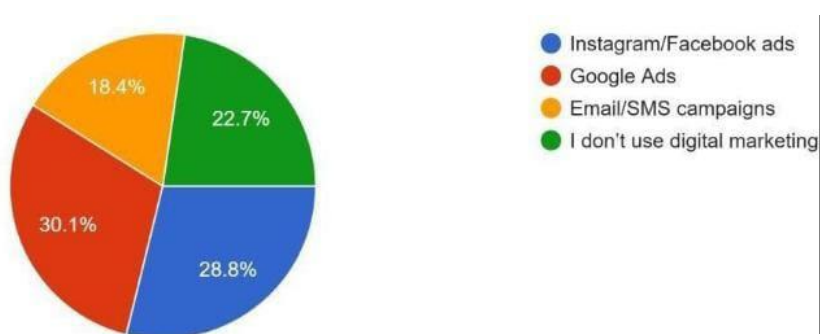
4. DAILY BUSINESS OPERATIONS BECOME MORE EFFICIENT



Interpretation:

The data shows that 29% of respondents felt their business became much more efficient after using e-commerce tools, and another 29% observed a slight improvement. On the other hand, 23% stated that operations became more complicated, and 19% noticed no impact. This indicates that a majority of users experienced improvements in efficiency, as e-commerce tools help automate processes like order tracking, payments, and inventory management. However, some respondents struggled with these tools, possibly due to a lack of technical knowledge or difficulty adapting to new systems.

5. EFFICIENCY IMPROVEMENT FROM E-COMMERCE TOOLS



Interpretation:

The data shows that Google Ads is the most used digital marketing channel (30%), followed closely by Instagram and Facebook ads (29%). Around 23% of respondents do not use any digital marketing, while 18% rely on email or SMS campaigns. This indicates that most businesses prefer social media and search engine platforms for promoting their products and reaching customers, as these channels offer wide visibility and targeted advertising options. The relatively lower use of email and SMS campaigns suggests that traditional digital marketing methods are becoming less popular compared to social media and search-based advertising. The fact that some respondents do not use digital marketing highlights the need for greater awareness about its benefits in boosting sales and brand presence. Overall, the findings suggest that Google and social media platforms play a dominant role in digital marketing for e-commerce businesses, helping them attract and engage a larger audience effectively.

Descriptive Analysis**Inferential Analysis**

H₀1: Adoption of e-commerce platforms does not significantly affect the business growth of SMEs

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	97.179 ^a	16	.000
Likelihood Ratio	116.291	16	.000
Linear-by-Linear Association	24.889	1	.000
N of Valid Cases	318		
a. 6 cells (24.0%) have expected count less than 5. The minimum expected count is 1.98.			

The Pearson Chi-Square test shows a value of 97.179 with 16 degrees of freedom and a p-value of .000, which is less than the significance level of 0.05. This indicates a statistically significant association between e-commerce adoption and business growth among SMEs.

Although 6 cells (24%) have expected counts less than 5, the test is still considered valid for a large sample size of 318 cases.

Conclusion:

We reject the null hypothesis (H_{01}) and accept the alternative hypothesis. This suggests that adoption of e-commerce platforms has a significant positive effect on the business growth of SMEs.

H₀₂: SMEs show no preference between large national e-commerce platforms and local platforms.

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	62.287 ^a	16	.000
Likelihood Ratio	72.854	16	.000
Linear-by-Linear Association	9.160	1	.002
N of Valid Cases	318		
a. 10 cells (40.0%) have expected count less than 5. The minimum expected count is .99.			

The Pearson Chi-Square test shows a value of 62.287 with 16 degrees of freedom and a p-value of .000, which is below the 0.05 significance level. This indicates a statistically significant association between SME platform choice and platform type.

Although 10 cells (40%) have expected counts less than 5 (minimum expected count = 0.99), the overall test is still interpretable given the sample size of 318 cases.

Conclusion:

We reject the null hypothesis (H_{02}) and accept the alternative hypothesis. This suggests that SMEs show a significant preference for certain e-commerce platforms, particularly large national platforms (e.g., Amazon, Flipkart) over local platforms.

Findings

1. Amazon and Flipkart emerged as the most widely used e-commerce platforms among SMEs in Kochi due to their large customer base, strong logistics support, and high brand visibility.
2. Local platforms and social media-based selling (such as WhatsApp Business and Facebook Marketplace) were commonly used by micro and small retailers, mainly to serve local customers and reduce platform dependency.
3. Impact of E-commerce Adoption E-commerce adoption significantly improved market reach, with many SMEs reporting access to customers beyond Kochi, including other districts and states.
4. A majority of SMEs experienced an increase in sales and revenue after adopting e-commerce, with around two-thirds of respondents indicating moderate to significant revenue growth.
5. Operational efficiency improved for many SMEs through the use of digital tools for order processing, inventory management, and customer communication, although some businesses reported increased complexity during the initial adoption phase.

Suggestions

1. SMEs should adopt a multi-platform selling strategy by using national platforms such as Amazon and Flipkart along with local and social commerce platforms to reduce dependency on a single marketplace and increase market reach.
2. Greater awareness and promotion of local e-commerce platforms should be encouraged, as they offer lower commission costs and better support for region-specific products produced by Kochi-based SMEs.
3. SMEs should improve product presentation and pricing strategies on e-commerce platforms by using high-quality images, accurate descriptions, competitive pricing, and customer reviews to boost sales and revenue.
4. Digital marketing tools integrated with e-commerce platforms such as social media ads, influencer marketing, and platform-based promotions should be actively used to attract new customers and expand market reach.

5. Training programs should be provided to SMEs on platform management and data analytics, helping them understand customer behavior, manage inventory efficiently, and make informed decisions that improve sales growth and profitability.

Conclusion

This study concludes that e-commerce has become a crucial driver of growth for Small and Medium-sized Enterprises (SMEs) in Kochi's retail sector. The findings show that the adoption of e-commerce platforms has significantly expanded market reach, allowing SMEs to access customers beyond local boundaries and compete in wider regional and national markets. Popular platforms such as Amazon and Flipkart play a major role in enabling this expansion, while local and social commerce platforms provide cost-effective alternatives for smaller businesses.

The study also reveals that e-commerce adoption has positively influenced sales performance and revenue generation for many SMEs by improving visibility, customer engagement, and operational efficiency. However, the benefits of e-commerce are not evenly experienced by all businesses, as challenges such as high platform fees, logistics issues, limited digital skills, and intense competition continue to affect sustainable growth.

Overall, the success of e-commerce integration among SMEs in Kochi depends not only on platform usage but also on digital literacy, infrastructure support, and strategic decision-making. With appropriate training, supportive policies, and a balanced use of national and local platforms, e-commerce can serve as a powerful tool for strengthening SME competitiveness, promoting inclusive growth, and ensuring long-term sustainability in the retail sector.

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48. AN ANALYSIS OF OMNICHANNEL MARKETING EFFECTIVENESS IN RETAIL INDUSTRY

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ABSTRACT

The retail industry has experienced substantial transformation in recent years, largely driven by technological advancements and evolving consumer behavior. As digital technologies reshape how consumers interact with brands, omnichannel marketing has emerged as a key strategic approach aimed at delivering a seamless and integrated customer experience across both online and offline channels. By coordinating multiple touchpoints—such as social media platforms, mobile applications, physical stores, and interactive websites—retailers are able to engage customers in a more holistic and personalized manner. Existing research indicates that effective omnichannel marketing enhances customer satisfaction, loyalty, and retention, ultimately contributing to increased sales and revenue growth. However, successful implementation requires a comprehensive understanding of customer preferences and behavior, as well as the capability to integrate data, technologies, and organizational processes across channels. Retailers that effectively adopt omnichannel strategies can achieve a significant competitive advantage, whereas those that fail to adapt may struggle to remain relevant in an increasingly dynamic marketplace. As the retail landscape continues to evolve, the strategic importance of omnichannel marketing is expected to grow further. The findings indicate that the retail sector has grown significantly in the past three years, encouraging many major organizations to implement omnichannel strategies in order to remain competitive. Unlike multi-channel and cross-channel approaches, omnichannel

retailing combines digital and physical channels to create a cohesive and seamless customer journey. By adopting a customer-focused approach that prioritizes integration and personalization, it enhances customer engagement, stimulates purchase behavior, strengthens retention, and improves overall customer satisfaction. This research seeks to offer practical insights for retail businesses aiming to strengthen their competitive edge in a swiftly evolving market.

Keywords: Omnichannel Retailing, Omnichannel Marketing, Technologies Awareness, customer engagement.

Introduction

The retail industry has undergone a significant transformation in recent years, driven by technological advancements and changing consumer behavior. One key strategy that has emerged as a result is omnichannel marketing, which aims to provide a seamless customer experience across online and offline channels. By integrating multiple channels, including social media, mobile interfaces, and interactive websites, retailers can engage with customers in a more holistic and personalized way. Research has shown that omnichannel marketing can improve customer satisfaction, loyalty, and retention, ultimately driving sales and revenue growth. Effective omnichannel marketing requires a deep understanding of customer behavior and preferences, as well as the ability to integrate data and systems across multiple channels. Retailers who successfully implement omnichannel marketing strategies can gain a competitive advantage in the market, while those who fail to adapt risk being left behind. As the retail industry continues to evolve, the importance of omnichannel marketing will only continue to grow. By providing a seamless and personalized customer experience, retailers can build strong relationships with their customers and drive long-term success. With the rise of e-commerce and changing consumer behavior, omnichannel marketing has become a crucial strategy for retailers to stay competitive. By leveraging technology and data, retailers can create a cohesive brand experience that meets the evolving needs of their customers. Omnichannel marketing has become a crucial strategy for retailers to stay competitive in the market. By providing a seamless and personalized customer experience across online and offline channels, retailers can build strong relationships with their customers and drive long-term success. The benefits of omnichannel marketing include improved customer experience, increased customer loyalty, enhanced customer insights, and increased sales and revenue growth. To implement effective

omnichannel marketing strategies, retailers must integrate multiple channels, including social media, mobile interfaces, and interactive websites, and leverage data and analytics to provide insights into customer behavior.

Retailers who successfully implement omnichannel marketing strategies can gain a competitive advantage in the market, while those who fail to adapt risk being left behind. The challenges of omnichannel marketing include data integration and management, channel consistency, and meeting customer expectations for seamless and personalized experiences. To overcome these challenges, retailers must invest in technology and infrastructure, and focus on understanding customer behavior and preferences. By providing a consistent brand experience across multiple channels, retailers can build trust and loyalty with their customers, and drive long-term success.

Statement of the Problem

Omnichannel marketing faces core challenges in creating a seamless, unified experience across online and offline channels, primarily driven by data fragmentation, technological, and operational hurdles. Key issues include inconsistent branding and messaging, inability to track customer journeys across devices, disjointed inventory management, and difficulties in scaling personalization.

Need for the Study

Over the past decade, rapid technological advancements and shifting consumer behaviors have significantly transformed the retail industry. As shoppers increasingly expect smooth and integrated experiences across multiple platforms, the importance of effective omnichannel marketing strategies has grown substantially. This research aims to address the pressing need to understand and implement these strategies within retail organizations for several key reasons.

Review of Literature

- **Anber Abraheem Shlash Mohammad et.al (2024)** A study in Jordan explored the effectiveness of omnichannel marketing in driving customer satisfaction and loyalty. Synchronization, accessibility, and consistency were key dimensions of omnichannel integration. Synchronization was the most influential dimension in enhancing customer satisfaction. Customer satisfaction was found to be a strong predictor of loyalty. The study suggests businesses focus on enhancing synchronization to meet customer needs. The findings provide practical implications for refining omnichannel strategies.

- **Sutomo (2023)** States that, omnichannel marketing strategies boost sales performance. The strategy integrates online and offline channels for a seamless customer experience. Companies saw an 18% average increase in sales performance customer satisfaction and operational efficiency. Omni channel strategies increase sales, customer satisfaction and operational efficiency. The study highlighted challenges faced by companies such as technology investment and inventory management suggest to invest in technology and employee training and stay competitive in the digital era.
- **Vera Butkouskaya et.al (2023)** analyzed how integrated marketing communication impact customer satisfaction. It focused on three components consistency, interactivity and connectivity. The study found that consistency boots product and service satisfaction. Interactivity only impacts service satisfaction. While connectivity affects product satisfaction. The study suggests applying all three IMC components together to enhance customer satisfaction. Consistency is key for product and service satisfaction. Connectivity is important for retail service satisfaction.
- **Kamalject Kaur et.al (2023)** A study in Malaysia explored factors influencing customers' decisions to buy fashion apparel through omnichannel retailing. Key factors included performance expectation, hedonic motivation, habit, fashion engagement, and personal innovativeness. These factors accounted for 70.7% of the variance in omnichannel usage. Fashion engagement and personal innovativeness were significant influencers. The study provides insights for retailers to improve customer experience and retention. The findings can help retailers attract and retain customers in the omnichannel retail environment.
- **Aregu and Shimelis (2022)** states that the retail industry is changing due to technological advances and digitization. Omnichannel retail strategy combines all customer touchpoints into one seamless experience. It integrates online and offline channels to increase customer satisfaction and loyalty. This approach requires companies to rethink their business models and provide a unified customer experience. Omnichannel retailing can improve customer engagement, satisfaction, and loyalty, and increase sales and revenue growth. Companies need to invest in technology and infrastructure to support this strategy. It helps companies stay competitive and attract new customers.

Research questions

1. What role do emerging technologies like AI, AR, and VR play in enhancing the omnichannel customer experience?
2. What factors influence customers' decisions to purchase fashion apparel through omnichannel retailing?
3. How does omnichannel marketing impact customer satisfaction and loyalty, and what metrics can retailers use to measure its effectiveness?

Objectives of the study

1. To evaluate the impact of omnichannel marketing on customer purchasing behavior.
2. To examine the effect of omnichannel strategies on customer satisfaction and loyalty.
3. To identify the most effective channels and combinations of channels in driving sales.
4. To study the role of technology and digital tools in implementing omnichannel marketing.
5. To assess the challenges and barriers faced by retailers in adopting an omnichannel approach.

Research Methodology

Data Collection: Primary data is collected through questionnaire. Secondary data collected from articles; website related to the topics’.

Data Analysis & Interpretation

Table 01 : Types of Retail business

Particular		Frequency	Percentage
Types of retail	Apparel	16	10.7
	Electronics	12	8.0
	Offline retail	92	61.3
	Online retail	30	20.0
	Total	150	100.0

Source: Primary Data

He above table shows the distribution of types of retail business among the respondents. Out of 150 respondents, 61.3% are involved in offline retail, 20% are involved in online retail, 10.7% deal with apparel retail, and 8% are engaged in electronics retail.

This indicates that the majority (61.3%) of respondents are engaged in offline retail business.

Table 02: Impact of omnichannel strategies on Customer Engagement

Particular		Frequency	Percentage
Impact of omnichannel strategies on Customer Engagement	Yes	114	76.0
	No	36	24.0
	Total	150	100.0

This indicates that the majority (76%) of respondents acknowledge the positive influence of omnichannel strategies on customer engagement.

Table No 03: Impact of omnichannel Integration on Sales Growth

Particular		Frequency	Percentage
Impact of omnichannel Integration on Sales Growth	Strongly agree	10	6.7
	Agree	92	61.3
	Neutral	26	17.3
	Disagree	18	12.0
	Strongly disagree	4	2.7
	Total	150	100.0

This indicates that the majority (67.9%) of respondents have a positive perception of the impact of omnichannel integration on sales growth.

Table No 04: Channels Integrated for Customer Interaction

Particular		Frequency	Percentage
Channels Integrated for Customer Interaction	Physical store	22	14.7
	Website	14	9.3
	Mobile app	60	40.0
	Social media	32	21.3
	Call centre	20	13.3
	Email/chat support	2	1.3
	Total	150	100.0

This indicates that the majority (40.0%) of respondents prefer using mobile apps as the primary channel for customer interaction.

Table No 05: Strategies used by Respondents to address Data Integration Challenges in Omnichannel marketing

Particular		Frequency	Percentage
Strategies used by Respondents to address Data Integration Challenges in Omnichannel marketing	Using data integration platforms	24	16.0
	Implementing master data management	62	41.3
	Developing customer integrations	60	40.0
	Outsourcing data integration	4	2.7
	Total	150	100.0

This indicates the majority of respondents (41.3%) emphasize implementing master data management as a key strategy to tackle data integration challenges.

Table No 06: Primary obstacle to delivering a seamless Customer Experience

Particular		Frequency	Percentage
Primary obstacle to delivering a seamless Customer Experience	Lack of data integration	36	24.0
	Insufficient staff training	30	20.0
	Inconsistent branding	48	32.0
	Technology limitations	36	24.0
	Total	150	100.0

This indicates that the majority (32.0%) of respondents identify inconsistent branding as the primary obstacle to delivering a seamless customer experience.

Table No 07 Respondents View on Role of Technology in Omnichannel Marketing

Variables		Level of Impact				
		SA	A	N	D	SD
Emerging technologies like AI and machine learning improve the personalization of customer experiences across multiple channels.	Count	84	54	8	0	4
	%	56.0	36.0	5.3	00	2.7
The integration of emerging technologies like AR and VR enhances the engagement and immersion of customer experiences.	Count	14	88	40	6	2
	%	9.3	58.7	26.7	4.0	1.3
Mobile technologies play a crucial role in enabling seamless omnichannel	Count	34	44	46	20	6
	%	22.7	29.3	30.7	13.3	4.0

customer experiences.						
The use of chatbots and conversational AI improves the efficiency and effectiveness of customer support in omnichannel environments.	Count	28	74	26	20	2
	%	18.7	49.3	17.3	13.3	1.3
Emerging technologies like IoT and 5G enable faster and more efficient customer experiences across multiple channels.	Count	32	28	50	12	28
	%	21.3	18.7	33.3	8.0	18.7

This indicates that the **highest majority (58.7%)** of respondents **agreed** that the integration of **emerging technologies like AR and VR** enhances the engagement and immersion of customer experiences in omnichannel marketing. On the other hand, the **lowest majority (1.3%)** was recorded for the view that strongly disagreed with the effectiveness of **AR and VR** and **chatbots with AI**.

Table No 08: Major challenges faced by organization in Implementing Omnichannel Integration

Particular		Frequency	Percentage
Major challenges faced by organization in Implementing Omnichannel Integration	Lack of technology infrastructure	32	21.3
	Data silos between departments	12	8.0
	Budget constraints	76	50.7
	Limited skilled workforce	8	5.3
	Resistance to organization change	22	14.7
	Total	150	100.0

This indicates majority (54.7%) of respondents believe that a seamless omnichannel experience has some influence on their satisfaction with a brand, suggesting that consistent and integrated customer interaction across platforms plays an important role in shaping customer satisfaction levels.

Findings

1. This indicates that the **highest majority (58.7%)** of respondents **agreed** that the integration of **emerging technologies like AR and VR** enhances the engagement and immersion of customer experiences in omnichannel marketing. On the other hand, the **lowest majority (1.3%)** was recorded for the view that strongly disagreed with the effectiveness of **AR and VR** and **chatbots with AI**
2. This indicates that the majority (48.0%) of respondents consider offering personalized marketing and promotions as the most effective way to improve customer experience across channels
3. This indicates a clear majority (85.3%) of respondents believe that retailers face challenges in providing a seamless omnichannel customer experience.
4. This indicates that the majority (34.7%) of respondents focus on increased sales as the key benefit of implementing omnichannel marketing.
5. This indicates that the majority (42.7%) of respondents rely on social media analytics to measure the effectiveness of their omnichannel marketing efforts.

Suggestions

- Ensure consistent brand experience across all customer touchpoints including in-store, website, mobile app, and social media platforms to build trust and familiarity.
- Invest in customer data integration systems to unify information across channels and enable personalized marketing and recommendations.
- Enable seamless transitions between online and offline shopping, such as allowing customers to check store availability online and pick up products in-store.
- Promote flexible fulfilment options like “buy online, pick up in store” (BOPIS), “reserve online, try in store,” and same-day delivery to improve convenience and satisfaction.
- Train retail staff to use digital tools and access customer profiles in-store, enabling them to offer a personalized shopping experience based on past behavior.

- Implement centralized customer support that functions across channels to provide quick and efficient service regardless of where the customer initiates contact.
- Leverage AI and automation tools to deliver real-time, behaviour-based marketing messages via email, SMS, and app notifications.

Conclusion

In conclusion, the study highlights that while many retail businesses have adopted omnichannel marketing strategies, there are still evident gaps in integration, personalization, and customer experience. Most retailers operate through multiple channels such as physical stores, websites, and mobile apps, but many struggle to deliver a seamless and consistent experience across these platforms. Challenges include poor data integration, inconsistent messaging, and underutilization of customer insights. Consumers today expect convenience, personalization, and flexibility throughout their shopping journey, and retailers who fail to meet these expectations risk losing competitive advantage. However, the findings indicate a positive trend, as businesses increasingly recognize the value of omnichannel approaches in enhancing customer engagement, loyalty, and sales. To fully realize the potential of omnichannel marketing, it is essential to invest in integrated technologies, train staff across platforms, and adopt customer-centric strategies. Strengthening data analytics capabilities, unifying branding, and offering flexible fulfilment options can significantly improve effectiveness. Overall, omnichannel marketing holds strong promise for the future of retail, provided it is implemented with strategic vision and customer focus.

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49. PERCEIVED USEFULNESS AND EASE OF USE OF ICT: EFFECTS ON EMPLOYEE ATTITUDES, ORGANIZATIONAL COMMITMENT, AND PERFORMANCE IN CHHATTISGARH'S MANUFACTURING SECTOR

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ABSTRACT

The paper analyses the relationship between the perceptions of Information and Communication Technology (ICT), namely, factors of perceived usefulness (PU) and perceived ease of use (PEOU) and perceptions towards ICT, organizational commitment and general organizational performance within the manufacturing industry of Chhattisgarh (India). As a theoretical framework, the Technology Acceptance Model (TAM) was applied to survey 300 employees (two public and two privately-owned manufacturing companies) and quantified PU, PEOU, employee attitude towards ICT, affective commitment and perceived organizational performance with valid Likert scales. The data were analyzed in two steps of SEM, which include confirmatory factor analysis (CFA) of the measurement model and structural equation modeling (SEM) of the hypothesis testing (in SPSS and AMOS). CFA measure of construct validity and reliability showed that they were (Cronbach alpha above 0.80 on all scales) and model fit acceptable (CFI = 0.95, RMSEA = 0.05). The results of SEM revealed that PU and PEOU are positively correlated with the positive attitude towards ICT (H1, H2 supported), where PU is stronger. The attitude to ICT, in turn, produced a positive impact on the organizational commitment and performance. Moreover, PU directly positively impacted the commitment and performance whereas the direct impacts of PEOU on the outcomes were less significant. The path coefficient of PU to performance, e.g., was huge ($\beta=0.40$, $p<.001$) as opposed to that of PEOU ($\beta= 0.12$, $p=.05$). Performance was also strongly predicted by commitment ($\beta = 0.48$, $p =.001$). Theories on all major routes were substantiated. The findings indicate that ICT perceived as one that is helpful and

convenient improves staff attitudes which in turn increases their commitment and ultimately, organizational performance. The findings are an extension of TAM by the connection of technology perceptions to organizational performance and practical implications concerning implementation of technology in industrial companies.

1. Introduction

ICT has become an important asset of manufacturing due to the rapid change in technology. Organizations invest in computers, networks and software to enhance productivity and communication yet they are successful when employees embrace the new systems. According to the Technology Acceptance Model (TAM), the attitudes of a person towards the use of a technology are formed based on the perceived usefulness (PU) and perceived ease of use (PEOU) (Or, C. 2024). Positive attitudes in turn result in increased usage and performance. There is however, lower information on the influence of these factors in the longer run (commitment of employees as well as organizational performance). This paper fills this gap by looking at the relationships between PU, PEOU, employee attitude towards ICT and commitment, and perceived organizational performance of the Chhattisgarh public and private manufacturing industry.

The economy of Chhattisgarh is well endowed with industry (steel, power) with both government-owned and privately owned firms. The concept of technology acceptance in this context should be understood because the dynamics of the state-owned enterprises can be different (compulsory systems) in comparison to the dynamic of the private firms. Key questions include:

Do PU and PEOU influence employees' attitudes toward ICT?

Do these attitudes translate into higher organizational commitment and performance?

Our hypothesis is as follows:

H1: There is a positive impact of perceived usefulness of ICT on attitude of employees about the use of ICT.

H2: The perceived ease to use of ICT positively influences the attitude of employees to use ICT.

H3: Attitude to ICT affects the affective commitment to the organization in a positive

way. H4: With an appreciative attitude towards ICT, organizational performance is increased.

H5: There is a direct positive impact of perceived usefulness on affective commitment.

H6: Perceived ease of use is directly positively related to affective commitment.

H7: Affective commitment has a positive impact on the performance of the organization.

In this case, the term attitude can be defined as a positive or negative assessment of the utilization of ICT by an employee (Or, C. 2024). Organizational commitment (especially affective commitment) refers to the emotional attachment and loyalty that the employee has to the company. Organizational performance entails such outcomes as productivity and profitability. To the extent that employees will form positive attitudes (which relate to TAM) that can boost their commitment and performance, we assume that they will form certain positive attitudes towards ICT when they find it useful and easy. The study is valuable in that it merges TAM and organizational consequences in a limited studied regional setting which has implications on theory and practice.

2. Literature Review

The TAM model assumes that the perceived usefulness and perceived ease of use are the key antecedents of technology acceptance (Or, C. 2024). Perceived usefulness is the level of individual thinking that the application of a given system would make him or her perform better, and perceived ease of use is the level of individual thinking that the application of a given system would not be accompanied by any effort. These constructs affect the attitude of the users towards technology which is the positive or negative judgment about the use of the technology. In the original TAM, Davis (1989) discovered that both PU and PEOU had a significant impact on attitude toward use. In most models PU is also sensitive to the PEOU (Or, C. 2024). Decades of experience with TAM itself and its extensions (TAM2) have demonstrated that in many cases PU exerts a more significant influence on acceptance consequences, and, through PU, PEOU offers an indirect pathway.

Attitude toward ICT: The attitude in TAM represents the positive or negative feelings of the user regarding the use of the technology. Attitude has been found to boost intention to use and satisfaction which is positive. In the recent studies of the field, e.g., PEOU and

PU were found to increase the contentment with AI tools. Practically, we believe that the same can be said of ICT in manufacturing, in the sense that in case ICT is convenient and convenient, employees will report more positive attitudes. Such a positive attitude is significant since it may be transferred to other job attitudes. According to Parvari et al. (2015), psychologically, the psychological connection between an employee and an organization can be strengthened through IT tools that are well-performing and user-friendly. That is, when technology experience is good, it can overflow into an increased organizational commitment. In this regard we postulate that the attitude towards ICT will be the predictor of the employee affective commitment.

Affective Commitment: Meyer and Allen define affective commitment as the feelings of attachment and involvement that an employee has with his organization. Devoted employees will strive to go an extra mile and become more loyal. Previous studies have indicated that satisfaction with resources and support enhances commitment and frustration may destroy it. When there is a positive attitude towards ICT (helpful and simple), this will be taken as organizational support and efficiency, which in turn is expected to increase commitment. Empirical testing of a TAM/commitment relationship has been done in few studies although conceptually a positive view of work tools can result in increased loyalties. Our hypothesis is therefore that the more positive the attitude towards ICT will be, the more the affective commitment will be. We also permit the direct impacts of PU and PEOU on the commitment as recommended by Parvari et al. (2015).

Organizational Performance: The actual output or the outcomes of an organization compared to the intended output is the broad organisational performance. This involves monetary benefits, productiveness, quality and other measures. ICT can enhance performance through optimization of the processes and facilitating decision-making. As an example, the adoption of ICT positively affected the operational and financial performance of manufacturing SMEs in a rather extensive way. We assume that increased employee commitment will result in greater performance (committed employees will work harder), and that the feelings towards ICT can have direct connections to performance (e.g. employees that can use technology more efficiently). A study by Bolodeoku et al. (2022) established a strong relationship between productivity and satisfaction and weak relationship between perceived usefulness and commitment.

We are going to look at these paths on an empirical basis.

Conceptual Framework; In brief, we combine the TAM and organizational constructs. The hypothesized model proposed by the theory and previous results is as follows: PEEU/PU PU Attitude Commitment PU PU/PEOU PU/PEOU Performance committed to the same direction, and other direct relationships exist between PU/PEOU and Performance. The conceptual framework that results is shown in Figure 1.

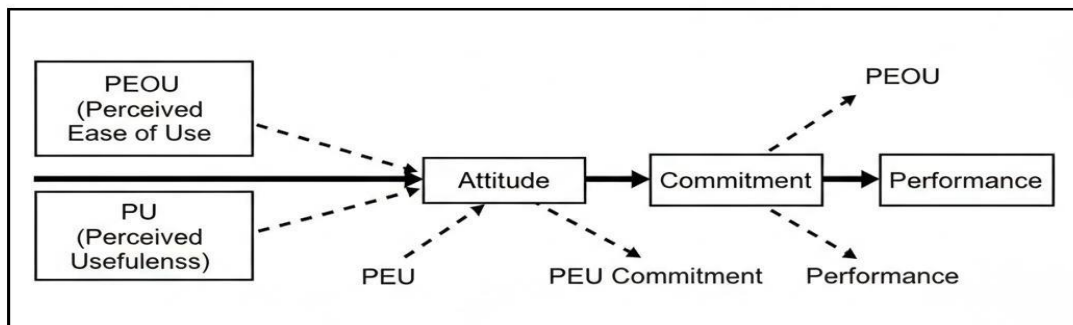


Figure 1: Conceptual Model

3. Methodology

Four manufacturing companies in Chhattisgarh (two public-sector, two private) were surveyed using a cross-sectional survey on employees. It contained 300 employees (around 75 employees per company). The process was voluntary and confidential. The questionnaire had validated scales: Perceived Usefulness (PU): Five items based on the adaptation of Davis (1989) (e.g., using the company ICT, the ICT enhances my job performance), 7-point Likert (1=strongly disagree to 7=strongly agree). Perceived Ease of Use (PEOU): Five items (as well) of Davis (1989) (e.g., “I find it easy to learn how to operate the ICT in the company) 7-point scale. Attitude toward ICT: There are four items that assess a general attitude (e.g. (I am positive about using ICT of the company) 7-point scale. Affective Commitment: 6 1- Meyer- Allen (e.g., I feel a strong sense of belonging to my organization), 7-point scale.

Organizational Performance: A 7-point scale based on 5 self-reported items (adapted to the success model by Delone and McLean) that describe perceived increases in productivity, quality and profitability as a result of ICT. This composite indicates non-financial and financial performance.

Good reliability was presented on all multi-item scales through pretests. The analysis of data was conducted using the SPSS (26) (descriptive statistics, reliability, correlations) and AMOS

(26) (CFA, SEM). Based on the common practice of SEM, we have initially carried out a confirmatory factor analysis to test the measurement model. Fit was measured using goodness- of-fit indices (e.g. CFI > .90, RMSEA <.08). Construct validity was ensured by computing composite reliabilities and Average Variance Extracted. The second step was the estimation of the structural model (Figure 1). Hypotheses were tested using path coefficients (standardized β) and R^2 . Assessment of the significance of paths was done ($p < .05$).

4. Results

Sample Characteristics: The profile of the respondents is summarized in table 1. There were 300 employees with 60 percent males and 40 percent females with 70 percent having a bachelors degree. The mean period of work in the organization was 5.8 years ($SD = 3.2$), and half worked in the government and the other half worked in the private.

Scale Reliability and Descriptives: The alpha value of the Cronbach was significantly higher than .80 (PU =.88, PEOU =.85, Attitude =.82, Commitment =.90, Performance =.89), which was good internal consistency. The mean score of the items tended to be high (means 4.5 to 5.2 on the 7-point Likert scale) meaning that the employees had an inclination to have a more positive attitude towards the ICT. There were correlations (unreported) to show that all constructs had positive interrelations ($p < .01$).

Measurement Model (CFA). Five-factor CFA (PU, PEOU, Attitude, Commitment, Performance) were also fitting well: $\chi^2(340)=630$, $\chi^2/df=1.85$; CFI=.947; TLI=.939; RMSEA=.052; SRMR=.045. The loading of all factors was significant ($p < .001$) and greater than 0.60 which implies convergent validity. All composite reliabilities were above .80. AVE values were >.50. The concept of discriminant validity was supported because all AVEs were bigger than squared correlations of the constructs. In this way the measurement model was good.

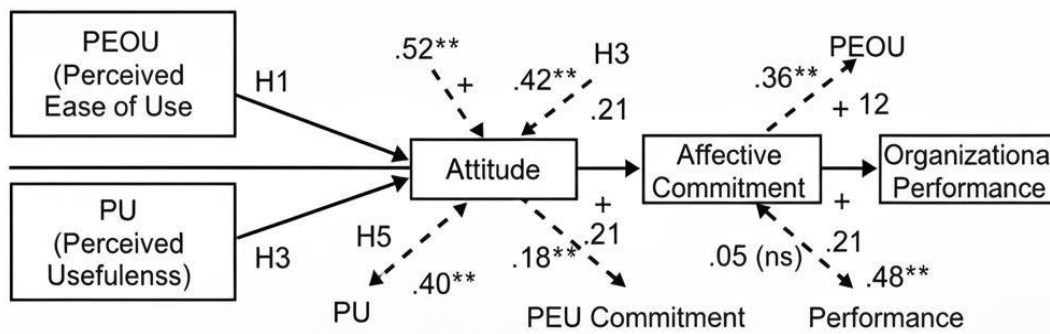


Figure 2: SEM path diagram with standardized coefficients

Hypothesis testing and Structural Model. Table 2 and Figure 2 provide the standardized path coefficients. The model fit acceptable fit ($\chi^2/df=1.92$, CFI=.943, RMSEA=.055).. Significant results: H1 and H2 (PU, PEOU = Attitude): PU ($\beta = .52$, $p<.001$) and PEOU ($\beta = .42$, $p<.001$) had significant positive consequences on Attitude. The effect of PU was significantly greater.

This justifies H1 and H2, which go in line with TAM predictions. H3 (Attitude → Commitment): Attitude to ICT had a positive impact on commitment ($\beta = .36$, $p<.001$), and, therefore, H3 was correct. H4 (Attitude → Performance): The positive effect of attitude on performance was also smaller yet significant ($\beta = .21$, $p=.012$), which supports H4 in part. H5 & H6 (PU, PEOU to Commitment): The effect of perceived usefulness on commitment was moderate ($\beta = .18$, $p=.007$) which partially proved H5. The direct impact of PEOU on commitment was insignificant and not strong ($\beta = .05$, $p=.342$), thus H6 was not born out. H7 (Commitment → Performance): H7 was supported, and the number of commitment predicting performance was high ($\beta = .48$, $p<.001$). Other directions (PU, PEOU → Performance): PU was a direct influential factor on performance ($\beta = .40$, $p<.001$), which is similar to studies indicating that PU enhances productivity. PEOU had a lesser direct impact on performance ($\beta = .12$, $p=.043$) but positive.

These findings imply that majority of the postulated effects were verified. The model had a combined variance of 57, 49 and 61 percent in employee Attitude, Commitment and Performance respectively. The summary of hypothesis tests is presented in Table 2. The powerful PU→Performance path (H8) is an example as the previous studies suggest that the usefulness is the driver of the effectiveness. PEOU had a big impact on performance through the attitude.

Table 1: Demographic Profile of Respondents (N = 300)

Variable	Category	Frequency	(%)
Gender	Male	180	60%
	Female	120	40%
Education	High school	60	20%
	Bachelor's degree	180	60%
	Postgraduate degree	60	20%
Organizational Tenure	< 3 years	90	30%
	4–6 years	150	50%
	> 6 years	60	20%
Organization Type	Public sector	165	55%
	Private sector	135	45%

Table 2: Standardized Path Coefficients and Hypothesis Test Results (SEM)

<i>Hypothesis</i>	<i>Path</i>	β	SE	<i>p</i>	<i>Supported</i>
H1	PEOU----- >Attitude	.42	.05	< .001	Yes
H2	PU----- >Attitude	.52	.04	< .001	Yes
H3	Attitude ----->Commitment	.36	.06	< .001	Yes
H4	Attitude ----->Performance	.21	.07	.012	Yes
H5	PU----- >Commitment	.18	.06	.007	Yes
H6	PEOU----- >Commitment	.05	.05	.342	No
H7	Commitment----->Performance	.48	.08	< .001	Yes
H8a	PU----- >Performance	.40	.06	< .001	(Yes)
H8b	PEOU----- >Performance	.12	.05	.043	(Yes)

The structural model exhibited an acceptable fit to the data: $\chi^2 = 1.92$, CFI = .943, RMSEA = df .055.

Note: β = standardized coefficient; SE = standard error. Boldface indicates hypothesized paths.

5. Discussion

The findings are good evidences of the extended TAM in this industry. In line with TAM theory, both the perception of usefulness and the perception of ease of use were both important antecedents of the attitude of employees towards ICT (H1-H2). Notably, the size of the effect of perceived usefulness was larger than that of ease of use and is consistent with previous research that indicated that usefulness is the key factor behind acceptance (Holden and Karsh, 2010). It would entail in practice that the inclination of employees to believe that ICT simplifies and improves their work is more significant to developing positive attitudes than simplicity.

Attitude in its turn did not show upstream effects: a positive attitude towards the ICT of the firm had a great impact on affective commitment (H3) and (to a smaller extent) self-rated organizational performance (H4). This is an indication that when the employees are fond of the technology offered by their organization, they have a greater emotional attachment and become more positive about their organization. These results are reminiscent of those by Parvari et al. (2015), who hypothetically related positive technology attitude with increased commitment. This is where we give evidence of that link empirically. Surprisingly, perceived usefulness too exerted a direct positive influence on commitment, but in a lesser way (H5), which means that, regardless of the attitude, the belief that ICT would improve oneself and his/her work led to commitment.

The model demonstrated that the level of performance is highly motivated by the level of employee commitment (H7). Dedicated employees probably have more interest in their line of duty and pursue the organizational objectives, increasing productivity. This is in line with the general human-resource literature, which has attributed commitment to improved results. Similarly to other ICT researches, we found that performance was significantly affected by perceived usefulness with a direct influence ($\beta=0.40$, $p=.001$). This suggests that where the employees appreciate ICT to be actually useful, the organization is able to experience performance benefits that are felt (e.g. efficiency or output). Performance was only significantly influenced by ease of use directly. This trend is similar to the results of the EAI Journal that reported that the influence of PU on performance was significantly higher compared to PEOU. According to our findings, better performance is produced when technology functionality (usefulness) is enhanced instead of emphasizing on usability, although the latter is also important in the

development of positive attitudes.

On the whole, every main hypothesis was proven to be positive except the PEOU→Commitment (H6). The nullification of H6 is an indication that ease of use has an indirect (directed by attitude) and not a direct impact on commitment. A friendly interface is not a sufficient tool to increase loyalty in real life unless it is useful as well. We observe that the model described a significant part of the variation in the most significant results (55% - 61%), which shows a strong predictive model.

6. Implications

Theoretically, this research serves as an extension of TAM in connection to organizational commitment and performance. It shows that TAM does not only build the predict usage intention (as in previous studies), but also affects the overall organizational attitudes and performance. In practice, managers are advised to appreciate the fact that it is important to invest in the utility of ICT. Listening ICT should be taught during training programs; and how ICT enhances job performance should be part of the design of the system. At the same time, a focus on the improvement of the user-friendliness will reinforce the positive attitudes, which subsequently promote the commitment. These observations can inform the implementation of both state-owned and privately owned firms in the Chhattisgarh manufacturing environment where technology is increasingly being applied.

7. Limitations and Future Research:

It is a cross-sectional study that uses self-report measures, which can cause common-method bias. The fact of causality cannot be proved. To confirm these results, future research is supposed to be based on longitudinal designs and incorporate objective measures of performance (e.g. output data). The study had a small number of four firms in a single region; a replication of the study across states, industries, or bigger samples would be an insight into generalizability. Furthermore, it would be interesting to work on moderating variables in the future (e.g. the age of an employee, the IT skill) or draw a comparison between the effects of the public and private sectors directly. Lastly, the model could be developed by including other TAM extensions (e.g. incorporating subjective norms or facilitating conditions).

8. Conclusion

This study illustrates that the perceptions of the employees towards ICT utility and usability are relevant in the establishment of positive attitudes towards technology, hence to the manufacturing companies, leading to enhanced organizational commitment and performance. Specifically, it turned out that perceived usefulness became the leading factor: once workers assume that ICT enhances their performance, they do not only accept the technology but also become more productive in the organization. The contribution made by the perceived ease of use is that of improving attitudes. Such results support the importance of using the Technology Acceptance Model (TAM) in understanding the reasons behind the behavior of employees beyond just using it. Increasing the functionality and usability of ICT, therefore, can be a strategic tool that may be used by managers who intend to increase employee loyalty and organizational success. Overall, the application of practical and convenient technology can result in the positive orientation of attitudes, increased commitment, and, finally, enhanced performance of the organization in the manufacturing industry in Chhattisgarh.

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50. IMPACT OF GEOPOLITICAL RISK ON GOLD PRICES: A COMPARATIVE STUDY OF INDIA, THE UNITED STATES, AND SOUTH AFRICA

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ABSTRACT

Escalating geopolitical tensions and macroeconomic instability have increased global uncertainty, reinforcing the role of gold as a safe-haven asset across both developed and emerging economies. This study aims to examine the impact of geopolitical risk on gold prices through a comparative analysis of India, the United States, and South Africa. Using monthly panel data, the study employs panel econometric techniques, including descriptive statistics, panel unit root tests, and fixed-effects and random-effects regression models, with model selection based on the F-test, Breusch–Pagan LM test, and Hausman specification test, while incorporating stock market indices, Brent crude oil prices, and consumer price inflation as control variables. The empirical findings reveal that geopolitical risk has a statistically significant effect on gold prices across the selected countries, confirming gold's role as a hedge during periods of heightened uncertainty. Stock market indices exhibit an inverse relationship with gold prices, indicating portfolio substitution effects, while Brent crude oil prices and inflation positively influence gold prices, reflecting global economic conditions and inflationary pressures. The magnitude of these effects varies across countries, highlighting differences in market structure, investor behavior, and economic exposure to geopolitical shocks. The study concludes that gold remains an effective risk-management instrument, offering valuable insights for investors, policymakers, and portfolio managers in formulating investment and hedging strategies under geopolitical and macroeconomic uncertainty.

Keywords: *Geopolitical Risk; Stock Market Index; Brent Crude Oil; Consumer Price Index; Panel Data Analysis; Safe-Haven Asset*

INTRODUCTION

Gold has historically played a crucial role in the global financial system as a store of value, medium of wealth preservation, and hedge against uncertainty. In periods of heightened economic, political, and financial instability, investors tend to reallocate their portfolios toward assets perceived as safe havens, with gold occupying a central position among such assets. In recent decades, the global economy has witnessed repeated episodes of geopolitical tension arising from armed conflicts, terrorism, trade wars, political instability, and international power struggles, all of which have significantly increased uncertainty in financial markets. Geopolitical risk represents a distinct form of uncertainty that differs from conventional macroeconomic shocks due to its sudden, unpredictable, and cross-border nature. Such risks influence investor sentiment, disrupt capital flows, and alter asset price dynamics. As a globally traded asset priced in international markets, gold is particularly sensitive to geopolitical developments. Understanding the relationship between geopolitical risk and gold prices has therefore become increasingly relevant for investors, policymakers, and financial institutions. This study examines the impact of geopolitical risk on gold prices through a comparative analysis of India, the United States, and South Africa. These countries represent heterogeneous economic structures: the United States as a developed financial market, India as one of the world's largest consumers of gold, and South Africa as a historically significant gold-producing economy. By employing a panel data framework, the study captures both cross-country differences and time-series dynamics, offering a comprehensive perspective on gold price behavior under geopolitical uncertainty.

PROBLEM STATEMENT

Despite the extensive literature on gold price determinants, empirical findings regarding the role of geopolitical risk remain fragmented and inconclusive. Many existing studies focus on traditional macroeconomic variables such as inflation, interest rates, and exchange rates, while treating geopolitical risk either as a secondary factor or excluding it altogether. Moreover, a large portion of the literature relies on single-country or time-series analyses, limiting the generalizability of results across different economic contexts. The absence of a unified panel-based approach that simultaneously incorporates geopolitical risk and key macroeconomic controls across developed and emerging economies creates ambiguity regarding the true magnitude and direction of the

geopolitical risk–gold price relationship. This study addresses this problem by adopting a comparative panel framework.

NEED OF THE STUDY

In an era characterized by persistent geopolitical tensions and macroeconomic volatility, identifying assets that provide effective protection against uncertainty is of critical importance. Gold continues to attract attention as a potential hedge and safe-haven asset; however, its effectiveness may vary across countries depending on market structure, investor behavior, and economic conditions. This study is needed to provide empirical evidence on how geopolitical risk influences gold prices across heterogeneous economies. The findings are expected to support informed decision-making by investors, policymakers, and portfolio managers, particularly in designing risk-management and diversification strategies under conditions of geopolitical and macroeconomic uncertainty.

RESEARCH OBJECTIVES

1. To identify the factors influencing gold price movements in India, the United States, and South Africa.
2. To assess the relationship between geopolitical risk, selected macroeconomic variables, and gold prices across the selected countries.
3. To investigate the short-run impact of geopolitical risk and macroeconomic variables on gold prices.
4. To examine whether geopolitical risk and macroeconomic variables exert any long-run influence on gold prices across the selected economies.
5. To conduct a comparative analysis of gold price dynamics across India, the United States, and South Africa under conditions of geopolitical and macroeconomic uncertainty.

RESEARCH QUESTIONS

1. What are the major geopolitical and macroeconomic factors influencing gold price movements in India, the United States, and South Africa?

2. Is there a significant short-run relationship between gold prices and geopolitical risk after controlling for key macroeconomic variables?
3. Is there a significant short-run relationship between gold prices and selected macroeconomic variables such as inflation, stock market performance, and crude oil prices?
4. To what extent do geopolitical risk and macroeconomic variables collectively explain gold price dynamics across the selected economies?

THEORETICAL BACKDROP

This study is grounded in three major theoretical frameworks. Safe-haven theory suggests that investors shift wealth into assets such as gold during periods of heightened uncertainty to protect against losses in risky assets. Portfolio substitution theory explains the inverse relationship between gold prices and stock market performance, as investors rebalance portfolios away from equities during crises. Inflation-hedging theory posits that gold preserves purchasing power during periods of rising prices, establishing a positive relationship between inflation and gold prices. Together, these theories provide a comprehensive foundation for examining gold price dynamics under geopolitical uncertainty.

LITERATURE REVIEW

Recent empirical literature on gold price dynamics has increasingly emphasized the role of macroeconomic uncertainty and geopolitical risk, particularly in the post-2015 period marked by intensified geopolitical tensions, financial volatility, and global economic disruptions. Studies such as Beckmann et al. (2015), Bredin et al. (2015), and Mensi et al. (2015) document that gold's hedging and safe-haven properties are time-varying and become more pronounced during periods of heightened uncertainty. Vigne et al. (2017) further argue that gold's primary contribution to portfolios lies in diversification rather than unconditional safe-haven behavior, especially in the short run. Empirical evidence also suggests that gold price responses differ across economic regimes and market conditions (Reboredo, 2013; Kang et al., 2016; Baur & Smales, 2020). A substantial strand of recent literature examines the interaction between gold prices and stock market performance. Mensi et al. (2015), Kang et al. (2016), and Balcilar et al. (2016) show that gold often exhibits weak or negative co-movement with equities during periods of market

stress, supporting the portfolio substitution hypothesis. However, this relationship is not uniform across countries or time periods, as highlighted by Beckmann et al. (2015) and Bredin et al. (2015). More recent evidence suggests that stock market volatility, rather than returns alone, plays a critical role in shaping gold price dynamics (Baur & Smales, 2020; Shahzad et al., 2019). Macroeconomic factors such as inflation and oil prices continue to feature prominently in post-2015 gold price studies. Balcilar et al. (2016), Mensi et al. (2015), and Zhang et al. (2019) report that oil price shocks and inflationary pressures significantly influence gold prices, particularly during periods of global economic stress. Jena and Goyari (2018), Sahoo and Sethi (2018), and Shahbaz et al. (2019) provide evidence from emerging markets that inflation remains a key driver of gold demand, reinforcing gold's role as a hedge against rising prices. These findings are further supported by Baur and Smales (2020) and Umar et al. (2021), who emphasize the importance of macroeconomic instability in gold price formation. More recent studies have increasingly focused on geopolitical risk as a distinct source of uncertainty affecting asset prices. The development of the Geopolitical Risk Index by Caldara and Iacoviello (2022) has enabled systematic empirical analysis of geopolitical shocks. Empirical evidence suggests that geopolitical risk significantly influences financial markets and investor behavior (Balcilar et al., 2018; Aysan et al., 2019; Demir et al., 2020). Fang et al. (2018), Baur and Smales (2020), and Shahzad et al. (2021) find that geopolitical risk increases gold market volatility and strengthens safe-haven demand during high-risk periods. However, Aysan and Demir (2020), Umar et al. (2021), and Das et al. (2022) show that the impact of geopolitical risk on gold prices is often asymmetric and regime-dependent, with weaker short-run effects once macroeconomic variables are controlled for. Despite these advancements, the recent literature remains limited in terms of cross-country panel analyses covering both developed and emerging economies in the post-2015 period. Most studies rely on single-country frameworks or focus predominantly on developed markets, thereby limiting comparative insights (Jena & Goyari, 2018; Shahzad et al., 2019; Umar et al., 2021). Moreover, few studies jointly examine geopolitical risk alongside inflation, stock market performance, and oil prices within a unified panel framework. This gap motivates the present study, which employs panel econometric techniques to analyze the short-run impact of geopolitical risk and macroeconomic factors on gold prices across India, the United States, and South Africa during the period 2015–2025.

RESEARCH GAP

The literature reveals several gaps. First, empirical studies using comparative panel data to examine the geopolitical risk–gold price nexus remain limited. Second, many studies analyze geopolitical risk or macroeconomic variables in isolation, leading to potential omitted variable bias. Third, cross-country differences in gold price responses to geopolitical risk are often overlooked. This study addresses these gaps by employing a panel econometric framework that jointly analyzes geopolitical risk and macroeconomic determinants across heterogeneous economies.

RESEARCH METHODOLOGY

RESEARCH APPROACH

The study adopts a quantitative and empirical research approach. A panel data framework is employed to capture both cross-sectional heterogeneity and temporal dynamics across countries.

DATA COLLECTION METHOD

The study relies on secondary data obtained from internationally recognized databases. Gold price data, geopolitical risk indices, stock market indices, oil prices, and inflation data are collected from reliable global sources to ensure consistency and accuracy.

TIME FRAME AND DATA FREQUENCY

Monthly data are used for the selected countries over the study period. Monthly frequency is chosen to capture short-term fluctuations and dynamic responses to geopolitical events.

VARIABLE IDENTIFICATION

- **Dependent Variable:** Gold Price
- **Independent Variable:** Geopolitical Risk Index (GPR), Stock Market Index, Brent Crude Oil Price, Consumer Price Index (CPI)

OPERATIONAL DEFINITION

Gold prices represent international benchmark gold prices. Geopolitical risk is measured using the Geopolitical Risk Index. Stock market indices capture equity market

performance. Brent crude oil prices proxy global economic activity, while CPI measures inflationary pressures.

ANALYTICAL TOOLS

The study employs descriptive statistics, panel unit root tests, correlation analysis, and panel regression techniques, including pooled OLS and fixed-effects models. Model selection is guided by the cross-section F-test. Due to the limited number of cross-sections, random effects estimation and the Hausman specification test are not feasible. The final model is estimated using pooled OLS with heteroskedasticity-robust (White) standard errors.

FINDINGS AND ANALYSIS

DESCRIPTIVE STATISTICS:

It reports the descriptive statistics of the first-differenced series of gold prices (DGOLD), consumer price index (DCPI), Brent crude oil prices (DBRENT), geopolitical risk index (DGPR), and stock market index (DSTOCK). The mean values of all variables are close to zero, indicating that the differenced series fluctuate around a stable mean, which is consistent with stationary behavior. The standard deviations reveal substantial volatility, particularly in gold prices and stock market indices, reflecting sharp market fluctuations during periods of economic and geopolitical uncertainty. The skewness statistics indicate pronounced asymmetry in most variables, with DGOLD and DGPR exhibiting negative skewness, while DCPI, DBRENT, and DSTOCK show positive skewness, suggesting the presence of large asymmetric shocks. The kurtosis values are significantly higher than three for all variables, indicating leptokurtic distributions with fat tails and frequent extreme observations. The Jarque–Bera test strongly rejects the null hypothesis of normality for all series at the 1% significance level, confirming that the data are non-normally distributed. Overall, these results highlight the volatile and non-normal nature of the variables, justifying the use of robust panel econometric techniques in the subsequent analysis.

Table 1: Descriptive statistics

Statistic	DGOLD	DCPI	DBRENT	DGPR	DSTOCK
Mean	-589.392	-0.169	-0.063	-0.001	59.676
Median	-27.500	-0.520	-0.790	0.000	-56.600
Maximum	47,980.000	221.923	23.320	2.975	75,807.010
Minimum	-73,570.000	-77.063	-11.670	-3.121	-8,533.760
Std. Deviation	5,291.036	12.397	6.101	0.426	4,242.517
Skewness	-5.313	15.287	0.865	-0.884	15.740
Kurtosis	120.844	290.233	4.761	21.914	282.403
Jarque–Bera	211,167.2	125,851.9	91.916	5,442.6	119,243.9
Probability	0.000	0.000	0.000	0.000	0.000
Observations	362	362	362	362	362

Source: Self-constructed

PANEL UNIT ROOT TEST (1ST DIFFERENCE):

The panel unit root test results indicate that all variables-DGOLD, DBRENT, DCPI, DGPR, and DSTOCK-are non-stationary at levels but become stationary after first differencing. While the Levin-Lin-Chu test fails to reject the null hypothesis of a unit root at levels for all variables, the IPS W-statistic, ADF-Fisher, and PP-Fisher tests consistently reject the null hypothesis at the 1% significance level after differencing. This confirms that all series are integrated of order one, I(1), and validates the use of first-differenced variables in the panel regression framework. The consistency across multiple panel unit root tests enhances the robustness of the stationarity results and ensures that subsequent econometric estimations are free from spurious regression problems.

Table 2: Panel Unit Root Test

Variable	Levin–Lin–Chu (p-value)	IPS W-stat (p-value)	ADF–Fisher (p-value)	PP–Fisher (p-value)	Order of Integration
DGOLD	48.9640 (1.0000)	-12.8016 (0.0000)	136.679 (0.0000)	55.2620 (0.0000)	I(1)
DBRENT	13.7421 (1.0000)	-15.0576 (0.0000)	166.487 (0.0000)	55.2620 (0.0000)	I(1)
DCPI	271.892 (1.0000)	-13.4619 (0.0000)	145.704 (0.0000)	55.2620 (0.0000)	I(1)
DGPR	5.6327 (1.0000)	-16.1465 (0.0000)	177.145 (0.0000)	55.2620 (0.0000)	I(1)
DSTOCK	33.2633 (1.0000)	-13.4413 (0.0000)	145.516 (0.0000)	55.2620 (0.0000)	I(1)

Source: Self-constructed

COVARIANCE, CORRELATION, PROBABILITY MATRIX

The correlation matrix with associated p-values indicates that gold prices exhibit a positive and statistically significant correlation with inflation (DCPI), Brent crude oil prices (DBRENT), and stock market indices (DSTOCK), suggesting that gold prices tend to move in tandem with broader macroeconomic and financial market conditions. The strongest correlation is observed between gold prices and inflation, reinforcing the role of gold as a hedge against rising prices. In contrast, the correlation between gold prices and geopolitical risk (DGPR) is weak and statistically insignificant, indicating that short-run movements in geopolitical risk do not have a direct linear association with gold price changes. Geopolitical risk is, however, significantly correlated with inflation, suggesting that geopolitical tensions may indirectly influence gold prices through macroeconomic channels rather than through an immediate direct effect. Overall, the correlation results provide preliminary evidence that inflation and financial market variables are more closely associated with gold price movements than geopolitical risk in the short run.

Table 3: Covariance Matrix

Variables	DGOLD	DBRENT	DCPI	DGPR	DSTOCK
DGOLD	1,735,933 1.000000 —	—	—	—	—
DBRENT	7,967.309 0.279161 (0.0000)	46.92230 1.000000 —	—	—	—
DCPI	10,402.17 0.501135 (0.0000)	18.27016 0.535365 (0.0000)	24.82022 1.000000 —	—	—
DGPR	29.40744 0.019358 (0.7143)	0.004823 0.001931 (0.9709)	0.289589 0.159425 (0.0024)	0.132938 1.000000 —	—
DSTOCK	22,76386 0.312543 (0.0000)	4,911.067 0.410125 (0.0000)	3,607.928 0.414272 (0.0000)	9.243287 0.014502 (0.7839)	305,5901 1.000000 —

Source: Self-Constructed

SHORT-RUN FIXED EFFECTS MODEL (DEPENDENT VARIABLE: DGOLD)

The fixed effects regression results indicate that stock market performance and inflation have a statistically significant impact on gold price changes, while geopolitical risk and Brent crude oil prices do not exert significant short-run effects within the fixed effects framework. The coefficient of the stock market index (DSTOCK) is positive and significant, suggesting that increases in stock market returns are associated with increases in gold price changes, reflecting contemporaneous co-movements in financial markets across countries. Consumer price inflation (DCPI) exhibits a strong positive and highly significant coefficient, indicating that inflationary pressures play an important role in driving gold prices in the short run, consistent with gold's role as a hedge against rising prices. In contrast, the coefficients of geopolitical risk (DGPR) and Brent crude oil prices (DBRENT) are statistically insignificant, implying that their short-run effects on gold price changes are weak once unobserved country-specific heterogeneity is controlled for through fixed effects. The overall model is statistically significant, as indicated by the F-

statistic, although the explanatory power is moderate, with the model accounting for approximately 27% of the variation in gold price changes.

Table 4: Short-Run Fixed Effects

Variable	Coefficient	Std. Error	t-Statistic	p-value
Constant	234.4966	189.3055	1.2387	0.2163
DGPR	-665.1783	527.7331	-1.2604	0.2083
DSTOCK	0.3080	0.1226	2.5123	0.0124
DCPI	394.0902	47.2574	8.3392	0.0000
DBRENT	-15.8169	33.8043	-0.4679	0.6401

Source: Self-constructed

Effects: Cross-section fixed effects. Model statistics: $R^2 = 0.2747$, Adjusted $R^2 = 0.2623$, F-statistic p-value = 0.0000.

OVERALL FINDINGS

The empirical analysis reveals that gold price movements across India, the United States, and South Africa are primarily influenced by macroeconomic factors in the short run. Among the explanatory variables, consumer price inflation exerts a positive and statistically significant effect on gold prices, confirming the role of gold as an effective hedge against inflation. In contrast, geopolitical risk does not exhibit a statistically significant short-run impact on gold price changes once inflation, stock market performance, and oil prices are accounted for. Stock market indices and Brent crude oil prices also do not show significant short-run effects on gold prices in the pooled panel framework. These findings suggest that while geopolitical risk is an important source of uncertainty, its influence on gold prices may operate through longer-term channels rather than immediate price adjustments.

LIMITATIONS OF THE STUDY

The study is subject to certain limitations that should be acknowledged. First, the analysis relies on aggregate national-level data, which may mask country-specific or regional dynamics within each economy. Second, the study focuses on short-run relationships using differenced panel data, and therefore does not capture potential long-run

equilibrium relationships between geopolitical risk and gold prices. Additionally, the presence of structural breaks arising from major global events may influence the results but are not explicitly modeled within the current framework.

POLICY IMPLICATIONS

The findings offer important implications for investors, policymakers, and portfolio managers. The significant role of inflation suggests that gold remains an effective instrument for protecting purchasing power during periods of rising prices. Although geopolitical risk does not exert a statistically significant short-run effect, gold may still serve as a strategic asset in broader risk-management and portfolio diversification strategies during periods of heightened uncertainty. Policymakers may also consider the stabilizing role of gold in financial markets, particularly in inflationary environments.

CONCLUSION

This study provides empirical evidence on the determinants of gold price movements across India, the United States, and South Africa using a panel econometric framework. The results highlight the dominant role of inflation in driving short-run gold price dynamics, while the direct impact of geopolitical risk appears to be limited in the short run once key macroeconomic factors are controlled for. By employing panel regression techniques and robust standard errors, the study contributes to the literature by offering a comparative analysis of gold price behavior across heterogeneous economies. The findings provide useful insights for investment decision-making and policy formulation under conditions of macroeconomic and geopolitical uncertainty.

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51. EXAMINING THE IMPACT OF BEHAVIORAL BIASES ON INVESTMENT DECISION-MAKING: A SYSTEMATIC REVIEW

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ABSTRACT:

The purpose of this paper is to review and summarize a literature review about the impact behavioral biases have on investment decision-making by examining several articles on the topic of behavioral finance. The research will be based on research papers published over a long period of time, starting with the landmark introductory research in 1974 and up to the latest published empirical and theoretical research as early as 2025. The identified studies are logically divided and examined with references to the presence of certain behavioral biases in order to define regular behavior patterns, their perspectives, and new trends in the behavior of investors. The paper is focused mainly on the individual investors and the contribution of psychological, cognitive, and emotional issues towards non-rational investment decision-making. According to the literature review, the study has found ten behavioral biases that are prominent and greatly affect investment behavior. They are traditional biases like overconfidence, loss aversion, anchoring, and herd behavior, and new biases that have been identified lately, which are fear of missing out (FOMO), information overload bias, and social media-induced herding. Through a combination of ancient and more recent approaches, the paper will give a comprehensive and more recent insight into the behavior of investors in the new digitally influenced financial markets. The implications of this study for the real world are applicable to individual investors, investment advisors, academicians, students, and financial institutions, as they can create awareness of the behavioral factors that guide financial decision-making. The unique value of this paper, in its turn, is its integrative nature, combining the existing foundations of the study of behavioral finance with the

latest developments, which contribute to the advancement of the research in the future and contribute to the creation of effective ways to eliminate the negative impact of behavioral biases on investment decisions.

Keywords: Behavioral finance, Behavioral biases, Investment decision-making, individual investors, Financial markets.

1. Introduction

The traditional financial theories have always been used in explaining investment decision-making based on the assumption that the investors act rationally and are fully informed and they are also expected to maximize expected utility. The original theories like the Modern Portfolio Theory and the Efficient Market Hypothesis have indicated that the market participants are objective in the way they process information and that the prices of assets are the complete information available (Markowitz, 1952; Fama, 1970). Nevertheless, it has been widely empirically established that investors often make irrational decisions such that they commit systematic errors and financial market anomalies that cannot be readily explained by classical theories. Behavioral finance is an area of study that came up to address these shortcomings through the introduction of psychology and cognition concepts in financial decision making. One of the most significant discoveries was made with the ground-breaking contribution of Kahneman and Tversky (1974), who proposed the concepts of heuristics and biases and saw that people have mental shortcuts during the decision-making process under uncertainty. Prospect theory reinforced this further, by clarifying the asymmetric assessment of gains and losses and the aversion to losses by individuals, risk aversion, risk aversion and framing effects (Kahneman and Tversky, 1979). Through these contributions, we have the foundations to understanding how the biases of behavior work systematically to guide investment decisions.

Later studies have found that there are numerous behavioral biases that influence investor behavior, especially regarding individual investors. Overconfidence, loss aversion, anchoring, mental accounting and herd behavior are some of the common biases which have been extensively reported to play a significant role in influencing investment decisions and portfolio selection and trading decisions (Barber and Odean, 2001; Odean, 1998; Barberis and Thaler, 2003). Such biases are particularly susceptible to individual investors who have little financial literacy, affect their emotions, and rely on heuristics

giving rise to excessive trading, under-diversification, and poor investment results (Statman, 2014). The global investor behavior has also been changed in the last few years due to the fast digitalization of financial markets. The rise of the trading platforms online, real-time market information, and social media have aggravated the behavioral responses, and created the new types of biases. Recent research points to such emerging behavioral biases as fear of missing out (FOMO), information overload bias, and social media-driven herding that have a significant impact when it comes to making investment decisions in digitally driven markets (Baker and Ricciardi, 2014; Bernales et al., 2023). The new biases interrelate with the old behavioral patterns, and ensuring irrational decision-making and contributing to the volatility of the market especially among the retail investors.

Although the literature on behavioral finance is extensive, the current research is disjointed over time, market, and the research method. It is evident that there is a need to merge the classical and emerging behavioral biases in a single perspective in a more extensive and updated manner. To fill this gap, the current research will perform a systematic literature review on behavioral finance literature published between 1974 and 2025, but it will mostly focus on individual investors. This paper has given a comprehensive insight into how investor behavior is changing with a list of ten key behavioral biases that affect the decision-making process. Besides bringing together the underlying theories of behavioral finance, the review also embraces new trends, thus providing meaningful contributions to investors, investment advisors, academicians, students, and financial institutions aiming at reducing the negative impact of behavioral biases in investment decision making processes.

2. Literature Review

1. Evolution of Behavioral Finance

History of behavioral finance can be traced back to the increasing realization that standard financial theories were not the best in explaining observed investor behavior and market anomalies. Classical models of finance (the Modern Portfolio Theory and the Efficient Market Hypothesis) presuppose the existence of rational investors and the perfect information (Markowitz, 1952; Fama, 1970). But the emergence of anomalies in the form of excess volatility, momentum and speculative bubbles, cast doubt on these assumptions, and led to the creation of alternative explanations. The groundbreaking

article by Kahneman and Tversky (1974) was a breakthrough in the field since it showed that people use heuristics to make choices in uncertain situations, which are susceptible to systemic error of judgment. This was further elaborated through the prospect theory they developed later, which helped in explaining how people consider gains and losses asymmetrically that leads to loss aversion and risk-seeking behavior in domains of losses (Kahneman and Tversky, 1979). These early works formed the psychological foundations of behavioral finance and offered a template on which investor irrationality can be examined. Later syntheses by Barberis and Thaler (2003), and Shiller (2003) established the behavioral finance as a valid and strong discipline with the capacity to explain market inefficiency and investor-level bias that could not be explained in classical models.

2. Traditional Behavioral Biases Affecting Investment Decisions

There is a large literature, which records the impact of the traditional behavioral biases, on making investment decision-making procedures, especially in individual investors. The most frequently studied bias is overconfidence bias, which is caused by the overestimation of knowledge and predictive skills of investors. Empirical data indicates that excessive trading by overconfident investors results in low returns to their portfolio (Odean, 1998; Barber and Odean, 2001). Loss aversion is a prospect-theory derived concept, which describes the investment behavior of investors who seek to avoid losses instead of taking on similar profits. This bias is also directly related to the disposition effect where investors will keep their losing investments too long and the winning investments too short (Shefrin and Statman, 1985). The bias of anchoring also influences investment decision making because when new information is in place investors will be greatly influenced by their initial reference points e.g. purchase prices or previous market levels (Tversky and Kahneman, 1974). Another behavioral finance literature that has highly been addressed is that of behavioral herd behavior. It is characterized by scenarios whereby investors follow the footsteps of other investors instead of relying on their information or analysis. Herding has been attributed to market bubbles, undue volatility and inefficient pricing especially in the emerging markets and among the retail investors (Bikhchandani and Sharma, 2001). Another bias that has been studied extensively is mental accounting which is the tendency of investors to separate financial decisions into

two or more mental accounts which in most cases leads to the failure to make optimal portfolio diversifications (Thaler, 1999).

3. Behavioral Biases and Individual Investors

It is always observed that individual investors are highly vulnerable to behavioral biases as compared to institutional investors because of low financial literacy, emotional engagement and heuristics. Statman (2014) claims that psychological comfort is those factors that are valued by normal investors instead of optimal financial results, so they make biased decisions. Behavioural factors have been found to cause under-diversification of portfolios, excess trading, and poor market timing by individual investors (Barber & Odean, 2001; Kumar and Goyal, 2015). The effect of behavioral biases is also moderated by demographical factors including age, gender, income, and education. As an example, younger and less experienced investors are more likely to exhibit more overconfidence and herd behavior, whereas older investors are more likely to be loss averse (Kumar and Goyal, 2015). These results allow highlighting the necessity to study the behavioral biases on the background of individual investors, which is the focus of the current study.

4. Emerging Behavioral Biases in Digital Financial Markets

The latest development in technology and digitalization of financial markets have brought new levels to the behavior of investors. The spread of online trading platforms, real-time access to information, and social media has further exacerbated the behavioral reaction and gave way to development of new biases. Fear of missing out (FOMO) is one of those biases and it leads investors to base their impulsive investment decisions on perceived missed opportunities instead of using fundamental analysis. Empirical research associates FOMO with the desire to engage in speculative trading, specifically in cryptocurrencies, IPOs, and meme stocks (Nguyen et al., 2025). The bias of information overload has come into the limelight with several investors being bombarded with too much financial information by various providers. The literature indicates that information overload negatively affects the quality of the decision, the use of heuristics, and irrational trading (Bernales et al., 2023). In the same manner, social media-driven herding has become a definite behavioral factor, as users invest based on the trend and discussion popularized on the internet, which adds to the conventional herd behavior and market volatility (Baker and Ricciardi, 2014). These new biases combine with conventional

behavioral tendencies, which enhance irrational investing behavior of digitally driven markets. Their growing topicality is a reason to suggest them as unique biases in the modern behavioral finance study.

5. Need for a Comprehensive Systematic Review

Although the biases related to behavior have been well researched, the available literature is still diffuse, time-wise, in terms of markets and methodology. Most of the studies concentrate on single biases or the situations that exist in the market, which makes it impossible to reach general conclusions. Additionally, the previous reviews focused more on the old-fashioned biases, whereas the latest research indicates the increasing significance of the biases of the digital era. It can be seen that there is a gap in research concerning the development of an updated systematic review that would incorporate both old and new behavioral biases in a unified analytical framework. To fill this gap, the current research is a systematic review of behavioral finance literature published in 1974-2025, which focuses on the behavior of individual investors and generalizes the evidence on ten major behavioral biases. Through this, the study can add a holistic picture of investor behavior and offer a base on which the further empirical research and policymaking can be developed.

Summary of Behavioral Biases Affecting Investment Decision-Making

No.	Behavioral Bias	Description	Impact on Investment Decisions	Key Studies (APA – Scopus Indexed)
1	Overconfidence Bias	Tendency of investors to overestimate their knowledge, skills, and ability to predict market movements	Excessive trading, under-diversification, lower portfolio returns	Odean (1998); Barber & Odean (2001)
2	Loss Aversion	Investors experience losses more intensely than gains of equal magnitude	Holding losing stocks too long, avoiding risky but profitable investments	Kahneman & Tversky (1979); Shefrin & Statman (1985)
3	Anchoring Bias	Reliance on initial information or reference points (e.g., purchase price)	Slow reaction to new information, biased valuation	Tversky & Kahneman (1974); Shiller (2003)

4	Herd Behavior	Investors imitate others' actions rather than relying on independent analysis	Market bubbles, excessive volatility, speculative trading	Bikhchandani & Sharma (2001); Barberis et al. (2009)
5	Mental Accounting	Segregating money into separate mental accounts	Poor portfolio diversification, inefficient asset allocation	Thaler (1999); Statman (2014)
6	Disposition Effect	Tendency to sell winning investments early and hold losing investments	Reduced returns, tax inefficiency	Shefrin & Statman (1985); Odean (1998)
7	Representativeness Bias	Judging future performance based on past trends or stereotypes	Overreaction to recent performance, mispricing	Barberis, Shleifer & Vishny (1998)
8	Fear of Missing Out (FOMO)	Anxiety about missing profitable investment opportunities	Impulsive buying, speculative behavior, bubble participation	Kaddouhah (2024); Nguyen et al. (2025)
9	Information Overload Bias	Difficulty in processing excessive financial information	Decision fatigue, reliance on heuristics, irrational trading	Bernales et al. (2023); Eppler & Mengis (2004)
10	Social Media–Induced Herding	Investment decisions influenced by social media trends and online communities	Short-term trading, volatility, misinformation-driven decisions	Baker & Ricciardi (2014); Warkulat & Pelster (2024)

6. RESEARCH GAP

The review of the behavioral finance literature that was published during 1974-2025 indicates that, despite the considerable advancements in the field, a number of research gaps are still significant. To begin with, much of available literature has been undertaken on established financial markets, especially the United States and European economies, and relatively little systematic evidence on emergent and developing markets. This introduces limitations to the application of behavioral finance to other economic and cultural settings. Second, most of the literature that exists today concentrates on a few examples of classical behavioral biases, including overconfidence, aversion to losses, and herd behavior. Though there has been a recent trend to focus on emerging biases that are linked to digitalization, including fear of missing out (FOMO), information overload, and herding that is brought about by social media, these biases are typically addressed separately and not as part of a single set of classical behavioral biases, through the use of

a single analytical framework. Third, previous systematic review studies in behavioral finance have focused on shorter time horizons or limited sample sizes of groups of investors. Most of the reviews focus on theoretical backgrounds or certain empirical contexts, which makes them partial. It is still apparent that there are no unanimous reviews that bring together behavioral finance studies over several decades and the dynamic behavior of investors in response to technological and informational shifts in the financial market. Lastly, although individual investors are often discussed as the group that is more prone to behavioral biases, there is a lack of research that brings together the evidence on the joint impact of both traditional and emerging biases on the decision-making of the investors. These gaps will be filled in the study at hand, which will offer a systematic and integrative review of the literature on behavioral finance over the last five decades and will therefore provide a systematic and comprehensive perspective of the nature of changes in behavioral biases toward individual investors.

7. METHODOLOGY

The current research will use a systematic literature review approach, which complies with the previous review-based research in behavioral finance and complies with the PRISMA 2020 guidelines. The goal of this method is to have transparency, replicability, and methodological rigor in the synthesis of existing research.

7.1 Data Sources and Search Strategy

The peer-reviewed articles of research were located in the leading academic databases such as Scopus, Web of Science, and Google Scholar. The keywords were necessary to cover the whole range of literature, and they included behavioral finance, behavioral biases, investment decision-making, individual investors, FOMO, information overload, and herd behavior, applied in different combinations.

7.2 Inclusion and Exclusion Criteria

Studies were included based on the following criteria:

- Published between 1974 and 2025
- Focused on behavioral biases in investment decisions.
- Examined individual investors
- Published in peer-reviewed journals

Studies were excluded if they:

- Had no relation to investment decisions.
- Narrow-minded to the institutional investors.
- Were non-English publications.
- Poor methodological clarity, empirical/theoretical irrelevance.

7.3 Study Selection and Synthesis

After removing duplicates and screening titles and abstracts, eligible studies were subjected to full-text review. The last group of studies was divided according to the type of study that was done on a particular behavioral bias. All the traditional and emerging biases were conglomerated to create the most prevalent patterns, theoretical developments and research trends. This systematic methodology guarantees consistency with the previous systematic reviews and a wider range of analysis to the digital-age biases.

8. FINDINGS AND DISCUSSION

The systematic review shows that there are large scale and consistent proofs of the existence of behavioral bias in investment decision-making. Past biases including overconfidence, loss aversion, anchoring, representativeness, mental accounting, disposition effect and herd behavior still feature prominently in the direction of influencing investor behavior. These biases tend to result in overtrading, inefficient diversification, slow response to new information and inefficient portfolio performance. Notably, the recent literature emphasizes the increased topicality of newly emerged behavioral biases caused by technological progress and virtual spaces of information. Fear of missing out (FOMO) has become an influential emotional bias in the speculative investment behaviour, especially in a volatile asset class. Information overload bias is the cognitive limitation of investors in the face of too much financial information, which makes them depend on his or her heuristic-based reasoning instead of making rational evaluations. The herding caused by social media enhances the conventional herd behavior by increasing the speed of information diffusion and strengthening the opinion

formation. This is due to the interaction between the old and new bias, which implies that the contemporary investment behavior cannot be completely understood without adopting the dynamic digital context. The results support the view that behavioral finance is a more realistic approach to explain the decision-making of investors in modern financial markets compared to the traditional finance approach.

9. PRACTICAL IMPLICATIONS

This systematic review can have a number of practical consequences. To the individual investors, behavioral bias awareness can enhance self-regulation and result in more informed and disciplined investment decisions. Behavioral information can be applied to advisory through investment advisors and financial planners to ensure that clients become aware of bias-related mistakes and control them. This review can be used by academicians and students as a reference packaged in one to grasp how behavioral finance studies have changed over the years. Moreover, investor education and decision-support model programs designed by financial institutions and policy-makers can deal with both conventional and novel behavioral biases.

10. Limitations of the Study

Even though this research provides a complete systematic review of behavioral biases in investment decision-making, there are some limitations that need to be considered. The review is based solely on the already published research and thus its information is dependent on the quality and breadth of already existing literature. Despite the long time period (1974-2025) of the analysis, the studies are not uniformly distributed over time, and the biases of the digital era are also explored within the last few years. Furthermore, the bulk of the evidence reviewed is developed market and that might limit the externalizability of the results. Lastly, the research considers the individual investors, and the findings might not be related directly to other forms of investors.

11. SCOPE FOR FUTURE RESEARCH

Future studies can build on this review with empirical studies in emerging and developing markets, where the evidence of behavioral finance is not as strong. More research might also be carried out regarding the interaction between demographic aspects

and new behavioral biases. Also, longitudinal research of behavioral changes through various market cycles and technological cycles would provide a more profound insight into the behavior of investors in unstable financial conditions.

12. CONCLUSION

The paper is a systematic review of the literature in behavioral finance published in 1974 through 2025 to discuss how behavioral bias influences investment decision making. As the review confirms, psychological, cognitive, and emotional aspects play a significant role in investor behavior, and systematic deviation of the assumptions of rational decision-making is observed. The synthesis of evidence about ten behavioral biases including both conventional and innovative ones allows the study to give a complete picture of how the behavior of investors has developed throughout the course of time. The fact that this review is integrative makes it stand out among previous works in that it has been able to bridge the gap between classical behavioral finance theories and the modern research that covers biases of the digital era. In the whole, the results support the relevance of behavioral finance as an essential model in the elucidation of investment actions and the necessity of further study to come up with measures that will minimize the negative impact of behavioral biases on financial decision-making.

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52. FUNCTIONAL AREA: ENTREPRENEURSHIP AND INNOVATION
INSTITUTIONAL SUPPORT AND STARTUP-
ENTREPRENEURSHIP AWARENESS AMONG YOUTH

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ABSTRACT:

This paper examines the youth awareness of startup support schemes and the role of educational institutions in promoting entrepreneurship in Thrissur district., Kerala. Using primary data collected from 120 youth through a structured questionnaire and analyzed using descriptive statistics, the study finds that educational institutions play a supportive role in encouraging entrepreneurial interest through entrepreneurship development cells. However, awareness of major startup support schemes remains only partial among a large section of youth, and participation in entrepreneurship development programme is limited. The study highlights the need for stronger collaboration between educational institutions and government agencies to improve entrepreneurial preparedness among youth.

Keywords- youth awareness, institutional support, startup awareness, entrepreneurship development, government schemes

I. INTRODUCTION

Entrepreneurship is widely recognized as a key driver of economic growth, innovation and employment generation, particularly in developing economies like India [1], [2]. Both central and state governments have introduced several policies and programmes aimed at fostering startup activity among youth. However, the effectiveness of these initiatives largely depends on the extent of awareness and institutional support available to potential entrepreneurs [3].

Educational institutions play a crucial role in shaping entrepreneurial orientation by providing exposure, motivation and foundational skills, institutional mechanisms such as Entrepreneurship Development Cells, incubation centres and awareness programmes are designed to nurture entrepreneurial aspirations among students [4]. Despite this, concerns remain regarding the extent to which institutional support translates into awareness of government schemes and active entrepreneurial engagement [5].

Thrissur district, known for its strong entrepreneurial tradition and educational infrastructure, provides an appropriate context for examining the institutional support and startup awareness among youth.

II OBJECTIVES

1. To assess the level of awareness of government startup support schemes among youth.
2. To examine the role of educational institutions in fostering entrepreneurial orientation
3. To analyse youth participation in entrepreneurship development and awareness programmes

III. RESEARCH METHODOLOGY

The study is empirical in nature and based on primary data collected from 120 youth in Thrissur district using a structured questionnaire. Respondents were selected through convenience sampling. The analysis focused on institutional exposure to entrepreneurship and awareness of startup related government schemes. Percentage analysis was employed as the primary analytical tool.

IV. DATA ANALYSIS AND RESULTS

TABLE 1

INSTITUTIONAL SUPPORT AND PROGRAMME PARTICIPATION AMONG YOUTH

Aspect	Indicator	Percentage(%)
Institutional Support	Institutions with Entrepreneurship Development Cells	71
Institutional encouragement to pursue own ideas	(agree/strongly agree)	79
Programme participation	Attended entrepreneurship development or awareness	

Programmes 47

Not attended such programmes 53

Source: primary data

Table 1 shows that a majority of respondents reported the presence of Entrepreneurship Development Cells in their educational institutions and agreed that their institutions encourage students to pursue their own innovative ideas. However, participation in entrepreneurship development and awareness programmes was relatively low, indicating limited engagement despite institutional support.

TABLE 2

AWARENESS OF GOVERNMENT STARTUP SUPPORT SCHEMES AMONG YOUTH

Startup support scheme Fully aware(%) Partly aware(%)

Not aware(%)

Kerala Startup Mission (KSUM) 28 61 11

ASPIRE Scheme 54 33 13

Pradhan Mantri Mudra Yojana 33 48 19

Startup India Seed Fund Scheme 34 46 20

Standup India Scheme 36 21 43

Aatma Nirbhar Bharath App Innovation Challenge 26 52 22

Source: primary data

Table 2 reveals that the awareness of government startup schemes among youth is largely at a partial level.

Although a reasonable proportion of respondents reported full awareness of schemes such as ASPIRE and Kerala Startup Mission, the majority indicated only limited awareness of key national initiatives including the Startup India Seed Fund Scheme and Pradhan Mantri Mudra Yojana. The presence of a notable share of respondents who are not aware of these schemes further highlights existing information gaps. This indicates that the outreach and communication of these schemes among youth remain inadequate, limiting effective utilisation of these schemes.

V. FINDINGS AND CONCLUSION

Most respondents reported the presence of Entrepreneurship Development Cells in their institutions and agreed that their institutions encourage students to pursue innovative ideas, indicating a supportive environment for entrepreneurship. Despite this, participation in entrepreneurship development and awareness programmes was low and awareness of government startup schemes was mostly partial. While schemes such as ASPIRE and Kerala Startup Mission were relatively well known, many were unaware of initiatives like Standup India Scheme and Startup India Seed Fund Scheme.

In conclusion, educational institutions play a positive role in motivating youth, but limited programme participation and incomplete awareness of government support restrict the translation of interest into action.

Strengthening collaboration between institutions and government agencies and implementing structured awareness programmes can improve entrepreneurial preparedness among youth.

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53 A STUDY ON DIGITAL COMPETENCY AMONG WORKING WOMEN

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ABSTRACT

Digital literacy helps to be more efficient and makes things more accessible, improving your quality of life. Being digitally competent is more important to women because to become more productive, carrier oriented, financially independent, aware of their rights, aware of the requirement to start their own business and also contribute to the country's economy as a whole. the objective of the study is to analyse the level of influence of demographic factors, Digital literacy, IT literacy, media literacy and Internet literacy on the digital competency among working women. Both secondary and primary data were collected and used for the study. The population of the study covers the 100 working women in government sector, private sector and self-employed categories in Trissur District. The Chi- Square result shows the ignificant association between age, educational qualification, occupation and Digital competency among working women. The correlation analysis shows that digital literacy, IT literacy, Media literacy, Internet literacy, and Digital competency have positively correlated each other.

Keywords: - Digital Competency, Demographic Factors, Digital Literacy, IT Literacy, Media Literacy, Internet literacy, Working women

Introduction

Digital competence involves the confident and critical use of Information Society Technology for work, leisure and communication. Digital competence is essential for learning, work and active participation in society. It is the confident and critical usage of the full range of digital technologies for information, communication and basic problem-solving in all aspects of life. It is also important to consider that “as a transversal competence, digital competence also helps us master other key competences, such as communication, language skills, or basic skills in maths and science (Riina Vuorikari , 2015). Digital competence is not just about knowing how to surf the Internet, but can be broken down into a range of smaller components. In the modern world being digital competent is more significant for the existence and survival in both personal and

professional life.

Statement of the problem

Digital literacy is the ability to use information and communication technologies like social media, internet platforms and mobile devices to find, create, evaluate and communicate pieces of information effectively. Being digitally literate has become an essential criterion in establishing your presence and making an identity in the modern world. Digital literacy helps to be more efficient and makes things more accessible, improving your quality of life. Technology as a whole is an essential component in achieving gender equality. The modern world is increasingly moving online, and it's equally important for men and women to adapt to the changes and be self-reliant on technology, whether for business or social connections. Ironically, most of our women are still dependent on men for various tasks due to lack of digital literacy. Whether making an online payment or preparing a presentation, women rely on men to perform these daily activities. This often leads to low self-esteem and a lack of confidence. Being digitally competent is more important to women because to become more productive, carrier oriented, financially independent, aware of their rights, aware of the requirement to start their own business and also contribute to the country's economy as a whole. Thus the present study is focused to analyse the level of influence of demographic factors, Digital literacy, IT literacy, media literacy and Internet literacy on the digital competency among working women and thus deserve much significance in the present scenario.

Objectives of the study

- To analyse the level of influence of demographic factors, Digital literacy, IT literacy, media literacy and Internet literacy on the digital competency among working women.

Hypothesis

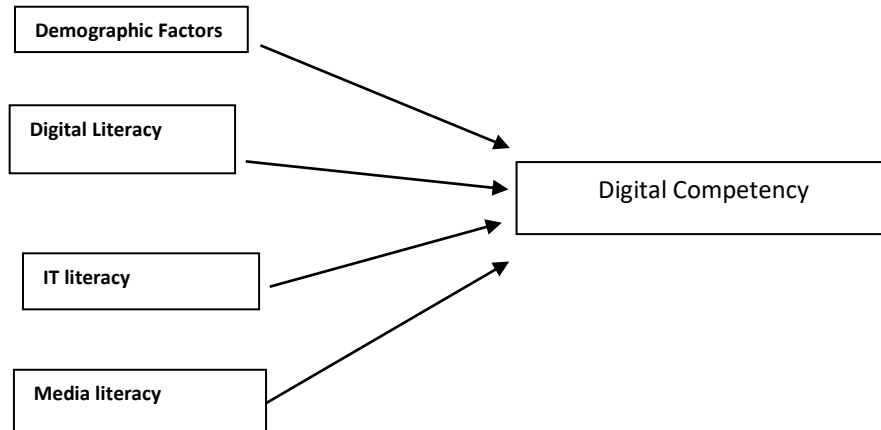
H1: There is a significant association between age and digital competency among working women

H2: There is a significant association between educational qualification and digital competency among working women

H3: There is a significant association between occupation and digital competency among working women

H4: There is a positive relationship between digital literacy, IT literacy, Media Literacy, Internet literacy and digital competency among working women.

The Conceptual Model



Methodology of the Study

The present study is both descriptive and explanatory in nature and both secondary and primary data were collected and used for the study. The population of the study covers the working women in government sector, private sector and self-employed categories in Trissur District. The primary data required for the study were collected from 100 respondents using convenient sampling method. A well-structured questionnaire was developed for the collection of primary data.

Tools used for Analysis of Data

The collected data were tabulated and analysed with the help of SPSS 21.0. The statistical techniques used for analysis include chi – square test and correlation. The reliability of the scale of measurement used was assessed using Cronbach’s Alpha coefficient, which was above the minimum acceptable level 0.7, there by confirmed the reliability of the scale of measurement used in the study.

Limitations of the Study

The digital competency is analyzed only among working women due to paucity of time. It is also noted that since the study depends mainly on the views of the individual, there are chances for their personal bias while responding to the questions; even then maximum care has been taken while analysing and interpreting the data to draw appropriate and logical conclusions.

Review of Literature

Geeta Rani and 2Anju Gandhi (2022) conducted a study On Digital Competence of Teachers: An Urgency for Future Classroom. A consequence of the COVID-19 pandemic creates uncertainties and many challenges regarding imparting education to every student. In India, all the educational regulatory bodies have forcibly endorsed online education to continue teaching and reach students. Furthermore, management of the available resources for delivering content was merely in teachers' hands that how effectively they have used. This pandemic forced us to strengthen the education sector by developing 21st-century skills in teachers and learners to quickly meet future demands and compete in the digital world. Therefore, if teachers have the knowledge, skills, and a positive attitude towards using digital technologies, they can facilitate their students and prepare them for the future world. This paper attempts to define digital competence and draw light on the need for digital competence in the future educational scenario. Also, it identifies an imbalance in the force of technology intrusion, reflects the lack of competent digital teachers and the urgency of digital immigrant teachers who will be proved helpful in preparing and facilitating new z- generation with their vast knowledge and learning attitude.

Nikola Vukčević¹ , Nikola Abramović , and Nataša Perovic (2021) Latest EU guidelines for the implementation of Digital Competence Framework and adopted Action Plan for Digital Education (2021-2027) clearly identifies two basic strategic priorities - Encouraging the development of a successful digital education ecosystem and Development of digital skills and competencies for digital transformation, clearly indicate the importance of high quality, inclusive and affordable digital education in Europe. Today, European higher education main problem is the management of the digital transition. As Montenegro is one of the candidate countries for EU, we believe that this is very important and attractive research area. The paper deals with basic and advanced digital competencies development levels of students of University "Adriatic" Bar, seen as Montenegro's and the EU's future labour market staff. The results of empirical research shows the real level of students digital competencies in relation to the EU required level. The results shows whether the teaching practice of digital competencies development is sufficiently present at the University, certain limitations, reasons, and possibilities for further improvement. Today, digitalization directly affects the modern labour market. As a result, young people in Montenegro must have highly developed digital competencies, in order to remain competitive in the EU labour market.

Yu Zhao,^a Ana María Pinto Llorente,^b and María Cruz Sánchez Gómez (2021) Digital competence in higher education research: A systematic literature review. In the information and knowledge society, where technology develops rapidly and penetrates deeply into our lives, the

discussion about digital competence has become a hot topic today. After the emergence of the Coronavirus (Covid-19) and with its huge impact on the education industry, the concern about digital competence has reached a new height. This systematic literature review uses Web of science and Scopus as databases to store and analyze the existing research on digital competence in higher education settings. The purpose of this review is to provide the scholar community with a current overview of digital competence research from 2015 to 2021 in the context of higher education regarding the definition of digital competence, dimensions used to evaluate digital competence, research purposes, methodologies, and results and limitations. Major findings include that the majority of publications cited both research and EU policy in describing the definition of digital competence. The review indicates that most university students and teachers have a basic level of digital competence. Besides, the institutions of higher education are encouraged to focus on the development students and teachers' digital competence, create relevant learning strategies and use appropriate tools to improve the quality of education.

Alberto D. Yazon, Karen Ang-Manaig, Chester Alexis C. Buama, John Frederick B. Tesoro (2019) Digital Literacy, Digital Competence and Research Productivity of Educators. This study determined the relationship between digital literacy, digital competence and research productivity of educators. This research employed the descriptive-correlational research design. The respondents of the study were the permanent faculty members of the university. The research instruments utilized were the standardized scales of Being Digital: Digital Literacy Checklist of The Open University © 2012 United Kingdom, measured the digital literacy of the respondents. And the digital competence was assessed through the Self-Assessment Tool of the European Digital Competence Framework for Educators.

Mala Mathew (2018) The Need for Digital and Media Literacy in Indian Higher Secondary and Secondary Curricula to Cater to Future Generations. The communication component of higher secondary and secondary curricula in India has become obsolete. It served Millennials the same way it served the preceding generations and continues to serve the current Generation Z. Digital and Media Literacy skills and competencies needed in the digital and post digital age are not incorporated into these curricula across India. Digital India tried to introduce technology into the education system as tools for learning; the curricula, however, remains the same, despite plans to update them by the MHRD. The paradox of education in India, where it is both the problem and the solution, needs to be fixed at the earliest; India still hasn't reformed its curricula to incorporate 21st century competencies and skills and that is precisely what is needed. The aim of this paper is to evaluate the current generational traits, higher secondary and secondary curricula and to propose a suitable panacea.

Analysis On Influence Of Demographic Factors, Digital Literacy, It Literacy, Media Literacy And Internet Literacy On Digital Competency Among Working Women

Test of Reliability

The reliability of the instrument used in the study was tested by computing Cronbach's Alpha (α) value for each of the five variables as well as for the entire set. The test result is presented in the Table 1.1.

Table 1.1 Test of reliability

Sl. No.	Variables	No of items	Cronbach's Alpha (α)
1	Demographic factors	3	0.870
2	Digital literacy	3	0.847
3	IT literacy	3	0.791
4	Media Literacy	3	0.867
5	Internet Literacy	6	0.903
6	Total	23	0.952

H1: There is a significant association between age and Digital competency among working women.

Chi square test result

	value	df	Asymp.Sig (2-sided)
Pearson Chi - Square	60.609	10	0.000

The Chi- Square result shows the association between age and Digital competency among working women. From the result it is seen that the Pearson Chi – Square value is 60.609, p value = 0.000 i.e the chi square test result is less than the alpha level of significance of 0.05. This tells that there is a statistically association between age and Digital competency among working women. Hence, the hypothesis there is a significant association between age and Digital competency among working women is accepted. H2: There is a significant association between Educational qualification and Digital competency among working women.

Chi square test result

	value	df	Asymp.Sig (2-sided)
Pearson Chi - Square	70.631	20	0.000

The Chi- Square result shows the association between age and Digital competency among working women. From the result it is seen that the Pearson Chi – Square value is 70.631, p value = 0.000 i.e the chi square test result is less than the alpha level of significance of 0.05. This tells that there is a statistically association between age and Digital competency among working women. Hence, the hypothesis there is a significant association between educational qualification and Digital competency among working women is accepted.

H3: There is a significant association between Occupation and Digital competency among working women.

Chi square test result

	value	df	Asymp.Sig (2-sided)
Pearson Chi - Square	75.504	10	0.000

The Chi- Square result shows the association between age and Digital competency among working women. From the result it is seen that the Pearson Chi – Square value is 75.504, p value = 0.000 i.e the chi square test result is less than the alpha level of significance of 0.05. This tells that there is a statistically association between age and Digital competency among working women. Hence, the hypothesis there is a significant association between occupation and Digital competency among working women is accepted.

Correlation between Digital literacy, IT literacy, Media literacy, Internet literacy and Digital Competency

Independent variables	Dependent Variable	Pearson Correlation	Sig. (2-tailed)	N
Digital Literacy	Digital Competency	.601**	.000	100
IT Literacy		.671**	.000	100
Media Literacy		.532**	.000	100
Internet Literacy		.644**	.000	100

****.** *Correlation is significant at the 0.01 level (2-tailed).*

From the above statistical results, it is inferred that Digital Literacy (.601**), IT Literacy (.671**), Media Literacy (.532**), Internet literacy (.644**) and Digital Competency are positively correlated each other. It indicates the extent to which two variables are linearly correlated. The probability value associated with the correlation is less than 0.01. It indicates that there is a positive relationship between digital literacy, IT literacy, Media Literacy, Internet literacy and digital competency among working women. Hence, the hypothesis formulated for the study, is accepted.

Findings

- The Chi- Square result shows the association between age and Digital competency among working women (p value = 0.000).
- The Chi- Square result shows the association between educational qualification and Digital competency among working women (p value = 0.000).
- The Chi- Square result shows the association between occupation and Digital competency among working women (p value = 0.000).
- The correlation analysis shows that digital literacy (.601**), IT literacy (.671**), Media literacy (.532**), Internet literacy (.644**) and Digital competency have positively correlated each other.

Conclusion

Digital technologies have huge potential to act as development enablers for women, as they bring new social, political and economic opportunities. Women face higher barriers when it comes to initial access, affordability of digital services and use of ICT. Particularly, lower levels of technical and digital literacy skills as well as lower confidence impact women's access to, and use of, ICT. In general, more women than

men report difficulties in using mobile phones or the internet. Being digitally competent is more important to women because to become more productive, career oriented, financially independent, aware of their rights, aware of the requirement to start their own business and also contribute to the country's economy as a whole. the present study is focused to analyse the level of influence of demographic factors, Digital literacy, IT literacy, media literacy and Internet literacy on the digital competency among working women. The study reveals the significant relationship between age, educational qualification, occupation and Digital competency among working women and the variables such as digital literacy, IT literacy, Media literacy, Internet literacy, and Digital competency have positively correlated each other.

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54. STRESS AND ITS SOURCES AMONG PROFESSIONAL STUDENTS OF THRISSUR DISTRICT

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ABSTRACT

Stress has become an integral part of modern student life and is increasingly recognised as a significant factor influencing academic performance, health, and overall well-being. Although numerous studies have examined stress among professional students at national and international levels, region-specific evidence from Kerala remains limited. The present study aims to assess the prevalence of stress among professional students in Thrissur District and to identify the major sources of stress across academic, socio-psychological, and physical/health domains.

The study was conducted among 156 professional students using a pre-tested structured questionnaire administered through Google Forms. Stress levels were computed using percentile scores, and associations between stress and selected demographic variables were examined using the chi-square test. Mean Percent Scores (MPS) were calculated to rank major stressor categories.

The findings reveal that 32.1% of the respondents experienced stress, with a slightly higher proportion among female students (32.7%) compared to males (30.6%). No statistically significant association was observed between stress and gender, place of residence, or course of study. Among the stressor categories, academic factors emerged as the most prominent source of stress (Overall MPS = 68.89), followed by socio-psychological factors (MPS = 56.16) and physical/health factors (MPS = 50.12). The results underline the dominance of academic pressure in stress generation among professional students. Understanding these stressors is essential for designing effective counselling interventions and stress management programmes in higher educational institutions.

Keywords: Stress, Professional students, Academic stress, Socio-psychological factors, Health factors

I. INTRODUCTION

Stress refers to any internal or external demand that challenges an individual's ability to maintain psychological and physiological equilibrium. While a moderate level of stress may act as a motivating force (eustress), prolonged or excessive stress often leads to distress, adversely affecting mental health, physical well-being, and academic performance. Professional students are particularly vulnerable to stress due to intensive curricula, frequent examinations, competitive academic environments, and high expectations regarding career outcomes (Hamza et al., 2011; Al-Dabal et al., 2010)

In recent years, stress among students has emerged as a major public health concern. Studies conducted across different countries have consistently reported high levels of stress among medical and other professional students, primarily attributed to academic workload, examination pressure, and fear of failure (Hamza et al., 2011; Amany et al., 2017) Persistent exposure to such stressors can result in anxiety, depression, reduced academic performance, and poor quality of life.

In the Indian context, student stress has gained increased attention due to its association with adverse mental health outcomes. Data from the National Crime Records Bureau highlight academic failure and examination-related issues as significant contributors to student suicides, underlining the urgent need to understand stress and its determinants among students (NCRB, 2021)

Although several international and national studies have examined stress among professional students, region-specific evidence from Kerala remains relatively limited. A recent study conducted among professional students in Kerala identified academic and psychological factors as major sources of stress, emphasising the need for localized empirical investigations (Femi Francis et al., 2023).

The present study seeks to evaluate the prevalence of stress among professional students in Thrissur District and to identify the relative contribution of academic, socio-psychological, and physical/health-related factors to stress generation.

METHODOLOGY

The study adopted an exploratory research design and was conducted during the academic year 2024–2025 among professional students enrolled in higher educational institutions in Thrissur District, Kerala. A total of 156 students participated in the study through voluntary response sampling.

Tool for Data Collection

A semi-structured, pre-tested questionnaire was developed based on relevant literature and expert consultation. The questionnaire consisted of four sections:

1. **Socio-personal profile** (age, gender, place of residence, and course of study)
2. **Academic stressors** (12 statements)
3. **Socio-psychological stressors** (8 statements)
4. **Physical and nutritional/health stressors** (4 statements)

All stressor statements were measured using a 3-point continuum scale: *Never* (1), *Sometimes* (2), and *Always* (3).

Measurement of Stress

The total stress score for each respondent was calculated by summing the scores across all statements. The stress percentile score was computed as:

$$\text{Stress Percentile Score} = (\text{Total obtained score} / \text{Maximum obtainable score}) \times 100$$

Respondents scoring above 66.66% were categorised as **stressed**, while the rest were classified as **unstressed**.

Statistical Analysis

- **Chi-square test** was used to examine the association between stress and selected demographic variables.
- **Mean Percent Score (MPS)** was used to rank academic, socio-psychological, and physical/health stressors using the formula:

$$\text{MPS} = (\text{Total obtained score} / \text{Maximum obtainable score}) \times 100$$

Ranks were assigned based on descending order of MPS values.

RESULTS AND DISCUSSION

Prevalence of Stress and Demographic Association

Out of the 156 respondents, 50 students (32.1%) were classified as stressed, while 106 students (67.9%) were unstressed. Among male students, 30.6% experienced stress, whereas 32.7% of female students were stressed. Although stress levels were marginally higher among females, the difference was not statistically significant ($\chi^2 = 0.07$, $p > 0.05$).

Similarly, no significant association was observed between stress and place of residence or course of study. Students residing in hostels constituted the majority of the sample, and stress prevalence did not differ significantly between hostel residents and those staying at home or in rented accommodation. These findings suggest that stress among professional students is widespread and not confined to specific demographic subgroups.

Ranking of Major Stressors

The analysis of Mean Percent Scores revealed that **academic factors** were the most dominant contributors to stress among professional students, followed by **socio-psychological** and **physical/health-related factors** (Table 3).

- **Academic Stressors:** Overall MPS = 68.89 (Rank I)
- **Socio-psychological Stressors:** Overall MPS = 56.16 (Rank II)
- **Physical/Health Stressors:** Overall MPS = 50.12 (Rank III)

This pattern was consistent across both genders, indicating that academic pressure is the primary source of stress irrespective of gender differences.

Academic Stressors

Among academic factors, frequent examinations, fear of poor academic performance, difficulty in understanding the curriculum, and anxiety regarding career opportunities after course completion were identified as major stress-inducing elements. The

competitive academic environment and limited leisure time further intensified stress levels. These findings align with earlier studies that identify academic workload and examination pressure as the most significant stressors among professional students.

Socio-Psychological Stressors

Socio-psychological factors ranked second in stress generation. Financial difficulties, lack of adequate transportation facilities within campus, and interpersonal issues contributed substantially to stress. Parental expectations and adjustment problems in hostel or home environments were also reported as stress-inducing factors by a considerable proportion of students. Such stressors are particularly relevant in the context of professional education, where financial investment and family expectations are often high.

Physical and Health-Related Stressors

Physical and nutritional factors ranked third among stressor categories. Issues related to dietary habits, physical illness, and nutritional deficiencies contributed to stress, with a slightly higher impact reported among female students. Poor health can adversely affect concentration, academic engagement, and overall quality of life, thereby indirectly amplifying academic stress.

Table 1: Gender wise association of stress factors.

Sl. no		Male			Female			Total			WM S ± SEM
		Alwa ys	Someti mes	Ne ver	Alw ays	Someti mes	Ne ver	Al wa ys	Som etim es	Never	
Academic Factors											
1	During your course of study, do you frequently experience academic pressure or strain.	14	29	6	37	66	4	51	95	10	2.265 ± 0.033
2	Have you felt emotionall y low or unhappy at any point during your profession al education.	11	34	4	29	76	2	40	110	6	2.213 ± 0.030

3	Have you ever doubted your abilities or felt unsuitable for the course you are pursuing.	24	12	13	58	31	18	82	43	31	1.787 ± 0.044
4	Have you ever came across with the problem of sleep apnea (loss of sleep) during your course period				23	41	43	32	57	67	
		9	16	24							1.774 ± 0.045
5	Have you felt of loss of confidence while studying	14	21	14	27	59	21	41	80	35	2.042 ± 0.041
6	Whether the frequency of exams contribute towards stress development	24	12	13	58	31	18	82	43	31	2.321 ± 0.047
7	Whether your poor performance in exam generates stress	18	21	10	52	31	24	70	52	34	2.223 ± 0.047

8	Whether the course curriculum is difficult for you?	17	18	14	35	41	31	52	59	45	2.045 ± 0.047
9	Whether the competition with peers generates stress in you?	8	15	26	31	33	46	39	48	69	1.808 ± 0.048
10	Whether the lack of extracurricular activities/recreation time creates stress in you?	17	8	24	40	32	35	57	40	59	1.979 ± 0.051
11	The career opportunities/fear of getting job after your course generates tension/stress in you	25	10	14	63	23	21	88	33	35	2.338 ± 0.049
12	Whether the lack of understanding the classes taken from the colleges accounts for stress generation?	14	19	16	37	37	33	51	56	49	2.007 ± 0.047
SOCIO PSYCHOLOGICAL FACTOR											

13	Are you affected by family-related issues that cause mental stress.	11	10	28	21	17	69	32	27	97	1.582 ± 0.048
14	Do parental expectations place psychological pressure on you.	10	14	25	15	35	57	25	49	82	1.638 ± 0.044
15	Does limited interaction or poor bonding with peers lead to stress	11	11	27	21	30	56	32	41	83	1.676 ± 0.047
16	Whether any financial problem exists? If existing whether it creates pressure on you?	17	10	22	25	31	51	42	41	73	1.805 ± 0.049
17	Whether your living conditions in the hostel/ home creates stress in you?	10	9	30	25	33	49	35	42	79	1.718 ± 0.048
18	Whether you find lack of interest in the concerned course during your	12	19	18	21	43	43	33	62	61	1.819 ± 0.045

	course period??											
19	Whether your relationship with opposite sex contributes towards your stress generation ?	5	15	29	10	18	79	15	33	108	1.401 ± 0.039	
20	Lack of transportation facilities inside the campus is creating stress in you.	17	8	24	32	25	50	49	33	74	1.840 ± 0.052	
NUTRITIONAL AND PHYSICAL FACTOR												
21	Do any existing physical disabilities contribute to stress in your daily academic life.	3	4	42	4	8	95	7	12	137	1.160 ± 0.028	

22	Do nutritional deficiencies or chronic health conditions lead to increased stress.	8	4	37	21	23	63	29	27	100	1.547 ± 0.047
23	Whether any physical illness exists? Are they contributing towards stress?	8	5	36	19	19	69	27	24	105	1.505 ± 0.046
24	Do your present dietary patterns or food habits contribute to physical or mental stress.	10	14	25	32	26	49	42	40	74	1.801 ± 0.050

WMS – Weighed Mean Score ; SEM – Standard Error of Mean

Table 2: Sociodemographic factors and stress

Sl. no	Variable	Category	Stressed	Unstressed	Total	Chi-square	P Value
1	Sex	Male	15(30.6%)	34 (69.4%)	49 (31.4%)	0.07 ^{NS}	>0.05
		Female	35(32.7%)	72 (67.3%)	107 (68.6%)		
		Overall	50(32.1%)	106 (67.9%)	156 (100%)		
2.	Place of residence	Home	5	8	13	0.89 ^{NS}	>0.05
		Hostel	44	96	140		
		Rental	1	2	3		
		Overall	50	106	156		
3	Course of Study	Medical (Includes MBBS, Ayurveda, Dental, Veterinary, etc)	26	52	78	2.14 ^{NS}	>0.05
		Engineering	7	21	28		
		Agriculture	12	22	34		
		Nursing	4	5	9		
		other professional courses	3	5	8		
		Overall	50	106	156		

NS - Non-significant (p>0.05)

Table 3: Ranking of stressors

Sl.No	Stressors	Male		Female		Overall	
		MPS	Rank	MPS	Rank	MPS	Rank
1	Academic	66.88	I	69.81	I	68.89	I
2	Psychological	57.36	II	55.60	II	56.16	II
3	Physical	47.13	III	51.48	III	50.12	III
4	Overall	60.42		62.02		61.52	

MPS – Mean Percent Score

CONCLUSIONS

The study concludes that nearly one-third of professional students in Thrissur District experience significant stress, with academic factors emerging as the predominant source. Although female students reported marginally higher stress levels, no significant association was found between stress and gender, place of residence, or course of study. The dominance of academic stress highlights the need for institutional interventions such as curriculum rationalisation, academic mentoring, counselling services, and stress management programmes. Encouraging participation in recreational and extracurricular activities may further help in promoting students' psychological well-being.

FUTURE SCOPE

Future research may focus on longitudinal assessment of stress across different academic phases, particularly during pre-examination and examination periods. Studies incorporating coping strategies, resilience levels, and institutional support mechanisms would provide deeper insights. Expanding the scope to include diverse socio-economic and cultural backgrounds would further enhance the generalisability of findings.

Conflict of Interest: None

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