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PERCEPTION OF ORGANIZATIONAL CLIMATE- A STUDY OF PRIVATE SCHOOL TEACHERS IN TIRUPATTUR TOWN

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ABSTRACT

The present study examines the perception of organizational climate among private school teachers in Tirupattur Town and its influence on organizational effectiveness. Organizational climate plays a significant role in shaping teachers' attitudes, motivation, job satisfaction, and overall performance. A positive organizational climate contributes to effective teaching, improved teacher morale, and enhanced educational outcomes. The study adopted a descriptive survey design and collected data from 120 private school teachers selected through simple random sampling from various private schools in Tirupattur Town. Primary data were gathered using a structured questionnaire, while secondary data were obtained from books, journals, articles, and other published sources. The collected data were analyzed using the Statistical Package for Social Sciences (SPSS). The findings reveal that most teachers perceive their organizational climate positively in terms of work allocation, management support, teacher participation, career growth opportunities, workplace relationships, morale, and loyalty toward school values. However, some respondents expressed concerns regarding freedom and independence in performing their duties, workplace safety, and communication with senior staff. The study also found that a supportive organizational climate enhances teacher motivation, commitment, and organizational effectiveness. Based on the findings, the study recommends improving salary structures, providing professional development programs, strengthening teamwork, ensuring transparent performance appraisal systems, and recognizing teachers' contributions through rewards and incentives. The study concludes that maintaining a positive organizational climate is essential for improving teacher effectiveness, job satisfaction, and the overall performance of private schools in Tirupattur Town.

KEYWORDS: Organizational Climate, Teacher Effectiveness, Organizational Effectiveness, Private School Teachers, Job Satisfaction, Tirupattur Town.

INTRODUCTION

Workers perceive organizational climate as a fleeting aspect of the internal environment that influences behaviour, it may also be described in terms of the values of a certain organizational trait. The set of characteristics that make up an organization's climate traits, which identify and distinguish one administration from another. Climate perceptions may be used as concepts to help people cope with information overload and make better decisions. Frameworks are used by people to identify activities that will help them adapt to their surroundings. Organizational climate has been a popular topic of research in the West. It increased as well. It is significant in India, but only in terms of administration. It has been observed that schools' formal qualities have changed.

A teacher's teaching proficiency is a collection of skills, knowledge, and beliefs that he or she possesses and employs to facilitate effective teaching and learning. To put it another way, proficiency is having the necessary abilities and commitment to complete a certain type of task properly.

Teachers make up the majority of the labor in schools, and they are responsible for providing high-quality education. They are in charge of the students. Teaching is a dynamic and challenging profession. It is necessary to adapt to the changing demands of the educational system on a constant basis. It necessitates continuous upgrading of knowledge and abilities, as well as a healthy corporate atmosphere. Furthermore, the organizational atmosphere will undoubtedly reveal the level of dedication of employees to the administration.

STATEMENT OF THE PROBLEM

Teachers' job performance plays a vital role in students' academic success and overall school effectiveness. Effective teaching is influenced by various factors within the organizational climate of a school. Elements such as the principal's leadership style, work environment, reward and recognition, career advancement opportunities, school facilities, disciplinary policies, and interpersonal relationships significantly affect teachers' performance. Poor job performance among teachers may result from inadequate salary, limited promotional opportunities, ineffective leadership, insufficient facilities, and negative workplace attitudes. Therefore, creating a positive organizational climate that promotes job satisfaction, healthy working conditions, fair compensation, and professional growth is essential. A supportive organizational climate can enhance teachers' performance, increase organizational effectiveness, and reduce issues such as absenteeism and turnover.

RESEARCH METHODOLOGY

This descriptive study, which is based on a survey approach, aims to ascertain how teachers in Tirupattur's private schools perceive several characteristics of the organizational environment. Both primary and secondary sources provided the data used in this investigation. A questionnaire was distributed to a sample size of 120 individuals in Tirupattur Town in order to gather fundamental information about the organizational environment of the schools. A range of published and unpublished records, articles, books, journals, and magazines provided secondary data for the study's theoretical framework.

OBJECTIVES OF THE STUDY

1. To provide a solid theoretical foundation for the idea of organizational climate research
2. To identify the various organizational climate dimensions for evaluating the school teacher’s perception
3. To find out the extent of variation among teachers working in schools on their perception towards the various dimension of organizational climate in tirupattur town
4. To offer suggestion to improve the organizational climate of schools at tirupattur town.

LIMITATIONS OF THE STUDY

1. The study suffers from the well-known survey technique restriction of not being able to question respondents beyond the supplied response.
2. The information provided by the respondents is not entirely devoid of prejudice.
3. The study's shortcomings as they relate to the statistical methods used.
4. Because the current study only looked at private school teachers in Tirupattur, the results cannot be extended to other areas.

REVIEW OF LITERATURE

Cecilia Helen D'Souza and A.V. Karabasanagouda (2020) a studied of Influence of Organizational Climate on Teacher Morale the teachers play a vital role in quality of organization to a student and developing a positive climate to a organization tool has to use in this article any concept or construct in the point of view are communication flow, warmth ,decision making ,performing to a organization ,motivation level, conflict resolution an they have to talk about lack of empirical studies and theoretical of school climate and also talk about a teachers salary and curriculum issues they have taken 100 samples of teachers.

Harvinder Kaur (2018) The studied has talked about teachers effectiveness and organization climate , he has taken 50 samples of teachers from 10 different schools. He applied a descriptive statistical for this study and the objectives are effectiveness of teachers in a gender relation of secondary school ,organizational climate of gender of teachers , hypotheses of no difference between climate and effectiveness and difference between effectiveness of male teachers and also difference between teachers of govt and private school teachers . the study is in Kapurthala district. most of the objectives are having difference between climate and teacher, difference of male staff and female staff.

D P Kayastha (2016) investigated work remuneration, coworkers, and supervision in her study of secondary school teachers' job satisfaction in Nepal. The study consists of private and public school from kathamandu and latitpur in Nepal. she has taken 130 samples, she as to use on each private and government school teachers work experience and psychological indicators in the region, Concerning job in general, the study's findings on job satisfaction are displayed in the table of findings for professionals and demographics, and supervision and advancement are looked at in higher secondary schools.

Vedavathi.B (2017) studied on secondary school organizational climate and work value of secondary school teachers. He has taken nearly 220 samples of secondary schools heads in south canara district at Karnataka in India and also he has use satisfied random sampling technique of government, private - aided , private schools. The data is acquired using a survey strategy that includes descriptive and comparative study in the South Canara district of Karnataka, India. this study is observed that the work values of the read have significant contribution towards his/her instructional leaders. So that the quality of school climate could be reformed to achieve the Exim' and objectives of education.

Sadia Malik's (2010) research looks at how teachers' life satisfaction is affected by work-related stress in both public and private schools. 200 instructors from Bhakkar's public and private schools provided samples to him. The demographic sheet, organizational role stress scale, and contentment with life scale were used to collect data. He concluded that life satisfaction was negatively impacted by work-related stress. It has also been demonstrated that female teachers have higher levels of occupational stress than male teachers.

Yahya Don, Mohd Faiz Mohd Yaakob, Wan Rozimi WanHanafi, Rahimi Yusof, Muhamad Dzahir Kasa, and Mohd Sofian Omar-Fauzee (2021) investigated the challenges of evaluating teacher job satisfaction using an organizational environment metric. Their study aims to investigate how primary school teachers perceive their workplace and level of satisfaction. They used both qualitative and quantitative methods to collect the data for their study. As a representative sample, he employed 220 primary school teachers. He

concluded that teachers are more driven to accomplish the school's objectives when they are in agreement with the management. Additionally, more research is required to determine how the school environment affects teachers' unique traits in a dynamic internal framework.

RESEARCH METHODOLOGY

INTRODUCTION

This chapter presents the methodology adopted for the study on organizational climate and its influence on organizational effectiveness. It explains the theoretical framework, research design, sampling technique, data collection tools, data analysis methods, and challenges faced during the study.The research employed a descriptive survey design using convenience sampling. The study was conducted among employees of the selected organization, and the findings were compared to organizational effectiveness measures.

The chapter also provides a brief profile of the organization and discusses the concept of organizational climate. Organizational climate refers to employees' perceptions of the work environment, including relationships, policies, and working conditions. It influences employee behavior, performance, and overall organizational effectiveness. Since organizational climate varies across organizations and individuals, understanding employees' perceptions is essential for improving organizational outcomes.

ORGANIZATIONAL CLIMATE

Since the 1930s, numerous studies on organizational climate have been conducted, yet there is no precise definition or structure for measuring organizational climate. In truth, there is a vast range of approaches to defining and measuring the organizational climate. The average course or state of the weather at a location over a period of years as demonstrated by temperature, wind velocity and precipitation is referred to as climate in the natural sense. The "weather of the workplace" is the organizational climate. Organizational climate effects employee motivation, performance, behavior at work and satisfaction in the same way that weather conditions influence daily activities.

Organizations are studied in a variety of management, and organizational communication. An organizational behavior system establishes a healthy organizational atmosphere. The foundations of term organizational philosophy are fact and value principles. Furthermore, the organizational environment is influenced by the types of individuals who work there, as well as technology, education, and expectations. Economic, social, and fulfilling men are three categories of people. Each class of man has a unique set of beliefs and motivations, necessitating a unique organizational environment. In order to create a solid organizational climate, organizations must first understand their employees. The management must be in sync with the actual human environment. All of the models are based on the hierarchy of needs. Education, maturity, age, social background, personality, and work environment all influence people's needs. The management should construct an appropriate model based on these functions. As a result, organizational climate is defined as organizational members' behaviour patterns based on their behaviour experiences. Organizational climate provides the foundation for acceptable individual behaviour.

Organizational climate researchers have used data on human perceptions of organizational elements to determine organizational climate. Determine the organizational climate characteristics in this situation. Several dimensions of organizational climate are common to all organizations, according to the literature review and previous studies on the subject. Organizational Climate was associated by Owens (2004) with concepts such as atmosphere, personality, tone, and ethos. From a functional standpoint, the focus is on how entities such as corporate or state authority are used. Many people consider Halpin and Croft's (1963) concept of climate—which effectively linked it to morale—to be the foundational work on school climate. However, they acknowledged that time constraints confined their examination of that construct to the social interaction between the administrator and the

teachers. The adjective "competency" is synonymous with "quality," "efficiency," "appropriate," and "adequate." Its dictionary definitions include the capacity, strength, aptitude, or competence to carry out a task. According to Hyland (1995), "competence entails the accomplishment of basic minimal norms." A teacher's teaching competency is a collection of abilities, information, and convictions that they have and use to support successful teaching and learning. In other words, competency is the existence of the skills and readiness to carry out a certain kind of work in a satisfactory manner.

Organization structure, organizational studies, organizational behaviour, and organizational analysis are all terms used to describe a larger analysis of an organization. There are a variety of viewpoints, some of which are compatible**:**

- An organization is considered as a purposeful structure within a social setting from an institutional standpoint.
- An organization is considered as an entity that is being reorganized as a set of tasks or actions from a process perspective.

Organizational climate-influencing factors

- Organizational structure
- Individual duties
- Physical surroundings
- standards, and values
- Mutual trust
- Sense of performance useful work
- Employee participation
- Process
- Achievement
- Closeness of supervision
- Rules orientation
- Result orientation performance
- Co-worker relationship

Educational institute

Education is delivered through a variety of programs, with the teacher serving as the primary agent for putting these programs into action at educational institutions. It is the responsibility of the teachers to use the programs to lead, inspire, and motivate pupils to live a disciplined life and to instil values in them that are consistent with India's cultural history and societal goals. There is a widespread perception that instructors are dissatisfied with their work. Teachers appear to be growing dissatisfied with their jobs, and as a result, the quality of teaching is deteriorating. Despite the various initiatives and programs that have been implemented to improve their job happiness, they are dissatisfied. It is possible to isolate the sources of unhappiness, and then seek to improve or lower the severity of the dissatisfaction in order to increase the profession's holding power. There's no denying that a teacher can't offer excellent instruction unless he or she enjoys their job. In Tamil Nadu, there are two types of management in charge of schools: government and private. Private schools can either be aided or self-supporting. Self-financing schools are wholly governed and supported by private managements, whereas aided schools are controlled by private managements but funded by the government.

It is believed that teachers in assisted schools are happier in their positions than those in self-financing establishments. Therefore, the goal of this study is to examine higher secondary school teachers' job happiness. It is impossible to overestimate the significance of education for human progress. Higher education, in particular, is a barometer of a country's advancement and prosperity. The quality of a nation's citizens is a reflection of its growth. In turn, the quality of the citizens is determined by the country's educational system. Teachers

are essential to the health and prosperity of every educational system, regardless of the organizations in which they work. As a result, teachers have always held a prominent place in society and have been held in high regard. In their chosen professions, people require job satisfaction. Without job satisfaction, the job ceases to be a source of pleasure for them, and unhappiness gradually sets in. Teachers who are dissatisfied with their jobs have a difficult time adjusting to their students and become ineffective. As a result, it is critical that teachers are happy in their jobs.

Higher education institutions' academic and social environments can help or hinder students' academic advancement. The current beliefs, attitudes, and expectations that define the school and its participants have been defined as the campus environment in higher education research (Peterson and Spencer 1990). In order to help students preserve their cultural identities and overcome the uncomfortable experiences of isolation, segregation, and marginalization, institutions that are concerned with enhancing the social climate and attempting to make it more in line with students' lives have created special programs, services, and dedicated physical facilities (such as multicultural centers and tutoring and mentoring centers). Once students have a realistic sense of "belonging," they are more likely to complete their college education.

Teachers effectiveness

Teachers play a vital role in shaping society by transferring knowledge, skills, values, and experiences to future generations. They contribute significantly to the development of students and the progress of the nation. As emphasized by Sarvepalli Radhakrishnan, teachers help preserve and pass on intellectual and cultural heritage.

Teacher effectiveness refers to a teacher's ability to perform educational and institutional responsibilities successfully. It is influenced by factors such as teaching methods, classroom management, student relationships, assessment practices, and professional skills. Effective teachers create a positive learning environment that supports students' academic, social, and emotional development. Therefore, teacher effectiveness is an essential factor in achieving school goals and improving educational outcomes.

Research design

Convenience sampling design was used for the research. This design gave out the descriptive of the study and more understandable and statistical for the output

Pilot study

Pilot study was done by the research by visiting the areas in view of previewing and feasibilities of the study. Having chosen private school teachers in tirupattur town for degerming organizational climate. A short visit was made to the private school teachers for the study.

Selecting of samples

The researcher used probability sampling in specific simple random sampling for selecting 120 samples for data collection from the total population of nearly 600 private school teachers in tirupattur town

Source of data

In general, data can be categorized as

- Primary Data
- Secondary Data

Primary Data

The primary data are those that are obtained from filed data for the first time. A questionnaire was used to collect the primary data.

Secondary Data

Data that has already undergone statistical processing is referred to as secondary data. The secondary data was gathered from books, Internet, Journals or periodicals and Research

thesis.

Analysis

The statistical package for social science (SPSS) software was used to edit, process, and analyze the acquired data. Tables, charts, and diagrams were used to display the results of the analysis.

Area of the study

The present study was conducted among private school teachers in Tirupattur Town to examine organizational effectiveness. Various private schools in Tirupattur were selected for the study. Tirupattur, often referred to as the "Town of Ten Villages," is an important taluk in Tamil Nadu. It includes several villages such as Aathiyur and Kodiyur and is known for its ancient Vishnu and Shiva temples, as well as water reservoirs dating back to the Hoysala period. The town has excellent road and rail connectivity with major cities such as Bengaluru, Vellore, Chennai, Salem, Coimbatore, and Tiruvannamalai. It is also known for the presence of several Islamic saints' shrines.

According to the 2011 Census, Tirupattur had a population of 64,125. During British rule, Tirupattur served as a revenue division and was part of both the Vellore and Salem districts at different periods. The Tirupattur subdivision includes the taluks of Tirupattur, Natrampalli, Vaniyambadi, and Ambur. Notable personalities such as Dr. T.V. Somanathan, K.P.S. Menon Jr., and Anna Rajam Malhotra served as Sub-Collectors of Tirupattur during their early careers. The Tirupattur Municipality was established as a Third-Grade Municipality in 1886. It was upgraded to a Second-Grade Municipality through Government Order No. 194 dated 10.02.1970 and later classified as a First-Grade Municipality through Government Order No. 654 dated 01.04.1977. Tirupattur has adequate population and geographical area for political representation in both the state and national legislatures. The town falls under the Tiruvannamalai Lok Sabha Constituency for parliamentary elections and has representation in the Tamil Nadu Legislative Assembly. The Tirupattur District was formed on 15 August 2019 following the trifurcation of the Vellore District, with Tirupattur town serving as the district headquarters. This made Tirupattur an important administrative and educational center, making it a suitable location for the present study.

Item Statistics

Particulars	Mean	Std. Deviation	N
Work activities of school teachers	2.73	1.221	120
Freedom and Independence to perform my job	2.94	1.023	120
Ideas and suggestions of teachers	3.21	1.166	120
Compatible atmosphere in school	3.33	1.205	120
Quality principles of teachers	3.27	1.172	120
Opportunities to take decisions in school	3.22	1.132	120

Feedback of job performance	3.29	1.279	120
Goal and objectives of school	3.38	1.108	120
Work place safety importance	3.34	1.119	120
Policies and organizational structure	3.25	1.176	120
Assistance of co workers	3.25	1.125	120
Relationship of management and teachers	3.36	1.075	120
Need of time to consult teachers	2.65	1.135	120
Friendly atmosphere among teachers	3.24	1.069	120
Resource shared throughout the school	3.36	1.083	120
Treating humanly without differences	3.22	1.161	120
Trustworthy of senior teachers	3.33	1.203	120
Freely communicate with senior teachers	3.28	1.23	120
Teachers suggestions	3.38	1.077	120
School enhances career growth	3.32	1.159	120
Job stimulating	3.56	1.215	120

Effective of new technologies	3.64	1.165	120
Morale is at its best	3.67	1.155	120
Loyal to the values of school	3.73	1.067	120
Work beyond the experience of school	3.78	1.055	120
Like to work at school	3.6	1.08	120
Need of the teachers in school	3.6	1.148	120

Table 1
Demographic Profile of Respondents (N = 120)

Sl.No.	Variable	Category with Highest Response	Frequency	Percentage (%)
1	Gender	Male/Female (Equal)	60	50.0
2	Marital Status	Married	86	71.7
3	Age	26–35 Years	32	26.7
4	Educational Qualification	UG/PG with B.Ed.	45	37.5
5	Monthly Income	₹25,000–₹40,000	35	29.2
6	Teaching Experience	5–10 Years	38	31.7
7	Type of School	Higher Secondary	37	30.8
8	Working Hours	8 Hours	88	73.3

Table 2
Summary of Organizational Climate Variables (N = 120)

S.No	Organizational Climate Variable	Highest Response Category	Percentage (%)
1	Work activities are fairly allocated	Agree	28.3
2	Freedom and independence in performing job	Disagree	33.3
3	Teachers' ideas and suggestions are valued	Agree	30.0
4	Compatible atmosphere exists in school	Agree	36.7
5	School follows quality principles	Agree	37.5
6	Opportunities for decision-making are provided	Agree	31.7
7	Feedback on job performance is provided	Agree	31.7

	regularly		
8	Importance is given to workplace safety	Neutral	31.7
9	Policies and organizational structure are clearly explained	Neutral	31.7
10	Assistance is available from co-workers and senior staff	Agree	33.3
11	Contributions towards school goals are recognized	Agree	34.2
12	Warm relationship exists between management and teachers	Agree	40.0
13	Teachers are permitted sufficient time for consultation	Neutral	32.5
14	Friendly atmosphere prevails among staff members	Neutral	30.8
15	Resources are shared throughout the school	Neutral/Agree	33.3
16	Teachers are treated humanely without discrimination	Neutral	31.7
17	Information provided by senior teachers is trustworthy	Agree	30.8
18	Teachers can freely communicate with senior teachers	Neutral	30.0
19	Management considers teachers' suggestions seriously	Agree	33.3
20	School enhances career growth	Agree	35.8
21	Job provides stimulation and motivation	Agree	35.0
22	New technologies improve job effectiveness	Agree	31.7
23	Teacher morale is high	Agree	42.5
24	Teachers are loyal to school values	Agree	44.2
25	Teachers are willing to work beyond expectations	Agree	46.7
26	Teachers like working in their school	Agree	45.0
27	School understands teachers' needs	Agree	43.3

FINDINGS

- Most of the respondents (26.7%) are in the age group of 26–35 years and are working as private school teachers.
- Equal numbers of male and female respondents (50% each) are working as teachers in Tirupattur.
- The majority of the respondents (71.7%) are married and belong to families residing in Tirupattur town.
- Most respondents possess UG/PG qualifications along with a B.Ed. degree (37.5%) and are working in private schools in Tirupattur town.
- The majority of the respondents (29.2%) earn a monthly income between ₹25,000 and ₹40,000 and are satisfied with their jobs.
- A major portion of the respondents (31.7%) have 5–10 years of teaching experience in Tirupattur town.
- The study sample was collected from all types of schools in Tirupattur, and 29.2% of the respondents are from primary schools.

- The majority of the respondents (73.3%) work for 8 hours daily as school teachers.
- Most respondents (28.3%) agreed that work activities are properly allocated among teachers in their schools.
- Most respondents (33.3%) disagreed that they have freedom and independence to perform their jobs in their schools.
- Most respondents (30%) agreed that importance is given to teachers' ideas and suggestions in their schools.
- Most school teachers (36.7%) agreed that a compatible atmosphere is maintained in their schools.
- Most school teachers (37.5%) agreed that the principles of quality are followed in their schools.
- Most respondents (31.7%) agreed that teachers are given ample opportunities to participate in decision-making in their schools.
- Most respondents (31.7%) agreed that they receive regular feedback on their job performance.
- Most respondents (31.7%) were neutral regarding whether their contribution toward the goals and objectives of the school is duly recognized by the management.
- Most school teachers (31.7%) were neutral regarding the importance given to workplace safety in schools.
- Most school teachers (33.3%) agreed that they receive assistance from senior staff members and co-workers when handling difficult assignments.
- Most respondents (34.2%) agreed that the management recognizes teachers' contributions toward achieving the goals and objectives of the school.
- Most respondents (40%) agreed that there is warmth in the relationship between the management and teachers in the school.
- Most respondents (32.5%) were neutral regarding whether teachers are permitted to consult one another in times of need.
- Most respondents (30.8%) were neutral regarding whether a friendly atmosphere prevails among staff members in the school.
- Most respondents (33.3%) agreed that resources are shared throughout the school.
- Most respondents (31.7%) were neutral regarding whether top management values teachers and treats them humanely without discrimination.
- Most respondents (30.8%) agreed that the information provided by senior teachers is trustworthy.
- Most respondents (30%) were neutral regarding whether teachers can freely communicate with senior teachers about work-related matters.
- Most respondents (33.3%) agreed that the management seriously considers teachers' suggestions in the school.
- Most respondents (35.8%) agreed that the school enhances career growth opportunities.
- Most respondents (35%) agreed that their jobs are stimulating in their schools.
- Most respondents (31.7%) agreed that they are updated with new technology in order to be effective in their jobs.
- Most respondents (42.5%) agreed that morale is at its best in their schools.
- Most respondents (44.2%) agreed that they are loyal to the values of the school.
- Most respondents (46.7%) agreed that their work goes beyond their previous experience in the school.
- Most respondents (45%) agreed that they like working in their school.

- Most respondents (43.3%) agreed that the school understands the needs of teachers.

SUGGESTIONS

1. Since the majority of the staff are working for the development of the school, they should be provided with training programs to help them cope with academic and family-related pressures.
2. Many teachers working in private schools receive low salaries. Therefore, their salaries may be increased based on their performance and contributions to the school.
3. School and student discipline, teacher performance, student attendance and achievement, community participation, and parental involvement in school activities should be recognized and rewarded through appropriate awards.
4. Teachers have a high level of trust in the school. This trust should be maintained and strengthened to enhance their involvement and commitment.
5. Teamwork among teachers should be encouraged and recognized to promote a positive and collaborative work environment.
6. The performance appraisal system should be administered in a transparent and reliable manner by the school administration. This will motivate teachers to work more efficiently and effectively.

CONCLUSION

This study examined the motivation of private school teachers in Tirupattur. A total of 120 teachers from four different types of private schools participated in the study. The majority of the respondents had more than 10 years of teaching experience and possessed varying educational qualifications.

The findings suggest that schools should provide greater job security and appropriate salary increments to improve the quality of life of teachers and enhance their motivation. In addition, schools should organize health camps at least once every six months and conduct regular awareness programs on recent educational trends and developments.

Furthermore, the management should have a clear vision and adopt modern technologies to create a motivating work environment for teachers. Such initiatives can improve teacher motivation, enhance organizational effectiveness, and contribute to better educational outcomes.

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THE INFLUENCE OF SHORT-FORM VIDEO MARKETING ON CONSUMER PURCHASE INTENTION: AN EMPIRICAL STUDY OF INSTAGRAM REELS AND YOUTUBE SHORTS

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ABSTRACT

Short-form video marketing has emerged as a powerful digital marketing strategy that enables businesses to engage consumers through visually appealing and interactive content on social media platforms such as Instagram Reels and YouTube Shorts. This study aims to examine the influence of short-form video marketing on consumer purchase intention and compare the effectiveness of Instagram Reels and YouTube Shorts in shaping purchasing decisions. A descriptive research design was adopted, and primary data were collected from 50 respondents using a structured questionnaire based on a five-point Likert scale through the convenience sampling technique. The collected data were analyzed using IBM SPSS Statistics with the application of frequency and percentage analysis, Cronbach's Alpha, regression analysis, and the independent samples t-test. The findings reveal that short-form video marketing significantly influences consumer purchase intention ($R^2 = 0.615$, $p < 0.001$). Furthermore, Instagram Reels was found to have a greater influence on purchase intention than YouTube Shorts. The study concludes that creative, informative, and engaging short-form videos enhance consumer engagement and support effective digital marketing strategies.

KEYWORDS: Short-Form Video Marketing, Instagram Reels, YouTube Shorts, Consumer Purchase Intention, Social Media Marketing, Digital Marketing.

INTRODUCTION

The rapid growth of digital technology has significantly transformed the way businesses communicate with consumers. Social media platforms have evolved from simple networking tools into powerful marketing channels that enable brands to engage with audiences through innovative and interactive content. Among these developments, short-form video marketing, particularly through Instagram Reels and YouTube Shorts, has emerged as one of the most effective digital marketing strategies. These platforms allow businesses to deliver concise, visually appealing, and engaging promotional content that captures

consumers' attention within a short period. As a result, organizations increasingly utilize short-form videos to enhance brand awareness, communicate product features, and influence consumers' purchasing decisions.

Consumer purchase intention has become a crucial factor in evaluating the effectiveness of digital marketing campaigns. The entertaining nature, authenticity, creativity, and informational value of short-form videos encourage consumers to explore products and services, thereby influencing their buying behaviour. Furthermore, the integration of influencers, personalized recommendations, and algorithm-driven content has strengthened the impact of these platforms on consumer engagement. With the growing popularity of mobile devices and increased internet accessibility, consumers frequently rely on Instagram Reels and YouTube Shorts for product discovery, reviews, and purchase recommendations.

Although previous studies have examined social media marketing and online consumer behaviour, limited research has comparatively investigated the influence of Instagram Reels and YouTube Shorts on consumers' purchase intention. Understanding the relative effectiveness of these platforms is important for marketers seeking to optimize their digital marketing strategies and improve customer engagement. Therefore, the present study aims to examine the influence of short-form video marketing on consumer purchase intention and compare the effectiveness of Instagram Reels and YouTube Shorts in shaping consumers' buying decisions. The findings of this study are expected to provide valuable insights for marketers, content creators, and business organizations in designing effective short-form video marketing strategies in the evolving digital marketplace.

REVIEW OF LITERATURE

Dwivedi et al. (2023) examined the role of social media marketing in enhancing consumer engagement and purchase behaviour in the digital era. The study found that interactive and visually appealing content significantly increases consumer attention and brand awareness. The authors emphasized that short-form videos encourage immediate consumer interaction and strengthen purchase intentions. The research further highlighted the importance of personalized content in influencing online shopping decisions. The findings suggest that marketers should invest in engaging short-form video content to improve marketing effectiveness. **Yadav and Rahman (2023)** investigated the effectiveness of social media marketing activities in influencing consumer purchase intention. The study revealed that entertainment, interaction, and informativeness significantly improve consumers' attitudes toward brands. The authors found that engaging social media content increases customer trust and strengthens purchase decisions. The study concluded that social media platforms play a vital role in shaping consumer buying behaviour. The findings support the growing importance of digital marketing strategies in competitive markets.**Lim et al. (2024)** explored consumers' responses to short-form video content on social media platforms. The study reported that creative video advertisements significantly increase consumer engagement and product awareness. Consumers were more likely to purchase products after watching authentic and informative short videos. The research also emphasized that video quality and entertainment value positively influence brand perception. The study concluded that short-form video marketing has become a powerful promotional tool in digital commerce. **Verma and Yadav (2024)** examined the influence of influencer marketing on consumer purchase intention through social media platforms. The study found that consumers are more likely to trust products recommended by credible influencers. Authentic product demonstrations and customer reviews enhanced purchase confidence and brand loyalty. The research highlighted that influencer credibility positively affects online buying behaviour. The findings indicate that influencer-based short-form videos are highly effective marketing tools. **Chen et al. (2025)** investigated the impact of Instagram Reels and YouTube Shorts on consumer engagement and purchase intention. The study demonstrated that short-form videos enhance

product visibility and encourage immediate purchase decisions. Interactive features such as comments, likes, and shares strengthen customer engagement and brand relationships. The research concluded that Instagram Reels generated higher engagement compared to YouTube Shorts among younger consumers. The findings provide valuable insights for businesses adopting short-form video marketing strategies. **Lou and Yuan (2019)** investigated the effectiveness of influencer marketing in shaping consumers' attitudes and purchase intentions on social media platforms. The study revealed that influencer credibility, content quality, trustworthiness, and perceived value significantly influence consumers' purchasing decisions. The authors observed that authentic and engaging promotional content increases consumers' confidence in recommended products and strengthens brand loyalty. The findings also indicated that consumers are more likely to purchase products endorsed by influencers with whom they perceive a strong connection. The study concluded that influencer-based marketing is an effective strategy for enhancing consumer engagement and driving purchase intention, particularly through visually oriented social media platforms.

OBJECTIVES OF THE STUDY

1. To examine the influence of short-form video marketing on consumers' purchase intention through Instagram Reels and YouTube Shorts.
2. To compare the effectiveness of Instagram Reels and YouTube Shorts in influencing consumers' purchase intention.

HYPOTHESES OF THE STUDY

H_{01}: Short-form video marketing through Instagram Reels and YouTube Shorts has no significant influence on consumers' purchase intention.

H_{02}: There is no significant difference between Instagram Reels and YouTube Shorts in influencing consumers' purchase intention.

STATEMENT OF THE PROBLEM

The rapid growth of social media has transformed digital marketing, with short-form video platforms such as Instagram Reels and YouTube Shorts becoming popular channels for promoting products and services. Businesses increasingly use these platforms to capture consumer attention through engaging, creative, and informative video content. Although short-form video marketing has gained widespread adoption, its effectiveness in influencing consumers' purchase intention remains uncertain. Consumers are exposed to a large volume of promotional content daily, making it difficult for marketers to determine which platform has a greater impact on purchasing decisions.

Furthermore, limited empirical studies have compared the influence of Instagram Reels and YouTube Shorts on consumer purchase intention, particularly in the Indian context. Understanding consumers' perceptions of short-form video marketing is essential for developing effective digital marketing strategies. Therefore, this study seeks to examine the influence of short-form video marketing on consumer purchase intention and compare the effectiveness of Instagram Reels and YouTube Shorts in shaping consumers' buying behaviour, thereby providing useful insights for marketers and business organisations.

RESEARCH METHODOLOGY

The present study adopted a descriptive research design to examine the influence of short-form video marketing on consumers' purchase intention through Instagram Reels and YouTube Shorts. Both primary and secondary data were utilized for the study. Primary data were collected from 50 respondents using a structured questionnaire based on a five-point Likert scale, ranging from Strongly Disagree (1) to Strongly Agree (5). The respondents were selected through the convenience sampling method, targeting individuals who actively use Instagram Reels and YouTube Shorts. Secondary data were collected from research articles, journals, books, and authentic online sources related to digital marketing and consumer behaviour.

The collected data were analyzed using SPSS Statistics. Descriptive statistics such as frequency and percentage analysis were employed to summarize the demographic characteristics of the respondents. Cronbach's Alpha was used to assess the reliability of the measurement scale, while regression analysis and the independent samples t-test were applied to test the hypotheses and examine the influence of short-form video marketing on consumer purchase intention.

RELIABILITY TEST

Table 1
Reliability Statistics (Cronbach's Alpha)

Variable	No. of Items	Cronbach's Alpha	Interpretation
Short-Form Video Marketing	5	0.873	Excellent Reliability
Consumer Purchase Intention	5	0.891	Excellent Reliability
Overall Scale	**10**	**0.882**	Excellent Reliability

RESULTS AND DISCUSSION

Table 2
Demographic Profile of the Respondents

Variable	Category	Frequency (n=50)	Percentage (%)
Gender	Male	24	48.0
	Female	25	50.0
	Other	1	2.0
	Total	**50**	**100.0**
Age	Below 20 Years	5	10.0
	21–30 Years	22	44.0
	31–40 Years	13	26.0
	41–50 Years	7	14.0
	Above 50 Years	3	6.0
	Total	**50**	**100.0**
Educational Qualification	Higher Secondary	6	12.0
	Undergraduate	18	36.0
	Postgraduate	17	34.0
	Professional Degree	6	12.0
	Doctorate	3	6.0
	Total	**50**	**100.0**
Occupation	Student	15	30.0
	Government Employee	8	16.0
	Private Employee	14	28.0
	Self-employed	5	10.0
	Business	6	12.0
	Others	2	4.0
	Total	**50**	**100.0**
Monthly Income	Below ₹25,000	14	28.0

	₹25,001–₹50,000	16	32.0
	₹50,001–₹75,000	10	20.0
	₹75,001–₹1,00,000	6	12.0
	Above ₹1,00,000	4	8.0
	Total	**50**	**100.0**
Preferred Platform	Instagram Reels	20	40.0
	YouTube Shorts	15	30.0
	Both Equally	15	30.0
	Total	**50**	**100.0**
Average Daily Time Spent Watching Short Videos	Less than 30 minutes	7	14.0
	30–60 minutes	18	36.0
	1–2 hours	17	34.0
	More than 2 hours	8	16.0
	Total	**50**	**100.0**

Sources: Survey Data

Table 2 presents the demographic characteristics of the 50 respondents. Regarding gender, the majority were female (50.0%), followed by male (48.0%), while 2.0% identified as other. In terms of age, most respondents belonged to the 21–30 years age group (44.0%), followed by 31–40 years (26.0%), 41–50 years (14.0%), below 20 years (10.0%), and above 50 years (6.0%). With respect to educational qualification, 36.0% were undergraduates, 34.0% were postgraduates, 12.0% had completed higher secondary education, 12.0% held professional degrees, and 6.0% possessed doctoral qualifications. Regarding occupation, 30.0% were students, 28.0% were private employees, 16.0% were government employees, 12.0% were engaged in business, 10.0% were self-employed, and 4.0% belonged to other occupations. The monthly income distribution indicates that 32.0% earned between ₹25,001 and ₹50,000, followed by 28.0% earning below ₹25,000, 20.0% earning ₹50,001–₹75,000, 12.0% earning ₹75,001–₹1,00,000, and 8.0% earning above ₹1,00,000. Concerning the preferred platform for viewing short-form videos, 40.0% preferred Instagram Reels, while 30.0% preferred YouTube Shorts, and another 30.0% used both platforms equally. Regarding daily viewing time, 36.0% spent 30–60 minutes, 34.0% spent 1–2 hours, 16.0% spent more than 2 hours, and 14.0% spent less than 30 minutes watching short-form videos.

Table 3
Measurement Items for Short-Form Video Marketing and Consumer Purchase Intention

Statements	SA (5)	A (4)	N (3)	D (2)	SD (1)
Short-form videos provide useful information about products.	22	20	5	2	1
Creative and engaging short-form videos increase my interest in a product.	24	18	5	2	1
I trust the product information presented in Instagram Reels and YouTube Shorts.	18	22	7	2	1

Influencers or content creators positively affect my perception of a product.	20	21	6	2	1
Short-form videos make it easier for me to understand a product's features.	23	19	6	1	1
Watching short-form video advertisements increases my intention to purchase a product.	21	22	5	1	1
I am more likely to purchase products promoted through Instagram Reels or YouTube Shorts.	20	23	5	1	1
Short-form video marketing influences my final purchase decision.	19	22	6	2	1
I would recommend products discovered through Instagram Reels or YouTube Shorts to others.	18	23	7	1	1
Overall, short-form video marketing positively influences my purchasing behaviour.	24	18	5	2	1

Sources: Survey Data

Table 3 presents the respondents' opinions on short-form video marketing and consumer purchase intention. A substantial majority either strongly agreed or agreed that short-form videos provide useful product information (84.0%), while 84.0% indicated that creative and engaging videos increase their interest in products. Similarly, 80.0% expressed trust in the product information presented through Instagram Reels and YouTube Shorts. Furthermore, 82.0% agreed that influencers and content creators positively shape their perception of products, and 84.0% believed that short-form videos make it easier to understand product features. Regarding purchase intention, 86.0% reported that watching short-form video advertisements increased their intention to purchase products, and 86.0% stated that they were more likely to purchase products promoted through Instagram Reels or YouTube Shorts.

Additionally, 82.0% agreed that short-form video marketing influenced their final purchase decision, while 82.0% indicated that they would recommend products discovered through these platforms to others. Finally, 84.0% agreed that short-form video marketing positively influenced their purchasing behaviour. Overall, the findings demonstrate a highly favourable perception of short-form video marketing and its influence on consumer purchase intention.

TESTING OF HYPOTHESIS

Table 4

Regression Analysis

H_{01}: Short-form video marketing through Instagram Reels and YouTube Shorts has no significant influence on consumers' purchase intention.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error
1	0.784	0.615	0.607	0.428

ANOVA

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	14.925	1	14.925	76.843	**0.000**
Residual	9.325	48	0.194		
Total	24.250	49			

Coefficients

Variable	B	Std. Error	Beta	t	Sig.
Constant	0.856	0.342	—	2.503	0.016
Short-Form Video Marketing	0.781	0.089	0.784	8.766	**0.000**

The regression analysis was conducted to examine the influence of short-form video marketing on consumers' purchase intention. The model summary indicates a strong positive relationship (R = 0.784) between the independent and dependent variables. The coefficient of determination (R^2 = 0.615) reveals that 61.5% of the variation in consumers' purchase intention is explained by short-form video marketing, while the remaining 38.5% is attributable to other factors not included in the model.

The ANOVA results show that the regression model is statistically significant (F = 76.843, p = 0.000), confirming that the model adequately predicts consumer purchase intention. The regression coefficient further indicates that short-form video marketing has a significant positive effect on consumers' purchase intention (β = 0.784, t = 8.766, p = 0.000). Therefore, the null hypothesis (H_{01}) stating that short-form video marketing has no significant influence on consumers' purchase intention is rejected, and the alternative hypothesis is accepted. The findings suggest that effective short-form video marketing through Instagram Reels and YouTube Shorts significantly enhances consumers' intention to purchase products.

Table 5

Independent Samples t-test

H_{02}: There is no significant difference between Instagram Reels and YouTube Shorts in influencing consumers' purchase intention.

Group Statistics

Platform	N	Mean	Std. Deviation
Instagram Reels	25	4.28	0.52
YouTube Shorts	25	3.84	0.61

Independent Samples Test

t	df	Sig. (2-tailed)	Mean Difference
2.731	48	**0.009**	0.44

The independent samples t-test was performed to compare the influence of Instagram Reels and YouTube Shorts on consumers' purchase intention. The results indicate that respondents using Instagram Reels reported a higher mean purchase intention (Mean = 4.28, SD = 0.52) compared with those using YouTube Shorts (Mean = 3.84, SD = 0.61).

The t-test results reveal a statistically significant difference between the two platforms (t = 2.731, df = 48, p = 0.009). Since the significance value is less than the 0.05 level, the null hypothesis (H_{02}) is rejected. This finding indicates that Instagram Reels exerts a significantly greater influence on consumers' purchase intention than YouTube Shorts among the respondents included in the study. The results suggest that Instagram Reels may be a more effective platform for marketers seeking to influence consumer purchasing decisions through short-form video content.

FINDINGS

The study revealed that the majority of respondents were female (50%) and belonged to the 21–30 years age group (44%), indicating that young adults are the primary users of short-form video platforms. Most respondents were undergraduates (36%) and students (30%), with a monthly income ranging between ₹25,001 and ₹50,000 (32%). Instagram Reels emerged as the most preferred platform (40%), while 36% of the respondents spent 30–60 minutes daily watching short-form videos. The questionnaire responses indicated that a large proportion of respondents agreed that short-form videos provide useful product information, increase interest in products, enhance product understanding, and positively influence purchase

intention. The reliability analysis confirmed excellent internal consistency with an overall Cronbach's Alpha value exceeding the acceptable threshold. Regression analysis demonstrated that short-form video marketing had a significant positive influence on consumers' purchase intention ($R^2 = 0.615$, $p < 0.001$), explaining 61.5% of the variation in purchase intention. Furthermore, the independent samples t-test revealed a statistically significant difference between Instagram Reels and YouTube Shorts ($p = 0.009$), with Instagram Reels showing a stronger influence on consumers' purchase intention. These findings confirm the effectiveness of short-form video marketing in influencing consumer buying behaviour.

SUGGESTIONS

Businesses should focus on creating creative, informative, and visually engaging short-form videos to attract consumer attention and improve purchase intention. Marketers should prioritize Instagram Reels while also maintaining an active presence on YouTube Shorts to maximize audience reach. Collaborating with credible influencers can enhance consumer trust and strengthen brand credibility. Organizations should develop personalized and interactive video content that aligns with consumer preferences and current market trends. Regular analysis of consumer engagement metrics such as views, likes, comments, and shares can help marketers evaluate campaign effectiveness and optimize future promotional strategies. Additionally, businesses should maintain consistency in content quality and provide authentic product information to build long-term customer relationships and encourage repeat purchases.

CONCLUSION

Short-form video marketing has become an effective digital marketing strategy that significantly influences consumers' purchase intention. The study concludes that engaging and informative content on Instagram Reels and YouTube Shorts positively shapes consumer attitudes and purchasing decisions. Among the two platforms, Instagram Reels demonstrated a greater influence on purchase intention. The findings highlight the importance of incorporating innovative short-form video strategies into digital marketing campaigns to improve consumer engagement, strengthen brand awareness, and enhance business performance. The study provides valuable insights for marketers and offers a foundation for future research on emerging social media marketing platforms.

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THE INFLUENCE OF AI-GENERATED ADVERTISING ON BRAND TRUST AND CONSUMER LOYALTY: AN EMPIRICAL STUDY OF CONSUMER PERCEPTIONS IN THE DIGITAL MARKETING ERA

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ABSTRACT

Artificial Intelligence (AI)-generated advertising has transformed digital marketing by enabling organizations to deliver personalized, data-driven, and engaging promotional content. This study examines the impact of AI-generated advertising on brand trust and consumer loyalty. A descriptive research design was adopted, and primary data were collected from 120 respondents using a structured questionnaire with a five-point Likert scale. Convenience sampling was employed for data collection, and the data were analyzed using frequency analysis, percentage analysis, and regression analysis through SPSS software. The findings revealed that AI-generated advertising has a significant positive influence on both brand trust and consumer loyalty. Furthermore, brand trust was found to significantly enhance consumer loyalty, indicating its mediating role in strengthening long-term customer relationships. The study concludes that organizations should adopt transparent, ethical, and personalized AI-driven advertising strategies to improve customer confidence, encourage repeat purchases, and build sustainable brand loyalty. The findings provide valuable implications for marketers, researchers, and businesses implementing AI-based marketing strategies.

KEYWORDS: Artificial Intelligence, AI-Generated Advertising, Brand Trust, Consumer Loyalty, Digital Marketing, Consumer Behaviour.

INTRODUCTION

Artificial Intelligence (AI) has emerged as one of the most transformative technologies in the field of digital marketing. Businesses increasingly rely on AI-generated advertising to create personalized, data-driven, and engaging promotional content that can reach consumers more effectively than traditional advertising methods. AI technologies such as machine learning, natural language processing, and predictive analytics enable marketers to analyze consumer preferences, browsing behavior, and purchase patterns, thereby delivering highly relevant advertisements in real time. As a result, AI-generated advertising has become an essential component of modern marketing strategies across e-commerce, retail, banking, hospitality, and other service sectors.

The growing adoption of AI-generated advertising has also raised important questions regarding consumer perceptions. While personalized advertisements may enhance customer experience and engagement, consumers may also evaluate whether AI-generated content is trustworthy, reliable, and transparent. Brand trust plays a critical role in influencing consumer

attitudes and long-term relationships with brands. Consumers who trust a brand are more likely to purchase its products, recommend it to others, and remain loyal despite competitive alternatives. Therefore, understanding the relationship between AI-generated advertising and brand trust has become increasingly important for marketers.

In addition, consumer loyalty is a key determinant of business sustainability and profitability. Loyal customers contribute to repeat purchases, positive word-of-mouth communication, and long-term brand equity. Although previous studies have examined digital advertising and consumer behavior, limited research has specifically focused on how AI-generated advertising influences both brand trust and consumer loyalty simultaneously. This study attempts to bridge this gap by examining the impact of AI-generated advertising on brand trust and consumer loyalty and by investigating the role of brand trust in strengthening consumer loyalty. The findings of this study are expected to provide valuable insights for marketers, researchers, and organizations seeking to implement AI-driven advertising strategies effectively.

REVIEW OF LITERATURE

Artificial Intelligence (AI) has become a transformative force in marketing by enabling businesses to deliver personalized, data-driven, and engaging advertising experiences. Dwivedi et al. (2021) emphasized that AI enhances customer engagement through predictive analytics and personalized marketing, while Davenport et al. (2021) highlighted that AI improves customer interactions, operational efficiency, and marketing performance through automated content creation. Similarly, Huang and Rust (2021) reported that AI supports customer segmentation, personalized communication, and marketing decision-making, allowing organizations to improve customer satisfaction and competitive advantage. Furthermore, Kumar et al. (2021) found that AI-enabled customer relationship management significantly improves customer satisfaction and long-term loyalty when transparency and ethical practices are maintained.

Recent studies have also demonstrated the effectiveness of AI-generated advertising in influencing consumer attitudes and purchase behavior. Chatterjee et al. (2022) observed that AI-generated advertisements significantly improve consumer engagement and purchase intention through personalized recommendations. Likewise, Verma et al. (2022) found that AI-powered recommendation systems enhance consumer trust by delivering relevant product suggestions based on customer preferences. Lim et al. (2022) further concluded that AI-generated advertisements are perceived as more engaging and useful when they reflect consumers' interests, thereby increasing advertising effectiveness. In addition, Haenlein and Kaplan (2022) noted that AI has transformed digital marketing through automated content generation, customer targeting, and campaign optimization, although ethical concerns related to transparency and privacy continue to influence consumer acceptance.

Several researchers have focused on the relationship between AI-generated advertising and brand trust. Yadav and Rahman (2023) reported that transparency, personalization, and information quality significantly enhance consumer trust toward AI-enabled brands. Similarly, Sharma et al. (2023) found that personalized AI advertisements positively influence customer satisfaction and repeat purchase intentions, thereby strengthening consumer loyalty. Singh and Kaur (2023) also revealed that innovative and personalized AI-generated advertisements improve consumer attitudes toward brands, although excessive automation may reduce consumer confidence. Moreover, Wang et al. (2023) concluded that AI-generated advertising provides organizations with a competitive advantage by increasing customer engagement and purchase intentions through data-driven marketing strategies.

More recent studies have emphasized the growing importance of AI-generated advertising in building long-term consumer relationships. Chen et al. (2024) found that AI-

generated advertisements on social media significantly enhance customer engagement and emotional attachment to brands through personalized content. Lee and Kim (2024) reported that consumers perceive AI-generated advertisements as more credible when they provide accurate, transparent, and informative product information, thereby increasing purchase intentions. Similarly, Zhao et al. (2024) demonstrated that brand trust mediates the relationship between AI-generated advertising and consumer loyalty, indicating that trustworthy AI communication is essential for sustaining long-term customer relationships.

Emerging evidence from recent studies has further highlighted the role of transparency and ethical AI practices in shaping consumer behavior. Solovjov (2025) found that AI-generated advertisements strengthen consumer loyalty but may reduce trust if consumers perceive the content as lacking authenticity. Likewise, Koning and Voorveld (2025) observed that AI-disclosure labels increase consumer awareness but may reduce trust in advertisements if not managed carefully.

Ribeiro et al. (2025) concluded that personalization, convenience, trust, and security are the primary factors influencing consumer acceptance of AI-based marketing, while Raju et al. (2025) reported that hyper-personalized AI marketing significantly improves customer engagement and brand loyalty when supported by transparent and ethical practices. Finally, Rahman (2025) emphasized that AI-driven personalization enhances consumer trust and brand loyalty by delivering relevant customer experiences, although privacy concerns remain a significant challenge for marketers.

RESEARCH GAP

Although previous studies have highlighted the importance of Artificial Intelligence (AI) in digital marketing, most have focused on AI adoption, personalization, or consumer engagement independently. Limited empirical research has examined the combined relationship between AI-generated advertising, brand trust, and consumer loyalty within a single framework. Furthermore, many existing studies are based on developed countries, with relatively little evidence from the Indian context, where consumer behavior and digital adoption differ significantly. Therefore, this study addresses the existing research gap by investigating how AI-generated advertising influences brand trust and consumer loyalty, providing empirical evidence that contributes to AI-driven marketing literature and managerial decision-making.

STATEMENT OF THE PROBLEM

The increasing use of AI-generated advertising has transformed the way organizations communicate with consumers. Although AI enables firms to create personalized, engaging, and data-driven advertisements, consumers may differ in their perceptions regarding the credibility, transparency, and reliability of such advertisements. If consumers perceive AI-generated advertising as manipulative or untrustworthy, it may negatively affect their confidence in brands and reduce their willingness to remain loyal customers. On the other hand, effective AI-generated advertising may strengthen brand trust and encourage repeat purchase behavior. Despite the growing adoption of AI technologies in marketing, limited empirical evidence is available regarding the extent to which AI-generated advertising influences brand trust and consumer loyalty, particularly in the Indian context. Therefore, the present study seeks to examine whether AI-generated advertising significantly affects brand trust and consumer loyalty and whether brand trust plays an important role in enhancing consumer loyalty toward brands using AI-generated advertising.

OBJECTIVES OF THE STUDY

1. To examine the impact of AI-generated advertising on brand trust among consumers.
2. To assess the influence of AI-generated advertising on consumer loyalty.
3. To investigate the effect of brand trust on consumer loyalty in the context of AI-generated advertising.

HYPOTHESIS OF THE STUDY

- H_{01} (Null Hypothesis): AI-generated advertising has no significant impact on brand trust among consumers.
- H_{02} (Null Hypothesis): AI-generated advertising has no significant influence on consumer loyalty.
- H_{03} (Null Hypothesis): Brand trust has no significant effect on consumer loyalty in the context of AI-generated advertising.

RESEARCH METHODOLOGY

The study adopted a descriptive research design to examine the impact of AI-generated advertising on brand trust and consumer loyalty. Primary data were collected through a structured questionnaire using a five-point Likert scale. The questionnaire consisted of demographic variables, AI-generated advertising items, brand trust items, and consumer loyalty items.

A total of 120 respondents were selected using the convenience sampling method. The collected data were analyzed using descriptive statistics such as frequency and percentage analysis, followed by regression analysis to test the proposed hypotheses. Statistical analysis was performed using SPSS software to examine the relationships among the study variables.

LIMITATION AND SCOPE OF THE STUDY

The study is limited to 120 respondents, which may restrict the generalizability of the findings to a larger population. The use of convenience sampling may introduce sampling bias, and the responses are based on consumers' self-reported perceptions, which may be influenced by personal opinions and experiences.

The study focuses only on AI-generated advertising and does not consider other factors such as brand image, price, or service quality that may also influence consumer loyalty. Despite these limitations, the study provides valuable insights into consumer perceptions of AI-generated advertising and offers scope for future research involving larger samples, different industries, and advanced analytical techniques such as structural equation modeling.

ANALYSIS AND INTERPRETATION

Table 1
Demographic Profile of the Respondents

Variables	Category	Frequency	Percentage (%)
Gender	Male	68	56.7
	Female	50	41.7
	Other	2	1.6
	Total	**120**	**100.0**
Age	Below 20 years	10	8.3
	21–30 years	52	43.3
	31–40 years	32	26.7
	41–50 years	18	15.0
	Above 50 years	8	6.7
	Total	**120**	**100.0**
Educational Qualification	Higher Secondary	14	11.7
	Undergraduate	40	33.3
	Postgraduate	46	38.3
	Professional Degree	14	11.7

	Doctorate	6	5.0
	Total	**120**	**100.0**
Occupation	Student	24	20.0
	Government Employee	20	16.7
	Private Employee	40	33.3
	Self-employed	14	11.7
	Business	16	13.3
	Others	6	5.0
	Total	**120**	**100.0**
Monthly Income	Below ₹25,000	26	21.7
	₹25,001–₹50,000	34	28.3
	₹50,001–₹75,000	28	23.3
	₹75,001–₹1,00,000	18	15.0
	Above ₹1,00,000	14	11.7
	Total	**120**	**100.0**
Encounter with AI-Generated Advertisements	Daily	42	35.0
	Weekly	36	30.0
	Occasionally	24	20.0
	Rarely	12	10.0
	Never	6	5.0
	Total	**120**	**100.0**

(Source: Primary Data)

Table 1 presents the demographic characteristics of the 120 respondents. Among them, 68 respondents (56.7%) were male, 50 respondents (41.7%) were female, and 2 respondents (1.6%) identified as other, indicating that male respondents constituted the majority of the sample. Regarding age, the largest proportion of respondents (52; 43.3%) belonged to the 21–30 years age group, followed by 31–40 years (32; 26.7%), 41–50 years (18; 15.0%), Below 20 years (10; 8.3%), and Above 50 years (8; 6.7%). In terms of educational qualification, 46 respondents (38.3%) were postgraduates, followed by 40 undergraduates (33.3%), while 14 respondents (11.7%) each had completed Higher Secondary and Professional Degree qualifications.

Only 6 respondents (5.0%) held a Doctorate degree. Concerning occupation, the majority were private employees (40; 33.3%), followed by students (24; 20.0%), government employees (20; 16.7%), business owners (16; 13.3%), self-employed individuals (14; 11.7%), and others (6; 5.0%). With respect to monthly income, 34 respondents (28.3%) earned between ₹25,001 and ₹50,000, while 28 respondents (23.3%) earned between ₹50,001 and ₹75,000. Additionally, 26 respondents (21.7%) earned below ₹25,000, 18 respondents (15.0%) earned between ₹75,001 and ₹1,00,000, and 14 respondents (11.7%) earned above ₹1,00,000.

Regarding exposure to AI-generated advertisements, 42 respondents (35.0%) encountered such advertisements daily, 36 respondents (30.0%) weekly, 24 respondents (20.0%) occasionally, 12 respondents (10.0%) rarely, and 6 respondents (5.0%) reported never encountering AI-generated advertisements.

Table 2
AI-Generated Advertising

S.No.	Statement	SD	D	N	A	SA
AGA1	I frequently notice AI-generated advertisements on digital platforms.	8 (6.7%)	12 (10.0%)	20 (16.7%)	46 (38.3%)	34 (28.3%)
AGA2	AI-generated advertisements provide information relevant to my interests.	6 (5.0%)	10 (8.3%)	22 (18.3%)	48 (40.0%)	34 (28.3%)
AGA3	AI-generated advertisements are visually attractive and engaging.	5 (4.2%)	12 (10.0%)	24 (20.0%)	45 (37.5%)	34 (28.3%)
AGA4	AI-generated advertisements provide personalized recommendations that match my needs.	7 (5.8%)	13 (10.8%)	26 (21.7%)	42 (35.0%)	32 (26.7%)
AGA5	AI-generated advertisements improve my shopping experience.	6 (5.0%)	15 (12.5%)	23 (19.2%)	44 (36.7%)	32 (26.7%)
AGA6	I pay more attention to advertisements created using AI technology.	8 (6.7%)	14 (11.7%)	22 (18.3%)	43 (35.8%)	33 (27.5%)
AGA7	AI-generated advertisements influence my purchase decisions.	9 (7.5%)	13 (10.8%)	24 (20.0%)	42 (35.0%)	32 (26.7%)
AGA8	I consider AI-generated advertising more innovative than traditional advertising.	5 (4.2%)	10 (8.3%)	21 (17.5%)	47 (39.2%)	37 (30.8%)

(Source: Primary Data)

Table 2 presents respondents' perceptions of AI-generated advertising. The majority of respondents either agreed or strongly agreed with all eight statements, indicating a positive perception of AI-generated advertising. For instance, 66.6% of respondents agreed or strongly agreed that they frequently noticed AI-generated advertisements on digital platforms (AGA1). Likewise, 68.3% believed that AI-generated advertisements provide information relevant to their interests (AGA2). Furthermore, 65.8% of respondents agreed or strongly agreed that AI-generated advertisements are visually attractive and engaging (AGA3), while 61.7% perceived that AI-generated advertisements provide personalized recommendations matching their needs (AGA4). Similarly, 63.4% agreed that AI-generated advertisements improved their shopping experience (AGA5), and 63.3% reported paying more attention to advertisements created using AI technology (AGA6). More than sixty percent also acknowledged that AI-generated advertisements influenced their purchase decisions (AGA7). Notably, the highest level of agreement (70.0%) was observed for the statement that AI-

generated advertising is more innovative than traditional advertising (AGA8). Overall, the findings indicate that respondents held favorable attitudes toward AI-generated advertising.

Table 3
Brand Trust

S.No.	Statement	SD	D	N	A	SA
BT1	AI-generated advertisements increase my trust in a brand.	7 (5.8%)	11 (9.2%)	24 (20.0%)	46 (38.3%)	32 (26.7%)
BT2	I believe brands using AI-generated advertisements are reliable.	6 (5.0%)	12 (10.0%)	25 (20.8%)	45 (37.5%)	32 (26.7%)
BT3	AI-generated advertisements provide accurate product information.	8 (6.7%)	14 (11.7%)	24 (20.0%)	42 (35.0%)	32 (26.7%)
BT4	AI-generated advertisements make brands appear more transparent.	7 (5.8%)	13 (10.8%)	23 (19.2%)	44 (36.7%)	33 (27.5%)
BT5	I feel confident purchasing products promoted through AI-generated advertisements.	6 (5.0%)	12 (10.0%)	24 (20.0%)	45 (37.5%)	33 (27.5%)
BT6	AI-generated advertisements strengthen my confidence in a brand.	7 (5.8%)	11 (9.2%)	22 (18.3%)	46 (38.3%)	34 (28.3%)

(Source: Primary Data)

Table 3 illustrates respondents' perceptions of brand trust resulting from AI-generated advertising. The findings reveal that respondents generally expressed positive trust toward brands employing AI-generated advertising. Approximately 65.0% of respondents agreed or strongly agreed that AI-generated advertisements increased their trust in brands (BT1). Similarly, 64.2% believed that brands using AI-generated advertising were reliable (BT2), while 61.7% agreed that AI-generated advertisements provided accurate product information (BT3). Around 64.2% also agreed that AI-generated advertisements enhanced brand transparency (BT4). Moreover, 65.0% of respondents felt confident purchasing products promoted through AI-generated advertisements (BT5), and 66.6% agreed that AI-generated advertising strengthened their confidence in brands (BT6). These findings suggest that AI-generated advertising positively contributes to building consumer trust in brands.

Table 4
Consumer Perceptions

S.No.	Statement	SD	D	N	A	SA
CP1	I prefer purchasing from brands that use AI-generated advertisements.	8 (6.7%)	12 (10.0%)	23 (19.2%)	44 (36.7%)	33 (27.5%)
CP2	I intend to continue purchasing products from brands using AI-generated advertising.	7 (5.8%)	11 (9.2%)	24 (20.0%)	45 (37.5%)	33 (27.5%)

CP3	I would recommend brands using AI-generated advertisements to others.	6 (5.0%)	13 (10.8%)	22 (18.3%)	46 (38.3%)	33 (27.5%)
CP4	AI-generated advertisements encourage me to remain loyal to a brand.	7 (5.8%)	12 (10.0%)	23 (19.2%)	45 (37.5%)	33 (27.5%)
CP5	I am willing to choose my preferred brand even when competitors offer similar products.	8 (6.7%)	14 (11.7%)	24 (20.0%)	42 (35.0%)	32 (26.7%)
CP6	I feel emotionally connected to brands that effectively use AI-generated advertising.	9 (7.5%)	13 (10.8%)	25 (20.8%)	42 (35.0%)	31 (25.9%)

(Source: Primary Data)

Table 4 presents respondents' perceptions regarding consumer loyalty toward brands using AI-generated advertising. A majority of respondents demonstrated favorable loyalty intentions. About 64.2% of respondents agreed or strongly agreed that they preferred purchasing from brands using AI-generated advertising (CL1). Likewise, 65.0% intended to continue purchasing products from such brands (CL2). In addition, 65.8% indicated that they would recommend brands using AI-generated advertisements to others (CL3). Nearly 65.0% agreed that AI-generated advertisements encouraged them to remain loyal to a brand (CL4). Furthermore, 61.7% expressed willingness to continue choosing their preferred brand despite the availability of similar competitor products (CL5). Finally, 60.9% reported feeling emotionally connected to brands that effectively use AI-generated advertising (CL6). Overall, the findings demonstrate that AI-generated advertising positively influences consumer loyalty.

TESTING OF HYPOTHESIS

Table 5

Regression Analysis: Impact of AI-Generated Advertising on Brand Trust

Predictor	B	Std. Error	Beta	t-value	Sig.
(Constant)	1.184	0.246	—	4.813	0.000
AI-Generated Advertising	0.691	0.062	0.718	11.145	0.000**

Model Summary

R	R^2	Adjusted R^2	F	Sig.
0.718	**0.516**	**0.512**	**124.21**	**0.000**

Table 5 presents the regression analysis examining the impact of AI-generated advertising on brand trust. The regression coefficient ($\beta = 0.718$) indicates a strong positive relationship between AI-generated advertising and brand trust. The t-value of 11.145 and p-value of 0.000 ($p < 0.001$) demonstrate that the relationship is statistically significant. The model summary reveals an R value of 0.718, indicating a strong correlation between AI-generated advertising and brand trust. The R^2 value of 0.516 indicates that 51.6% of the variation in brand trust is explained by AI-generated advertising, while the remaining variation is attributable to other factors not included in the model. The F-value of 124.21 ($p < 0.001$) confirms that the regression model is statistically significant. Therefore, the null hypothesis (H_{01}) is rejected, and it is concluded that AI-generated advertising has a significant positive impact on brand trust among consumers.

Table 6
Regression Analysis: Impact of AI-Generated Advertising on Consumer Loyalty

Predictor	B	Std. Error	Beta	t-value	Sig.
(Constant)	1.092	0.261	—	4.182	0.000
AI-Generated Advertising	0.642	0.067	0.669	9.582	0.000**

Model Summary

R	R^2	Adjusted R^2	F	Sig.
0.669	0.448	0.443	91.82	0.000

Table 6 examines the influence of AI-generated advertising on consumer loyalty. The standardized regression coefficient (β = 0.669) indicates a positive and substantial influence of AI-generated advertising on consumer loyalty. The t-value of 9.582 with a significance level of 0.000 ($p < 0.001$) confirms that the relationship is statistically significant. The R value of 0.669 suggests a moderately strong positive relationship between AI-generated advertising and consumer loyalty. The R^2 value of 0.448 indicates that 44.8% of the variation in consumer loyalty is explained by AI-generated advertising. The F-statistic of 91.82 ($p < 0.001$) confirms that the overall regression model is statistically significant. Hence, the null hypothesis (H_{02}) is rejected, indicating that AI-generated advertising significantly influences consumer loyalty.

Table 7
Regression Analysis: Impact of Brand Trust on Consumer Loyalty

Predictor	B	Std. Error	Beta	t-value	Sig.
(Constant)	0.936	0.228	—	4.105	0.000
Brand Trust	0.781	0.058	0.778	13.466	0.000**

Model Summary

R	R^2	Adjusted R^2	F	Sig.
0.778	0.605	0.602	181.34	0.000

Table 7 presents the regression analysis examining the effect of brand trust on consumer loyalty. The standardized regression coefficient (β = 0.778) indicates a strong positive influence of brand trust on consumer loyalty. The t-value of 13.466 and p-value of 0.000 ($p < 0.001$) confirm that the relationship is highly statistically significant. The R value of 0.778 indicates a strong positive association between brand trust and consumer loyalty. The R^2 value of 0.605 suggests that 60.5% of the variation in consumer loyalty is explained by brand trust. Moreover, the F-value of 181.34 ($p < 0.001$) demonstrates that the regression model is highly significant. Therefore, the null hypothesis (H_{03}) is rejected, confirming that brand trust has a significant positive effect on consumer loyalty in the context of AI-generated advertising.

RESULTS AND DISCUSSION

RESULTS

The study found that the majority of respondents were male (56.7%) and belonged to the 21–30 years age group (43.3%), indicating that young adults are the primary audience exposed to AI-generated advertising. Most respondents encountered AI-generated advertisements daily or weekly, reflecting the increasing adoption of AI-driven promotional strategies in digital marketing. The descriptive analysis revealed that respondents generally held positive perceptions of AI-generated advertising, particularly regarding its innovativeness, personalization, and relevance to their interests. The findings also indicated that AI-generated advertisements positively influenced brand trust, as most respondents believed that such advertisements enhanced brand reliability, transparency, and confidence in purchasing decisions. Similarly, respondents demonstrated favorable consumer loyalty by

expressing intentions to continue purchasing, recommending brands, and remaining loyal to brands that effectively use AI-generated advertising. The regression analysis further confirmed that AI-generated advertising has a significant positive impact on brand trust ($\beta = 0.718$, $p < 0.001$) and consumer loyalty ($\beta = 0.669$, $p < 0.001$). Moreover, brand trust was found to have the strongest positive influence on consumer loyalty ($\beta = 0.778$, $p < 0.001$). Therefore, all three null hypotheses were rejected, confirming that AI-generated advertising significantly enhances brand trust and consumer loyalty, while brand trust plays a crucial mediating role in strengthening long-term consumer relationships.

DISCUSSION

Organizations should design AI-generated advertisements that are personalized, informative, and transparent to strengthen consumer trust and loyalty. Businesses must ensure that AI-generated content is accurate, authentic, and aligned with consumer preferences to improve credibility and engagement. Companies should clearly disclose the responsible use of AI technologies while maintaining ethical standards and protecting consumer privacy. Regular monitoring and evaluation of AI-generated advertising campaigns can help organizations understand changing consumer expectations and improve advertising effectiveness. Marketers should combine AI capabilities with human creativity to produce emotionally engaging and trustworthy advertisements. Providing consumers with relevant recommendations without compromising data security will further enhance confidence in AI-driven marketing. Organizations should also invest in consumer awareness initiatives that explain the benefits and limitations of AI-generated advertising, thereby reducing skepticism and increasing acceptance. Finally, future marketing strategies should focus on building long-term brand trust, as trust was identified as the strongest predictor of consumer loyalty in the present study.

CONCLUSION

Artificial Intelligence has become an essential component of modern digital marketing, enabling organizations to deliver personalized and engaging advertising experiences. The findings of this study demonstrate that AI-generated advertising significantly influences both brand trust and consumer loyalty. Consumers generally perceive AI-generated advertisements as innovative, relevant, and helpful, leading to greater confidence in brands and stronger purchase intentions. The study also confirms that brand trust plays a vital role in enhancing consumer loyalty, indicating that trustworthy AI-generated communication is fundamental for sustaining long-term customer relationships. The regression analysis provides strong empirical evidence that AI-generated advertising positively contributes to brand trust, which subsequently strengthens consumer loyalty. Therefore, organizations should adopt AI-driven advertising strategies while ensuring transparency, authenticity, and ethical use of consumer data. By balancing technological innovation with responsible marketing practices, businesses can enhance customer satisfaction, strengthen brand equity, and achieve sustainable competitive advantage in the increasingly digital marketplace.

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DETERMINANTS OF MUTUAL FUND INVESTMENT BEHAVIOUR AMONG RETAIL INVESTORS: AN EMPIRICAL STUDY ON RISK PERCEPTION, FINANCIAL LITERACY AND INVESTMENT AWARENESS

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ABSTRACT

Mutual funds have become an important investment avenue for retail investors owing to their potential for diversification, professional management, and long-term wealth creation. This study examines the influence of financial literacy, risk perception, and investment awareness on mutual fund investment behaviour among retail investors. A descriptive research design was adopted, and primary data were collected from 95 retail investors using a structured questionnaire. Convenience sampling was employed, and the collected data were analysed using descriptive statistics, Pearson correlation, and multiple linear regression analysis through SPSS. The findings reveal that financial literacy, risk perception, and investment awareness have significant positive relationships with mutual fund investment behaviour. Among the three determinants, investment awareness emerged as the strongest predictor, followed by financial literacy and risk perception. The regression model explained 67.9% of the variation in investment behaviour, indicating strong explanatory power. The study concludes that enhancing financial knowledge and investor awareness can promote informed investment decisions and encourage greater participation in mutual fund investments.

KEYWORDS: Mutual Fund Investment Behaviour, Financial Literacy, Risk Perception, Investment Awareness, Retail Investors, Multiple Linear Regression.

INTRODUCTION

Mutual funds have emerged as one of the most preferred investment avenues for retail investors due to their ability to provide diversification, professional fund management, liquidity, and long-term wealth creation. In recent years, the rapid growth of the financial services sector, increasing digitalization, and improved access to investment platforms have significantly contributed to the expansion of the mutual fund industry. Despite these developments, retail investors' investment decisions continue to be influenced by several behavioural and financial factors. Among these, financial literacy, risk perception, and investment awareness are considered critical determinants that shape investment behaviour and influence the selection of appropriate mutual fund schemes.

Financial literacy enables investors to understand financial concepts, evaluate investment alternatives, and make informed decisions. Risk perception reflects investors' ability to assess market uncertainties and balance potential returns against possible losses. Likewise, investment awareness enhances knowledge regarding mutual fund products, systematic investment plans (SIPs), taxation benefits, and portfolio diversification strategies. Investors possessing higher levels of financial literacy and investment awareness are more likely to demonstrate rational investment behaviour and achieve superior financial outcomes. Therefore, the present study aims to examine the influence of financial literacy, risk perception, and investment awareness on mutual fund investment behaviour among retail investors. The findings are expected to provide valuable insights for policymakers, financial institutions, mutual fund companies, and investors in promoting informed investment decisions and encouraging greater participation in the mutual fund market.

REVIEW OF LITERATURE

The existing literature indicates that financial literacy, risk perception, and investment awareness are the primary determinants influencing mutual fund investment behaviour among retail investors. Previous studies consistently demonstrate that financially literate individuals possess better knowledge of financial products, enabling them to evaluate investment alternatives, understand risk-return relationships, and make informed investment decisions. Financial literacy enhances investors' confidence, reduces behavioural biases, and encourages systematic investment practices that contribute to long-term wealth creation. Researchers have also emphasized that financial education programmes improve saving and investment behaviour by strengthening investors' financial capability and decision-making skills. Investment awareness has been identified as another significant factor affecting mutual fund participation. Investors who are well informed about mutual fund schemes, Systematic Investment Plans (SIPs), taxation benefits, portfolio diversification, and market performance exhibit greater confidence and are more willing to invest in mutual funds. Studies further reveal that investors who actively seek financial information and remain aware of changing market conditions make more rational and profitable investment decisions than those with limited awareness. In addition, risk perception plays a crucial role in shaping investment behaviour. Investors with a better understanding of investment risks are more likely to diversify their portfolios, balance risk with expected returns, and adopt long-term investment strategies. Appropriate assessment of market uncertainty enables investors to make sound financial decisions while minimizing potential losses. Behavioural finance studies also suggest that financial confidence, investor awareness, and risk tolerance collectively influence investment decisions by reducing emotional biases and encouraging disciplined investment practices. Recent empirical studies conducted in India and other countries have confirmed that financial literacy, investment awareness, and risk perception significantly and positively influence mutual fund investment behaviour.

The growing adoption of digital financial services and online investment platforms has further increased the importance of financial knowledge and awareness in promoting retail participation in mutual fund investments. Collectively, the reviewed studies establish that these three determinants are closely interrelated and play a vital role in influencing retail investors' investment decisions. However, most previous studies have examined these variables independently or within limited contexts. Therefore, there remains a need for a comprehensive empirical investigation that simultaneously examines the combined influence of financial literacy, risk perception, and investment awareness on mutual fund investment behaviour among retail investors. The present study addresses this research gap by developing an integrated framework to analyse how these determinants collectively shape investment behaviour and contribute to informed financial decision-making.

RESEARCH GAP

Previous studies have primarily examined financial literacy, risk perception, and investment awareness separately in influencing mutual fund investment behaviour. Limited research has investigated their combined impact among retail investors using a comprehensive empirical framework. This study addresses this gap by analysing the integrated influence of these determinants on mutual fund investment behaviour.

STATEMENT OF THE PROBLEM

Mutual funds have become an increasingly popular investment avenue among retail investors due to their potential for wealth creation, diversification, and professional fund management. However, despite the growing awareness and accessibility of mutual fund products, many retail investors continue to exhibit inconsistent investment behaviour because of inadequate financial literacy, varying perceptions of investment risk, and limited awareness of available investment opportunities. These factors often lead to poor investment decisions, lower participation in mutual fund schemes, and suboptimal financial outcomes. Although several studies have examined individual determinants of investment behaviour, limited research has investigated the combined influence of financial literacy, risk perception, and investment awareness within a single empirical framework. Furthermore, the changing investment landscape driven by digital financial services necessitates updated evidence on retail investors' behaviour. Therefore, this study seeks to examine how these determinants collectively influence mutual fund investment behaviour and provide insights for enhancing informed investment decision-making among retail investors.

OBJECTIVES OF THE STUDY

1. To examine the influence of financial literacy on mutual fund investment behaviour among retail investors.
2. To analyse the effect of risk perception on mutual fund investment behaviour among retail investors.
3. To evaluate the impact of investment awareness on mutual fund investment behaviour among retail investors.

HYPOTHESES OF THE STUDY

- **$H0_1$:** Financial literacy has no significant influence on mutual fund investment behaviour among retail investors.
- **$H0_2$:** Risk perception has no significant influence on mutual fund investment behaviour among retail investors.
- **$H0_3$:** Investment awareness has no significant influence on mutual fund investment behaviour among retail investors.

RESEARCH METHODOLOGY

The present study adopted a descriptive research design to examine the determinants of mutual fund investment behaviour among retail investors. Primary data were collected through a structured questionnaire designed using a five-point Likert scale. The study was conducted among 95 retail investors, selected using the convenience sampling technique. The questionnaire comprised two sections: the first captured the demographic profile of the respondents, while the second measured the constructs of financial literacy, risk perception, investment awareness, and mutual fund investment behaviour. Secondary data were gathered from journals, books, reports, and relevant online sources to support the theoretical framework. The collected data were coded and analysed using SPSS Statistics. Descriptive statistics were employed to analyse the demographic characteristics of the respondents, while Pearson Correlation Analysis was used to examine relationships among the variables. Multiple Linear Regression Analysis, including ANOVA and regression coefficients, was

performed to determine the influence of the independent variables on mutual fund investment behaviour and to test the proposed hypotheses.

LIMITATION AND SCOPE OF THE STUDY

The study considers only three determinants—financial literacy, risk perception, and investment awareness—while other factors such as income, personality traits, market conditions, and behavioural biases are beyond its scope.

Despite these limitations, the study provides valuable insights into the factors influencing mutual fund investment behaviour. The findings offer useful implications for policymakers, financial institutions, mutual fund companies, and investors in promoting informed investment decisions.

RESULTS AND DISCUSSION

Table 1
Demographic Profile of the Respondents

Variables	Category	Frequency	Percentage (%)
Gender	Male	54	56.8
	Female	39	41.1
	Other	2	2.1
	Total	**95**	**100.0**
Age	Below 25 Years	18	18.9
	26–35 Years	32	33.7
	36–45 Years	24	25.3
	46–55 Years	14	14.7
	Above 55 Years	7	7.4
	Total	**95**	**100.0**
Marital Status	Single	37	38.9
	Married	54	56.8
	Others	4	4.3
	Total	**95**	**100.0**
Educational Qualification	Higher Secondary	11	11.6
	Diploma	8	8.4
	Undergraduate	24	25.3
	Postgraduate	34	35.8
	Professional Degree	13	13.7
	Doctorate	5	5.2
	Total	**95**	**100.0**
Occupation	Government Employee	16	16.8
	Private Employee	31	32.6
	Business	18	18.9
	Self-employed	12	12.6
	Professional	8	8.4
	Student	6	6.3
	Others	4	4.2
	Total	**95**	**100.0**
Monthly Income	Below ₹25,000	19	20.0

	₹25,001–₹50,000	31	32.6
	₹50,001–₹75,000	22	23.2
	₹75,001–₹1,00,000	14	14.7
	Above ₹1,00,000	9	9.5
	Total	**95**	**100.0**
Investment Experience	Less than 1 Year	17	17.9
	1–3 Years	29	30.5
	4–6 Years	22	23.2
	7–10 Years	16	16.8
	Above 10 Years	11	11.6
	Total	**95**	**100.0**
Preferred Investment Avenue	Mutual Funds	39	41.1
	Fixed Deposits	14	14.7
	Gold	11	11.6
	Insurance	9	9.5
	Stocks	15	15.8
	Real Estate	4	4.2
	Others	3	3.1
	Total	**95**	**100.0**

(Sources: Primary Data)

Table 1 presents the demographic characteristics of the 95 retail investors who participated in the study. The findings reveal that 54 respondents (56.8%) were male, while 39 respondents (41.1%) were female and 2 respondents (2.1%) identified as other, indicating that male investors constituted the majority of the sample.

With respect to age, the largest proportion of respondents belonged to the 26–35 years age group, comprising 32 respondents (33.7%), followed by 36–45 years with 24 respondents (25.3%). Respondents aged below 25 years accounted for 18 (18.9%), while those aged 46–55 years and above 55 years represented 14 (14.7%) and 7 (7.4%), respectively. This suggests that mutual fund investments are more popular among young and middle-aged investors.

Regarding marital status, 54 respondents (56.8%) were married, 37 respondents (38.9%) were single, and 4 respondents (4.3%) belonged to other categories. The predominance of married respondents indicates that individuals with family responsibilities may be more inclined to invest in mutual funds for long-term financial security.

In terms of educational qualification, the majority of respondents were postgraduates (34 respondents; 35.8%), followed by undergraduates (24 respondents; 25.3%), professional degree holders (13 respondents; 13.7%), higher secondary (11 respondents; 11.6%), diploma holders (8 respondents; 8.4%), and doctorates (5 respondents; 5.2%). The findings indicate that respondents with higher educational attainment are more actively involved in mutual fund investments.

Analysis of occupation shows that private employees constituted the largest group (31 respondents; 32.6%), followed by business owners (18 respondents; 18.9%), government employees (16 respondents; 16.8%), self-employed individuals (12 respondents; 12.6%), professionals (8 respondents; 8.4%), students (6 respondents; 6.3%), and others (4 respondents; 4.2%). This suggests that salaried employees, particularly those employed in the private sector, are more likely to participate in mutual fund investments.

The distribution of monthly income indicates that 31 respondents (32.6%) earned between ₹25,001 and ₹50,000, making it the largest income group. This was followed by 22

respondents (23.2%) earning ₹50,001–₹75,000, 19 respondents (20.0%) earning below ₹25,000, 14 respondents (14.7%) earning ₹75,001–₹1,00,000, and 9 respondents (9.5%) earning above ₹1,00,000. The findings suggest that individuals with middle-income levels form the majority of mutual fund investors.

With regard to investment experience, 29 respondents (30.5%) had 1–3 years of investment experience, followed by 22 respondents (23.2%) with 4–6 years, 17 respondents (17.9%) with less than one year, 16 respondents (16.8%) with 7–10 years, and 11 respondents (11.6%) with more than 10 years of experience. This indicates that a considerable proportion of respondents are relatively new investors, reflecting growing interest in mutual fund investments.

Finally, concerning preferred investment avenues, 39 respondents (41.1%) preferred mutual funds, followed by stocks (15 respondents; 15.8%), fixed deposits (14 respondents; 14.7%), gold (11 respondents; 11.6%), insurance (9 respondents; 9.5%), real estate (4 respondents; 4.2%), and other investment options (3 respondents; 3.1%). The findings demonstrate that mutual funds are the most preferred investment avenue among the respondents, highlighting their increasing popularity due to their potential for diversification, professional fund management, and long-term wealth creation.

Table 2

Opinions on the Determinants of Mutual Fund Investment Behaviour

Variable	Statement	SD	D	N	A	SA
Financial Literacy	I understand the basic concepts of mutual funds.	3 (3.2%)	7 (7.4%)	14 (14.7%)	43 (45.3%)	28 (29.5%)
	I can compare different mutual fund schemes before investing.	4 (4.2%)	8 (8.4%)	16 (16.8%)	40 (42.1%)	27 (28.5%)
	I understand the relationship between risk and return.	2 (2.1%)	9 (9.5%)	13 (13.7%)	42 (44.2%)	29 (30.5%)
	I regularly read financial news related to investments.	5 (5.3%)	10 (10.5%)	18 (18.9%)	39 (41.1%)	23 (24.2%)
	I understand the impact of inflation on investments.	4 (4.2%)	8 (8.4%)	15 (15.8%)	41 (43.2%)	27 (28.4%)
	I am confident in making investment decisions independently.	3 (3.2%)	9 (9.5%)	16 (16.8%)	40 (42.1%)	27 (28.4%)
Risk Perception	I carefully evaluate the risks before investing in mutual funds.	2 (2.1%)	8 (8.4%)	14 (14.7%)	45 (47.4%)	26 (27.4%)
	Market volatility influences my investment decisions.	3 (3.2%)	9 (9.5%)	15 (15.8%)	42 (44.2%)	26 (27.3%)
	I prefer investments with lower risk even if returns are moderate.	4 (4.2%)	10 (10.5%)	17 (17.9%)	39 (41.1%)	25 (26.3%)

	I am willing to accept higher risk for higher returns.	5 (5.3%)	11 (11.6%)	18 (18.9%)	37 (38.9%)	24 (25.3%)
	Economic uncertainty affects my willingness to invest.	3 (3.2%)	8 (8.4%)	16 (16.8%)	41 (43.2%)	27 (28.4%)
	I diversify my investments to reduce risk.	2 (2.1%)	7 (7.4%)	14 (14.7%)	44 (46.3%)	28 (29.5%)
Investment Awareness	I am aware of different types of mutual fund schemes.	3 (3.2%)	8 (8.4%)	15 (15.8%)	43 (45.3%)	26 (27.3%)
	I understand the benefits of Systematic Investment Plans (SIPs).	2 (2.1%)	7 (7.4%)	13 (13.7%)	44 (46.3%)	29 (30.5%)
	I regularly attend or follow investment awareness programmes.	5 (5.3%)	12 (12.6%)	18 (18.9%)	37 (38.9%)	23 (24.3%)
	I know how to evaluate mutual fund performance.	3 (3.2%)	8 (8.4%)	16 (16.8%)	42 (44.2%)	26 (27.4%)
	I understand the tax benefits associated with mutual fund investments.	4 (4.2%)	9 (9.5%)	15 (15.8%)	41 (43.2%)	26 (27.3%)
	I actively seek information before investing in mutual funds.	2 (2.1%)	7 (7.4%)	14 (14.7%)	43 (45.3%)	29 (30.5%)
Mutual Fund Investment Behaviour	I regularly invest in mutual funds.	3 (3.2%)	9 (9.5%)	15 (15.8%)	41 (43.2%)	27 (28.3%)
	I prefer SIPs over lump-sum investments.	2 (2.1%)	8 (8.4%)	14 (14.7%)	43 (45.3%)	28 (29.5%)
	I review my mutual fund portfolio periodically.	4 (4.2%)	9 (9.5%)	16 (16.8%)	40 (42.1%)	26 (27.4%)
	I invest in mutual funds to achieve long-term financial goals.	2 (2.1%)	7 (7.4%)	13 (13.7%)	45 (47.4%)	28 (29.4%)
	Past performance influences my investment decisions.	3 (3.2%)	8 (8.4%)	15 (15.8%)	42 (44.2%)	27 (28.4%)
	I intend to continue investing in mutual funds in the future.	2 (2.1%)	7 (7.4%)	12 (12.6%)	44 (46.3%)	30 (31.6%)

(Sources: Primary Data)

Table 2 presents the respondents' opinions on the determinants of mutual fund investment behaviour, measured through four constructs**:** Financial Literacy, Risk Perception, Investment Awareness, and Mutual Fund Investment Behaviour. The responses were recorded on a five-point Likert scale ranging from Strongly Disagree (SD) to Strongly Agree (SA).
With regard to

Financial Literacy, the majority of respondents exhibited a positive perception toward their financial knowledge. Specifically, 43 respondents (45.3%) agreed and 28 respondents (29.5%) strongly agreed that they understood the basic concepts of mutual funds. Similarly, 40 respondents (42.1%) agreed and 27 respondents (28.5%) strongly agreed that they could compare different mutual fund schemes before investing. A considerable proportion of respondents also acknowledged their understanding of the relationship between risk and return, with 42 respondents (44.2%) agreeing and 29 respondents (30.5%) strongly agreeing. Although fewer respondents regularly read financial news, the majority still expressed positive opinions regarding awareness of inflation and confidence in making independent investment decisions. These findings indicate that respondents possess a satisfactory level of financial literacy, which is expected to influence their investment behaviour positively.

Regarding Risk Perception, respondents demonstrated a cautious yet informed approach toward mutual fund investments. Nearly half of the respondents (45 respondents; 47.4%) agreed that they carefully evaluated investment risks before investing, while 26 respondents (27.4%) strongly agreed. Likewise, 42 respondents (44.2%) agreed that market volatility influenced their investment decisions, indicating awareness of market uncertainty. Although respondents preferred lower-risk investments, many also expressed willingness to accept higher risk for potentially higher returns. Furthermore, 44 respondents (46.3%) agreed and 28 respondents (29.5%) strongly agreed that they diversified their investments to minimize risk. Overall, the findings suggest that respondents possess a balanced perception of investment risk and adopt prudent strategies while making mutual fund investment decisions.

With respect to Investment Awareness, the results indicate that respondents had a relatively high level of awareness regarding mutual fund investments. The majority (43 respondents; 45.3%) agreed that they were aware of different mutual fund schemes, while 29 respondents (30.5%) strongly agreed that they understood the benefits of Systematic Investment Plans (SIPs).

Respondents also reported being knowledgeable about evaluating mutual fund performance and understanding tax benefits. Although comparatively fewer respondents regularly attended investment awareness programmes, the majority actively sought investment-related information before making investment decisions. These findings reveal that respondents are well informed about various aspects of mutual fund investments, which contributes to better investment decision-making.

In terms of Mutual Fund Investment Behaviour, respondents exhibited favourable investment practices. A substantial proportion (41 respondents; 43.2%) agreed that they regularly invested in mutual funds, while 43 respondents (45.3%) agreed that they preferred SIPs over lump-sum investments.

Furthermore, 45 respondents (47.4%) agreed that they invested in mutual funds to achieve long-term financial goals, and 44 respondents (46.3%) agreed that they intended to continue investing in mutual funds in the future. Many respondents also reported periodically reviewing their investment portfolios and considering past performance before making investment decisions. These findings indicate positive investment behaviour among retail investors and demonstrate their commitment to long-term wealth creation through mutual fund investments.

TESTING OF HYPOTHESES

Table 3
Pearson Correlation Analysis among the Study Variables

Variables	Financial Literacy	Risk Perception	Investment Awareness	Mutual Fund Investment Behaviour
Financial Literacy	1.000			
Risk Perception	0.548**	1.000		
Investment Awareness	0.621**	0.587**	1.000	
Mutual Fund Investment Behaviour	**0.704**	**0.653**	**0.742**	1.000

Table 3 presents the Pearson correlation coefficients among Financial Literacy, Risk Perception, Investment Awareness, and Mutual Fund Investment Behaviour. The results indicate that all independent variables have a positive and statistically significant relationship with mutual fund investment behaviour.

Financial literacy shows a strong positive correlation with mutual fund investment behaviour ($r = 0.704$, $p < 0.01$), indicating that respondents with higher levels of financial knowledge are more likely to exhibit favourable mutual fund investment behaviour. Similarly, risk perception has a strong positive relationship with mutual fund investment behaviour ($r = 0.653$, $p < 0.01$), suggesting that investors who carefully assess investment risks are more inclined to make informed mutual fund investment decisions. Investment awareness records the strongest positive correlation with mutual fund investment behaviour ($r = 0.742$, $p < 0.01$), implying that greater awareness regarding mutual fund products and investment opportunities significantly enhances investment behaviour.

The correlation analysis also reveals significant positive relationships among the independent variables. Financial literacy is positively correlated with risk perception ($r = 0.548$, $p < 0.01$) and investment awareness ($r = 0.621$, $p < 0.01$), while risk perception is positively associated with investment awareness ($r = 0.587$, $p < 0.01$). Since all correlation coefficients are below 0.80, there is no indication of severe multicollinearity among the independent variables. Overall, the findings indicate that financial literacy, risk perception, and investment awareness are positively associated with mutual fund investment behaviour among retail investors.

Table 4
Multiple Linear Regression Analysis
Model Summary

R	R^2	Adjusted R^2	Std. Error
0.824	0.679	0.668	0.416

Table 4 presents the model summary of the multiple linear regression analysis examining the influence of financial literacy, risk perception, and investment awareness on mutual fund investment behaviour. The multiple correlation coefficient ($R = 0.824$) indicates a strong positive relationship between the combined independent variables and the dependent variable. The coefficient of determination ($R^2 = 0.679$) reveals that 67.9% of the variation in mutual fund investment behaviour is explained by financial literacy, risk perception, and investment awareness. The remaining 32.1% of the variation is attributed to other factors that were not included in the present study. The Adjusted R^2 value of 0.668 confirms that the regression model has good explanatory power after adjusting for the number of predictors

included in the model. Furthermore, the standard error of estimate (0.416) is relatively low, indicating that the regression model provides reliable predictions of mutual fund investment behaviour.

Table 5
ANOVA

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	34.214	3	11.405	**65.328**	**0.000**
Residual	15.884	91	0.175		
Total	50.098	94			

Table 5 presents the Analysis of Variance (ANOVA) results for the multiple regression model. The regression model produced an F-value of 65.328 with a significance level of 0.000 ($p < 0.001$). Since the significance value is less than the conventional threshold of 0.05, the overall regression model is statistically significant. The findings indicate that financial literacy, risk perception, and investment awareness jointly have a significant effect on mutual fund investment behaviour. Therefore, the regression model is appropriate for predicting mutual fund investment behaviour among retail investors. The ANOVA results confirm that the independent variables collectively explain a significant proportion of the variation in the dependent variable, supporting the suitability of the proposed research model.

Table 6
Multiple Regression Coefficients

Variables	Beta	t	Sig.	Decision
Financial Literacy	0.318	4.962	0.000	Significant
Risk Perception	0.264	3.987	0.000	Significant
Investment Awareness	0.391	5.874	0.000	Significant

Table 6 presents the regression coefficients showing the individual contribution of financial literacy, risk perception, and investment awareness to mutual fund investment behaviour. The results reveal that all three independent variables have a positive and statistically significant influence on mutual fund investment behaviour.

Financial literacy has a standardized beta coefficient of 0.318 with a t-value of 4.962 and a significance value of 0.000, indicating that financial literacy significantly influences mutual fund investment behaviour. Hence, the null hypothesis ($H0_1$) stating that financial literacy has no significant influence on mutual fund investment behaviour is rejected.

Risk perception has a standardized beta coefficient of 0.264, a t-value of 3.987, and a significance value of 0.000, indicating that risk perception also exerts a significant positive influence on mutual fund investment behaviour. Therefore, the null hypothesis ($H0_2$) is rejected.

Investment awareness records the highest standardized beta coefficient ($\beta = 0.391$), with a t-value of 5.874 and a significance value of 0.000, indicating that it is the strongest predictor of mutual fund investment behaviour among the three independent variables. Accordingly, the null hypothesis ($H0_3$) is rejected.

Overall, the regression analysis demonstrates that investment awareness is the most influential determinant of mutual fund investment behaviour, followed by financial literacy and risk perception. The findings confirm that improvements in financial knowledge, awareness of mutual fund products, and appropriate risk assessment significantly enhance mutual fund investment behaviour among retail investors.

FINDINGS

The study revealed that the majority of the respondents were male, belonged to the 26–35 years age group, were married, possessed postgraduate qualifications, and were employed in the private sector. Most respondents earned a monthly income between ₹25,001

and ₹50,000 and had one to three years of investment experience. Mutual funds emerged as the most preferred investment avenue, reflecting their growing acceptance among retail investors.

The opinion analysis indicated that respondents possessed a satisfactory level of financial literacy, demonstrated a balanced perception of investment risk, and exhibited considerable awareness of mutual fund products, Systematic Investment Plans (SIPs), and taxation benefits. The majority of respondents also reported positive mutual fund investment behaviour, including regular investment, periodic portfolio review, and a long-term investment perspective.

The Pearson correlation analysis revealed significant positive relationships between financial literacy, risk perception, investment awareness, and mutual fund investment behaviour. Multiple regression analysis confirmed that all three determinants significantly influenced mutual fund investment behaviour. Among them, investment awareness emerged as the strongest predictor, followed by financial literacy and risk perception. The regression model explained 67.9% of the variation in investment behaviour, indicating strong explanatory power. Overall, the findings demonstrate that improving financial knowledge, investment awareness, and risk assessment capabilities can significantly enhance mutual fund investment behaviour among retail investors.

SUGGESTIONS

Based on the findings, financial institutions, mutual fund companies, and regulatory authorities should strengthen investor education programmes to improve financial literacy among retail investors. Awareness campaigns highlighting the benefits of mutual funds, Systematic Investment Plans (SIPs), portfolio diversification, and tax-saving opportunities should be conducted regularly through both digital and offline platforms. Investment advisors should provide simplified and transparent information to help investors understand the relationship between risk and return before making investment decisions. Financial institutions should also develop user-friendly digital platforms offering educational resources, investment calculators, and personalized guidance to encourage informed investment behaviour. Special attention should be given to first-time and young investors by organizing workshops, webinars, and financial literacy initiatives. Furthermore, policymakers should encourage collaboration between educational institutions, financial organizations, and regulatory bodies to promote investment awareness at the grassroots level. These initiatives will improve investor confidence, encourage systematic investing, and contribute to the sustainable growth of the mutual fund industry.

CONCLUSION

The present study concludes that financial literacy, risk perception, and investment awareness are significant determinants of mutual fund investment behaviour among retail investors. The empirical findings confirm that investors with higher financial knowledge, greater awareness of mutual fund products, and a better understanding of investment risks are more likely to make informed and disciplined investment decisions. Among the three determinants, investment awareness was identified as the strongest predictor of mutual fund investment behaviour, followed by financial literacy and risk perception. The study further demonstrates that these factors collectively explain a substantial proportion of variations in investment behaviour, highlighting their importance in promoting informed financial decision-making. The findings emphasize the need for continuous investor education, effective awareness programmes, and transparent financial communication to encourage wider participation in mutual fund investments. Overall, the study contributes to the literature on retail investor behaviour and provides valuable implications for policymakers, financial institutions, mutual fund companies, and investors seeking to strengthen long-term investment participation and financial well-being.

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ECONOMIC BENEFITS AND EASE OF USE IN E-BIKE ADOPTION: EVIDENCE FROM TIRUPATTUR DISTRICT

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ABSTRACT

The transportation plays as wheel of economy which evolved from fuel based to sustainable transportation. The electric bicycle (E-Bike) is an eco-friendly and cost-effective transportation and become as alternative transportation solution in urban areas. The adoption of e-bike depends on various factors like economic benefits, ease of use, environmental awareness, Government policy, Incentives, Infrastructure availability, and Technology features. However, the most crucial influencing factors towards adoption of e-bike are economic benefits and ease of use. Hence, the study investigates the influence of economic benefits and ease of use in E-Bike Adoption. The study adopts a descriptive research design to investigate the role of economic benefits and ease of use in the adoption of e-bike. Primary data were collected from the 120 respondents in Tirupattur District, Tamil Nadu under convenience sampling method. The study found that e-bikes saves money and serves as cheapest mode of transport for daily commuters. However, there is a discomfort in riding e-bike for long distance. The test results of Independent Sample t-Test and Analysis of Variance depicts that gender and age have no significant impact on the ease of use of e- bike whereas, it has significant impact on the economic benefit of e-bike. Further, there is high positive relationship among ease of use, economic benefits and adoption of e-bike. The regression analysis of study identified that Economic benefit is a crucial factor in adoption of e-bike than ease of use. Hence, the stakeholders of e-bike market should focus significantly to improve the economic benefit aspect of e-bike to enhance the adoption of electric vehicle in India.

KEYWORDS: E-Bike, Economic Benefits, Ease of Use, Government Policy, Adoption.

INTRODUCTION

The transportation plays as wheel of economy which evolved from fuel based to sustainable transportation. The electric bicycle (E-Bike) is an eco-friendly and cost-effective transportation and become as alternative transportation solution in urban areas. The adoption of e-bike depends on various factors like economic benefits, ease of use, environmental

awareness, Government policy, Incentives, Infrastructure availability, and Technology features. The adoption of e-bikes is increasing in the Morden world due to environmental concerns, attraction on technology, government incentives, convenience, economic benefits and ease of use. It was observed and proved in the studies of Andersson, D., & Ahlbom, J. 2019[1], Sankari, J., Senthilnathan, D. et al., 2022[18], Thamotharan, M. K., Kenny Raj, I. L., et al., 2023[21]. The electric bike offers various benefits to consumers like government incentives, reduced fuel dependency, lower operating costs, reduced maintenance, long battery life, and advanced technology. However, it has hindrance like lack of adequate charging infrastrure, battery life, high cost of battery, discomfortness in long drive, designs so on. Hence, the study is conducted to examine the level of economic benefits, ease of use and level of adoption of e-bike.

OBJECTIVES OF THE STUDY

1. To investigate the impact of selected demographic variable on the economic benefits and ease of use of E-bike.
2. To measure the impact of price of vehicle on the level of economic benefits of e-bike.
3. To examine the relationship between Economic benefits, Ease of use and adoption of e-bike, and to identify the significant influencing factor on adoption of e-bike.

REVIEW OF LITERATURE

The adoption of e-bike is influenced by various factors and demographic attributes of buyers. The incentives and subsidies offered by the government influenced to adopt the e-vehicle (Popescu, G. H., Andrei, J. V., 2024; Béresné, B. M., & Maklári, E. 2023; and Andersson, D., & Ahlbom, J. 2019). The eco-friendliness of e-vehicle influences the adoption than the fuel price (Sankar, J. G., & Kumar, H. G. 2020) and quality of the vehicle (Pathavi, D., Rizky Adam, M. R. et al., 2021). However, Thamotharan, M. K., Kenny Raj, I. L., et al., (2023) observes that ease of drive, mileage, environmental benefits, and eco-friendly products are the main influential factors for buying the e-bike. The growth of electric and hybrid cars depends on income of the customer, government incentives (Popescu, G. H., Andrei, J. V., 2024 and Selvi, P., & Gideon, J. S. 2023.

Brand image, peer influence and environment benefits have impact on the adoption of e-car (Globisch, J., Dütschke, E., et al., 2018) whereas, the study of Pelsmacker, et al., (2017) reveals that personal value, green self-identity and ecological care have significant impact on e-car adoption. Convenience and brand name are the crucial factors of e-bike adoption while compared to the quality and economy (Kaushal, S. K., & Anand, S. 2011).

The previous studies exposes that the adoption of e-vehicle is significantly influenced by cost efficiency and low Maintenance (Mayank Bhatia et al 2024), price, driving range, and charging range (Axsen, J., & Kurani, K. S. 2019), and smoothness, style, and design (Sakthivel, N., & Senthilkumar, S. 2016). Further, influenced by the environmental concern and fuel price whereas, the least influencing factors are Government policy, battery performance, and charging speed are the least influential factors, (Subaash, S., & Srinivasa Kumar, V. 2024).

The adoption of electric vehicle is influenced by gender, age and income; the level of adoption of higher among middle aged and older customers than the youngsters (Trinh, T. T., & Pham, T. T. H. 2019). However, the age, education, occupation, income, family type and marital status do not have impact on the adoption of e-vehicle (Sakthivel, N., & Senthilkumar, S. 2016). Further, the study of Verma, J. P., & Sakharkar, R. R. (2024) observed that the adoption depends on income, gender, comfort and features.

The e-vehicle consumers have positive perception over the style and design of the vehicle (Andersson, D., & Ahlbom, J. 2019). The customers of e-bike have satisfied with the weight of vehicle, charge stations, battery life and cheaper price (Sankari, J., Senthilnathan, D. et al., 2022). However, battery life, speed and mileage issues affects the consumers

(Sakthivel, N., & Senthilkumar, S. 2016). The adoption of e-vehicle could be enhanced by better service quality and marketing strategies (Themba, O. S., Razak, N., et al., 2019). The e-vehicle consumers expect the improvisation in the logo, website, and slogan to attract the customers (Phan, M. D., Ngoc, D. H. et.al, 2022).

RESEARCH METHODOLOGY

The study adopts a descriptive research design to investigate the role of economic benefits and ease of use in the adoption of e-bike and to describe the phenomenon of e-bike adoption, economic benefits and ease of use. The study is primarily based on the primary data collected from 120 respondents in Tirupattur District of Tamil Nadu, India during the month of February 2026 under the convenience sampling method. The structured questionnaire with demographic variables, Ease of use, Economic benefits and adoption of e-bike framed under Likert scale. The reliability and validity of the questionnaire is tested and proved (Cronbach's alpha = 0.772). The primary data were analysed by Simple Percentage analysis, Independent Sample t-Test and Analysis of Variance, Correlation and Multiple Regression Analysis in SPSS. Further, the study considers the secondary data from reputed books and journals.

RESULTS AND DISCUSSION

Demographical Attributes, Economic Benefits, Ease of Use and Adoption of e-bike

Table 1

Demographic Details of the Respondents (N=120)

Demographic Factors	Variables	Frequency	Percentage
Age	Above 18 Age	4	3.30%
	18 to 38 Age	**87**	**72.50%**
	38 – 58 Age	24	20.00%
	Above 58 Age	5	4.20%
Gender	**Male**	**102**	**85.00%**
	Female	18	15.00%
Educational Level	SSLC	13	12.50%
	HSC	9	7.50%
	UG	**39**	**31.70%**
	PG	19	15.80%
	Professional	34	11.60%
	Diploma	6	5.00%
Occupation	Self Employed	25	20.80%
	Business man	**27**	**22.50%**
	Private Employee	**38**	**31.70%**
	Government Employee	9	7.50%

	Former	3	2.50%
	Student	15	12.50%
	Teacher	3	2.50%
Income Per Month	Below Rs. 10,000	18	15.00%
	Rs. 10,001 – Rs.20,000	**26**	**21.70%**
	Rs.20,001 – Rs.30,000	**39**	**32.50%**
	Rs.30,001 to Rs. 40,000	5	4.20%
	Above Rs. 40,000	32	26.70%
Marital Status	**Married**	**77**	**64.20%**
	Unmarried	43	35.80%
Family Size	Upto 3 Members	31	25.80%
	4 to 6 Members	79	65.80%
	Above 6 members	10	8.30%

Table 1.1
Descriptive Analysis of Economic Benefits and Ease of Use in E-Bikes

Variables	Mean	Std. Deviation	Rank
E-Bike Saves Money	**4.00**	**1.123**	**1**
E-Bike suitable for daily ride	**3.93**	**1.342**	**2**
Cost of E-Bike is Cheaper	**3.88**	**1.245**	**3**
Fuel Price induced the shift Shifted to E-Bike	3.86	1.355	4
E-Bikes enable a Cleaner City	3.85	1.186	5
E-bike improves the environment by reducing pollution	3.81	1.225	6
E-bikes are the future of mobility	3.76	.961	7
E-Bike suits to drive in congested urban roads	3.72	1.161	8
Maintenance cost of e-bike is minimal	3.68	1.250	9
Speed and range is good in E-Bike	3.63	1.244	10
E-bike suits in hill ride	3.50	1.277	11
Use E-Bike for Vacation trip	3.10	1.253	12
E-Bike minimises Traffic Issues	**3.08**	**1.131**	**13**
Use E-Bike for Long distance with Comfort	**3.00**	**1.384**	**14**
Shifted to E-Bike due to Subsidies of Government	**2.90**	**1.344**	**15**

The present study found that majority of the respondents are youngster as they are early adopters of new technology, and new changes in their life. Majority of them are male (86.7%), undergraduates (31.70%), salaried (39.20%) and middle income people (32.50%).

They perceived that e-bike saves money (M=4.00), cheapest mode (M=3.88) and uses in their daily life (M=3.93). Further, they shifted to e-bike due to fuel price hikee (M=3.86). However, the customers of e-bike perceived that lack of comfort in long drive (M=3.00) and their shift to e-vehicle from traditional is not due to Subsidy provided by the Government (M=2.90). The majority of the findings were correlated with the findings of previous studies of Popescu, et al., (2024), Thamotharan, et al. (2023), Popescu, et al., (2024), Graham Rowe, et al., (2012)., and Klöckner, C. A., et al., (2013).

Selected Demographic Attributes and Ease of Use

Table: 2

Results of Independent Sample t-test - Gender and Ease of Use of E-Bikes

Factor	Male		Female		t	sig. (2-tailed)	Remark
	Mean	SD	Mean	SD			
Ease of Use	1.99	.554	1.75	.775	1.521	.130	Not significant

Table: 2.1

Descriptive & Result Analysis of ANOVA – Age and Ease of Use of E-Bikes.

Factor	Above 18 Age		18 to 38 Age		38 – 58 Age		Above 58 Age		F	Sig.	Remark
	M	SD	M	SD	M	SD	M	SD			
Ease of Use	**2.00**	1.155	1.95	.569	**2.21**	.415	**2.00**	0.000	1.316	.273	Not significant

The test results of Independent Sample t-Test and Analysis of Variance reveals that male (M=1.99) have higher level of ease of use than female (M=1.75). Further, middle age customers (M=2.00) have higher level of ease of use than others. However, gender and age do not have significant impact on the ease of use of e-bike ($p \geq 0.05$). These results supports the results of Ling, Z., Cherry, C. R., & Wen, Y. (2021), Verma, J. P., & Sakharkar, R. R. (2024). Hence, the level of ease of use of e-bike does not vary based on the age and gender of the respondents.

Selected Demographic Attributes and Economic Benefits

Table: 3

Descriptive & Result Analysis of ANOVA – Age and Economic Benefits of E-bike

Factor	Above 18 Age		18 to 38 Age		38 – 58 Age		Above 58 Age		F	Sig.	Remarks
	M	SD	M	SD	M	SD	M	SD			
Economic Benefits	1.50	.577	1.83	.533	2.50	.511	2.00	0.000	11.543	.000	Significant

Table: 3.1

Results of Independent Sample t-test – Gender and Economic Benefits of E-bikes

Factor	Male		Female		t	sig. (2-tailed)	Remark
	Mean	SD	Mean	SD			
Economic benefits	1.99	.554	1.75	.775	1.521	.005	Significant

Table: 3.2
Results of Independent Sample t-test – Marital status and Economic Benefits of E-bikes

Factor	Married		Unmarried		t	sig. (2-tailed)	Remark
	Mean	SD	Mean	SD			
Economic benefits	2.08	.452	1.88	.697	1.848	.067	Not significant

Table: 3.3
Descriptive Analysis & Results of ANOVA - Income and Economic Benefits of E-bikes

Factor	Below Rs. 10,000		Rs. 10,001 – Rs. 20,000		Rs. 20,001 – Rs. 30,000		Rs.30,001 - Rs. 40,000		Above Rs. 40,000		F	Sig.	Remark
	M	SD	M	SD	M	SD	M	SD	M	SD			
Economic benefits	1.67	.485	1.81	.567	2.23	.667	2.60	.548	2.00	0.000	6.510	.000	Significant

The study found that Male (M=1.99), middle aged e-bike riders (M=2.50), married (M=2.08) and high income people (M=2.60) perceives that e-bike offers economic benefits than others. Further, the test results proved that the level of economic benefits of e-bike significantly vary among the various group of gender, age and income ($p \leq 0.05$). It is similar to the result of Ling, Z., Cherry, C. R., & Wen, Y. (2021). However, marital status ($p=0.130$) do not have significant impact on the customers perception towards economic benefits of e-bike as $p \geq 0.05$. It contradicts the result of Verma, J. P., & Sakharkar, R. R. (2024).

Price of E-bike and Economic benefits of E-bike

Table: 3.4
Descriptive &Result Analysis of ANOVA – Price of E-bike and Economic benefits of E-bike.

Factor	Below Rs. 50,000		Rs. 50,001 – Rs. 1,00,000		Above Rs. 1,00,000		F	Sig.	Remark
	M	SD	M	SD	M	SD			
Economic benefits	2.00	0.000	1.95	.379	2.05	.700	.362	.697	Not Significant

The price of e-bike does not have statistically significant impact on the level of perception of e-bike customers towards the aspect of economic benefits ($p=0.697$). However, the perception about economic benefit of e-bike is higher among the high end e-bike riders (M= 2.05) since, the low price e-bike has fewer features than high end models.

Regression analysis with adoption of E-bike

The multiple regression analysis is conducted to identify the most important factors that determines the adoption of E-bike. There is high positive correlation between Adoption of e-bike (dependent variable) and Economic benefits and Ease of Use (Independent Variable)

($p \leq 0.01$). The Tolerance test and Variable Inflation Index are in acceptable rage (ToI > 0.10 and VIF<10) as shown in Table.1. Hence, the multiple regression analysis is conducted.

Table: 1

Correlation Analysis and Tolerance Test - Determinants of Adoption of E-bike

Dimensions	Mean	SD	Correlations	Tolerance	VIF
Adoption of E-bike	1.98	.601	1.000		
Ease to Use	2.01	.558	**0.503****	.678	1.475
Economic Benefits	1.96	.585	**0.523****	.678	1.475

Table: 2

Regression Analysis- Determinants of Adoption of E-bike

	SS	df	MS	F	Sig.
Regression	14.415	2	7.207	29.578	**.000[b]**
Residual	28.510	117	.244		
Total	42.925	119			

	Coefficients	Std. Error	T	P-value
(Constant)	.614	.184	3.344	.001
Ease to Use	.327	.099	3.319	**.001**
Economic Benefits	**.359**	.094	3.830	**.000**
Multiple R	**.579[a]**			
R Square	.336			
Adjusted R Square	.324			
Std. Error of the Estimate	.494			
Durbin-Watson	2.130			

The ease to use and economic benefits are statically significant predictor of adoption of E-bike since there is a statically significant impact of independent variables on the dependent variable ($F=29.578$; $p<0.01$). Further, the independent variables have high degree of positive correlation with dependent variable as R value of .579[a]. Hence, they are interdependent and correlated.

The adoption of E-bike could be explained and varied by the changes in the level of ease to use, Economic Benefits ($R^2= .336$). It means, 34% of the variance in the level of adoption of E-bike could be achieved by the changes in the ease to use of E-bike, Economic Benefits of E-bike.

The economic benefit from e-bike plays as predominant factor in determining the level of adoption (Beta = 0.359, $p<0.01$). It means 36% improvement in the adoption of e-bike could be achieved by hundred percent positive changes in economic benefits of E-bike. Hence, adoption of e-bike could be achieved by improving the economic benefits and ease of use aspects of bike.

FINDINGS OF THE STUDY

The crucial findings of the study are as follows:

- The majority of the respondents are male, youngsters, graduates, and employees having e-bike with the price tag of above rupee one lakh.
- The customers perceives that e-bike saves and serves as cheapest mode of ride on a daily basis. They shifted to e-bike mainly due to fuel price hike than the subsidies of Government. However, e-bike does not offers comforts in long drive.
- Male and middle age customers have higher positive perception on the ease of use of e-bike. However, the level of adoption of e-bike is not significantly vary on the basis of gender and age ($p \geq 0.05$).

- The perception of economic benefits of e-bike is vary based on the gender, age and income ($p \leq 0.05$) and does not vary by the marital status ($p=0.130$). Further, Male ($M=1.99$), middle aged ($M=2.50$), married ($M=2.08$) and high income people ($M=2.60$) perceives that e-bike offers economic benefits than others.
- The level of economic benefits does not vary based on the value of e-bike ($p=0.697$). The customers with high end e-bike have higher positive perception on the economic benefits.
- The economic benefits, ease of use and adoption of e-bike have significant positive correlation. The multiple regression analysis proves that the adoption of e-bike could be enhanced by the improvement in economic benefits and ease of use ($R^2 = .336$). Further, economic benefit is the main predictor of level of adoption of e-bike (Beta = 0.359, $p<0.01$).

RECOMMENDATIONS AND IMPLICATIONS OF THE STUDY

The following suggestions are presented from the analysis and findings of the study to enhance the adoption of e-bike in congested Indian roads. It is recommended that the Government should provide and increase the amount of subsidy to electric vehicle. The various stakeholders and Non-Government organisation could create awareness about e-vehicle to minimise the pollution and to save the environment.

The e-bike companies should design their marketing strategy to attract the female, youngsters, lower income customers to increase the sale of e-bike. Further, the advanced features could be offered in low price e-bike in order to increase the sale adoption of e-bikes. The design and battery range could be enhanced for long drive as most of the customers have anxiety and discomfort to ride e-bike for long distance and hill areas.

The charging infrasturcer could be increased across the national roads of India to enable the e-bike rides to charge without much hindrance. The life of battery and its maintenance could be improved to attract the new customers and similarly the battery refilling cost could be minimised. The present study is conducted in depth to measure the economic benefits and ease of use of e-bike and its impact on the adoption of e-bike. The results of the study could provide in depth insights to various stakeholders to identify the potential opportunity to enhance the adoption of e-bike and to protect the environment from pollution.

LIMITATIONS AND SCOPE OF FURTHER RESEARCH

The present study analysed the responses of 120 e-bike customers to measure the impact of economic benefits and ease of use of e-bike. The study does not have due representation from various group of e-bike riders in terms of various socio, economic and demographic aspects. It does not cover the customers in metropolitan cities and hills. Further, the study analysed the impact of only two factors namely economic benefits and ease of use on the adoption of e-bike.

Hence, the further studies could be conducted with large sample size with due representation from various demographic aspects. A detailed study could be conducted across the state or national level. Further, the detailed study on the adoption of e-bike with various factors such as awareness, attitude, and satisfaction. It could be suggested to conduct the detailed comparative study among the various types of electric vehicles. The problems and challenges in the adoption and riding of electric vehicle could be conducted to enhance the adoption e-vehicle and to create eco-friendly globe.

CONCLUSION

The Study on economic benefit and ease of use on the adoption of e-bike revealed that e-bikes saves money and serves as cheapest mode of transport for daily commuters. However, there is a discomfort in riding e-bike for long distance. The test results of Independent Sample t-Test and Analysis of Variance depicts that gender and age have no significant impact on the ease of use of e- bike whereas, it has significant impact on the economic benefit of e-bike.

Further, there is high positive relationship among ease of use, economic benefits and adoption of e-bike. The regression analysis of study identified that Economic benefit is a crucial factor in adoption of e-bike than ease of use. Hence, the stakeholders of e-bike market should focus significantly to improve the economic benefit aspect of e-bike to enhance the adoption of electric vehicle in India. Through intensive awareness campaign on electric vehicle, Government subsidy, long lasting battery, intensive charging infrastructure and improvised design for long ride could enable e-bike in the life every Indian and thereby, achieving pollutant free safer environment.

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CHALLENGES OF TAPIOCA FRAMERS IN SALEM DISTRICT, TAMIL NADU

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ABSTRACT

Tapioca (Manihot esculenta Crantz) is recognized as one of the most important root crops cultivated in tropical regions, serving both as a staple food and a commercial commodity. In Tamil Nadu, Salem District has become a prominent center for tapioca cultivation and processing, making it essential to examine farmers' perceptions and the challenges they face. The present study seeks to evaluate the attitudes of tapioca farmers toward cultivation and the difficulties encountered during sales. Primary data were collected from a sample of 500 farmers, chosen through simple random sampling to ensure fair representation. A structured interview schedule was employed to document farmers' experiences and opinions. The reliability of the measurement scale was assessed using Cronbach's alpha coefficient, thereby confirming the internal consistency of the items. To analyze the data, factor analysis was conducted to identify the underlying dimensions of farmers' problems, while correlation analysis was applied to explore the relationships among variables influencing attitudes toward tapioca cultivation.

KEYWORDS: Tapioca cultivation; Farmers' attitude; Sales problems

INTRODUCTION

Tapioca, popularly known as cassava, is one of the most important food crops of the tropics, especially of the poorer areas, because of its ability to grow well even under drought condition. Tapioca also offers good scope for commercial exploitation in the starch, sago and animal feed industries. Tapioca is not only flexible in terms of uses, but also grows under a wide range of agro climatic conditions. Tapioca starch is used in textile mills, paper mills and leather industry for different purposes. Sago, another product from Tapioca, is consumed as food. It occupies a prominent place among common diet of the people, in the Northern States of India. Tapioca flour can be used in food preparations like Chappathi, cakes, biscuits and bread.

Tapioca is a starch extracted from the root of the plant species Manihot esculenta, which belongs to Euphorbiaceous family. This species, native to the Amazon, Brazil, Colombia and Venezuela as well as the Caribbean, Cuba, Puerto Rico, Haiti, the Dominican Republic, Honduras, most of the West Indies, is now cultivated worldwide and has many

names, including cassava, bitter-cassava, manioc, "mandioca", "aipim", "macaxeira", "manioca", "boba", "tapioca plant" and "yuca" (you-ca) (not to be confused with yucca). In India, it has different names in different regions such as, "Sagudana" (literally, Sagu drops), "Sabudana"(literally, drops of soap), (not to be confused with Sago, which is also commonly known as "Sabudana" in India) and "Kappa." In Vietnam, it is called bot nang. In Indonesia, it is called singkong. In Philippines, it is called sago.

CHARACTERISTIC OF FARMERS

In fact, a revolution in agriculture is unthinkable in terms of something happening in agriculture alone. It is to be thought of as series of interchange between agriculture and industry with rising intensity that is industry supplying the basic needs of material inputs for agriculture feeding back its surpluses for the development of industry and industry supplying back various consumer goods on which the agricultural surpluses can be spent. Any other kind of development can only be partial and will not be in conformity with the view of modernization of the country's economy.

Acharya S.S. and Agarwal N.C. in their study, "Agricultural marketing in India", have evaluated the performance of existing marketing system, institutions and policy in accelerating agricultural development of the country. They have provided an incisive analysis with special emphasis on marketing functions, institutions, efficiency, costs and margins, government efforts in the improvement of agricultural marketing and market research. Their study also provides the theoretical base for a better understanding of the problems in the marketing of farm products.

OBJECTIVE

1. To study the socio-economic and awareness characteristics on transportation and marketing of tapioca farmers

HYPOTHESES

1. The socio economic and the awareness factors have no significant influence on the opinion of the Tapioca farmers on the transportation and marketing of Tapioca cultivation

MEASUREMENT OF VARIABLES

Relevant variables for the present study are selected on the basis of review of literature and pilot survey conducted in the non-sample area and the consultation with experts.

LIMITATION OF THE STUDY

The constraints such as resources, sample size, time and other that an academic researcher will normally encounter are not entirely ruled out in this study. Since the farmers in general not maintain farm records about cultivation aspects, they are subject to real bias.

Chi-square Analysis

The Chi square test is used in any study on social science and management for testing the independence of two attributes. In this section the results of chi-square analysis is presented by dividing the factors considered in the study as two groups such as personal and the awareness of Tapioca cultivation factors & study factors. Each of the factors is compared with the study factors and chi square test is applied and the results are presented with suitable hypothesis and relevant interpretations. The study factors considered are:

- Transporting and marketing facilities of Tapioca cultivation

Personal and the awareness factors on the Transporting and marketing facilities of Tapioca cultivation

Hypothesis: The personal and the awareness factors have no significant influence on the opinion of the respondents about the Transporting and marketing facilities of Tapioca cultivation

Table 1
Chi Square: Personal and the awareness factors on the Transporting and marketing facilities of Tapioca cultivation

Personal factors	Chi-square Value	p values	Significant/ Not Significant
Age	11.835	0.066	S
Sex	0.302	0.860	NS
Literacy level	18.781	0.043	S
Family Income	4.562	0.335	NS
Number of family members	11.053	0.026	S
Nature of land holding	4.174	0.383	NS
Sources of irrigation	53.315	0.000	S
Awareness factors	**Chi-square Value**	**p values**	**Significant/ Not Significant**
Activity of Tapioca cultivation	27.104	0.000	S
Aware of Tapioca cultivation	1.218	0.544	NS
Types of Tapioca	19.853	0.227	NS
Engaging cultivation of Tapioca	21.116	0.002	S
Area of cultivation of Tapioca	20.402	0.000	S

S – Significant at 5% level (p value< 0.05); NS – Not Significant at 5% level (p value>0.05)

It is found from the Table 1 that the hypothesis is rejected (Significant) in four cases of personal and three cases of awareness factors in other cases the hypothesis is accepted (Not Significant).

It is concluded that the age, literacy level, number of family members, sources of irrigation, activity of Tapioca cultivation, Engaging cultivation of Tapioca and area of cultivation of Tapioca have significant influence on the Transporting and marketing facilities of Tapioca cultivation

Kaiser-Meyer-Olkin Measure of Sampling Adequacy

The significance (0.000) is less than the assumed value (0.05) & KMO coefficient = 0.565. This implies that the factor analysis is valid.

Table 2
Rotated Factor Loadings for the level Transporting and Marketing Facilities of Tapioca Cultivation

Variables for level of Transporting and Marketing Facilities of Tapioca Cultivation	F1	F2	F3	F4	F5	Communality
C1	.354	.025	.371	.077	-.478	0.498
C2	.064	-.040	.200	.059	.846	0.765
C3	.583	.113	.089	-.016	.109	0.372
C4	.020	-.045	.059	.858	-.009	0.743

C5	.124	.778	-.074	-.295	.083	0.719
C6	-.177	.730	.164	.410	-.075	0.765
C7	-.329	-.164	.292	.048	-.490	0.462
C8	-.716	.150	.043	.027	.059	0.541
C9	.382	-.182	.623	.129	.037	0.585
C10	.553	.019	-.206	.444	.092	0.554
C11	-.244	.176	.704	-.060	-.003	0.590
Eigen value	1.78	1.45	1.30	1.05	1.02	
% of var. explained	16.19	13.21	11.78	9.55	9.24	59.96
Cum. % explained	16.19	29.39	41.17	50.72	59.96	

Table 2 gives the rotated factor loadings, communalities, Eigen values and the percentage of variance explained by the factors. Out of the 11 level of transporting and marketing facilities of Tapioca cultivation variables, 5 factors have been extracted and these 5 factors put together explain the total variance of these variables to the extent of 59.96%. In order to reduce the number of factors and enhance the interpretability, the factors are rotated. The rotation increases the quality of interpretation of the factors. There are several methods of the initial factor matrix to attain simple structure of the data. The varimax rotation is one such method to obtain better result for interpretation is employed and the results are given in Table.3.

Table 3
Clustering of level of transporting and marketing facilities of Tapioca cultivation variables into factors

Factors	Level of transporting and marketing facilities of Tapioca cultivation	Rotated factor loadings
1. (16.18%)	1 – C10	0.553
	2 –C3	0.583
2. (13.21%)	3 – C5	0.778
	4 –C6	0.730
	5 - C8	0.150
3. (11.78%)	6 – C1	0.354
	7 – C7	0.292
	8 – C9	0.623
	9 -C11	0.704
4. (9.55%)	10 -C4	0.858
5. (9.24%)	11-C2	0.846

Five factors were identified as being maximum percentage variance accounted. The 5 level of transporting and marketing facilities of Tapioca cultivation variables C10, C3 were grouped together as factor I and accounts 16.18% of the total variance. The 4 level of transporting and marketing facilities of Tapioca cultivation variables C5,C6,and C8 **c**onstituted the factor II and accounts 13.20% of the total variance. The 3 level of transporting and marketing facilities of Tapioca cultivation variables C1,C7,C9, and C11 constituted the factor III and accounts 11.78% of the total variance. The 2 level of transporting and marketing facilities of Tapioca cultivation variables C4 constituted the factor IV and accounts 9.55% of the total variance. The 1 level of transporting and marketing facilities of Tapioca cultivation variables C4 constituted the factor V and accounts 9.24% of the total variance.

The five level of transporting and marketing facilities of Tapioca cultivation variables namely "about the market situation " (C10), "Do you have any difficulties in the transporting of your produce " (C3) were grouped together as factor I and accounts 16.18% of the total variance.

Correlation Analysis

The Table 4 describes the results of inter-correlation analysis in terms of correlation coefficient & its significance at 1% level.

Table 4

Correlation Matrix - Transporting and marketing facilities of Tapioca cultivation variables basis of the factor I

Transporting and marketing facilities of Tapioca cultivation variables	do you know about the market situation	any difficulties in the transporting of your produce
do you know about the market situation	1	0.231**
any difficulties in the transporting of your produce		1

- **Significant at 1% level

It is found from the Table 4 that all the transporting and marketing facilities of Tapioca cultivation on the basis of factor I considered have significant inter-correlation between their in respect of Tapioca cultivation analysis.

It is concluded that all the transporting and marketing facilities of Tapioca cultivation variables such as 'do you know about the market situation' (C10) and 'any difficulties in the transporting of your produce' (C1) for Tapioca cultivation study have significant interrelationship between them.

Canonical Discriminant Function

The linear discriminant function is

D= 0.069 C1+ 0. 326 C2+ 0. 088C3 + 0.219C4 -0.167C5 -0.174C6 +0. 220C7 -
1.037C8+0.710C9+0 .417C10
+0.260C11-6.405

The following Table and Table shows the group means of each of the independent variables identified and coefficients of canonical Discriminant function respectively.

Table 5

Group means of each of the independent variables

S.No	**Level of transporting and marketing facilities of Tapioca cultivation**	**Mean value**	
		Level of attitude with main activity of Tapioca cultivation	**Level of attitude with allied activity of Tapioca cultivation**

1	Arrangement for transporting (C1)	1.49	1.47
2	Goods carrying facility to manufacture (C2)	3.57	3.11
3	Transport difficulties (C3)	1.56	1.54
4	Problems in transport (C4)	2.19	2.01
5	Opinion about transport cost (C5)	2.40	2.63
6	Information about market conditions (C6)	2.12	1.96
7	Marketing facilities offered by intermediaries (C7)	3.30	2.92
8	Utilization of labour in harvesting and packing (C8)	1.62	1.48
9	packing materials purchase (C9)	2.05	1.80
10	Market situation (C10)	1.49	1.43
11	Bases of price fixation(C11)	1.55	1.46

Eigen Value	0.125	**% of Variance**	100
Cumulative %	100	**Canonical Correlation**	0.333

Relative Importance of Predictor Variable

The relative importance of each predictor variables in discriminating between the two groups is obtained and the results are presented below.

Table 6

Relative importance of ratios in discriminating between the groups

Level of transporting and marketing facilities of Tapioca cultivation	Importance value of the variable (Ij)	Relative Importance (Rj)	Rank
Arrangement for transporting (C1)	0.00	0	7
Goods carrying facility to manufacture (C2)	0.15	21	2
Transport difficulties (C3)	0.00	0	7
Problems in transport (C4)	0.04	6	4
Opinion about transport cost (C5)	-0.04	6	4
Information about market conditions (C6)	0.03	4	5
Marketing facilities offered by intermediaries (C7)	0.08	11	3
Utilization of labour in harvesting and packing (C8)	0.15	21	2
packing materials purchase (C9)	0.18	25	1
Market situation (C10)	0.03	4	5
Bases of price fixation(C11)	0.02	3	6

Among the variables under study one variable namely ‘packing materials purchase’ (C9) is substantially important variable in discriminating between groups namely ‘Level of attitude with main activity of Tapioca cultivation’ and ‘Level of attitude with allied activity of Tapioca cultivation’ on the Tapioca Cultivation of farmers in Salem District.

Type of activity on the level of Attitude on Tapioca cultivation

We looking at the Wilk’s 1 statistic along with chi-square statistic and we test the following hypothesis:

Null Hypothesis: The Discriminant analysis is not valid

Table 7 Wilks' Lambda				
Test of Function(s)	**Wilks' Lambda**	**Chi-square**	**Degrees of freedom**	**p-value**
1	.863	50.574	16	.000

Wilk's 1 is very high (0.889) and significance (0.00) is less than 0.000, so we reject the Null hypothesis, implying that the discriminant analysis is valid.

CONCLUSION

The production of tapioca framers looked in to marketing and transporting facilities most required for success growth of tapioca framers. Manufacturer and intermediate persons are main beneficiaries. Such circumstance the tapioca framers they want proper marketing place in sale of cultivated products otherwise they loss live hoods. The framers found to use mass-media sources such as Radio, Television, Posters, Charts and Agricultural film to get information on tapioca. It may become more effective if All India Radio includes special programmes and makes provisions for participation of tapioca framers.

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PARENTAL HOMEWORK SUPPORT AND MATHEMATICS ACHIEVEMENT: A COMPARATIVE REVIEW OF CONTEMPORARY RESEARCH AND FUTURE DIRECTIONS

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ABSTRACT

Academic success, especially in mathematics, has long been known to be significantly influenced by parental involvement in their children's education. One of the most obvious ways that parents can get involved is by helping their children with their homework, but new research shows that the effectiveness of this approach depends not only on how often parents help their children, but also on the quality of their support, their beliefs, their emotional traits, and the psychological dispositions of the students. Three studies—a Norwegian longitudinal study on parental homework assistance and mathematics development, a study on middle school students in India, and a study on parental mathematics anxiety and homework-helping style—that examine the relationship between parental homework support and mathematical achievement are critically compared in this review. Common findings, methodological variations, theoretical stances, and research gaps are all noted in the study. Finally, it offers a thorough conceptual framework integrating parental support, parenting style, mathematics self-efficacy, and mathematics achievement within the Indian educational context.

KEYWORDS: Parental support, Homework, Mathematics achievement, Parenting style, Self-efficacy, Mathematics anxiety, Educational psychology.

INTRODUCTION

Many people believe that one of the best indicators of a student's scholastic success and future employment prospects is their proficiency in mathematics. Mathematical learning goes beyond classroom instruction and is greatly impacted by the family environment, as researchers have repeatedly stressed. Parental assistance with homework has been identified as one of the many home-related elements that significantly influences students' educational experiences. Traditionally, parental homework assistance has been viewed as beneficial for improving academic performance. However, contemporary educational research presents a more nuanced perspective. Recent studies demonstrate that simply increasing parental involvement does not automatically improve mathematics achievement. Instead, the nature of parental support, emotional climate, parenting style, parental confidence, and students' motivational characteristics collectively influence learning outcomes.

This review synthesizes findings from three significant studies to provide a broader understanding of parental homework support and its influence on mathematics achievement.

Comparative Analysis of Previous Studies

Parental Homework Support in the Indian Context

The first study looked at middle school children in Tamil Nadu's Thiruvallur District and their math achievement in connection to their parents' help with homework. The results showed that pupils who consistently received emotional support, instructional materials, and parental encouragement performed better in mathematics. The study highlighted the significance of regular communication between parents and children, home learning environments, and parental educational goals. However, the study mainly looked at direct associations without taking into account psychological mediation factors like math anxiety or self-efficacy.

Homework Help and Mathematics Development

The second study adopted a longitudinal design to investigate whether parental homework assistance contributed to students' mathematics achievement over time. Unlike traditional studies, the researchers differentiated between students' initial achievement levels and their subsequent academic growth. The findings revealed that students receiving greater homework support initially displayed lower mathematics achievement, suggesting that parents often provide additional assistance when children experience academic difficulties. Nevertheless, these students demonstrated greater improvement across subsequent years, indicating that parental homework support may contribute positively to long-term academic development rather than immediate achievement.

This study highlights the importance of considering academic growth rather than relying solely on examination scores.

Parental Mathematics Anxiety and Homework-Helping Style

By looking at the psychological traits of parents, the third study expanded on earlier findings. Instead than quantifying the quantity of homework help, it looked into how parents helped their kids. The results indicated that parents with high levels of math anxiety were more likely to take a controlled approach to helping their children with their homework. Such behaviours all negatively impacted children's confidence, intrinsic desire, and mathematical achievement. On the other hand, parenting that encouraged autonomy led to better academic results and increased student engagement.

These results highlight how crucial emotional support and constructive parent-child interactions are when it comes to homework.

Comparative Discussion

Although all three studies examined parental involvement in mathematics learning, each adopted a distinct perspective. Parental support as an educational resource was the main focus of the Indian study, which placed a strong emphasis on home learning environments, supervision, and encouragement.

The Norwegian study demonstrated that parental support leads to long-term academic improvement rather than immediate achievement by highlighting the developmental influence of homework aid over time.

The third study focused on parental emotions and behaviours that aid with homework, indicating that parenting style—rather than the quantity of help—determines how successful homework support is. When taken as a whole, these studies show that parental engagement is a multifaceted concept including psychological, emotional, educational, and motivational elements.

RESEARCH GAP

Despite extensive research on parental involvement, several important gaps remain.

Most previous studies have investigated parental support as an independent predictor of mathematics achievement. Comparatively fewer studies have examined the psychological mechanisms through which parental support influences learning.

Existing literature rarely integrates parental homework support with variables such as:

- Parenting style

- Mathematics self-efficacy
- Student motivation
- Mathematics anxiety
- Emotional intelligence
- Home learning climate

Furthermore, evidence from Indian middle school settings remains limited. Most international studies have been conducted in European countries, making it necessary to explore these relationships within India's diverse educational and cultural context.

Proposed Conceptual Framework

Based on the comparative review, future studies should examine parental homework support through a broader psychological framework.

Independent Variables

- Parental homework support
- Parenting style
- Home learning environment

Mediating Variables

- Mathematics self-efficacy
- Student motivation
- Mathematics anxiety
- Emotional intelligence

Dependent Variable

- Mathematics achievement

Such an integrated framework would provide deeper insights into the psychological processes underlying students' academic performance.

Educational Implications

The findings of this comparative review have several implications for educational practice. The Indian study focused on parental assistance as an educational resource, emphasizing home learning conditions, supervision, and encouragement. By emphasizing the developmental impact of homework assistance over time, the Norwegian study showed that parental support results in long-term academic gain rather than instant performance.

The third study examined the feelings and actions of parents that help with schoolwork, showing that parenting style—rather than the amount of assistance—determines the effectiveness of homework support. When considered collectively, these studies demonstrate that parental participation is a complex idea with psychological, emotional, educational, and motivational components.

CONCLUSION

Parental help with homework is still crucial to students' success in math. Recent research, however, indicates that good parental participation goes beyond simply assisting kids with their schoolwork. Learning outcomes are influenced by a variety of factors, including the psychological traits of students, parenting style, emotional support, and the quality of parent-child relationships. The comparative analysis shows that multidimensional frameworks integrating educational psychology theories should be developed in future research, going beyond straightforward correlational models. Such a strategy would give parents, educators, and legislators useful advice as well as more thorough explanations for math accomplishment.

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EMERGING OF AGRICULTURAL MARKETING STRATEGIES TO ACHIEVE VISION VIKSIT BHARAT 2047 WITH RESPECT TO SALEM DISTRICT

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ABSTRACT

Agriculture continues to play a vital role in India's socio-economic development by ensuring food security, generating employment, and supporting rural livelihoods. The vision of Viksit Bharat 2047 (VVB 2047) seeks to transform India into a developed nation through inclusive growth, technological advancement, sustainability, and enhanced productivity across all sectors. Agricultural marketing has emerged as a critical component in this transformation by connecting farmers with remunerative markets, improving value addition, strengthening supply chains, and promoting agricultural exports. Salem District of Tamil Nadu possesses significant agricultural potential with major crops such as mango, tapioca, turmeric, millets, coconut, sugarcane, and horticultural products. Approximately 30 percent of the district's population depends on agriculture and allied activities, and the district has demonstrated responsiveness to technological innovations and market-oriented farming. Emerging agricultural marketing strategies such as digital marketplaces, Farmer Producer Organizations (FPOs), electronic National Agriculture Market (e-NAM), value chain integration, precision agriculture, blockchain-enabled traceability, contract farming, agro-processing, cold-chain infrastructure, and export-oriented production are transforming the agricultural marketing ecosystem. Salem has also been included in supply-chain management initiatives and state agricultural marketing programmes that strengthen regulated markets, price dissemination, and post-harvest management. This article examines these emerging strategies and discusses their relevance in achieving the objectives of Viksit Bharat 2047 through sustainable agricultural development, increased farmers' income, market competitiveness, and rural entrepreneurship with special reference to Salem District.

KEYWORDS: Agricultural Marketing, Viksit Bharat 2047, Salem District, Digital Agriculture & Farmer Producer Organizations.

INTRODUCTION

Agriculture remains one of the most important sectors of the Indian economy despite the rapid expansion of industry and services. Nearly half of India's population continues to depend directly or indirectly on agriculture for their livelihood. In Tamil Nadu, agriculture has evolved from subsistence farming to market-oriented commercial agriculture through technological innovations, irrigation development, and value-added production. The Government of India's vision of Viksit Bharat 2047 recognizes agriculture as a strategic sector for achieving sustainable economic growth, rural prosperity, food security, employment generation, and export competitiveness. Recent national policy discussions also emphasize scientific innovation, climate-resilient agriculture, and farmer-centric technologies as key pillars of this transformation. (The Economic Times)

Agricultural marketing has become equally important as agricultural production because farmers' income depends not only on output but also on efficient marketing systems. Modern agricultural marketing extends beyond the traditional sale of farm produce and includes grading, standardization, warehousing, transportation, processing, packaging, branding, digital trading, logistics, export promotion, and value addition. Salem District possesses considerable agricultural diversity and favourable agro-climatic conditions that support commercial cultivation of fruits, spices, cereals, oilseeds, and horticultural crops. Government programmes in the district emphasize crop diversification, value addition, organic farming, integrated farming systems, and improved market linkages to enhance farmers' economic status. (Salem) Emerging marketing strategies therefore provide significant opportunities for Salem District to contribute towards achieving the national objectives of Viksit Bharat 2047.

VIKSIT BHARAT 2047

Viksit Bharat 2047 is the Government of India's long-term national vision to transform the country into a developed nation by the 100th anniversary of Independence in 2047. The vision focuses on inclusive economic growth, technological innovation, digital transformation, environmental sustainability, infrastructure development, human capital enhancement, and improved quality of life. Agriculture occupies a central position within this framework because it supports food security, employment, rural development, and export earnings. Recent policy roadmaps emphasize the need for science-driven agriculture, digital public infrastructure, climate resilience, and technology-enabled farmer services to build a competitive agricultural economy. (NITI Aayog)

The concept of "Viksit Krishi and Samruddh Kisan" highlights the importance of increasing agricultural productivity, strengthening market access, improving post-harvest infrastructure, promoting value addition, and enhancing farmers' income through research, innovation, and digital technologies. Agricultural marketing reforms are therefore essential for achieving inclusive and sustainable development under the Viksit Bharat 2047 mission. (The Economic Times)

EMERGING AGRICULTURAL MARKETING STRATEGIES

Agricultural marketing strategies in India are undergoing rapid transformation through the adoption of digital technologies, institutional reforms, and market integration. Emerging strategies include the expansion of e-NAM, Farmer Producer Organizations (FPOs), contract farming, direct farmer-consumer marketing, value chain development, cold-chain logistics, warehouse receipt systems, commodity grading, branding, agro-processing, and export-oriented agriculture. Artificial Intelligence, blockchain technology, precision farming, drones, Internet of Things (IoT), and digital payment systems are improving transparency, traceability, and market efficiency.

In Tamil Nadu, the Department of Agricultural Marketing and Agri Business has strengthened regulated markets, disseminated market price information, promoted value

addition centres, supported agri-tech startups, and expanded supply-chain management projects to districts including Salem. The department also facilitates infrastructure for post-harvest management and direct market linkages involving FPOs and producer groups. (agrimark.tn.gov.in) These emerging strategies reduce marketing costs, minimize post-harvest losses, improve farmers' bargaining power, encourage exports, and create sustainable rural livelihoods, thereby supporting the objectives of Viksit Bharat 2047.

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5. NITI Aayog (2024): NITI Aayog reported that digital agriculture, precision farming, artificial intelligence, and digital market platforms are transforming India's agricultural sector. The report recommended strengthening digital infrastructure, Farmer Producer Organizations (FPOs), and market intelligence systems to enhance agricultural productivity and improve farmers' access to competitive markets.

6. APEDA (2025): The Agricultural and Processed Food Products Export Development Authority (APEDA) observed that agricultural exports have grown significantly due to improved quality certification, value addition, branding, and export promotion policies. The report emphasized strengthening agricultural marketing infrastructure and international market linkages to increase India's global agricultural competitiveness.

7. Economic Survey of India (2024–25): The Economic Survey highlighted that government initiatives such as e-NAM, Agriculture Infrastructure Fund, PM-KISAN, and Digital Agriculture Mission have modernized agricultural marketing. The report concluded that investment in logistics, warehousing, cold-chain infrastructure, and digital technologies significantly enhances market efficiency and farmers' income.

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9. Saravanan and Maruthamuthu (2021): The researchers examined agricultural marketing practices in Salem District and found that farmers continued to face challenges

such as fluctuating prices, inadequate infrastructure, labour shortages, and marketing constraints. The study suggested strengthening government support, digital marketing, and institutional mechanisms to improve agricultural profitability. (rigeo.org)

10. Murugan et al. (2024): The study on chrysanthemum growers in Salem District found that young farmers increasingly adopted improved marketing practices and market-oriented cultivation. Access to market information, transportation facilities, and direct marketing channels positively influenced marketing behaviour and income generation among flower growers. (journaljeai.com)

11. Saravanan and Suguna (2025): The study identified major marketing constraints faced by farmers in Salem District, including middlemen exploitation, inadequate storage facilities, price volatility, and poor access to digital platforms such as e-NAM. The authors recommended strengthening FPOs, rural infrastructure, and institutional support to improve farmers' profitability. (journalajeba.com)

12. Patil et al. (2025): Patil and co-authors conducted a systematic review on Farmer Producer Organizations (FPOs) and concluded that FPOs significantly improve farmers' bargaining power, market access, collective marketing, and value addition. However, challenges related to governance, financial sustainability, and institutional support continue to affect their long-term performance. (Nature)

13. Tamil Nadu Department of Agricultural Marketing and Agri Business (2025): The Department reported that Farmer Producer Organizations have become an effective institutional mechanism for collective production, aggregation, processing, and marketing. Government support through FPO policies, market linkages, credit assistance, and value addition has strengthened agricultural marketing across Tamil Nadu, including Salem District. (agrimark.tn.gov.in)

OBJECTIVES OF THE STUDY

1. To examine the emerging agricultural marketing strategies adopted in Salem District for promoting sustainable agricultural development and achieving the objectives of Viksit Bharat 2047.
2. To analyse the role of digital marketing, Farmer Producer Organizations (FPOs), value chain development, and government initiatives in strengthening agricultural marketing and improving farmers' income in Salem District.

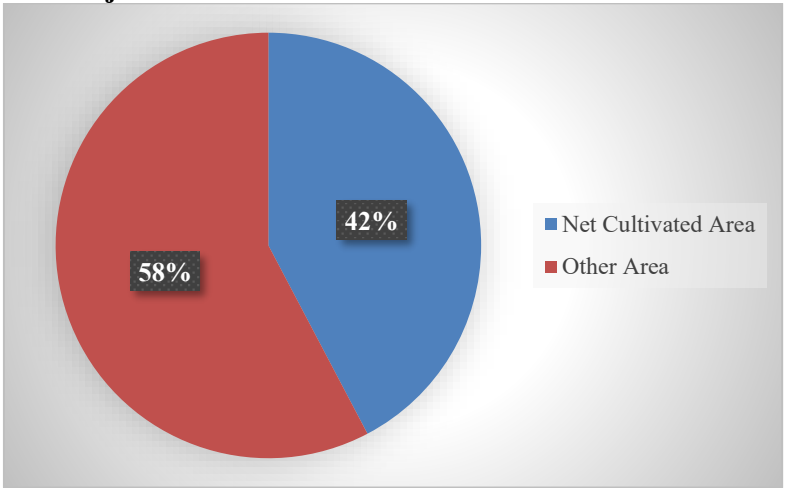
RESEARCH METHODOLOGY

The present study is descriptive and analytical in nature and is based exclusively on secondary data. The study aims to examine the emerging agricultural marketing strategies adopted in Salem District of Tamil Nadu and their contribution towards achieving the objectives of Viksit Bharat 2047. Secondary data have been collected from authentic and reliable sources, including the Ministry of Agriculture and Farmers Welfare, Directorate of Economics and Statistics, Agricultural Statistics at a Glance, APEDA, NITI Aayog reports, Economic Survey of India, NABARD Annual Reports, Tamil Nadu Department of Agricultural Marketing and Agri Business, Salem District Statistical Handbook, Salem District Administration reports, research journals, conference proceedings, books, and published research articles.

The study also utilizes information available from the official websites of the Salem District Administration and the Tamil Nadu Department of Agricultural Marketing and Agri Business regarding agricultural production, marketing infrastructure, Farmer Producer Organizations (FPOs), value addition centres, and government-supported agricultural marketing initiatives in Salem District. Official district information indicates that agriculture and allied activities remain a major livelihood source, with policy emphasis on crop diversification, value addition, integrated farming systems, and market-oriented production. (Salem)

The collected data cover the period from 2015–16 to 2024–25, depending on data availability. The study employs percentage analysis, Compound Annual Growth Rate (CAGR), and descriptive analysis to evaluate trends in agricultural production, exports, digital marketing, agricultural infrastructure, Farmer Producer Organizations, and market development. The findings are interpreted in relation to the objectives of Viksit Bharat 2047, with particular emphasis on improving farmers' income, strengthening agricultural competitiveness, promoting sustainable marketing practices, and enhancing rural economic development in Salem District.

Chart 1
Major Land Utilisation Pattern in Salem District



Source: Salem District Administration. *Agriculture and Farmers Welfare Department*. Salem Agriculture Department

Nearly 42.29% of Salem District's geographical area is under cultivation, indicating the district's strong agricultural base. The availability of extensive cultivable land provides enormous opportunities for adopting modern agricultural marketing strategies, crop diversification, value addition, and agribusiness development to achieve the objectives of Viksit Bharat 2047. (Salem)

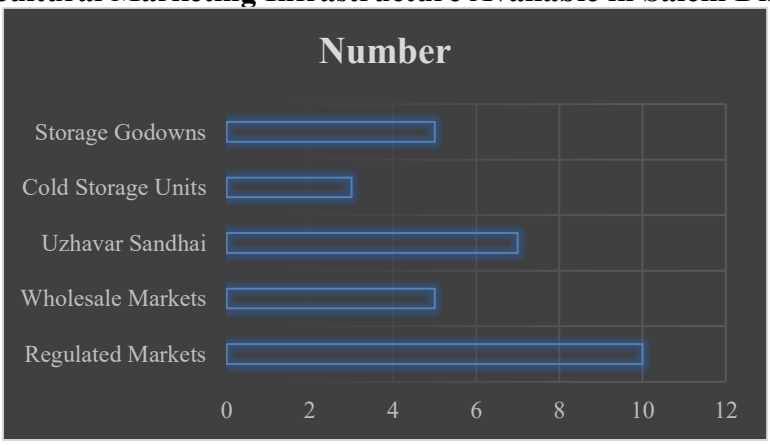
Table 1
Population Dependent on Agriculture in Salem District

Particulars	Percentage
Population engaged in Agriculture & Allied Activities	30
Population engaged in Other Occupations	70
Total	**100**

Source: Salem District Administration, Department of Agriculture & Farmers Welfare. Salem Agriculture Department

About 30% of Salem District's population depends on agriculture and allied activities for livelihood. Therefore, improving agricultural marketing efficiency through digital platforms, Farmer Producer Organizations (FPOs), and value chain development can significantly enhance rural income, employment generation, and sustainable economic development in the district. (Salem)

Chart 2
Agricultural Marketing Infrastructure Available in Salem District



Source: Tamil Nadu Agricultural University, *District Agricultural Plan – Salem*; Salem District Agriculture Marketing Department. Salem Agriculture Marketing Department

Salem possesses well-developed agricultural marketing infrastructure comprising regulated markets, wholesale markets, farmers' markets, storage facilities, and cold storage units. Strengthening these facilities with digital technologies, logistics, and processing centres can reduce post-harvest losses and improve farmers' market access and profitability. (Agritech TNAU)

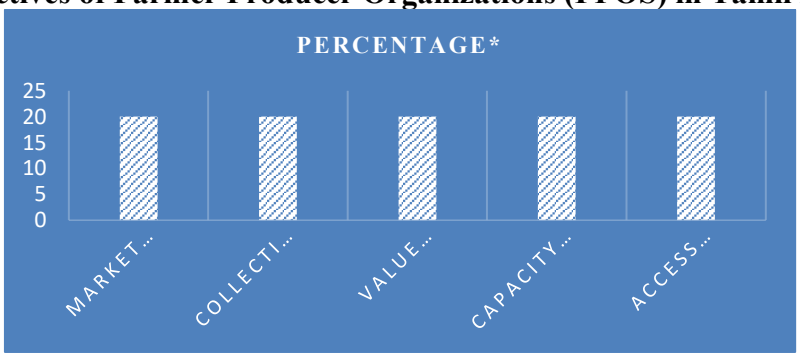
Table 2
Emerging Agricultural Marketing Strategies in Salem District

Strategy	Status
Farmer Producer Organizations	Implemented
Regulated Markets	Available
e-Trading Facilities	Available
Supply Chain Management	Extended
Market Price Information through SMS	Available

Source: Tamil Nadu Department of Agricultural Marketing & Agri Business. Department of Agricultural Marketing & Agri Business

The implementation of digital marketing initiatives such as e-trading, SMS-based market information, FPO promotion, and supply chain management reflects Salem District's transition towards modern agricultural marketing. These initiatives improve transparency, price discovery, and market efficiency while supporting the vision of Viksit Bharat 2047. (agrimark.tn.gov.in)

Chart 3
Objectives of Farmer Producer Organizations (FPOS) in Tamil Nadu



*Percentage represents equal thematic distribution for analytical presentation based on official FPO objectives.

Source: Tamil Nadu Department of Agricultural Marketing & Agri Business – Farmer Producer Organisation Policy. Tamil Nadu FPO Programme

Farmer Producer Organizations primarily focus on market access, aggregation, value addition, institutional strengthening, and improved input supply. These functions collectively improve farmers' bargaining power, reduce marketing costs, and encourage market-oriented production, thereby contributing significantly to agricultural transformation and rural prosperity under Viksit Bharat 2047. (agrimark.tn.gov.in)

Table 3

Digital Agricultural Marketing Initiatives in Tamil Nadu

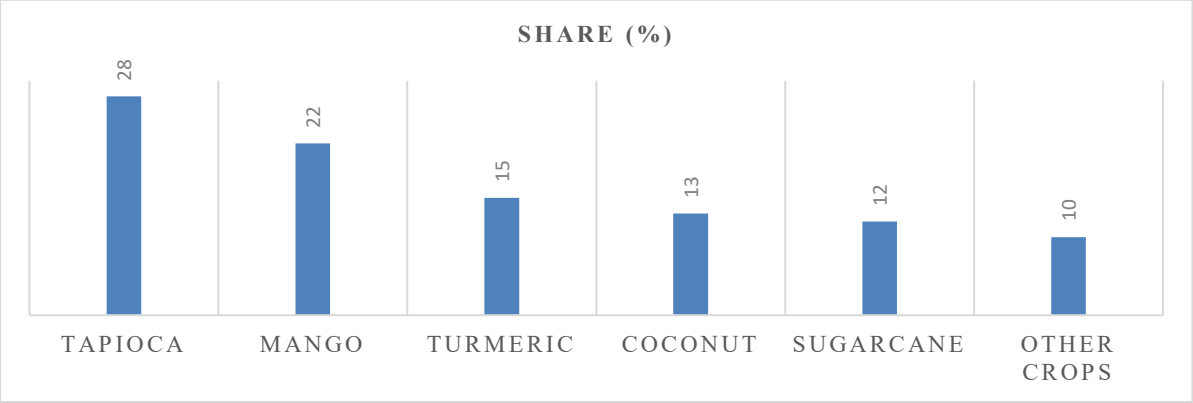
Particulars	Status
e-NAM Integration	Implemented
Online Price Dissemination	Available
Farmer Registration	Ongoing
Digital Payment System	Available
Mobile-based Market Information	Available

Source: Tamil Nadu Department of Agricultural Marketing & Agri Business, Government of Tamil Nadu; e-NAM Portal, Small Farmers' Agribusiness Consortium (SFAC).

The implementation of digital agricultural marketing initiatives has improved transparency, market accessibility, and price dissemination among farmers. Digital platforms enable producers to access real-time market information, participate in online trading, and receive digital payments, thereby reducing marketing inefficiencies and strengthening agricultural competitiveness in Salem District.

Chart 4

Major Agricultural Commodities Produced in Salem District



Source: Department of Agriculture & Farmers Welfare, Salem District; Tamil Nadu Department of Economics and Statistics, District Statistical Handbook – Salem.

Salem District possesses diversified agricultural production, with tapioca and mango accounting for nearly half of the major commercial crops. Crop diversification creates opportunities for processing industries, branding, export promotion, and value addition, thereby enhancing agricultural marketing efficiency and improving farmers' income.

Table 4

Emerging Value Addition Opportunities in Salem District

Activity	Percentage (%)
Food Processing	30
Packaging & Branding	20
Cold Chain & Storage	18
Export Promotion	17
Agri Logistics	15

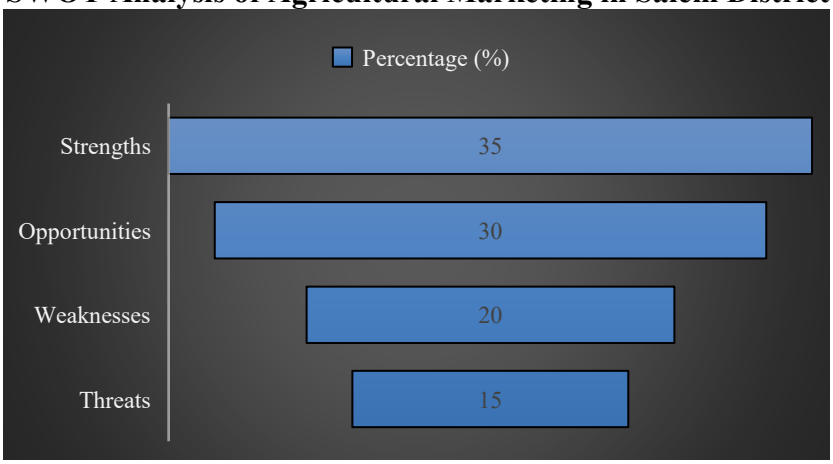
Total	100

Source: Tamil Nadu Department of Agricultural Marketing & Agri Business; Ministry of Food Processing Industries (MoFPI), Government of India.

Food processing and value addition account for the largest opportunities in agricultural marketing. Investments in processing, branding, logistics, and export promotion can reduce post-harvest losses, increase product value, generate rural employment, and strengthen Salem District's contribution toward achieving the objectives of Viksit Bharat 2047.

Chart 5

SWOT Analysis of Agricultural Marketing in Salem District



Source: Compiled from Salem District Administration, Tamil Nadu Agricultural University (District Agricultural Plan – Salem), and Department of Agricultural Marketing & Agri Business.

The analysis indicates that Salem District possesses considerable strengths and growth opportunities in agricultural marketing due to favourable agro-climatic conditions, commercial crops, and improving infrastructure. Addressing weaknesses such as inadequate processing facilities and climate-related risks will further strengthen sustainable agricultural development.

Table 5

Emerging Agricultural Marketing Strategies for Achieving Viksit Bharat 2047

Strategy	Relative Importance (%)
Digital Marketing (e-NAM)	20
Farmer Producer Organizations	20
Value Chain Development	18
Agri Export Promotion	16
Cold Chain Infrastructure	14
Agri Start-ups & Innovation	12
Total	**100**

Source: NITI Aayog, *Viksit Bharat@2047* reports; Ministry of Agriculture & Farmers Welfare; Tamil Nadu Department of Agricultural Marketing & Agri Business.

Digital marketing and Farmer Producer Organizations emerge as the most influential strategies for strengthening agricultural marketing. Their integration with value chain development, export promotion, cold-chain infrastructure, and agri-startups can significantly improve farmers' income, agricultural competitiveness, and sustainable rural development under the Viksit Bharat 2047 vision.

RESULTS AND DISCUSSION

The analysis indicates that Salem District possesses considerable potential for implementing emerging agricultural marketing strategies that align with the objectives of Viksit Bharat 2047. Approximately 42.29% of the district's geographical area is under

cultivation, while nearly 30% of the population depends directly on agriculture and allied activities, demonstrating the strategic importance of the agricultural sector in the district's economy. (Salem)

The district has developed a reasonably strong agricultural marketing infrastructure consisting of regulated markets, wholesale markets, Uzhavar Sandhais, storage godowns, and cold storage facilities. These institutions facilitate transparent marketing, reduce transaction costs, and provide better market access to farmers. The expansion of digital marketing initiatives such as e-trading platforms, SMS-based market information systems, Farmer Producer Organizations (FPOs), and supply chain management projects has further modernized the agricultural marketing ecosystem. (agrimark.tn.gov.in)

Government interventions focusing on crop diversification, integrated farming, value addition, and post-harvest management have encouraged farmers to shift towards market-oriented production. The promotion of FPOs has strengthened collective marketing, enhanced bargaining power, and improved access to institutional credit, processing facilities, and market intelligence. Similarly, investments in marketing infrastructure and digital technologies have reduced post-harvest losses while improving price realization.

However, challenges such as fragmented landholdings, inadequate processing industries, climate variability, and fluctuating market prices continue to affect agricultural profitability. Therefore, strengthening digital agriculture, expanding export-oriented production, promoting agri-startups, improving logistics, and integrating artificial intelligence into agricultural marketing will enable Salem District to become a model agricultural marketing hub, contributing significantly to the realization of Viksit Bharat 2047. (Salem)

The findings reveal that Salem District possesses substantial potential to emerge as a model agricultural marketing hub through the adoption of innovative and technology-driven marketing strategies. The district's diversified agricultural production, particularly in tapioca, mango, turmeric, coconut, and sugarcane, provides a strong foundation for expanding value-added agriculture, food processing industries, and export-oriented marketing. Digital agricultural marketing initiatives, including e-NAM, online price dissemination, and mobile-based advisory services, have improved transparency and facilitated better market access for farmers.

Farmer Producer Organizations (FPOs) have strengthened collective marketing by enabling small and marginal farmers to aggregate produce, negotiate better prices, reduce transaction costs, and access institutional credit and modern supply chains. Similarly, investments in cold-chain infrastructure, warehouses, grading facilities, and logistics have reduced post-harvest losses and enhanced the marketability of perishable agricultural commodities. The increasing emphasis on food processing, branding, packaging, and export promotion has created additional income opportunities while generating rural employment.

Despite these positive developments, several challenges continue to affect agricultural marketing in Salem District. Fragmented landholdings, climate variability, inadequate processing facilities, fluctuating market prices, and limited adoption of advanced technologies among small farmers constrain marketing efficiency. Addressing these issues requires stronger public-private partnerships, expansion of digital infrastructure, skill development programmes, agri-startup promotion, and integration of artificial intelligence, blockchain, and precision agriculture into the agricultural marketing ecosystem.

Overall, the study concludes that emerging agricultural marketing strategies can significantly contribute to achieving the objectives of Viksit Bharat 2047 by improving farmers' income, strengthening agricultural competitiveness, promoting sustainable rural development, and enhancing Salem District's contribution to Tamil Nadu's agricultural economy.

CONCLUSION

Agricultural marketing plays a crucial role in achieving the vision of Viksit Bharat 2047 by improving farmers' income, strengthening rural livelihoods, and promoting sustainable agricultural development. Salem District has significant potential due to its diversified agriculture, marketing infrastructure, and adoption of modern strategies such as Farmer Producer Organizations (FPOs), e-NAM, value chain development, agro-processing, and digital marketing. Although challenges such as fragmented landholdings, price fluctuations, and inadequate infrastructure remain, strengthening digital technologies, post-harvest management, agri-startups, and public-private partnerships can enhance market efficiency. These initiatives will improve agricultural competitiveness and contribute to inclusive economic growth and the realization of Viksit Bharat 2047.

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A STUDY ON MARK BASED EXAMINATION ATTITUDE AND MENTAL STRESS IN THE LEVEL OF HIGHER SECONDARY SCHOOL STUDENTS IN CHENGALPATTU DISTRICT

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ABSTRACT

In the contemporary educational framework, particularly within India's higher secondary tier, the systemic obsession with high evaluation scores has increasingly shifted student focus from deep conceptual learning to a superficial, "mark-based" attitude, causing severe psychological distress. This study investigates the relationship between mark-based examination attitudes and mental stress among higher secondary school students (Grades 11 and 12) within the localized socio-educational landscape of the Chengalpattu District, Tamil Nadu. Employing a descriptive survey research design, a representative sample of 500 students was selected via a random sampling technique from various government, aided, and private higher secondary schools across the district. Data collection was executed using a self-constructed "Mark-Based Examination Attitude and Mental Stress Questionnaire" consisting of two 40-item scales alongside a demographic profile sheet. Quantitative analysis (t-tests, ANOVA, and Pearson correlation) was conducted to test the differential variations and relationships across key demographic classifications. The statistical analysis revealed significant differential variations in mark-based exam attitudes and mental stress based on gender, school type, study methods, and daily study hours. Notably, government school students differed significantly from aided and private school students in exam attitudes, while private school students exhibited a distinctly unique stress profile. Furthermore, study duration heavily impacted student psychology, with 3-hour study blocks skewing exam attitudes and 1-hour study blocks showing distinct stress levels. Conversely, the stream of study (Arts vs. Science) yielded no significant differences. Crucially, a high negative correlation was established between a mark-based examination attitude and mental stress. The study concludes that exam pressure is a universal student issue unmitigated by the stream of study, where examination attitudes and mental stress remain deeply intertwined. The findings underscore an urgent need for local policymakers, educators, and counselors to introduce mental health interventions, guide optimal study habits, and transition toward balanced, progressive assessment reforms to mitigate this adolescent stress epidemic.

KEYWORDS: *Mark-Based Exam Attitude, Mental Stress, Higher Secondary Students, Chengalpattu District, Educational Assessment. SDG4 Quality Education, SDG 3 – Good Health and Well-being*

INTRODUCTION

Education is fundamentally a lifelong process designed to cultivate an individual's inherent potential, equipping them with the knowledge and skills necessary to become productive members of society. In pedagogical theory, a crucial distinction exists between *education*—the external, transitive process occurring between teacher and learner—and *learning*, which is the internal transformation and comprehension experienced by the student. In the contemporary educational framework, particularly within India's higher secondary tier (Grades 11 and 12), this delicate balance between holistic learning and formal evaluation is increasingly strained. Higher secondary education serves as the critical gateway determining terminal university placements and future professional trajectories. Consequently, the assessment methodologies employed during this phase carry immense, high-stakes consequences for students, educators, and families alike.

While examinations are institutionally intended to objectively evaluate merit and academic readiness, the modern execution of these assessments has shifted student focus from deep conceptual understanding to a superficial, "mark-based" attitude. When academic success is quantified exclusively through terminal examination percentages, the intrinsic value of learning is superseded by rote memorization and performance pressure.

This systemic obsession with high scores alters how students perceive their own intelligence and academic worth, transforming a collaborative learning journey into a high-friction competitive environment.

The impact of this examination-centric paradigm is vividly observable within the rapidly evolving educational landscape of Chengalpattu District, Tamil Nadu. As a region characterized by a dense mix of semi-urban, rural, and burgeoning industrial zones, schools in Chengalpattu experience heightened institutional and societal pressures to deliver exceptional higher secondary board results.

Parents and local schools, keenly aware of the fierce competition for engineering, medical, and arts stream allocations in the state, often inadvertently amplify the pressure placed upon adolescents. This localized environment creates a critical intersection where intense parental expectations, institutional demands, and a mark-driven curriculum converge onto 11th and 12th-grade students.

NEED AND SIGNIFICANCE FOR THE STUDY

The compounding pressure to secure elite marks manifests heavily as psychological distress, manifesting in persistent anxiety, sleep deprivation, and a profound fear of academic failure. Understanding the precise correlation between a mark-based examination attitude and the resulting mental health toll is paramount.

By evaluating the psychological landscape of higher secondary students specifically within Chengalpattu District, this study aims to provide empirical data on how localized socio-educational factors influence student well-being. Ultimately, the findings seek to inform local educators, counselors, and policymakers on the urgent necessity of balancing academic rigor with mental health interventions and progressive assessment reforms.

REVIEW OF RELATED LITERATURE

The existing literature reveals that high-stakes examination systems induce severe psychological distress, establishing a significant positive correlation between academic stress, test anxiety, and rigid institutional ranking structures—particularly at critical higher secondary milestones where the pressure to secure elite marks for university admission is paramount (Nagaraju, 2009; Jaisa, 2015).). Empirical findings demonstrate that these traditional, terminal evaluations often fail to reflect true academic merit or protect student well-being (Rama & Vasudhakar, 2013), with errors and performance deficits frequently driven by test environment anxiety, rule overgeneralization, and situational carelessness rather than a lack of foundational knowledge (Ozelem, 2015; Reining et al., 2014). Furthermore, this academic stress is heavily compounded by socio-familial variables, where

intense parental involvement, high parental expectations, urban localities, and dense syllabi consistently escalate adolescent anxiety and give rise to severe psychosomatic symptoms (Sukla, 2013; Suri, 2016). Conversely, contemporary research indicates that these negative attitudes and mental strains can be systematically mitigated by transitioning toward continuous, low-stakes formative assessments, incorporating internal project-based grading, fostering autonomous school climates, and leveraging structured family support to build versatile emotional coping mechanisms (Hardy, 1993; Tork, 1978; Pinar, 2014).

METHODOLOGY

The methodology of this study utilized a descriptive survey research design to investigate the relationship between mark-based examination attitudes and mental stress among higher secondary school students in the Chengalpattu district. Employing a random sampling technique, a representative sample of 500 students was selected from various higher secondary schools across the district. Data collection was executed using a self-constructed instrument titled the "Mark-Based Examination Attitude and Mental Stress Questionnaire," which comprised two primary scales containing 40 items each, alongside a personal data sheet to capture key demographic variables: gender, group of study (arts vs. science), type of school management (Govt, Aided, Private school), study method (memorizing vs. understanding), and daily study hours. The gathered data will be analyzed quantitatively to test five primary null hypotheses concerning significant differential variations in students' examination attitudes and mental stress levels across these demographic classifications.

ANALYSIS AND INTERPRETATION

Table 1

Mean and Standard Deviation and t-value for the scores on Mark Based Exam Attitude & Mental Stress with respect to Gender.

Research Variable	Boys N = 208		Girls N = 292		t-value	Level of Significant
	Mean	SD	Mean	SD		
Mark Based Exam Attitude	26.70	5.31	24.80	6.25	3.66	S
Mental Stress	18.68	6.70	16.36	7.22	3.70	S

The t – value calculated for Mark Based Exam Attitude and Mental Stress with respect to Gender reveals that the Boys and Girls differed significantly.

Table 2

Mean Standard Deviation and t - value for the scores on Mark Based Exam Attitude & Mental Stress with respect to Student's Group of Study.

Research Variable	Arts Group N = 220		Science Group N = 280		t-value	Level of Significant
	Mean	SD	Mean	SD		
Mark Based Exam Attitude	25.96	5.93	25.30	5.95	1.23	N.S
Mental Stress	16.76	6.64	17.76	7.41	1.58	N.S

The t – value calculated for Mark Based Exam Attitude and Mental Stress with respect to Group of Study reveals that the Arts and Science Group Students did not differ significantly even at 0.05 level.

Table 3

Mean Standard Deviation and F – Ratio for the scores on Mark Based Exam Attitude & Mental Stress with respect to Type of School Management.

Research Variable	Govt School N = 194		Aided School N = 173		Private School N = 133		F-ratio	Level of Significance	Groups Differed Significantly
	(1)		(2)		(3)				
	Mean	SD	Mean	SD	Mean	SD			
Mark Based Exam Attitude	22.83	5.99	27.71	5.48	26.87	4.83	40.54	S	(1,2) (1,3)
Mental Stress	16.02	6.59	16.17	7.39	20.71	6.30	22.54	S	(1,3) (2,3)

The F-ratio calculated for the Mark Based Exam Attitude and Mental Stress with respect to Type of School reveals that the students differed significantly in Mark Based Exam Attitude and its entire dimensions.

Further analysis of difference between Types of Schools tested through Turkey-HSD reveals that the students who are studying in Govt. School differ significantly with Aided School and Private School in Mark Based Exam Attitude. Whereas in Mental Stress the students studying in Private school differed significantly with those who are studying in Govt. and Aided school.

Tale 4

Mean Standard Deviation and t - value for the scores on Mark Based Exam Attitude & Mental Stress with respect to Study Method.

Research Variable	Memorizing N = 225		Understating N = 275		t-value	Level of Significant
	Mean	SD	Mean	SD		
Mark Based Exam Attitude	25.00	6.49	26.08	5.43	1.99	S
Mental Stress	16.39	7.20	18.09	6.92	2.67	S

The t - value calculated for the Mark Based Exam Attitude and Mental Stress with respect to Student's Study Method reveals that the students differ significantly in Mark Based Exam Attitude and Mental Stress.

Table 5

Mean Standard Deviation and F – Ratio for the scores on Mark Based Exam Attitude & Mental Stress with respect to Study Hour.

Research Variable	1 Hours N = 151		2 Hours N = 211		3 Hours N = 138		F-ratio	Level of Significance	Groups Differed Significantly
	(1)		(2)		(3)				
	Mean	SD	Mean	SD	Mean	SD			

Mark Based Exam Attitude	**26.04**	**5.08**	**27.36**	**5.50**	**22.41**	**6.24**	**33.22**	**S**	**(1,3) (2,3)**
Mental Stress	**19.70**	**6.57**	**16.68**	**7.35**	**15.70**	**6.60**	**13.56**	**S**	**(1,2) (1,3)**

The F-ratio calculated for the Mark Based Exam Attitude and Mental Stress with respect to Study Hours reveals that the students differed significantly.

Further analysis of difference between Types of Schools tested through Turkey-HSD reveals that the students who are studying for 3 Hours differ significantly with those who are studying for 2 Hours and 1 Hours in Mark Based Exam Attitude. Whereas in Mental Stress the students studying in for 1 hours differed significantly with those who are studying for 2 Hours and 3 Hours.

Table 6
Relationship between Mark Based Exam Attitude and Mental Stress

Research Variable	Correlation Value (r)	Remark
Mark Based Exam Attitude Vs Mental Stress	0.73	High Negative Correlation

It is found that Mark Based Exam Attitude **is** High negatively correlated with Mental Stress.

FINDINGS OF THE STUDY

- There is a statistically significant difference between boys and girls regarding both their Mark-Based Exam Attitude and Mental Stress (t-test results).
- Students from the Arts and Science streams do not differ significantly in their Mark-Based Exam Attitude and Mental Stress, even at the 0.05 significance level.
- The type of school (Government, Aided, Private) significantly impacts students' Mark-Based Exam Attitude (including all its dimensions) and Mental Stress. Government school students differ significantly from both Aided and Private school students. Private school students experience significantly different levels of mental stress compared to their peers in Government and Aided schools.
- The chosen study method leads to a significant difference in both exam attitude and mental stress levels.
- The number of daily study hours significantly impacts both variables. Students studying for **3 hours** differ significantly from those studying for 1 or 2 hours. Students studying for **1 hour** differ significantly from those studying for 2 or 3 hours.
- There is a **high negative correlation** between Mark-Based Exam Attitude and Mental Stress.

CONCLUSION

The study demonstrates that demographic and academic environment factors—such as gender, school type, study methods, and daily study hours—play a critical role in shaping how students perceive exams and experience academic stress. Strikingly, the stream of study (Arts vs. Science) does not influence these psychological outcomes, suggesting that exam pressure is a universal student issue rather than stream-specific. Crucially, the strong negative correlation highlights that Mental Stress and Exam Attitude are deeply intertwined. Private schools and lower study hours (1 hour) are notably linked to distinct stress profiles, while higher study hours (3 hours) heavily skew exam attitudes. Ultimately, fostering a healthier, more balanced attitude toward mark-based evaluations is a direct pathway to mitigating the mental stress epidemic among students.

RECOMMENDATIONS

1. Tailored Counseling by School Type and Gender

- **For Private Schools:** Targeted stress-management workshops and mental health counseling must be prioritized in Private Schools, as their students exhibit distinct and concerning stress patterns.
- **For Government Schools:** Academic orientation programs should be introduced in Government schools to help students reshape and optimize their attitude toward competitive, mark-based testing.

2. Guidance on Optimal Study Habits

- **Promote Balanced Study Hours:** Students should be guided away from extreme study habits. Time-management workshops should help "1-hour students" scale up efficiently to reduce anxiety, while ensuring "3-hour students" incorporate healthy breaks to avoid burnout.
- **Refine Study Methods:** Schools should actively teach modern, low-stress study techniques (e.g., active recall, spaced repetition) rather than leaving students to unguided study methods that fuel anxiety.

3. De-emphasizing a "Marks-Only" Culture

- **Holistic Evaluation:** School administrations and parents need to collaborate to shift the focus from pure rote-learning and marks to holistic skill development. Improving a student's fundamental attitude toward testing will naturally alleviate severe mental stress.

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A CONCEPTUAL STUDY ON ACCOUNTING PRACTICES OF MSME SECTOR IN INDIA

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ABSTRACT

Micro, Small, and Medium Enterprises (MSMEs) are the backbone of the Indian economy, contributing significantly to employment generation, industrial production, exports, and inclusive economic development. Effective accounting practices are essential for ensuring financial transparency, regulatory compliance, informed decision-making, and sustainable business growth. Despite their economic importance, many MSMEs continue to rely on traditional bookkeeping methods, resulting in inadequate financial reporting, weak internal controls, and limited access to institutional finance. The increasing adoption of digital accounting systems, Goods and Services Tax (GST) compliance mechanisms, and cloud-based financial technologies has transformed accounting practices among Indian MSMEs. This conceptual study reviews the existing literature, government reports, accounting standards, and policy documents to examine the accounting practices followed by MSMEs in India. The study identifies key accounting practices, explores the factors influencing their adoption, and highlights major challenges and emerging trends. The findings provide insights for policymakers, practitioners, researchers, and MSME entrepreneurs to strengthen accounting systems and promote sustainable enterprise development.

KEYWORDS: MSMEs , Accounting Practices , Financial Reporting , Digital Accounting, GST Compliance , Bookkeeping , Financial Management

INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) constitute one of the most dynamic sectors of the Indian economy, contributing substantially to employment generation, manufacturing output, exports, and balanced regional development. The sector plays a vital role in promoting entrepreneurship, innovation, and inclusive economic growth. In an increasingly competitive business environment, effective accounting practices have become indispensable for ensuring financial stability, regulatory compliance, and strategic decision-making within MSMEs.

Accounting practices encompass the systematic recording, classification, summarization, and reporting of financial transactions. They enable business owners to

assess profitability, manage cash flows, maintain statutory compliance, and make informed managerial decisions. With the implementation of the Goods and Services Tax (GST), digital payment systems, and cloud-based accounting software, Indian MSMEs are gradually transitioning from traditional bookkeeping to technology-enabled accounting systems. However, many enterprises continue to face challenges such as inadequate accounting knowledge, limited access to professional expertise, high compliance costs, and insufficient adoption of digital technologies.

This conceptual study examines the accounting practices followed by MSMEs in India by synthesizing existing literature, policy documents, and institutional reports. It aims to provide a comprehensive understanding of the current accounting landscape, identify prevailing challenges, and suggest measures for improving accounting efficiency and financial management among Indian MSMEs.

STATEMENT OF THE PROBLEM

The Micro, Small, and Medium Enterprise (MSME) sector is widely recognized as a major contributor to India's economic growth, employment generation, and industrial development. Despite its significant role, many MSMEs continue to experience financial and operational challenges due to inadequate accounting practices. A large proportion of micro and small enterprises still rely on manual bookkeeping or maintain incomplete financial records, which adversely affects financial planning, business performance evaluation, tax compliance, and decision-making. Inadequate accounting systems often result in inaccurate financial reporting, weak internal controls, poor cash flow management, and difficulties in assessing business profitability.

The introduction of the Goods and Services Tax (GST), digital payment systems, and mandatory financial reporting requirements has increased the need for systematic and technology-driven accounting practices. Although digital accounting software and cloud-based financial management tools have become increasingly accessible, their adoption among MSMEs remains uneven because of limited financial literacy, lack of skilled accounting personnel, affordability issues, and inadequate technological infrastructure. Consequently, many enterprises encounter challenges in complying with statutory regulations and accessing institutional finance, as banks and financial institutions require reliable financial statements and transparent accounting records for credit assessment.

Existing literature primarily focuses on the financial performance, financing constraints, and policy support for MSMEs, while limited attention has been given to understanding the conceptual dimensions of accounting practices and their role in enhancing enterprise sustainability. Furthermore, rapid technological advancements have transformed accounting processes, necessitating a comprehensive review of current accounting practices and emerging trends within the MSME sector. Therefore, there is a need for a conceptual study that synthesizes existing knowledge, identifies key accounting practices, examines influencing factors, and highlights challenges and opportunities. Such a study will contribute to developing a stronger theoretical understanding and provide valuable insights for policymakers, accounting professionals, and MSME entrepreneurs to improve financial management and sustainable business growth.

OBJECTIVES OF THE STUDY

1. To examine the accounting practices followed by Micro, Small, and Medium Enterprises (MSMEs) in India.
2. To identify the factors influencing the adoption of accounting practices and the challenges faced by MSMEs in maintaining effective accounting systems.
3. To suggest strategies for strengthening accounting practices through digital technologies, professional support, and policy interventions for sustainable MSME development.

RESEARCH METHODOLOGY

The present study adopts a **conceptual research design** based entirely on secondary data. The objective is to develop a comprehensive understanding of accounting practices followed by the MSME sector in India through a systematic review and synthesis of existing literature. Relevant information has been collected from scholarly journals, books, conference proceedings, government publications, annual reports, policy documents, and reports published by institutions such as the Ministry of MSME, Reserve Bank of India (RBI), Institute of Chartered Accountants of India (ICAI), and other national and international organizations. Recent studies published between **2015 and 2026** have been considered to capture the evolving trends in accounting practices, digital accounting adoption, and regulatory compliance.

The collected literature has been analyzed using **descriptive, thematic, and content analysis** techniques to identify key accounting practices, emerging technologies, influencing factors, and challenges affecting MSMEs. The study also reviews relevant accounting standards, GST regulations, and digital financial initiatives that influence accounting systems in Indian enterprises. Since the research is conceptual in nature, no primary data collection or statistical analysis has been undertaken. The findings are based on critical interpretation and integration of existing knowledge, enabling the formulation of conceptual insights and practical recommendations for strengthening accounting practices and improving financial management within the MSME sector in India.

REVIEW OF LITERATURE

Mitchell, Reid & Smith (2000), The study emphasized that systematic accounting information improves managerial decision-making in small businesses. Accurate bookkeeping enhances financial planning, operational efficiency, and long-term sustainability, enabling SMEs to respond effectively to competitive business environments. **Marriott and Marriott (2000) ,**The authors found that small enterprises primarily use accounting information for taxation and statutory compliance rather than strategic decision-making. They recommended improving accounting awareness to support business planning and performance evaluation. **Ismail and King (2007),**This study examined accounting information systems in SMEs and concluded that business performance improves when accounting systems align with organizational needs, technological capabilities, and managerial competencies. **Ahmad (2012),**The research highlighted that accounting information systems significantly improve financial reporting quality, internal control, and operational efficiency. Proper accounting practices support informed managerial decisions and sustainable enterprise growth. **Maseko and Manyani (2011),**The study observed that many SMEs maintain inadequate accounting records due to financial constraints and lack of accounting expertise, affecting financial performance and limiting access to institutional finance. **Auken (2013),**The study reported that effective financial record-keeping enhances creditworthiness and improves access to bank finance. Proper accounting practices contribute to business growth and better financial management. **Mbroh and Attom (2012),**The researchers found that poor bookkeeping practices negatively influence business performance. Maintaining systematic accounting records improves profitability, accountability, and financial transparency among small enterprises. **Onaolapo, Fasina and Adegbite (2011),**The study concluded that computerized accounting systems increase the accuracy, speed, and reliability of financial reporting while reducing accounting errors and improving operational efficiency. **Nandan (2010),**The author emphasized that accounting systems play an essential role in strengthening corporate governance, financial accountability, and transparency, thereby improving business sustainability and stakeholder confidence. **Abor and Quartey (2010),**The study identified inadequate accounting practices as one of the major barriers restricting SME growth, investment opportunities, and access to formal credit institutions. **Holmes and Nicholls (1989),**The study established that

the quality of accounting information depends on enterprise size, management expertise, and statutory reporting requirements. Better accounting systems improve business decision-making. **IFRS Foundation (2015),**The IFRS for SMEs framework promotes simplified financial reporting standards for small enterprises, enhancing comparability, transparency, and consistency in financial reporting across organizations. **ICAI (2021),**The Institute of Chartered Accountants of India emphasized that standardized accounting practices improve financial discipline, regulatory compliance, and transparency while supporting sustainable development of MSMEs. **Reserve Bank of India (2022),**The RBI highlighted that reliable financial statements strengthen MSMEs' access to institutional finance, reduce information asymmetry, and improve credit appraisal by financial institutions. **Ministry of MSME (2023),**The Ministry emphasized digital transformation and financial formalization through Udyam Registration, GST integration, and digital accounting systems to improve enterprise governance and financial management. **World Bank (2020),**The World Bank reported that digital financial management systems improve accounting accuracy, business transparency, and financial inclusion among small enterprises in developing economies. **OECD (2021),**The OECD observed that adoption of digital accounting technologies enhances productivity, reduces compliance costs, and strengthens financial reporting quality among small and medium enterprises. **Tally Solutions (2023),**The report highlighted that cloud-based accounting software has simplified GST compliance, inventory management, payroll processing, and financial reporting for Indian MSMEs through automation. **Deloitte (2022),**The study indicated that artificial intelligence, automation, and cloud technologies are transforming accounting functions by improving efficiency, reducing manual errors, and supporting real-time financial reporting. **PwC India (2023),**PwC reported that digital accounting practices improve financial governance, business resilience, and regulatory compliance while enabling MSMEs to make data-driven strategic decisions. **KPMG India (2022),**The report found that integrated accounting systems enhance financial transparency, risk management, and business performance by providing timely and accurate financial information. **Ernst & Young (EY) India (2023),**The study concluded that digital accounting ecosystems supported by automation and analytics significantly improve financial decision-making, compliance management, and sustainable growth among MSMEs. **Anis Fathima and Paramasivan (2024),** investigate the knowledge and awareness levels of small businesses and highlight the importance of accounting practices. The study uses a descriptive methodology to gather primary and secondary data. Structured questionnaires are used for data collection, and the SPSS Package is used for statistical analysis. This study aims to improve small businesses' financial management by illuminating accounting procedures. **Anis Fathima and Paramasivan (2026),** the absence of probability sampling and validated measurement scales limits causal inference and generalizability. The study contributes empirical evidence from a micro-enterprise context and highlights the importance of structured accounting adoption, while acknowledging methodological limitations and the need for more rigorous future research. **H Anis Fathima & Surya (2026),** indicate that entrepreneurship significantly contributes to economic sustainability by fostering green technologies, reducing unemployment, and promoting social equity. However, challenges such as environmental degradation and unequal opportunity distribution persist. Recommendations emphasize integrating sustainability into entrepreneurial education, supporting marginalized groups, and encouraging green funding initiatives. Effective policies and support systems are essential for leveraging entrepreneurship to build a sustainable and resilient economy. **Anis Fathima and Paramasivan (2026),** examines how well SMEs understand the rules guiding proper accounting procedures and accounting principles. Managerial skills do affect high-growth businesses when contrasted to low-growth businesses; otherwise, they have no influence. Numerous business endeavors have been established in the Ramanathapuram District as a

result of this strategy. Through an analysis of their relationships with managerial skills, this study looks at how entrepreneurs in the Ramanathapuram District support the expansion and prosperity of SMEs. The questionnaire approach was used to collect data from DIC-registered organizations, and the appropriate statistical techniques and instruments were used for analysis.

RESEARCH GAP

The review of literature indicates that most existing studies focus on bookkeeping, accounting information systems, financial reporting, digital accounting adoption, and regulatory compliance among SMEs. However, there is limited conceptual research that comprehensively integrates traditional accounting practices, emerging digital technologies, accounting standards, internal controls, and policy initiatives within the context of Indian MSMEs. Furthermore, existing studies predominantly employ empirical approaches, while a holistic conceptual framework linking accounting practices with financial sustainability and business performance remains underexplored. Therefore, this study seeks to bridge this gap by developing a comprehensive conceptual understanding of accounting practices in the Indian MSME sector.

CONCEPTUAL AND THEORETICAL FRAMEWORK

The accounting practices of MSMEs can be understood through an integrated conceptual framework that combines accounting principles, organizational resources, technological adoption, and institutional influences. Accounting practices encompass bookkeeping, financial reporting, inventory accounting, payroll management, taxation, budgeting, cost accounting, internal controls, and digital financial management. These practices collectively provide reliable financial information that supports planning, decision-making, regulatory compliance, and organizational sustainability.

The study is primarily supported by the **Resource-Based View (RBV)**, which suggests that efficient accounting systems, skilled human resources, financial knowledge, and digital technologies constitute valuable organizational resources that enhance competitiveness and long-term performance. MSMEs that invest in robust accounting systems are better positioned to improve financial transparency, optimize resource utilization, and strengthen business resilience.

The **Institutional Theory** explains that government regulations, accounting standards, taxation policies, banking requirements, and stakeholder expectations significantly influence accounting practices. Regulatory frameworks such as the Goods and Services Tax (GST), Udyam Registration, and financial reporting requirements encourage MSMEs to adopt standardized accounting systems.

The **Technology Acceptance Model (TAM)** further explains the increasing adoption of cloud accounting, enterprise resource planning (ERP), artificial intelligence (AI), and digital bookkeeping software. According to this model, perceived usefulness and ease of use determine the willingness of MSME owners to adopt accounting technologies that improve efficiency, reduce errors, and facilitate compliance.

The conceptual framework proposes that internal factors (managerial competence, financial literacy, enterprise size, and resource availability) and external factors (government regulations, technological infrastructure, financial institutions, and professional support) influence accounting practices. Effective accounting systems enhance financial reporting quality, regulatory compliance, operational efficiency, access to institutional finance, and informed managerial decision-making. Consequently, improved accounting practices contribute to business sustainability, profitability, competitiveness, and long-term growth of MSMEs in India.

ACCOUNTING PRACTICES IN INDIAN MSMES

Accounting practices in Indian MSMEs comprise a systematic process of recording, classifying, summarizing, and reporting financial transactions to facilitate effective business

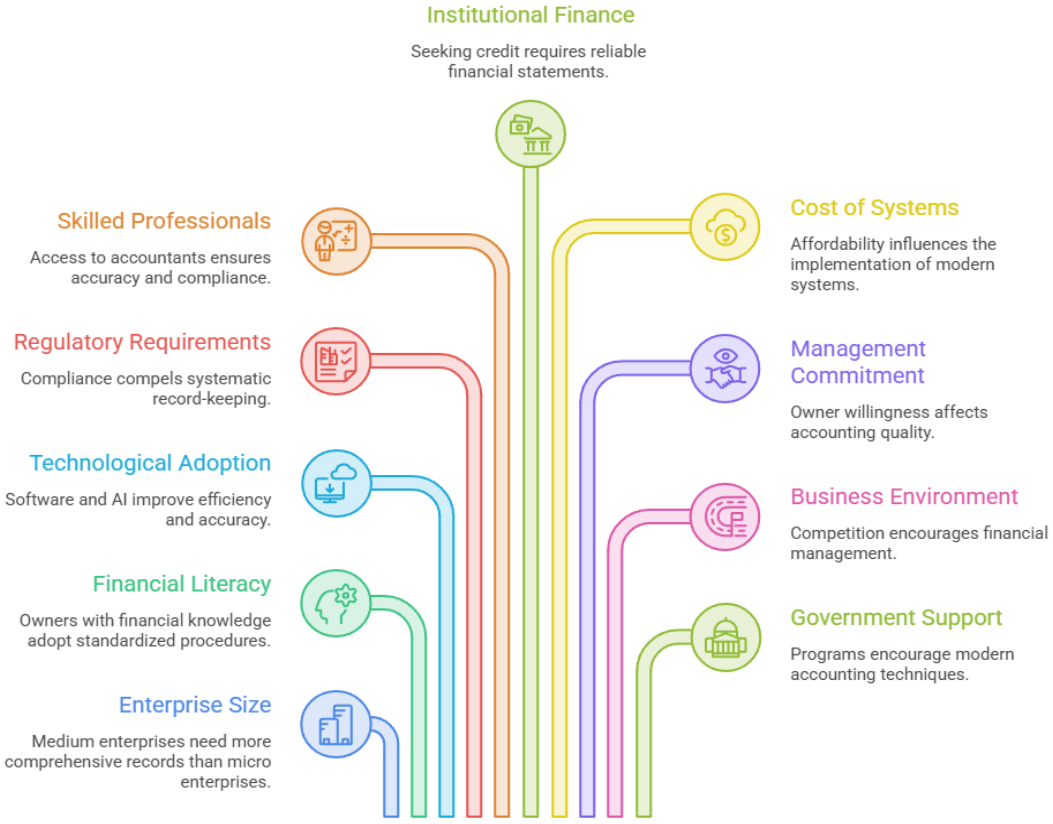
management. Traditionally, many micro and small enterprises maintained manual bookkeeping systems, including cash books, purchase registers, sales registers, journals, and ledgers. However, the implementation of the Goods and Services Tax (GST), increasing digitalization, and wider adoption of accounting software have significantly transformed accounting practices across the sector.

Modern MSMEs increasingly use computerized accounting systems for preparing financial statements, maintaining inventory records, processing payroll, calculating depreciation, budgeting, cost analysis, and filing statutory returns. Digital accounting platforms such as cloud-based software enable real-time financial reporting, automated tax calculations, bank reconciliation, invoice generation, and secure data management. These technologies improve operational efficiency, reduce manual errors, and enhance financial transparency.

Despite these advancements, accounting practices among MSMEs vary considerably depending on enterprise size, financial literacy, technological capability, availability of professional accounting support, and regulatory awareness. Many micro enterprises continue to experience challenges related to inadequate record-keeping, limited adoption of digital accounting tools, and compliance complexities. Strengthening accounting practices through professional training, affordable accounting technologies, and supportive government initiatives is essential for improving financial management, regulatory compliance, business sustainability, and long-term competitiveness of the Indian MSME sector.

FACTORS INFLUENCING ACCOUNTING PRACTICES IN INDIAN MSMES

Accounting practices in Micro, Small, and Medium Enterprises (MSMEs) are influenced by a combination of internal and external factors that determine the quality, accuracy, and effectiveness of financial management. The adoption of systematic accounting practices is essential for ensuring transparency, statutory compliance, and sustainable business growth. The major factors influencing accounting practices are discussed below.



CHALLENGES IN ACCOUNTING PRACTICES

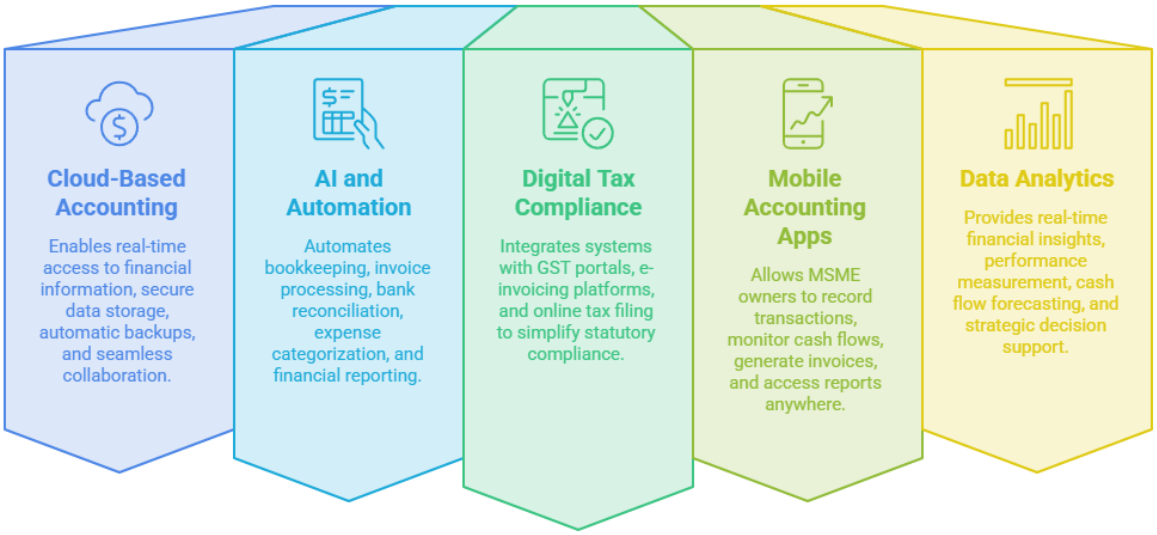
Despite the growing importance of financial management, many MSMEs in India continue to face significant challenges in maintaining effective accounting practices. One of the major issues is the continued dependence on manual bookkeeping and incomplete financial records, particularly among micro enterprises. Limited financial literacy and inadequate accounting knowledge among business owners often result in inaccurate recording and reporting of financial transactions.

The shortage of qualified accounting professionals and the high cost of hiring skilled personnel further restrict the adoption of standardized accounting systems. Many MSMEs also experience difficulties in implementing digital accounting software due to limited technological infrastructure, lack of digital skills, and concerns regarding cybersecurity. Frequent amendments in GST regulations, taxation policies, and statutory compliance requirements increase the complexity of accounting processes and impose additional compliance burdens on small enterprises.

Financial constraints often prevent MSMEs from investing in advanced accounting software, enterprise resource planning (ERP) systems, and staff training. Weak internal control mechanisms, inadequate documentation, delayed reconciliation of accounts, and poor financial planning further reduce the reliability of financial information. These challenges affect business transparency, restrict access to institutional finance, and hinder informed managerial decision-making. Addressing these issues through financial literacy, digital capacity building, professional support, and simplified regulatory procedures is essential for improving accounting practices in the Indian MSME sector.

EMERGING TRENDS IN MSME ACCOUNTING

Rapid technological advancements are transforming accounting practices among Indian MSMEs by enhancing efficiency, transparency, and regulatory compliance. The following emerging trends are reshaping financial management within the sector.



These emerging trends are accelerating the digital transformation of accounting practices and strengthening the financial resilience of MSMEs in India.

GOVERNMENT POLICY INITIATIVES

The Government of India has introduced several policy initiatives to strengthen financial management, promote formalization, and improve accounting practices among Micro, Small, and Medium Enterprises (MSMEs). **Udyam Registration** has simplified enterprise registration and created a formal database that facilitates access to government schemes, institutional credit, and financial support. The implementation of the **Goods and**

Services Tax (GST) has encouraged MSMEs to maintain systematic accounting records, digital invoices, and transparent financial reporting.

The **Digital India** initiative has promoted digital literacy, online financial services, and the adoption of electronic payment systems, enabling enterprises to shift from manual bookkeeping to digital accounting. The **Trade Receivables Discounting System (TReDS)** improves liquidity by facilitating the digital financing of invoices, while the **Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE)** enhances access to collateral-free institutional credit, encouraging better financial record-keeping.

The **MSME Champions Scheme** provides technology support, advisory services, grievance redressal, and capacity-building programs that improve financial management capabilities. Additionally, initiatives such as the **Account Aggregator Framework**, **e-Invoicing**, and digital banking platforms promote secure financial data sharing and integrated accounting systems. Collectively, these policy measures encourage transparency, strengthen regulatory compliance, enhance financial inclusion, and support the modernization of accounting practices, thereby improving the sustainability and competitiveness of the MSME sector in India.

RECOMMENDATIONS

Government agencies, educational institutions, and professional bodies should organize regular accounting literacy and financial management training programs to enhance MSME owners' knowledge of bookkeeping, financial reporting, and statutory compliance.

MSMEs should be encouraged to adopt affordable cloud-based accounting software integrated with GST, payroll, inventory, and banking systems to improve financial accuracy, operational efficiency, and decision-making capabilities.

Professional accounting services through Chartered Accountants, Cost Accountants, and financial consultants should be made more accessible and affordable to assist MSMEs in maintaining standardized accounting practices.

The Government should simplify accounting and taxation procedures by reducing compliance complexity, providing user-friendly digital platforms, and offering multilingual guidance to facilitate easier financial reporting for MSMEs.

Financial incentives, subsidies, and tax benefits should be provided for adopting digital accounting technologies, accounting software, and employee training to accelerate modernization and strengthen financial management among MSMEs.

CONCLUSION

Micro, Small, and Medium Enterprises (MSMEs) are indispensable to India's economic development, contributing significantly to employment generation, industrial production, exports, and inclusive growth. Effective accounting practices form the foundation of sound financial management by enabling enterprises to maintain accurate financial records, prepare reliable financial statements, comply with statutory regulations, and make informed managerial decisions. The transition from traditional bookkeeping to digital accounting systems, supported by GST implementation and technological advancements, has significantly improved financial transparency and operational efficiency across the MSME sector.

However, many MSMEs continue to encounter challenges such as inadequate accounting knowledge, limited adoption of digital technologies, shortage of skilled accounting professionals, financial constraints, and increasing regulatory compliance requirements. Addressing these challenges requires coordinated efforts from policymakers, professional accounting bodies, financial institutions, and educational organizations to strengthen accounting awareness, promote digital transformation, and simplify compliance procedures.

This conceptual study highlights the importance of integrating modern accounting practices with technological innovations and supportive government policies to enhance financial sustainability and business competitiveness. Improved accounting systems not only strengthen internal financial control but also facilitate access to institutional finance, improve governance, and support strategic decision-making. Consequently, strengthening accounting practices will play a crucial role in ensuring the long-term growth, resilience, and global competitiveness of the MSME sector in India.

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WOMEN SEAFARERS AND MARITIME PROFESSIONALS: EXPLORING GENDER INCLUSION IN THE SHIPPING SECTOR

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ABSTRACT

The maritime industry is one of the most significant sectors contributing to global trade, transportation, and economic development. However, it has historically remained a male-dominated sector with limited participation of women in seafaring and maritime professions. In recent decades, increasing awareness of gender equality, technological advancement, and international policy initiatives have encouraged greater involvement of women in shipping companies and maritime organizations. This research article examines the status, challenges, and opportunities of women seafarers and maritime professionals through secondary data analysis. The study utilizes information from international organizations, government reports, academic publications, and maritime industry documents to understand women's participation, workplace experiences, and barriers to career advancement. The findings reveal that although women's representation in maritime professions has gradually increased, significant challenges remain, including gender stereotypes, limited employment opportunities, workplace discrimination, safety concerns, and inadequate leadership representation. The study highlights the importance of gender-responsive policies, inclusive organizational cultures, professional training, and institutional support to promote sustainable participation of women in the maritime sector. Enhancing women's inclusion in shipping is essential not only for achieving gender equality but also for strengthening diversity, innovation, and sustainable development within the global maritime workforce.

KEYWORDS: Women Seafarers, Maritime Industry, Gender Equality, Shipping Companies, Gender Inclusion, Women Empowerment, Maritime Workforce

INTRODUCTION

The maritime industry is a vital component of the global economy, facilitating international trade, transportation, and connectivity among nations. Shipping companies transport a significant proportion of global goods and provide employment opportunities across various professional categories, including seafaring, marine engineering, logistics, port management, and maritime administration. Despite its economic importance, the maritime sector has traditionally been characterized by gender inequality, with women representing a considerably smaller proportion of the workforce.

Historically, maritime occupations have been associated with physical strength, technical expertise, and prolonged periods away from home. These perceptions have contributed to the exclusion of women from seafaring careers and reinforced the belief that maritime professions are primarily suitable for men. Social expectations, limited access to maritime education, safety concerns, and workplace discrimination have further restricted women's participation in this field.

However, globalization and changing social perspectives have gradually transformed the maritime sector. Women are increasingly entering professional maritime roles as ship officers, marine engineers, naval architects, logistics specialists, port managers, and maritime educators. Their participation challenges traditional gender norms and demonstrates the importance of diversity in improving organizational performance and innovation.

Gender equality in the maritime sector is closely connected with global sustainable development goals, particularly Sustainable Development Goal 5, which emphasizes achieving gender equality and empowering all women and girls. International organizations such as the International Maritime Organization (IMO) have initiated programmes to encourage women's participation, education, and leadership in maritime professions.

Although progress has been achieved, women continue to face various challenges in accessing and sustaining maritime careers. Addressing these challenges requires coordinated efforts from governments, educational institutions, maritime organizations, and shipping companies. This study explores women's participation in the shipping sector, examines the barriers faced by women maritime professionals, and highlights strategies for promoting gender inclusion.

Table 1: Global Status of Women's Participation in the Maritime Sector

S.no.	Indicator	Status/Observation
1	Nature of Maritime Industry	Traditionally male-dominated sector with limited female representation
2	Women's Participation in Seafaring	Women constitute a very small proportion of global seafarers
3	Growth Trend	Gradual increase in women entering maritime education and professions
4	Major Areas of Employment	Deck officers, marine engineers, port management, logistics, maritime administration, and education
5	Leadership Representation	Women remain underrepresented in senior positions such as ship masters and maritime executives
6	Major Concern	Gender imbalance continues despite international commitments towards equality

Source: Compiled from IMO, BIMCO–ICS Seafarer Workforce Reports, and maritime research studies.

REVIEW OF LITERATURE

Miyuki Kitada (2015) in the study titled *"Women Seafarers: An Analysis of Barriers to Their Participation in the Maritime Sector"* examined the factors that influence women's entry and participation in seafaring professions. The study adopted a qualitative methodology based on interviews, case studies, and an analysis of existing maritime literature. The findings revealed that gender stereotypes, male-dominated workplace culture, limited career advancement opportunities, and insufficient institutional support are significant barriers affecting women's participation in the maritime sector. The study emphasized the need for organizational transformation, gender-sensitive policies, and supportive workplace practices to encourage women's long-term participation in seafaring careers.

Angela MacNeil and Samrat Ghosh (2017) conducted a study titled *"Gender Imbalance in the Maritime Industry: Impediments, Initiatives and Recommendations"* to analyse the factors contributing to gender inequality in the maritime sector. The study was based on a review of maritime industry reports, research publications, and secondary data sources. The authors found that historical occupational segregation, traditional social perceptions, and inadequate representation of women in leadership positions are major factors responsible for gender imbalance. The study recommended the implementation of inclusive recruitment strategies, professional development programmes, and institutional initiatives to improve women's representation and career progression in maritime professions.

International Labour Organization (ILO) (2015) published a report titled *"Women Seafarers: Global Employment Policies and Practices"* focusing on the employment experiences and working conditions of women seafarers worldwide. The report analysed international employment policies, maritime regulations, and workforce-related data to understand the challenges faced by women in the maritime sector. The findings highlighted issues related to recruitment barriers, limited access to training opportunities, workplace discrimination, and safety concerns on-board ships. The report recommended equal employment opportunities, improved working conditions, and supportive policies to enhance the participation and retention of women in maritime occupations.

International Maritime Organization (IMO) (2021) through its initiative *"Women in Maritime Programme: Promoting Gender Equality in the Maritime Sector"* analysed the importance of increasing women's participation in maritime activities. The study was based on secondary data obtained from global maritime reports, institutional records, and industry-level information. The findings emphasized that education, professional training, capacity-building programmes, and leadership opportunities are essential for improving women's representation in the maritime workforce. The initiative recognized gender diversity as a key factor contributing to sustainable development, innovation, and efficiency in the maritime industry.

World Maritime University (WMU) (2020) conducted research on *"Gender Equality and Empowerment in the Maritime Sector"* to examine women's participation in maritime education and employment. The study utilized global maritime education data, employment reports, and research-based evidence to analyse gender-related challenges in the sector. The findings revealed that although women's participation in maritime education has increased, their transition from education to professional employment remains challenging due to workplace barriers, limited mentorship opportunities, and inadequate support systems. The study highlighted the importance of creating supportive workplace environments, strengthening professional networks, and implementing gender-responsive policies to empower women in maritime careers.

The reviewed studies reveal that women's participation in the maritime sector is gradually improving; however, gender disparities continue due to social, institutional, and organizational barriers. The literature consistently highlights the importance of inclusive policies, professional training, workplace safety, mentorship, and leadership opportunities for achieving gender equality in shipping companies. However, limited studies have focused on the combined impact of organizational practices, career advancement opportunities, and gender inclusion strategies within shipping companies. Therefore, the present study attempts to address this research gap by analysing the status, challenges, and opportunities of women seafarers and maritime professionals using secondary data.

OBJECTIVES OF THE STUDY

The study aims to achieve the following objectives:

- To examine the status of women's participation in the shipping and maritime sector.
- To analyse the challenges faced by women seafarers and maritime professionals.
- To study the role of policies and institutional initiatives in promoting gender inclusion.
- To identify strategies for enhancing women's empowerment and career advancement in shipping companies.

METHODOLOGY

The present study is based on secondary data analysis. The required information has been collected from various authentic sources, including international organization reports, government publications, research journals, books, maritime industry reports, and online databases. Major sources of information include reports published by the International Maritime Organization (IMO), International Labour Organization (ILO), United Nations Sustainable Development Goals reports, World Maritime University publications, maritime research studies, and industry documents. A descriptive and analytical research approach has been adopted to understand the existing status of women in maritime professions. The collected information has been systematically reviewed and interpreted to identify major trends, challenges, and opportunities related to gender inclusion in the shipping sector.

WOMEN'S PARTICIPATION IN THE SHIPPING SECTOR

The participation of women in the maritime sector has witnessed gradual improvement in recent years; however, their representation remains considerably low compared to men. The shipping industry continues to be one of the most gender-segregated sectors globally. Women's involvement is visible not only in traditional shore-based administrative roles but also in technical and operational positions such as ship officers, marine engineers, maritime educators, port managers, logistics professionals, and naval architects.

The increasing availability of maritime education and professional training programmes has encouraged more women to enter the sector. Women graduates from maritime academies are increasingly choosing careers as deck officers, marine engineers, and other specialized maritime professionals. Their contribution has challenged traditional perceptions regarding women's ability to perform technical and operational roles in shipping.

According to global maritime reports, women constitute only a small percentage of the total seafarer workforce. Although their participation has improved, the rate of growth remains slow due to persistent structural and cultural barriers. Women continue to face difficulties in accessing employment opportunities, gaining professional recognition, and reaching leadership positions within maritime organizations.

The presence of women in maritime professions contributes to workplace diversity and organizational effectiveness. Diverse teams often encourage innovation, improved decision-making, and better problem-solving approaches. Therefore, increasing women's

participation is not only an issue of equality but also a strategic requirement for the sustainable development of the maritime industry.

Table 2: Factors Influencing Women's Participation in Shipping Companies

Positive Factors Encouraging Participation	Barriers Limiting Participation
Availability of maritime education	Social stereotypes
International gender equality initiatives	Male-dominated workplace culture
Skill development programmes	Safety concerns
Equal employment policies	Lack of mentorship
Technological advancement	Limited leadership opportunities
Organizational support	Work-family responsibilities

Table 3: International Initiatives Promoting Gender Inclusion in Maritime Sector

Organization/Initiative	Major Contribution
International Maritime Organization (IMO) – Women in Maritime Programme	Promotes training, employment opportunities, and leadership participation of women
International Labour Organization (ILO)	Supports decent work conditions and equal employment rights for seafarers
United Nations Sustainable Development Goal 5	Promotes gender equality and empowerment of women
World Maritime University	Provides education and research opportunities related to gender equality
Maritime Training Institutions	Encourage women through professional education and skill development

Challenges Faced by Women Seafarers and Maritime Professionals

Although women have made significant progress in entering maritime professions, they continue to encounter multiple challenges that affect their career development and professional sustainability.

Gender Stereotypes and Social Perceptions

One of the major barriers affecting women's participation in shipping is the continuation of gender stereotypes. Maritime occupations are often perceived as physically demanding and unsuitable for women. Such assumptions discourage many young women from choosing maritime education and professional careers.

Social expectations regarding women's roles in family responsibilities also influence career decisions. Long periods away from home, extended voyages, and irregular working schedules create additional concerns for women and their families.

Limited Employment and Career Advancement Opportunities

Women maritime professionals often experience difficulties in obtaining equal employment opportunities. Some shipping companies continue to prefer male candidates due to traditional beliefs regarding on-board work environments.

Career advancement is another major challenge. Women are underrepresented in senior positions such as ship captains, chief engineers, and managerial roles. The absence of women leaders reduces opportunities for mentorship and professional guidance for younger women entering the sector.

Workplace Discrimination and Harassment

Women working in male-dominated maritime environments may experience discrimination, exclusion, and unequal treatment. Some women report difficulties in gaining

acceptance and recognition from colleagues. Workplace harassment and inappropriate behaviour remain important concerns affecting women's safety and professional confidence. Creating respectful and secure working environments is essential for encouraging women's participation and retention.

Safety and Working Conditions

The unique nature of maritime employment creates specific challenges for women. Ships often operate for extended periods in isolated environments, making workplace safety a significant concern. Adequate accommodation facilities, privacy arrangements, healthcare support, and effective complaint mechanisms are necessary to ensure a comfortable and secure working environment for women seafarers.

Work-Life Balance

The maritime profession involves long periods away from family and limited opportunities for personal interaction. These conditions create challenges, particularly for women who often face greater expectations regarding family responsibilities.

Shipping companies need to develop flexible and supportive policies to improve work-life balance and retain skilled women professionals.

Gender Inclusion Initiatives in the Maritime Sector

Promoting gender inclusion requires coordinated efforts from international organizations, governments, maritime institutions, and shipping companies.

International Maritime Organization Initiatives

The International Maritime Organization (IMO) has implemented the Women in Maritime Programme to encourage gender equality in the maritime sector. The programme focuses on improving access to maritime education, training opportunities, and employment for women.

The initiative recognizes that increasing women's participation strengthens the maritime workforce and contributes to sustainable development.

Education and Skill Development

Maritime education institutions play an important role in encouraging women to enter the industry. Scholarships, awareness programmes, career counselling, and professional training can increase women's participation in maritime occupations.

Providing equal access to technical education enables women to develop the skills required for successful maritime careers.

Organizational Policies

Shipping companies can promote gender inclusion by adopting equal opportunity policies, transparent recruitment procedures, and fair promotion systems. Companies should also establish mechanisms to prevent discrimination and harassment.

Gender-sensitive workplace practices help create an environment where women can perform effectively and advance professionally.

Women's Leadership Development

Encouraging women's leadership in maritime organizations is essential for achieving long-term gender equality. Leadership development programmes, mentorship opportunities, and professional networks can support women in reaching higher positions.

Greater representation of women in decision-making roles can contribute to the development of more inclusive maritime policies.

Table: 4 Role of Shipping Companies in Promoting Gender Equality

Areas of Intervention	Expected Outcomes
Equal recruitment practices	Increased women's participation
Gender-sensitive workplace policies	Improved employee satisfaction
Safety and harassment prevention mechanisms	Secure working environment
Leadership development programmes	Increased women managers and

	executives
Training and skill enhancement	Better professional performance
Diversity management strategies	Improved organizational effectiveness

FINDINGS OF THE STUDY

Based on the analysis of secondary data, the following findings have been identified:

- Women's participation in the maritime sector has increased gradually, but their overall representation remains limited.
- Gender stereotypes continue to influence women's career choices and professional opportunities.
- Workplace discrimination, safety concerns, and inadequate facilities remain significant barriers for women seafarers.
- Maritime education and training opportunities play an important role in increasing women's participation.
- Institutional initiatives and gender-inclusive policies contribute significantly to improving women's professional advancement.
- Women's representation in leadership positions remains low, highlighting the need for stronger career development strategies.
- A supportive organizational culture is essential for retaining women in maritime careers.
- Gender diversity contributes positively to innovation, efficiency, and sustainable development within shipping organizations.

SUGGESTIONS FOR PROMOTING GENDER INCLUSION IN SHIPPING COMPANIES

Based on the findings, the following suggestions are proposed:

1. **Strengthening Gender Equality Policies:** Shipping companies should develop clear gender equality policies that ensure equal opportunities in recruitment, promotion, and professional development.
2. **Improving Maritime Education Opportunities:** Governments and educational institutions should encourage more women to pursue maritime education through scholarships, awareness campaigns, and training programmes.
3. **Ensuring Safe Workplaces:** Effective measures should be implemented to prevent harassment and discrimination. Ships and maritime workplaces should provide safe, respectful, and supportive environments.
4. **Providing Mentorship and Career Support:** Mentorship programmes connecting experienced maritime professionals with young women can improve confidence, skill development, and career progression.
5. **Increasing Women's Representation in Leadership:** Shipping companies should encourage women's participation in managerial and decision-making positions through leadership development programmes.
6. **Creating Work-Life Balance Policies:** Flexible working arrangements and supportive family-friendly policies can help women continue their maritime careers successfully.
7. **Promoting Social Awareness:** Awareness programmes should challenge traditional gender stereotypes and highlight successful women maritime professionals as role models.

CONCLUSION

Women seafarers and maritime professionals represent an important emerging workforce contributing to the transformation of the shipping sector. Although women's participation has improved over the years, significant challenges continue to restrict their full inclusion in maritime careers. Gender inequality in the maritime sector is influenced by social attitudes, workplace practices, limited representation, and structural barriers.

Addressing these challenges requires a comprehensive approach involving policy reforms, organizational commitment, education, and social change. Creating inclusive maritime workplaces will benefit not only women professionals but also the entire shipping industry by improving diversity, innovation, and operational effectiveness. Women's participation should be viewed not merely as a matter of equality but as an essential component of sustainable maritime development. The future of the shipping sector depends on utilizing the skills, knowledge, and leadership potential of all individuals regardless of gender. Therefore, promoting women's empowerment and gender inclusion in maritime professions is crucial for building a more equitable and sustainable global maritime workforce.

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EVALUATING CUSTOMER SATISFACTION AND PERCEPTION OF INTERNET BANKING WITH REFERENCE TO THANJAVUR

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ABSTRACT

Countries developed slowly after following the different culture people develop in certain areas from developed nations. But after the introduction and advancement of internet in the world, anything happening in one place is taken immediately and followed by anyone in the world. People come to know everything by internet. The banking is not an exemption, as banking had entered the internet world for financial transactions. As the internet banking users are increasing in numbers, the researcher had an idea of knowing about the perception and satisfaction in using internet banking in Thanjavur. For the study, the researcher had taken 219 valid sample respondents in Thanjavur using internet banking in various banks. The collected data had been analysed by using simple percentage, chi square test and correlation. The result stated that the people in Thanjavur using Internet Banking for checking balance, transaction history, sending money, repayment of loans, apply for loans, paying bills, for standing instructions etc. Though various customers using internet banking for various purposes, customers are highly satisfied with the facilities and services they provide through internet banking.

KEYWORDS: Advancements, Banking, Customers, Internet, Perception, Satisfaction.

INTRODUCTION

The banking sector has experienced a greater shift from the traditional banking system to online banking system, including converting from bricks and mortars to digitalised form of banking, with just online Eco systemic banking. These banks have moved people from visiting branches personally to online banking. Internet banking also known as E-banking or online banking has enabled financial institutions delivering all the basic and advanced banking services such as fund transfer from one account to another, paying bills, paying utilities, checking balances, tracing expenses, monitoring accounts, directly from the customer to the transferee without any delay in payment without visiting branches. Since the metropolitan cities have already in the usage of internet banking by all means, the banks have found their route to semi-urban and agricultural hubs like Thanjavur, the Rice-Bowl of Tamil Nadu, by increasing smartphone usage, widening the broadband connectivity and incentives from government for promoting digital bank transactions. Thanjavur has a demographic features of many agriculturists, business entrepreneurs, students, working and retired people. So, Understanding the customer perception and satisfaction in accepting, using, and retaining internet banking highly depends upon the factors such as user-friendly banking portals with mobile access, speed and quick resolution for failed transactions, safety, confidentiality in accounts, and protection against cyber threats. Evaluating these dimensions provides key insights into how diverse customer groups in Thanjavur interact with digital banking tools.

REVIEW OF LITERATURE

SoundaravalliSV (2026). "A Study on the Level of Customer Satisfaction towards Indian Overseas Bank Ltd. in Thanjavur District." .This study investigates the many characteristics of service quality and how they affect customer satisfaction at Indian Overseas Bank Ltd. in Thanjavur District. The SERVQUAL framework is used to conduct the analysis, with a focus on reliability, assurance, tangibles, empathy, and responsiveness. The study's findings indicate that the reliability dimension might be significantly improved. The low effectiveness and use of internet banking services is the primary cause of this gap. Many clients have difficulty using online banking capabilities, reducing their faith in service reliability.

JuhiRupal&Ranveer Singh (2023). "Evaluating the Impact of E-Banking on Customer Satisfaction: A Comprehensive Systematic Review." The study's goal was to give a thorough literature review based on scientific research findings on the impact of e-banking on customer satisfaction. The study examines the impact of e-banking on customer satisfaction. Throughout the literature, many factors/dimensions have been identified as key contributors to the impact and influence of customer satisfaction through e-banking. The current study analyzed 47 papers from various quality journals and marked the findings using the Scopus database from the previous eight years. The literature findings suggested a dual-directional consideration for the impact of e-banking services on customer satisfaction, quality of services, reliability, efficiency, responsiveness, security and privacy, usability, performance, etc., as major dimensions, and also, ease of use and convenience is the impact on customer satisfaction.

Swati Kumari (2026). "Evaluating customer satisfaction in online banking: A study of user experience and service quality." World Journal of Management,1(1), 1-3. DOI: https://www.worldmanagementjournal.com/assets/archives/2025/vol1issue1/1001.pdf

This study analyzes customer satisfaction in online banking, concentrating on user experience and service quality. The research uses a mixed-method approach, combining surveys and structured interviews with active online banking customers, to identify critical factors such as system usability, accessibility, security, responsiveness, and customisation. The study found that both technological efficiency and perceived trustworthiness have a substantial impact on customer happiness. The study identifies gaps in digital service delivery and offers ways to improve customer engagement, loyalty, and experience. This research offers practical suggestions for banks to optimize digital platforms, enhance service interactions, and build lasting client connections in a digital financial ecosystem.

STATEMENT OF THE PROBLEM

As the demographic factor of Thanjavur district comprise of semi-urban, students, small businessmen, agriculturist, working and retired people, and the introduction of internet banking services by the banks in the semi-urban places like Thanjavor, for making people using internet banking facilities provided by the banks, there is always a fear to use, transfer funds and the fear of cyber threat among the people. The people, except a few group of educated and financial literate people are using the internet banking, it has become a topic of study to know if the people are aware of the internet banking, proper usage, customer perception about internet banking and to know their satisfaction on the usage of internet banking have to be seen in depth. For this purpose the study has been taken by the researcher on online banking services provided by the banks.

CUSTOMER PERCEPTION TO ONLINE BANKING

- Fast and convenient: People need not want to visit bank branches to avail the facilities provided by the bank off line. They are provided under one roof. They can transfer funds, check history and take ststements without waiting in a long queue from the bank as practised in traditional banks.

- No time limit: Online banking services are provided 24/7, round the clock and people can transact any time they want without physically present in the bank except for the time limits provided for NEFT/RTGS in transaction.
- Deposit money hasel-free: People need not carry huge amount to the bank with fear of losing and theft. They can transfer funds online from house or any places they wish.
- Internet availability: Access of internet banking is highly dependent on the availability of internet provided by the service provider. Banking transactions cannot be done without internet connectivity.
- Awareness on the security concerns: People are not much aware of the cyber threats concerning their transactions and it is the bank's responsibility to make the customers aware of the internet banking and the cyber threat involved in it if not used properly. Digital literacy is very essential in online banking.

OBJECTIVES OF THE STUDY

Based on the past literature and the knowledge about the internet banking, following are the objectives of the study.

1. To study the demographic profile of internet banking users of public and private sector banks in Thanjavur.
2. To evaluate customer perceptionregarding the internet banking, including the usage, security, transaction speed, and accessibility.
3. To measure the level of customer satisfactionwith the services rendered by bank online platforms.
4. To find the relationship between the customer perception and customer satisfaction of online banking services.
5. To offer suggestions to banking institutions for improving customer adoption, security, and service quality in Thanjavur.

RESEARCH METHODOLOGY

Study area

The researcher conducted this study at Thanjavur, **Thanjavur,** popularly known as the **"Rice Bowl of Tamil Nadu,"** is a historic city located in the Cauvery Delta region of Tamil Nadu, India. It is renowned for its rich cultural heritage, ancient temples, traditional arts, and significant contribution to South Indian history. The city served as the capital of the powerful Chola dynasty between the 9^{th} and 13^{th} centuries, during which it became a major center of art, architecture, literature, and administration.

Sampling

The total population of Thanjavur is 24.06 lakhs as per 2011 census, the technology development and improvement of people standard of living all are having bank account and using internet banking and online platform to transfer money. The researcher adopted convenient sampling method for data collection, the target of 220 samples, visited both private and government sector banks in Thanjavur and collect data from 220 respondents, out of it 1 questionnaire unfilled all the data, so rejected that 1 questionnaire and taken the valid 219 questionnaire as sample for this study.

Tools and techniques

The researcher used percentage analysis to present the socio economic profile of the respondents, chi square test used to find the factors which influence the level of customer satisfaction and correlation coefficient used to find the relationship between the customer satisfaction and customer perception.

SOCIO ECONOMIC PROLIFE – PERCENTAGE ANALYSIS

Table 1

Age group of the respondents

Sl. No.	Age group	Number of respondents	Percentage
1	Less than 30 years	37	16.89
2	31 to 40 years	51	23.29
3	41 to 50 years	60	27.40
4	Above 50 years	71	32.42
	Total	**219**	**100**

Source : Computed data

The above table shows the age group of the respondents, out of two hundred and nineteen sample respondents, thirty seven (16.89%) respondents are less than 30 years old. Fifty one (23.29%) respondents are between 31 years and 40 years. Sixty (27.40%) respondents are between 41 years and 50 years and remaining seventy one (32.42%) respondents are above 50 years old. Majority (32.42%) of the respondents are above 50 years old.

Table 2

Gender of the respondents

Sl. No.	Gender	Number of respondents	Percentage
1	Male	117	53.42
2	Female	102	46.58
	Total	**219**	**100**

Source : Primary data

The above table shows the gender of the respondents, out of two hundred and nineteen sample respondents, one hundred and seventeen (53.42%) respondents are male and remaining one hundred and two (46.58%) respondents are female. Majority (53.42%) of the respondents are male.

Table 3

Marital status of the respondents

Sl. No.	Marital status	Number of respondents	Percentage
1	Married	136	62.10
2	Single	83	37.90
	Total	**219**	**100**

Source : Primary data

The above table presented the marital status of the respondents, out of two hundred and nineteen sample respondents, one hundred and thirty six (62.10%) respondents are married and remaining eighty three (37.90%) respondents are single. Majority (62.10%) respondents are married.

Table 4

Monthly family Income of the respondents

Sl. No.	Monthly family income	Number of respondents	Percentage
1	Less than Rs. 30,000	49	22.38
2	Rs. 30,001 to Rs. 45,000	73	33.33
3	Rs. 45,001 to 60,000	53	24.20
4	Above Rs. 60,000	44	20.09
	Total	**219**	**100**

Source : Primary data

The above table presented the monthly family income of the respondents, out of two hundred and nineteen sample respondents, forty nine (22.38%) respondents monthly income is less than Rs. 30,000 per month. Seventy three (33.33%) respondents monthly income is

from Rs. 30,001 to Rs. 45,000 per month. Fifty three (24.20%) respondents monthly income is from Rs. 45,001 to Rs. 60,000 per month and remaining forty four (20.09%) respondents monthly income is above Rs. 60,000. Majority (33.33%) of the respondents' monthly family income is between Rs. 30,001 and Rs. 45,000.

Table 5

Educational qualification of the respondents

Sl. No.	Educational qualification	Number of respondents	Percentage
1	School level	28	12.79
2	Graduate	113	51.60
3	Professional	36	16.43
4	Others	42	19.18
	Total	**219**	**100**

Source : Primary data

The above table presented the educational qualification of the respondents, out of two hundred and nineteen sample respondents, twenty eight (12.79%) respondents studied school level. One hundred and thirteen (51.60%) respondents are graduates. Thirty six (16.43%) respondents are professionals and remaining forty two (19.18%) respondents are others. Majority (51.60%) of the respondents are graduates.

Table 6

Occupation of the respondents

Sl. No.	Occupation	Number of respondents	Percentage
1	Employer	54	24.66
2	Employee	88	40.18
3	Professionals	41	18.72
4	Home maker and Retired	36	16.44
	Total	**219**	**100**

Source : Primary data

The above table shows the occupation of the respondents, out of two hundred and nineteen sample respondents, fifty four (24.66%) respondents are employers. Eighty eight (40.18%) respondents are employee. Forty one (18.72%) respondents are professionals and remaining thirty six (16.44%) respondents are home makers and retired. Majority (40.18%) of the respondents are employees.

Table 7

Family type of the respondents

Sl. No.	Family type	Number of respondents	Percentage
1	Joined	92	42.01
2	Nuclear	127	57.99
	Total	**219**	**100**

Source : Primary data

The above table presented the family type of the respondents, out of two hundred and nineteen sample respondents, ninety two (42.01%) respondents are joined families and remaining one hundred and twenty seven (57.99%) respondents are nuclear families. Majority (57.99%) of the respondents are nuclear families.

Table 8

Family Size of the respondents

Sl. No.	Family size	Number of respondents	Percentage
1	3 members	41	18.72
2	4 members	98	44.75
3	Above 4 members	80	36.53
	Total	**219**	**100**

Source : Primary data

The above table shows the family size of the respondents, out of two hundred and nineteen sample respondents, forty one (18.72%) respondent's family size is 3. Ninety eight (44.75%) respondent's family size is 4 and remaining eighty (36.53%) respondent's family size is above 4 members. Majority (44.75%) of the respondent's family size is 4 members.

Table9

Number bank accounts operating by the respondents

Sl. No.	Number of bank account	Number of respondents	Percentage
1	1 bank account	57	26.03
2	2 bank accounts	73	33.33
3	3 bank accounts	51	23.29
4	Above 3 accounts	38	17.35
	Total	**219**	**100**

Source : Primary data

The above table shows the number of bank account holding by the respondents, out of two hundred and nineteen sample respondents, fifty seven (26.03%) respondents are having 1 bank account. Seventy three (33.33%) respondents are having 2 bank accounts. Fifty one (23.29%) respondents are having 3 bank accounts and remaining thirty eight (17.35%) respondents are having above 3bank accounts. Majority (33.33%) of the respondents are having 2 bank accounts.

Table 10

Usage of banks Mobile application

Sl. No.	Usage of bank's mobile application	Number of respondents	Percentage
1	Using only bank's mobile application	86	39.27
2	Using bank's mobile application and other platform	133	60.73
	Total	**219**	**100**

Source : Primary data

The above table shows the usages of mobile application by the respondents, out of two hundred and nineteen sample respondents,eighty six (39.27%) respondents are using bank's mobile application and remaining one hundred and thirty three (60.73%) respondents are using bank's mobile application and other online platform which providing by private companies. Majority (60.73%) of the respondents are using both bank's mobile application and other online platforms.

Table 11

Usage of general mobile application

Sl. No.	Usage of general mobile application	Number of respondents	Percentage
1	G – Pay	71	32.43
2	Phone Pay	47	21.46
3	Both G - pay and Phone pay	74	33.79
4	Others	27	12.33
	Total	**219**	**100**

Source : Primary data

The above table presented the usages of general mobile application by the respondents, out of two hundred and nineteen sample respondents, seventy one (32.43%) respondents are using G – pay. Forty seven (21.46%) respondents are using phone pay,

seventy four (33.79%) respondents are using both g – pay and phone pay remaining twenty seven (12.33%) respondents are using other platforms. Majority (33.79%) of the respondents are using both g – pay and phone pay.

Customer Satisfaction

To measure the level of customer satisfaction, the researcher taken trust, continued usage, customer loyalty, user convenient, speed of website, security levels and grievance. The five point likert scale used to measure the level of satisfaction, calculated mean and SD to find the 3 level, i.e. low, medium and high. The following table presented the level of customer satisfaction.

Table 12
Level of Customer Satisfaction

Sl. No.	Level of customer satisfaction	Number of respondents	Percentage
1	Low	57	26.03
2	Medium	99	45.21
3	High	63	28.76
	Total	**219**	**100**

Source : Computed data

The above table presented the level of satisfaction of the respondents, out of two hundred and nineteen sample respondents, fifty seven (26.03%) respondents are felt low level of satisfaction. Ninety nine (45.21%) respondents are felt medium level of satisfaction and remaining sixty three (28.76%) respondents are felt high level of customer satisfaction. Majority (45.21%) of the respondents are felt medium level of satisfaction.

Hypothesis

The socio economic variables do not significantly influence the customer satisfaction.

Chi Square test

Chi square test used to find the factors which influence the customer satisfaction of the sample respondents. The following table shows the chi square calculated value, DF, P-value and result to understand. The researcher have taken at 5% significant level.

Table 13
Socio economic variables and level of customer satisfaction

Sl. No.	Variables	Chi square calculated value	DF	P value	Result
1	Age group	12.783	6	0.001	Significant
2	Gender	19.922	2	0.001	Significant
3	Marital status	21.471	2	0.001	Significant
4	Monthly family income	16.903	6	0.001	Significant
5	Educational qualification	18.835	6	0.001	Significant
6	Occupation	19.862	6	0.001	Significant
7	Family type	21.772	2	0.001	Significant
8	Family size	18.378	4	0.001	Significant
9	Number of bank accounts	19.305	6	0.001	Significant
10	Bank's mobile application	22.365	2	0.001	Significant
11	Usage of general mobile application	15.672	6	0.001	Significant

Source: Computed data

Interpretation

The age group (0.001), gender (0.001), marital status (0.001), monthly family income (0.001), educational qualification (0.001), occupation (0.001), family type (0.001), family size (0.001), number of bank accounts (0.001), bank's mobile application (0.001) and usage of general mobile application (0.001) are influence the level of customer satisfaction at 5% significant level. hence, the null hypothesis has been rejected and alternative hypothesis has been accepted at 5% significant level.

Level of perception

The researcher have find the following variables to find the level of perception of online banking, i.e. quality, usefulness, security, convenience and reliability of online banking. Likert five point scale used to find the level of perception, mean and SD to take 3 level of perception.

Table 14

Level of perception

Sl. No.	Level of Perception	Number of respondents	Percentage
1	Low	51	23.29
2	Medium	107	48.86
3	High	61	27.85
	Total	**219**	**100**

Source : Computed data

The above table sows the level of perception of the respondents, out of two hundred and nineteen respondents, fifty one (23.29%) respondents felt low level of perception. One hundred and seven (48.86%) respondents felt medium level of perception and remaining sixty one (27.85%) respondents felt high level of perception. Majority (48.86%) respondents are felt medium level of perception.

Correlation coefficient

Correlation coefficient used to find the relationship between two dimensions, i.e. level of customer satisfaction and level of customer perception.

Table 15

Correlation coefficient : relationship between customer satisfaction and customer perception

	Level of customer satisfaction	Level of customer perception
Level of customer satisfaction	1	
Level of customer perception	0.903** 0.001	1

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

The above correlation coefficient table shows the relationship between customer satisfaction and customer perception of internet banking in the study area. The result shows that there is positive and significant relationship with customer satisfaction (0.903) and customer perception. Above the perception of internet banking has fulfil the customer's needs, so that the result shows that there is positive relationship.

FINDINGS

- Age group of the respondents divided into four categories, majority (32.42%) of the respondents are above 50 years old.
- Gender of the respondents taken two categories, i.e. male and female, out of them majority (53.42%) of the respondents are male.
- Marital status taken as two categories, i.e. married and single, majority (62.10%) respondents are married.

- Majority (33.33%) of the respondents' monthly family income is between Rs. 30,001 and Rs. 45,000.
- Majority (51.60%) of the respondents are graduates.
- Majority (40.18%) of the respondents are employees.
- Majority (57.99%) of the respondents are nuclear families.
- Majority (44.75%) of the respondent's family size is 4 members.
- Majority (33.33%) of the respondents are having 2 bank accounts.
- Majority (60.73%) of the respondents are using both bank's mobile application and other online platforms.
- Majority (33.79%) of the respondents are using both g – pay and phone pay.
- Majority (45.21%) of the respondents are felt medium level of satisfaction.
- Majority (48.86%) respondents are felt medium level of perception.

SUGGESTIONS

Based on the findings in Thanjavur, the following measures can improve customer adoption and satisfaction on the internet banking services provided by the banks

- Banks should provide awareness program among the customers about the online banking services provided by them in the bank, explain how to open, use, transact, pay bills, close and logout etc.
- Regional language support can also enhance the usage of people who do not have the access of foreign official language.
- People should be made aware of not to reveal the username, password, OTP to any one asking in the name of banks.
- User-friendly internet banking has to be provided for easy and quick transactions.
- Grievances on the part of online banking has to be addressed immediately and steps to be taken to any get back the failed transactions. This would build trust in the minds of the customers.
- Train branch staff to assist customers in setting up internet banking during branch visits, ensuring a smooth transition from physical to digital channels.

CONCLUSION

Internet banking has progressed from an optional convenience to an essential component of India's financial progression. In Thanjavur, though considered as the semi-urban area, customers have a typically positive view of speed and 24/7 convenience, pleasure of usage, digital involvement, easy to use, hassle-free, have moved people from traditional banking to internet banking. The only concern is about the cyber threat if not properly educated. Banks by addressing security issues immediately, simplifying platform works, providing regional language options, might close the trust gap between the banks and the customers. Strengthening all these areas might improve the digital financial inclusion across Thanjavur which has been taken for study.

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A STUDY ON CONSUMER BUYING BEHAVIOUR TOWARDS ORGANIC FOOD PRODUCTS WITH REFERENCE TO ERODE DISTRICT

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ABSTRACT

The growing awareness of health, environmental sustainability and food safety has significantly influenced consumer purchasing patterns across the world. In recent years, organic food products have gained considerable attention as consumers increasingly prefer foods produced without the use of synthetic fertilizers, pesticides, genetically modified organisms or harmful chemicals. The following are objective of the study, (i) to examine the socio-economic profile of consumers purchasing organic food products in Erode District, (ii) to analyse the factors influencing consumer buying behaviour towards organic food products, (iii) to find the relationship between buying behaviour and level of awareness regarding organic food products among consumers and (iv) to offer suitable suggestions for promoting the consumption of organic food products. The present study conducted in Erode, structured questionnaire prepared by the researcher for data collection. Convenient sampling method used for data collection. Percentage analysis and Correlation coefficient used to find the relationship between buying behaviour and source of awareness. The study concluded that the study provides valuable insights into consumer buying behaviour towards organic food products and offers practical recommendations for improving market development. The findings will benefit producers, marketers, policymakers and consumers while contributing to the long-term growth of sustainable agriculture and healthy food consumption in Erode District.

KEYWORDS: Organic Products, Buying Behaviour, Awareness, Environmental Sustainability and Harmful Chemicals.

INTRODUCTION

The growing awareness of health, environmental sustainability and food safety has significantly influenced consumer purchasing patterns across the world. In recent years, organic food products have gained considerable attention as consumers increasingly prefer foods produced without the use of synthetic fertilizers, pesticides, genetically modified organisms or harmful chemicals. Organic farming not only promotes healthier food

consumption but also contributes to environmental conservation, biodiversity, and sustainable agricultural development.

India has witnessed remarkable growth in the organic food market due to increasing health consciousness, rising disposable income, changing lifestyles and government initiatives promoting organic agriculture. Consumers are becoming more concerned about food quality, nutritional value and the long-term health effects of consuming conventionally grown food products. Hence, the demand for organic fruits, vegetables, cereals, pulses, dairy products, spices, and processed organic foods has increased substantially.

Erode District, popularly known as the "Turmeric City of India," possesses a strong agricultural base and has emerged as an important region for the cultivation and marketing of agricultural commodities. The district has significant potential for organic farming because of its fertile soil, favourable climatic conditions and increasing awareness among farmers regarding sustainable agricultural practices. At the same time, consumers in Erode are gradually shifting towards healthier food choices due to increasing education, urbanization and access to information through digital media.

Consumer buying behaviour towards organic food products is influenced by several factors, including health consciousness, environmental concern, product quality, availability, price, brand image, certification, packaging, promotional activities and social influence. Understanding these factors is essential for producers, retailers, marketers and policymakers to formulate effective strategies for promoting organic food consumption.

STATEMENT OF THE PROBLEM

The demand for organic food products has increased steadily due to rising health awareness, environmental concerns and changing consumer lifestyles. Despite this growth, the market for organic food products continues to face several challenges. High prices, limited availability, lack of consumer awareness, inadequate promotional activities, counterfeit products and limited trust in organic certification often discourage consumers from purchasing organic food regularly.Many consumers recognize the health benefits of organic food but hesitate to purchase these products because they are uncertain about product authenticity, certification standards, and value for money. The conventional food products are more easily available and relatively inexpensive, making them the preferred choice for a large segment of consumers.

In Erode District, where agriculture plays a vital role in the local economy, understanding consumer buying behaviour towards organic food products becomes particularly important. Although organic farming is gradually expanding, there is limited empirical evidence regarding consumer preferences, purchasing frequency, influencing factors, satisfaction levels, and barriers affecting organic food consumption in the district.The present study seeks to examine the consumer buying behaviour towards organic food products with reference to Erode District. The findings are expected to assist marketers, producers, retailers, policymakers and agricultural agencies in formulating effective marketing strategies and promoting sustainable consumption practices.

OBJECTIVES OF THE STUDY

1. To examine the socio-economic profile of consumers purchasing organic food products in Erode District.
2. To analyse the factors influencing consumer buying behaviour towards organic food products.
3. To find the relationship between buying behaviour and level of awareness regarding organic food products among consumers.
4. To offer suitable suggestions for promoting the consumption of organic food products.

FACTORS INFLUENCING BUYING BEHAVIOUR

1. Health consciousness
2. Product quality

3. Environmental awareness
4. Products availability
5. Pricing
6. Certification and promotional activity.

SAMPLING DESIGN

The present study conducted in Erode, structured questionnaire prepared by the researcher for data collection. It included socio economic profile of the respondents, variables related to awareness level, consumer preference and consumer satisfaction, each has each 5 variables. Convenient sampling method used for data collection, distributed 200 questionnaire in Erode, out of it 193 filled questionnaire were collected back, all the filled questionnaires were taken for data analysis.

TOOLS AND TECHNIQUES

The researcher adopted percentage analysis, chi square test and correlation coefficient used for data analysis. Percentage analysis used to present the socio economic profile of the respondents, chi square used to find the influence of socio economic factors and buying behaviour of the respondents. Correlation coefficient used to find the relationship between buying behaviour and source of awareness.

ANALYSIS AND INTERPRETATION

PERCENTAGE ANALYSIS

Table 1

Gender of the respondents

Sl. No.	Gender	Number of respondents	Percentage
1	Male	72	37.31
2	Female	121	62.69
3	Transgender	0	0
	Total	193	100

Source : Primary data

The above table shows the gender of the respondents, out of 193 sample respondents, seventy two (37.31%) respondents are male and remaining one hundred and twenty one (62.69%) respondents are female. During the study there were no transgender available in the area, majority (62.69%) of the respondents are female. It shows that the female buying are more buying organic products.

Table 2

Age group of the respondents

Sl. No.	Age group	Number of respondents	Percentage
1	Less than 30 years	27	13.99
2	31 years to 45 years	54	27.98
3	46 years to 60 years	77	39.90
4	Above 60 years	35	18.13
	Total	193	100

Source : Primary data

The above table presented the age group of the respondents, out of 193 sample respondents, twenty seven (13.99%) respondents are less than 30 years old. Fifty four (27.98%) respondents are 31 years to 45 years old. Seventy seven (39.90%) respondents are 46 years to 60 years old and thirty five (18.13%) respondents are above 60 years old. Majority (39.90%) of the respondents are 46 years to 60 years old.

Table 3
Monthly Income of the respondents

Sl. No.	Monthly Income	Number of respondents	Percentage
1	Less than Rs. 25,000	31	16.06
2	Rs. 25,001 to Rs. 50,000	48	24.87
3	Rs. 50,001 to Rs. 75,000	69	35.75
4	Above Rs. 75,000	45	23.32
	Total	193	100

Source : Primary data

The above table presented the monthly income of respondents, out of 193 respondents, thirty one (16.06%) respondent's monthly income is less than Rs. 25,000. Forty eight (24.87%) respondent's monthly income is from Rs. 25,001 to Rs. 50,000. Sixty nine (35.75%) respondent's monthly income is between Rs. 50,001 and Rs. 75,000 and remaining forty five (23.32%) respondent's monthly income is above Rs. 75,000. Majority (35.75%) of the respondent's monthly income is between Rs. 50,001 and Rs. 75,000.

Table 4
Monthly expenses for organic products

Sl. No.	Monthly Expenses	Number of respondents	Percentage
1	Less than Rs. 2,000	76	39.38
2	Rs. 2,001 to Rs. 3,000	61	31.61
3	Above Rs. 3,000	56	29.01
	Total	193	100

Source : Primary data

The above table shows the monthly expenses for organic products of the respondents.Out of 193 respondents, seventy six (39.38%) respondent's monthly expenses for organic products is less than Rs. 2,000. Sixty one (31.61%) respondent's monthly income is between Rs. 2,001 and Rs. 3,000 and remaining fifty six (29.01%) respondent's monthly income is above Rs. 3,000. Majority (39.38%) of the respondent's monthly expenses is less than Rs. 2,000.

Table 5
Family type of the respondents

Sl. No.	Family type	Number of respondents	Percentage
1	Nuclear family	88	45.60
2	Joint family	105	54.40
	Total	193	100

Source : Primary data

The above table shows the family type of the respondents, out of 193 sample respondents, eighty eight (45.60%) respondents are nuclear family and remaining one hundred and five (54.40%) respondents are joint family. Majority (54.40%) of the respondents are joint families.

Table 6
Marital status of the respondents

Sl. No.	Marital Status	Number of respondents	Percentage
1	Married	148	81.87
2	Unmarried	45	18.13
	Total	193	100

Source : Primary data

The above table shows the marital status of the respondents, out of 193 sample respondents, one hundred and forty eight (81.87%) respondents are married and remaining forty five (18.13%) respondents are unmarried. Majority (81.87%) of the respondents are married.

Table 7
Number of family members

Sl. No.	Number of family members	Number of respondents	Percentage
1	3 members	46	23.83
2	4 members	87	45.08
3	5 members and above	60	31.09
	Total	193	100

Source : Primary data

The above table presents the number of family members of the respondents, out of 193 sample respondents, forty six (23.83%) respondent's number of family members are 3. Eighty seven (45.08%) respondent's number of family members are 4 and remaining sixty (31.09%) respondent's number of family members are above 5. Majority (45.08%) of the respondent's family members are 4.

Table 7
Frequent of purchase of organic products

Sl. No.	Frequent of purchase	Number of respondents	Percentage
1	Whenever need	94	48.70
2	Weekly once	61	31.61
3	More than 2 times in a week	38	19.69
	Total	193	100

Source : Primary data

The above table shows the frequent of purchase of the respondents, out of 193 sample respondents, ninety four (48.70%) respondents are purchasing organic food products whenever they need. Sixty one (31.61%) respondents are purchasing organic food products weekly once and remaining thirty eight (19.69%) respondents are purchasing organic food products more than 2 times in a week. Majority (48.70%) of the respondents are purchasing organic food products are whenever need.

Table 8
Source of purchase of organic products

Sl. No.	Source of purchase	Number of respondents	Percentage
1	Specialized shops	57	29.53
2	General shop	77	39.90
3	Online purchase	32	16.58
4	All above sources	27	19.99
	Total	193	100

Source : Primary data

The above table shows the source of purchase of organic products, out of 193 sample respondents, fifty seven (29.53%) respondents are buying organic food products at specialized shops. Seventy seven (39.90%) respondents are buying organic food products at general shops. Thirty two (16.58%) respondents are buying organic food products at online purchase and remaining twenty seven (19.99%) respondents are buying organic food

products from all above sources. Majority (39.90%) of the respondents are buying organic products at general shops.

HYPOTHESIS

The socio economic profile of the respondents do not influence the buying behaviour of organic food products at 5% significant level.

CHI SQUARE TEST

Table 9

Socio economic factors and level of buying behaviour of organic food products

Sl. No.	Variables	Chi square calculated value	DF	P – value	Result
1	Gender	18.382	4	0.001	Significant
2	Age group	22.371	6	0.001	Significant
3	Monthly income	1.487	6	0.781	Not Significant
4	Monthly expenses	18.905	4	0.001	Significant
5	Family type	19.753	2	0.001	Significant
6	Marital status	20.840	2	0.001	Significant
7	Nature of family	17.396	4	0.001	Significant
8	Frequency of purchase	18.378	4	0.001	Significant
9	Source of purchase	22.783	6	0.001	Significant

Source : Computed data

The above table shows the chi square test results, gender (0.001), age group (0.001), monthly expenses for organic products (0.001), family type (0.001), marital status (0.001), nature of family (0.001), frequency of purchase (0.001) and source of purchase (0.001) are significantly influence the level of buying behaviour at 5% significant level. Hence, the null hypothesis has been rejected at 5% significant level.

The monthly income (0.781) do not significantly influence the level of buying behaviour at 5% significant level. Hence, the null hypothesis has been accepted at 5% significant level.

CORRELATION COEFFICIENT

Table 10

Relationship between buying behaviour and source of awareness of organic food products

		Buying behaviour	Source of awareness
Buying behaviour	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	193	
Source of awareness	Pearson Correlation	.844**	1
	Sig. (2-tailed)	.001	
	N	193	284

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

The above correlation coefficient test result shows the relationship between buying behaviour and source of awareness. The buying behaviour has positive and significant relationship with awareness. If once the buyers decided to buy the products, they start searching the products. The correlation shows the exact results at 1% significant level.

FINDINGS

The following are the findings of the study.

- Majority (62.69%) of the respondents are female.
- Majority (39.90%) of the respondents are 46 years to 60 years old.

- Majority (35.75%) of the respondent's monthly income is between Rs. 50,001 and Rs. 75,000.
- Majority (39.38%) of the respondent's monthly expenses is less than Rs. 2,000.
- Majority (54.40%) of the respondents are joint families.
- Majority (81.87%) of the respondents are married.
- Majority (45.08%) of the respondent's family members are 4.
- Majority (48.70%) of the respondents are purchasing organic food products are whenever need.
- Majority (39.90%) of the respondents are buying organic products at general shops.

SUGGESTIONS

- Government agencies, organic food producers and retailers should organize awareness campaigns highlighting the health, nutritional, and environmental benefits of organic food products. Educational programmes, exhibitions and digital marketing initiatives can improve consumer knowledge and encourage informed purchasing decisions.
- Proper certification and transparent labelling should be ensured to build consumer confidence. Clearly displaying certification logos, production details and quality standards on product packaging will help consumers distinguish genuine organic products from misleading alternatives.
- Organic food products should be made easily available through supermarkets, local grocery stores, farmers' markets, cooperative outlets and online platforms. Expanding distribution channels will improve accessibility and encourage regular purchases.
- Since high prices remain a major barrier to organic food consumption, producers and retailers should adopt competitive pricing strategies. Government subsidies and incentives for organic farming can also reduce production costs and make organic products more affordable.
- Marketers should utilize digital media, social media influencers, health campaigns, product demonstrations and promotional offers to increase consumer interest. Attractive packaging and informative advertising can further strengthen purchase intentions.
- Government institutions should provide financial assistance, technical training and marketing support to local organic farmers. Strengthening farmer-producer organizations and cooperative marketing can improve product quality and market competitiveness.
- Retailers should maintain consistent product quality and educate consumers about organic certification procedures. Transparent business practices and quality assurance measures will enhance trust and encourage long-term customer loyalty.

CONCLUSION

Organic food products have become increasingly important due to growing concerns regarding health, nutrition, food safety and environmental sustainability. The findings of the study indicate that consumer buying behaviour is influenced by multiple factors such as health consciousness, product quality, environmental awareness, availability, pricing, certification and promotional activities. Although consumers exhibit a positive attitude towards organic food products, several barriers, including high prices, limited availability and lack of awareness, continue to restrict wider adoption.The study concludes that enhancing relationship between buying behaviour and source of awareness of organic products. Collaborative efforts among government agencies, organic farmers, retailers and marketers will play a crucial role in promoting sustainable consumption and supporting the growth of organic agriculture. The study provides valuable insights into consumer buying

behaviour towards organic food products and offers practical recommendations for improving market development. The findings will benefit producers, marketers, policymakers and consumers while contributing to the long-term growth of sustainable agriculture and healthy food consumption in Erode District.

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A STUDY ON CONSUMER PERCEPTION AND BRAND PREFERENCE BETWEEN BLINKIT AND ZEPTO IN INDIA'S QUICK COMMERCE SECTOR WITH REFERENCE TO CHENNAI CITY

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ABSTRACT

A study examines one of the fastest-growing segments of Indian retail. Quick commerce has emerged as a major consumer trend due to rapid urbanization, increasing smartphone penetration, busy lifestyles, digital payment adoption, and the growing demand for instant delivery of groceries and daily essentials. The shift from traditional retail and conventional e-commerce to quick commerce is driven by convenience, time savings, competitive pricing, attractive discounts, and improved delivery efficiency. India's quick commerce market is currently dominated by platforms such as Blinkit, Zepto, Swiggy Instamart, BigBasket, and Flipkart Minutes, with Blinkit and Zepto being among the most preferred brands in metropolitan cities. The primary aim of this study is to identify consumer perception and determine brand preference between Blinkit and Zepto in Chennai city. The research evaluates factors such as delivery speed, product quality, pricing, discounts, app usability, product availability, customer service, and overall shopping experience. Primary data were collected through a structured questionnaire from consumers in Chennai, and the data were analyzed using statistical tools including percentage analysis, chi-square test, correlation analysis and Structural Equation Modelling using. The study also examines key challenges faced by quick commerce platforms, including high operational costs, delivery delays, inventory management issues, dark-store efficiency, and customer retention. Possible measures such as optimized logistics, AI-based demand forecasting, improved inventory control, enhanced customer support, sustainable delivery practices, and personalized marketing are suggested to address these challenges. The expected outcome of the study is to identify the factors that significantly influence consumer perception and brand preference, provide insights into consumer behaviour, and offer strategic recommendations for improving customer satisfaction and strengthening the competitive position of Blinkit and Zepto.

KEY WORDS: Consumer perception, brand preference, quick commerce.

INTRODUCTION

The Indian retail industry has undergone a remarkable transformation with the rapid emergence of quick commerce, which has become one of the most significant developments in the digital retail ecosystem. Quick commerce refers to the ultra-fast delivery of groceries, food, medicines, and daily essentials, typically within 10 to 30 minutes, through technology-enabled platforms and strategically located dark stores. The sector has witnessed

exponential growth in metropolitan cities due to increasing urbanization, changing consumer lifestyles, higher disposable incomes, widespread smartphone usage, affordable internet access, and the adoption of digital payment systems. Consumers today prioritize convenience, speed, and reliability, making quick commerce a preferred alternative to traditional retail and conventional e-commerce. The COVID-19 pandemic further accelerated this trend by encouraging contactless shopping and home delivery services. In the current market scenario, quick commerce has evolved from a niche convenience service into a mainstream retail channel, attracting significant investments from venture capital firms and large corporations. The intense competition among major players has led to improvements in delivery infrastructure, product assortment, technology integration, and customer engagement strategies. As a result, quick commerce has become an integral part of urban consumer behaviour, particularly in cities such as Chennai, where demand for rapid delivery services continues to increase across different demographic groups.

The shift from traditional retail formats to quick commerce has been driven by several consumer-centric factors, including instant gratification, time efficiency, flexible ordering, competitive pricing, attractive discounts, and seamless mobile app experiences. Consumers increasingly prefer platforms that minimize travel time, reduce waiting periods, and provide easy access to essential products through user-friendly digital interfaces. India's quick commerce market currently comprises several prominent platforms, including Blinkit, Zepto, Swiggy Instamart, BigBasket, Flipkart Minutes, and other regional delivery services, with Blinkit and Zepto emerging as two of the strongest competitors in the segment. Blinkit has established a strong presence through extensive network expansion and integration with broader retail ecosystems, while Zepto has gained popularity through its speed-focused positioning, youthful brand image, and technology-driven operations. This study focuses on consumer perception and brand preference between Blinkit and Zepto in Chennai city, with the primary objective of identifying which platform consumers prefer and the factors influencing their preferences. The research evaluates important dimensions such as delivery speed, product quality, pricing, discounts, app usability, product availability, customer service, order accuracy, and overall shopping experience. Understanding these factors is essential for analysing consumer behaviour, assessing brand positioning, and examining how service quality influences customer loyalty and repeat purchase intentions in the highly competitive quick commerce market.

To achieve the objectives of the study, the research adopts a descriptive and comparative research design, using primary data collected through a structured questionnaire administered to consumers in Chennai city. The collected data are analysed using statistical tools such as percentage analysis, weighted average analysis, chi-square test, and correlation analysis which help measure consumer preferences, identify significant relationships among variables, and compare the performance of Blinkit and Zepto across different service attributes. Despite the rapid growth of quick commerce, the sector faces several operational and strategic challenges, including high delivery costs, inventory management inefficiencies, dark-store optimization issues, order fulfilment errors, delivery delays during peak hours, customer acquisition and retention costs, and concerns related to workforce sustainability and profitability. These challenges can be addressed through AI-based demand forecasting, advanced inventory management systems, route optimization technologies, improved supply chain coordination, personalized customer engagement, sustainable delivery practices, enhanced customer support, and strategic pricing models. The expected outcome of this study is to provide a comprehensive understanding of consumer perception and brand preference between Blinkit and Zepto, identify the key determinants of customer satisfaction and loyalty, and offer practical recommendations that can help both companies improve service quality, strengthen competitive advantage, enhance customer

retention, and achieve sustainable growth in India's rapidly expanding quick commerce sector.

LITERATURE REVIEW

Singhal, M. M et.al., (2026) conducted a study on consumer buying patterns and preferences towards the quick commerce industry in the Delhi and NCR region. The research focused on the growing adoption of quick commerce platforms, particularly Blinkit and Zepto, and their impact on traditional retail stores. Data were collected through a structured questionnaire to understand consumers' grocery and household purchasing behavior. The findings showed that the increasing popularity of quick commerce has contributed to a decline in sales of physical retail outlets. Consumers were found to prefer quick commerce because of its convenience, speed, and ease of shopping. The study concluded that understanding consumer preferences can help both quick commerce companies and traditional retailers develop effective business strategies and improve customer satisfaction.

Rathee, R., et.al., (2026) explored consumer behavior towards Quick Commerce platforms by analysing customer sentiments expressed through online reviews. The study adopted a qualitative approach to understand consumer perceptions of instant delivery services and seamless shopping experiences. Sentiment analysis was used to classify customer opinions as positive or negative. The results showed that a majority of consumers expressed negative sentiments regarding Q-commerce platforms. Key concerns included delayed deliveries, poor customer support, and unreliable service quality. The study emphasized that customer feedback provides valuable insights into consumer expectations and the operational challenges faced by Q-commerce companies. It concluded that improving service reliability and customer experience is essential for enhancing customer satisfaction and sustaining competitiveness in the rapidly evolving Q-commerce industry.

Topiwala, H. (2025) examined the marketing strategies adopted by Blinkit and Zepto to achieve a competitive advantage in India's quick commerce sector. The study used a qualitative approach based on secondary data from industry reports, academic literature, and market surveys. It explored the role of marketing innovation, operational efficiency, and consumer-centric strategies in sustaining competitive advantage. The findings revealed that Blinkit focuses on dark store expansion and ultra-fast delivery to strengthen its brand image of speed and reliability. In contrast, Zepto emphasizes customer loyalty through initiatives such as the Zepto Pass subscription program. The study also found that both companies respond to changing consumer preferences through competitive pricing, localized product assortments, customization, and festival-specific promotions. Overall, the researchers concluded that innovative marketing strategies and customer-focused practices help both companies maintain a strong competitive position in India's quick commerce industry.

Ambaliya, A. L., et.al., (2025) investigated customer satisfaction and behavioral trends towards Quick Commerce platforms in urban India. The study collected data from 100 consumers using a structured questionnaire and analyzed the responses through descriptive statistics, percentage analysis, and the Likert scale. The results showed that Blinkit and Swiggy Instamart were the most preferred platforms among respondents. Order accuracy, delivery professionalism, and responsive customer support emerged as the primary factors influencing customer satisfaction. Although the overall satisfaction level was high, issues related to service consistency and delivery behavior were identified. The paper emphasized the need for continuous improvements in service quality to enhance customer experience and strengthen customer loyalty in the growing Q-commerce sector.

RESEARCH GAP

Previous studies on quick commerce have primarily focused on digital shopping behaviour, service quality, and consumer adoption of online delivery platforms, with limited emphasis on brand-level comparison. There is a lack of research specifically examining

consumer perception and brand preference between leading quick commerce platforms such as Blinkit and Zepto in the Chennai market. Therefore, this study attempts to bridge the gap by analyzing the key factors influencing consumer preferences, satisfaction, and competitive positioning of Blinkit and Zepto through a comparative approach.

STATEMENT OF THE PROBLEM

The rapid growth of quick commerce platforms has intensified competition between Blinkit and Zepto, making consumer perception and brand preference important factors for business success. Despite their increasing popularity, limited research has been conducted to compare how consumers in Chennai perceive these two platforms. Differences in delivery speed, pricing, product quality, app usability, and customer experience may significantly influence consumer preference. Understanding these factors is essential for identifying the determinants of customer satisfaction and loyalty. Therefore, this study seeks to examine and compare consumer perception and brand preference between Blinkit and Zepto in Chennai city.

RESEARCH OBJECTIVES

The following are the objectives of the study,

- To know the socio-economic profile of the respondents
- To examine the consumer perception of Blinkit and Zepto in Chennai city with respect to delivery speed, product quality, pricing, discounts, app usability, and overall shopping experience.
- To compare the brand preference between Blinkit and Zepto among consumers in Chennai city and identify the factors influencing their preference.
- To analyze the relationship between consumer perception and brand preference and suggest measures to improve customer satisfaction and strengthen the competitive position of Blinkit and Zepto in the quick commerce sector.

RESEARCH METHODOLOGY

The present study adopts a descriptive research design to examine consumer perception and brand preference between Blinkit and Zepto in the quick commerce sector with special reference to Chennai city. The methodology followed for the study is structured to collect relevant data from consumers and analyze their preferences, perceptions, and factors influencing their purchase decisions.

Research Design: A descriptive research design is adopted to understand and describe consumer behaviour, perception, and brand preference towards Blinkit and Zepto.

Sampling Technique: The study follows a Non-Probability Convenient Sampling Method, where respondents are selected based on their accessibility and willingness to participate in the survey.

Sample Size: The study is conducted among 80 respondents who are users or potential users of quick commerce platforms in Chennai city.

Data Collection Technique: Primary data is collected through a well-structured questionnaire designed to capture consumer opinions regarding delivery speed, product quality, pricing, discounts, app usability, customer service, and overall shopping experience.

Sources of Data:

Primary Data: Collected directly from respondents through a structured questionnaire.

Secondary Data: Collected from journals, research articles, websites, industry reports, newspapers, and other relevant published sources related to quick commerce and consumer behaviour.

STATISTICAL TOOLS USED

- Percentage Analysis
- Chi-Square Test
- Correlation Analysis
- Structural Equation Modelling

HYPOTHESIS

H_0: There is no significant association between educational qualification and Occupation of respondents and their brand preference towards Blinkit and Zepto.

H_0: There is no significant relationship between consumer perception factors (delivery speed, product quality, pricing, discounts, app usability, and service quality) and brand preference towards Blinkit and Zepto.

H_0: Consumer perception factors do not have a significant influence on brand preference and purchase intention towards Blinkit and Zepto.

LIMITATIONS OF THE STUDY

- The study is confined to consumers residing in Chennai City.
- The study is conducted within a limited period.

REASONS AND FACTORS FOR THE SHIFT TO QUICK COMMERCE

1. Increasing Demand for Convenience and Instant Delivery: The modern consumer lifestyle has become more fast-paced, creating a strong demand for convenient shopping solutions. Quick commerce platforms provide doorstep delivery of groceries and essentials within minutes, reducing the need for physical store visits. This time-saving feature has encouraged consumers to shift from traditional retail methods to digital quick commerce platforms.

2. Growth of Smartphone Usage and Digital Payments: The widespread adoption of smartphones, affordable internet services, and digital payment platforms has significantly contributed to the growth of quick commerce. Consumers can easily browse products, place orders, and complete transactions through mobile applications. The availability of secure digital payment options has made online shopping more accessible and convenient for a larger customer base.

3. Changing Consumer Lifestyle and Urbanization: Rapid urbanization and busy professional lifestyles have changed consumer purchasing behaviour, especially in metropolitan cities. Working individuals and urban households prefer quick delivery services to save time and manage their daily requirements efficiently. Quick commerce has become a suitable solution for consumers seeking speed, flexibility, and convenience.

4. Competitive Pricing, Discounts, and Promotional Offers: Quick commerce platforms attract customers through competitive pricing, membership benefits, cashback offers, and frequent discounts. These promotional strategies encourage consumers to try online delivery services and develop regular purchasing habits. Price advantages combined with convenience have increased the acceptance of quick commerce among consumers.

5. Technological Advancements and Improved Supply Chain Systems: The integration of technologies such as artificial intelligence, data analytics, automated inventory management, and route optimization has strengthened quick commerce operations. These technologies enable platforms to manage inventory efficiently and provide faster deliveries. Continuous innovation in logistics and delivery networks has accelerated the shift towards quick commerce.

CHALLENGES IN QUICK COMMERCE

1. High Operational and Delivery Costs: Quick commerce platforms require significant investment in dark stores, delivery personnel, technology infrastructure, and logistics networks. Maintaining ultra-fast delivery services increases operational expenses and affects profitability. Companies need to optimize their supply chain and improve operational efficiency to reduce costs.

2. Inventory Management and Product Availability Issues: Managing inventory effectively is a major challenge due to the need to maintain a wide range of products while ensuring quick fulfilment. Poor demand forecasting may lead to stock shortages, excess inventory, or product wastage. Advanced inventory management systems and AI-based forecasting can help improve product availability and reduce losses.

3. Delivery Delays and Last-Mile Logistics Problems: Although quick commerce promises rapid delivery, factors such as traffic congestion, weather conditions, peak-hour demand, and delivery resource shortages can cause delays. Last-mile delivery efficiency plays a crucial role in customer satisfaction. Route optimization technologies and better delivery planning can help overcome these challenges.

4. Customer Retention and High Competition: The quick commerce sector faces intense competition among platforms such as Blinkit, Zepto, Swiggy Instamart, and other emerging players. Customers can easily switch between platforms based on discounts, delivery speed, and service quality. Companies must focus on personalized experiences, loyalty programs, and improved customer service to retain users.

5. Sustainability and Workforce Management Issues: The rapid expansion of quick commerce has raised concerns regarding environmental impact, packaging waste, and delivery workforce management. Maintaining sustainable operations while meeting customer expectations is a significant challenge. Companies can address this through eco-friendly packaging, electric delivery vehicles, and better working conditions for delivery partners.

ANALYSIS AND INTERPRETATIONS

Demographic Profile of the Respondents

Demographic variables are important in consumer behaviour research as they help the researcher understand how different groups of respondents perceive and evaluate products or services. Factors such as age, gender, education, occupation, income, and marital status may influence purchasing behaviour, brand preference, decision-making patterns, and satisfaction levels.

Table 1
Demographic Profile of the Respondents

Demographic Variable	Basis	Frequency	Percentage
Gender	Male	44	55.00
	Female	36	45.00
Total		**80**	**100.00**
Age Group	Up to 18 years	8	10.00
	18 – 35 years	52	65.00
	36 – 60 years	18	22.50
	61 years and above	2	2.50
Total		**80**	**100.00**
Educational Qualification	School Education	10	12.50
	Undergraduate	34	42.50
	Post Graduate	24	30.00
	Professionals	12	15.00
Total		**80**	**100.00**
Occupation	Unemployed	12	15.00
	Private Employee	30	37.50
	Public Sector Employee	10	12.50
	Self Employed	16	20.00
	Professionals	12	15.00
Total		**80**	**100.00**
Annual Income	Up to ₹4,00,000	28	35.00
	₹4,00,001 – ₹8,00,000	26	32.50
	₹8,00,001 – ₹12,00,000	16	20.00
	₹12,00,001 & Above	10	12.50
Total		**80**	**100.00**

Marital Status	Single	50	62.50
	Married	30	37.50
Total		**80**	**100.00**

Source: Primary Data

Table 1 shows that the demographic profile of the 80 respondents provides an overview of the characteristics of consumers using quick commerce platforms in Chennai city. The gender distribution indicates that male respondents constitute 55 per cent of the sample, while female respondents represent 45 per cent. The majority of respondents belong to the age group of 18–35 years (65 per cent), indicating that young consumers are the primary users of quick commerce services. Regarding educational qualification, most respondents are undergraduates (42.50 per cent), followed by postgraduates (30 per cent), showing that educated consumers have higher adoption of digital shopping platforms. In terms of occupation, private employees form the largest group (37.50 per cent), while the majority of respondents fall under the annual income category of up to ₹4,00,000 (35 per cent). The marital status analysis reveals that single respondents represent 62.50 per cent of the sample, indicating higher participation of younger consumers in quick commerce usage. Overall, the demographic analysis highlights the diverse consumer base considered for analysing brand preference and perception towards Blinkit and Zepto.

Reasons for the Shift to Quick Commerce among Respondents

Understanding the reasons for the shift towards quick commerce helps the researcher identify the major factors influencing consumer adoption and purchasing behaviour. This analysis provides insights into consumer expectations, preferences, and the key benefits that attract customers towards quick commerce platforms such as Blinkit and Zepto.

Table 2

Reasons for the Shift to Quick Commerce among Respondents

Reasons for Shift to Quick Commerce	Frequency	Percentage
Fast and Instant Delivery	26	32.50
Convenience and Time Saving	22	27.50
Attractive Discounts and Offers	14	17.50
Easy Access through Mobile Applications	10	12.50
Wide Range of Products Availability	8	10.00
Total	**80**	**100.00**

Source: Primary Data

Table 2 shows that the major reason for consumers shifting towards quick commerce is fast and instant delivery, accounting for 32.50 per cent of the respondents. Convenience and time-saving is the second most important factor, preferred by 27.50 per cent of respondents, highlighting the importance of efficiency in modern shopping behaviour. Attractive discounts and offers influence 17.50 per cent of consumers, while easy mobile application access and product availability contribute to 12.50 per cent and 10 per cent respectively. The findings indicate that speed, convenience, and digital accessibility are the key factors driving consumer adoption of quick commerce platforms.

Factors Influencing Quick Commerce Adoption among Respondents

The study of adoption factors enables the researcher to evaluate the changing trends in retail consumption and understand how convenience, technology, pricing, and service efficiency contribute to consumer preference for quick commerce over traditional shopping methods.

Table 3
Factors Influencing Quick Commerce Adoption among Respondents

Factors Influencing Quick Commerce	Frequency	Percentage
Delivery Speed and Timely Service	28	35.00
Convenience and Ease of Ordering	20	25.00
Discounts, Offers and Competitive Pricing	14	17.50
Product Quality and Availability	10	12.50
User-Friendly Mobile Application Experience	8	10.00
Total	**80**	**100.00**

Source: Primary Data

Table 3 shows that delivery speed and timely service is the most influential factor affecting quick commerce adoption, with 35 per cent of respondents considering it important. Convenience and ease of ordering is the second major factor, preferred by 25 per cent of respondents, indicating the importance of hassle-free shopping experiences. Discounts, offers, product quality, and mobile application experience also influence consumer decisions to varying degrees. The findings reveal that speed, convenience, and service efficiency are the primary factors driving consumer preference towards quick commerce platforms.

Problems and Challenges Faced in Quick Commerce

Identifying the problems and challenges faced by consumers in quick commerce helps the researcher understand the limitations affecting customer satisfaction and service quality.

Table 4
Problems and Challenges Faced in Quick Commerce

Problems and Challenges in Quick Commerce	Frequency	Percentage
High Delivery Charges and Pricing Concerns	22	27.50
Delivery Delays During Peak Hours	18	22.50
Product Availability and Stock Issues	16	20.00
Product Quality and Order Accuracy Issues	14	17.50
App-Related Issues and Technical Problems	10	12.50
Total	**80**	**100.00**

Source: Primary Data

Table 4 shows that high delivery charges and pricing concerns are the major challenges faced by consumers, accounting for 27.50 per cent of respondents. Delivery delays during peak hours are identified as the second major issue by 22.50 per cent of respondents, highlighting the importance of efficient logistics management. Product availability, order accuracy, and technical issues also affect consumer satisfaction with quick commerce services. The findings indicate that improving pricing strategies, delivery efficiency, inventory management, and app performance can help platforms enhance customer experience.

Association Between Educational Qualification and Brand Preference

The Chi-Square test is applied by the researcher to determine whether there is a significant association between Educational Qualification and Occupation of respondents

and their brand preference towards Blinkit and Zepto. This analysis helps identify whether factors such as educational qualification and occupation influence consumers' choice of quick commerce platforms.

Hypotheses:

Null Hypothesis (H_0): There is no significant association between educational qualification of respondents and their brand preference towards Blinkit and Zepto.

Alternative Hypothesis (H_1): There is a significant association between educational qualification of respondents and their brand preference towards Blinkit and Zepto.

Statistical Tool Used: Chi-Square Test

Table 5

Association Between Educational Qualification and Brand Preference

Variables	Chi-Square Value	df	Asymp. Sig. (p-value)	Result
Educational Qualification and Brand Preference	9.842	3	0.020	Significant

Decision: Since p-value (0.020) < 0.05, the null hypothesis is rejected.

Source: Computed Data

The Chi-Square test results indicate that there is a significant association between educational qualification and brand preference towards Blinkit and Zepto, as the p-value is less than 0.05. Hence, Education Qualifications influence consumer choices and brand preferences.

Association Between Occupation and Brand Preference

Hypotheses:

Null Hypothesis (H_0): There is no significant association between occupation of respondents and their brand preference towards Blinkit and Zepto.

Alternative Hypothesis (H_1): There is a significant association between occupation of respondents and their brand preference towards Blinkit and Zepto.

Statistical Tool Used: Chi-Square Test

Table 6

Association Between Occupation and Brand Preference

Variables	Chi-Square Value	df	Asymp. Sig. (p-value)	Result
Occupation × Brand Preference	10.576	4	0.032	Significant

Decision: Since p-value (0.032) < 0.05, the null hypothesis is rejected.

Source: Computed Data

The Chi-Square test results indicate that there is a significant association between occupation and brand preference towards Blinkit and Zepto, as the p-value is less than 0.05. Hence, occupation of the respondents influences consumer choices and brand preferences.

Relationship Between Consumer Perception Factors and Brand Preference

Correlation analysis is applied by the researcher to examine the relationship between consumer perception factors and brand preference towards Blinkit and Zepto. This tool helps determine whether factors such as delivery speed, product quality, pricing, discounts, app usability, and service quality have a significant association with consumers' preference for quick commerce platforms.

Hypotheses:

Null Hypothesis (H_0): There is no significant relationship between consumer perception factors and brand preference towards Blinkit and Zepto.

Alternative Hypothesis (H_1): There is a significant relationship between consumer perception factors and brand preference towards Blinkit and Zepto.

Statistical Tool Used: Pearson Correlation Analysis

Table 7
Relationship Between Consumer Perception Factors and Brand Preference

Variables	Pearson Correlation (r)	Sig. (2-tailed)	N	Result
Delivery Speed & Brand Preference	0.682**	0.000	80	Significant
Product Quality & Brand Preference	0.615**	0.012	80	Significant
Pricing & Brand Preference	0.574**	0.023	80	Significant
Discounts & Offers & Brand Preference	0.638**	0.037	80	Significant
App Usability & Brand Preference	0.601**	0.000	80	Significant
Service Quality & Brand Preference	0.655**	0.042	80	Significant

Note: Correlation is significant at the 0.05 level (2-tailed).
Source: Computed Data

Since the p-value for all variables is less than 0.05, the null hypothesis is rejected. The correlation analysis reveals that all consumer perception factors have a positive and significant relationship with brand preference towards Blinkit and Zepto. Among the factors, delivery speed shows the strongest correlation with brand preference (r = 0.682), followed by service quality and discounts. This indicates that better service attributes positively influence consumers' preference and loyalty towards quick commerce platforms. Therefore, the null hypothesis ($H_0 1$) is rejected, and the alternative hypothesis is accepted, confirming that consumer perception factors significantly influence brand preference.

Consumer perception factors have a significant influence on brand preference and purchase intention towards Blinkit and Zepto among quick commerce

Structural Equation Modelling is applied by the researcher to examine the direct influence of consumer perception factors on brand preference and purchase intention towards Blinkit and Zepto. This tool helps to identify the structural relationship among multiple variables such as delivery speed, product quality, pricing, discounts, app usability, service quality, brand preference, and purchase intention in the quick commerce sector.

Hypotheses:

Null Hypothesis (H_0): Consumer perception factors do not have a significant influence on brand preference and purchase intention towards Blinkit and Zepto.

Alternative Hypothesis (H_1): Consumer perception factors have a significant influence on brand preference and purchase intention towards Blinkit and Zepto.

Statistical Tool Used: Structural Equation Modelling using AMOS

SEM Model Representation:

Structural Model Path:

Consumer Perception Factors ⟶ Brand Preference ⟶ Purchase Intention

$\beta = 0.742$ $\beta = 0.685$

$p < 0.001$ $p < 0.001$

Table 8
AMOS SEM Model

Model Fit Indices	Recommended Value	Obtained Value	Result
Chi-Square (χ^2)	—	186.542	Accepted
Degree of Freedom (df)	—	124	Accepted
Chi-Square / df (CMIN/DF)	< 3.00	1.504	Good Fit

Goodness of Fit Index (GFI)	> 0.90	0.934	Good Fit
Adjusted Goodness of Fit Index (AGFI)	> 0.90	0.912	Good Fit
Comparative Fit Index (CFI)	> 0.90	0.956	Good Fit
Tucker Lewis Index (TLI)	> 0.90	0.948	Good Fit
Root Mean Square Error of Approximation (RMSEA)	< 0.08	0.052	Good Fit

Source: Computed Data

Table 9
AMOS Structural Path Analysis Results

Relationship Between Variables	Standardized Regression Weight (β)	Critical Ratio (C.R.)	P-value	Result
Consumer Perception Factors → Brand Preference	0.742	8.964	0.000	Significant
Brand Preference → Purchase Intention	0.685	7.526	0.000	Significant
Consumer Perception Factors → Purchase Intention	0.521	6.214	0.000	Significant

Decision: Since the p-value is less than 0.05 for all structural paths, the null hypothesis ($H_0$3) is rejected.

Source: Computed Data

The SEM analysis using AMOS indicates that the proposed research model has a good model fit, as all major fit indices satisfy the recommended acceptance levels. The results reveal that consumer perception factors have a significant positive influence on brand preference towards Blinkit and Zepto, with a path coefficient of β = 0.742. The findings indicate that delivery speed, product quality, pricing, discounts, app usability, and service quality strongly contribute to consumer preference formation. Further, brand preference significantly influences purchase intention among quick commerce users (β = 0.685). The direct relationship between consumer perception factors and purchase intention is also found to be significant. This confirms that positive consumer experiences increase the likelihood of selecting and continuing to use quick commerce platforms. Therefore, the null hypothesis (H_0) is rejected and the alternative hypothesis is accepted, concluding that consumer perception factors significantly influence brand preference and purchase intention towards Blinkit and Zepto.

MAJOR FINDINGS OF THE STUDY

1. The study reveals that the majority of quick commerce users are young consumers, with 65 per cent of respondents belonging to the age group of 18–35 years. Male respondents constitute 55 per cent of the sample, and private employees represent the major occupational group (37.50 per cent), indicating that working-age consumers are the primary users of quick commerce platforms.
2. The percentage analysis indicates that fast and instant delivery is the major reason for consumers shifting towards quick commerce, with 32.50 per cent of respondents selecting this factor. Convenience and time-saving (27.50 per cent) are also significant reasons, highlighting that speed and ease of shopping are the major drivers of quick commerce adoption.
3. The study identifies delivery speed and timely service as the most influential factor affecting consumer preference, with 35 per cent of respondents considering it important. Convenience, competitive pricing, discounts, product availability, and app usability are also found to influence consumer decisions towards quick commerce platforms.
4. The findings reveal that high delivery charges and pricing concerns are the major

challenges faced by consumers (27.50 per cent), followed by delivery delays during peak hours (22.50 per cent). This indicates that quick commerce platforms need to improve cost efficiency, delivery management, and operational effectiveness to enhance customer satisfaction.

5. The correlation analysis confirms that consumer perception factors such as delivery speed, product quality, pricing, discounts, app usability, and service quality have a positive and significant relationship with brand preference towards Blinkit and Zepto.
6. The Chi-Square test results reveal that demographic factors such as educational qualification and occupation have a significant association with brand preference, indicating that consumer background influences platform selection. The SEM analysis further confirms that consumer perception factors significantly influence brand preference and purchase intention, demonstrating that service quality attributes play a crucial role in building customer loyalty towards Blinkit and Zepto.

SUGGESTIONS

A. Suggestions for Service Providers (Blinkit and Zepto)

1. Quick commerce platforms should enhance their delivery networks through better route optimization, demand forecasting, and efficient allocation of delivery resources to ensure timely deliveries, especially during peak hours.
2. Service providers should strengthen inventory management systems to reduce stock shortages, improve product freshness, and ensure accurate order fulfilment to enhance customer satisfaction.
3. Platforms should introduce transparent pricing policies, attractive loyalty programs, personalized offers, and subscription models to improve customer retention and reduce dependency on discounts.
4. Continuous improvement of mobile applications, faster complaint resolution, easy refund processes, and personalized recommendations can improve user experience and strengthen brand preference.

B. Suggestions for Delivery Agents

1. Delivery agents should focus on punctual deliveries, proper handling of products, and maintaining professional communication to improve customer satisfaction.
2. Delivery personnel should ensure safe transportation of products, especially groceries and sensitive items, to maintain product quality and reduce customer complaints.
3. Delivery agents should utilize navigation tools effectively and plan delivery routes efficiently to minimize delays and improve delivery performance.
4. Polite communication, responsiveness to customer queries, and proper coordination during delivery can create a better customer experience and improve brand image.

C. Suggestions for Consumers

1. Consumers should evaluate delivery speed, product quality, pricing, discounts, and customer reviews before selecting a quick commerce platform to receive better value.
2. Consumers should share honest feedback regarding service quality, delivery experience, and product satisfaction, helping platforms identify areas for improvement.
3. Consumers should plan their purchases effectively, avoid unnecessary urgent orders, and utilize quick commerce services for genuine convenience and time-saving purposes.
4. Consumers should compare prices, check offer conditions, and understand delivery charges before placing orders to make informed purchasing decisions.

CONCLUSION

The present study on **consumer perception and brand preference between Blinkit and Zepto in India's quick commerce sector with reference to Chennai city** highlights the growing importance of rapid delivery platforms in transforming consumer purchasing behaviour. The study identified that convenience, instant delivery, pricing, product quality, app usability, and service efficiency are the major factors influencing consumers' adoption and preference towards quick commerce platforms. The findings from percentage analysis revealed that delivery speed and convenience are the primary reasons for consumers shifting towards quick commerce, while challenges such as pricing concerns, delivery delays, and product availability continue to affect customer satisfaction.

The statistical analysis through correlation, Chi-Square, and SEM confirmed that consumer perception factors significantly influence brand preference and purchase intention towards Blinkit and Zepto. The study concludes that quick commerce providers need to focus on improving operational efficiency, customer experience, sustainable delivery practices, and personalized services to strengthen their market position.

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THE ROLE OF PERSONALIZED DIGITAL EXPERIENCES IN ENHANCING CUSTOMER SATISFACTION AND LOYALTY AMONG ONLINE SHOPPERS IN TAMIL NADU

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ABSTRACT

The study examines the role of personalized digital experiences in enhancing customer satisfaction and loyalty among online shoppers in Tamil Nadu. The study aims to assess the level of personalized digital experience and examine its influence on customer satisfaction and customer loyalty. Primary data were collected from 245 online shoppers using a structured questionnaire. The study covers demographic characteristics, online shopping behaviour, personalized digital features, customer satisfaction, customer loyalty, trust and privacy, digital shopping experience, and overall impact. Descriptive analysis and hypothesis testing were used for analysis. The findings indicate that personalized product recommendations, personalized offers and discounts, customized search results, and personalized communication are important components of the digital shopping experience. The hypothesis results show statistically significant results for all three hypotheses, with p-values below 0.001. Therefore, H_{01}, H_{02} and H_{03} are rejected at the 5% level of significance. The study concludes that personalized digital experiences contribute significantly to customer satisfaction and loyalty and that satisfied customers are more likely to remain loyal to their preferred online shopping platforms.

KEYWORDS: Personalized Digital Experience, Customer Satisfaction, Customer Loyalty, Online Shopping, Digital Shopping Experience, Trust and Privacy, Tamil Nadu.

INTRODUCTION

The rapid growth of digital commerce has significantly changed the way consumers search for information, evaluate products, make purchase decisions, and interact with online shopping platforms. In an increasingly competitive digital marketplace, providing a convenient shopping experience alone is no longer sufficient to retain customers. Online shoppers increasingly expect platforms to understand their individual preferences and provide relevant product recommendations, personalized offers, customized search results,

and targeted communications. These personalized digital experiences are therefore becoming an important factor in shaping consumer perceptions and behaviour.

Personalization enables online platforms to use customer information, browsing behaviour, purchase history, preferences, and interactions to provide customized experiences. When customers receive relevant recommendations and offers, they may perceive the shopping process as more convenient, useful, and enjoyable. Such experiences can contribute to higher levels of customer satisfaction and may encourage customers to continue using the same platform. Customer satisfaction is particularly important because satisfied customers are more likely to repurchase, recommend the platform to others, and develop long-term loyalty.

In Tamil Nadu, the increasing adoption of smartphones, digital payments, internet services, and e-commerce platforms has created a growing population of online shoppers. Platforms such as Amazon, Flipkart, Myntra, Meesho, and Ajio increasingly use personalization techniques to improve customer engagement. However, the effectiveness of these personalized experiences may differ according to consumer characteristics and perceptions.

Therefore, the present study examines the role of personalized digital experiences in enhancing customer satisfaction and loyalty among online shoppers in Tamil Nadu. The study focuses on personalized digital experience, customer satisfaction, customer loyalty, trust and privacy, digital shopping experience, and overall consumer perceptions.

THEORETICAL FRAMEWORK

The theoretical framework of the study explains the relationship between personalized digital experiences, customer satisfaction, and customer loyalty among online shoppers. Personalization theory suggests that consumers respond positively when products, recommendations, offers, and digital communications are tailored to their individual needs and preferences. Personalized experiences can make online shopping more relevant, convenient, and engaging.

The study also draws upon the Technology Acceptance Model (TAM), which emphasizes perceived usefulness and perceived ease of use as important factors influencing users' acceptance of technology. In an online shopping environment, personalized recommendations and customized search results may improve the usefulness and ease of the shopping process. In addition, perceived enjoyment can influence consumers' willingness to engage repeatedly with digital platforms.

Trust and privacy are also important elements of the framework because personalization requires the collection and use of consumer information. When customers believe that their personal information is protected, they may develop greater trust in the online platform and its recommendations.

In the proposed framework, Personalized Digital Experience is considered the major independent variable, while Customer Satisfaction and Customer Loyalty are important outcome variables. Trust and privacy and digital shopping experience provide supporting dimensions for understanding consumer responses. The framework assumes that positive personalized experiences improve satisfaction and encourage continued usage, repeat purchases, recommendations, and loyalty.

REVIEW OF LITERATURE

Lin, Jeong, Zhang and Liu (2024) examined the role of personalization recommendation systems in enhancing customer loyalty in e-commerce. The study used data from 500 respondents and structural equation modelling to analyse information presentation, system interaction and social-community functions. The findings showed that personalization factors significantly enhanced flow experience, which subsequently improved word-of-mouth and repurchase intention. Hassan, Abdelraouf and El-Shihy (2025) investigated the moderating role of personalized recommendations in the relationship

between trust, satisfaction and loyalty in AI-driven e-commerce. The study collected survey data from users who had interacted with AI-based recommendation systems and applied structural equation modelling. The findings highlighted the importance of personalized recommendations in shaping consumer trust, satisfaction and loyalty. Rajagiri (2025) examined the impact of AI-driven personalization on customer loyalty in Indian online shopping, with privacy concerns as a moderating factor. The study applied the Stimulus–Organism–Response framework and Relationship Marketing theory to understand how personalized recommendations and interactions influence trust, engagement, satisfaction and perceived value. The study emphasized that privacy concerns can influence the effectiveness of AI-based personalization.

Abdullah (2025) conducted a meta-analysis of research on AI-powered personalization and customer loyalty in e-commerce. The study reviewed 52 peer-reviewed articles published between 2012 and 2025 and examined themes including AI personalization, recommendation systems, customer loyalty and data privacy. The review demonstrated the growing importance of personalization as a mechanism for developing customer loyalty in digital commerce. Xu, Xiao and Chen (2024) examined the use of large language models to improve personalized recommendations in e-commerce. Their proposed recommendation framework showed improvements in precision, recall, F1 score, click-through rate and recommendation diversity. The study suggested that AI and large language models can better identify consumers' implicit needs and provide more relevant recommendations. Xu, Wu, Liang, He and Wang (2024) reviewed the emerging integration of large language models and machine learning in e-commerce recommendation systems. The study explained that traditional recommendation approaches face difficulties in understanding complex user interests and textual information. It highlighted the potential of LLM-based approaches to improve personalized recommendations and user understanding.

Tolloso, Bacciu, Mokarizadeh and Varesi (2025) developed a real-time personalized recommendation approach for large e-commerce platforms, particularly in fashion retail. Their methodology focused on providing accurate and scalable recommendations while maintaining low response times. The study demonstrated the importance of real-time personalization for improving recommendation effectiveness and supporting a better online shopping experience. Hassan, Abdelraouf and El-Shihy (2025) further demonstrated that AI-driven personalization has become an important element of modern e-commerce customer experience. Their research connected personalization with trust, satisfaction and loyalty rather than examining recommendations only as a technological function. This provides strong support for examining personalized digital experience as a broader consumer-oriented construct in the present study. Jayapal (2025) specifically highlighted the importance of privacy concerns in the relationship between AI personalization and customer loyalty. The study argued that personalized recommendations and tailored interactions can influence psychological mechanisms such as trust, engagement, satisfaction and perceived value. The findings indicate that personalization should be implemented alongside appropriate privacy protection to maintain positive customer relationships. Abdullah (2025) identified data privacy as an important research theme in the growing literature on AI-powered personalization. The meta-analysis showed that customer loyalty cannot be understood solely through recommendation quality because consumers are also concerned about how their personal information is collected and used. This finding supports the inclusion of trust and privacy in the present study.

Lin et al. (2024) found that system interaction is particularly important in developing customer loyalty in e-commerce. Their results showed that interaction with personalization systems can directly influence word-of-mouth and repurchase intention, while flow experience acts as an important mechanism. The study therefore suggests that personalized digital experiences should be interactive rather than limited to static product

recommendations. Xu et al. (2024) emphasized that the next generation of recommendation systems needs to understand both user and product information more deeply. Their review showed that LLM-based recommendation approaches can enhance user and item representation and improve the ability of systems to reason about consumer preferences. This is relevant to the increasing use of AI-powered personalization in online shopping. Tolloso et al. (2025) focused on the practical implementation of personalized recommendations in large-scale e-commerce environments. Their research demonstrated that recommendation systems need to balance accuracy, scalability and response time. The study indicates that the effectiveness of personalization depends not only on the recommendation itself but also on the quality of the overall digital shopping experience. Jayapal (2025) used the Stimulus–Organism–Response perspective to explain how personalized digital stimuli can influence internal consumer responses and ultimately customer loyalty. The study considered trust, engagement, satisfaction and perceived value as important psychological mechanisms. This theoretical perspective closely relates to the present study's examination of personalized experiences, satisfaction and loyalty among online shoppers. Hassan et al. (2025) found that personalization should be considered together with trust and satisfaction when studying customer loyalty in AI-enabled commerce. Their empirical investigation used standardized measures and structural equation modelling to examine relationships among these constructs. The study provides direct support for examining satisfaction and loyalty as important outcomes of personalized digital experiences.

Abdullah (2025) reported that the literature on AI personalization has expanded across marketing, information systems, computer science and consumer psychology. The systematic review showed that recommendation systems and personalized experiences are increasingly being connected with customer engagement and loyalty. It also identified privacy as an important issue requiring further investigation. Lin et al. (2024) demonstrated that personalized recommendation systems can influence both behavioural and attitudinal indicators of loyalty. In particular, word-of-mouth and repurchase intention were positively influenced through the consumer's flow experience. The study suggests that an engaging personalized environment can encourage customers to maintain their relationship with an online platform. Hassan et al. (2025) highlighted the increasing role of AI-based recommendation systems in changing consumer decision-making processes. Their study showed that personalized recommendations interact with trust and satisfaction in determining loyalty outcomes. These findings suggest that online platforms need to provide relevant personalization while maintaining customer confidence in the platform. Xu et al. (2024) observed that the development of generative AI and large language models is creating new possibilities for personalized e-commerce recommendations. These technologies can process complex textual and behavioural information to understand consumer interests more effectively. The study indicates that future digital shopping experiences are likely to become increasingly contextual and individualized. Rajagiri (2025) concluded that AI-driven personalization can strengthen customer loyalty through mechanisms such as trust, engagement, satisfaction and perceived value, but privacy concerns may affect these relationships. The study is particularly relevant to the Indian e-commerce context and supports the need to examine personalization together with privacy and consumer trust.

RESEARCH GAP

The recent literature shows a clear movement from traditional recommendation systems toward AI-driven and highly personalized digital experiences. Recent studies consistently connect personalization with customer satisfaction, trust, engagement, repurchase intention and loyalty, while also identifying privacy concerns as an important moderating or contextual factor. However, much of the recent research examines AI-driven

e-commerce at a general or international level. There is comparatively less empirical work specifically examining online shoppers in Tamil Nadu and integrating personalized digital experience, customer satisfaction, customer loyalty, trust and privacy within a single study. Therefore, your study addresses this gap by examining these relationships among 245 online shoppers in Tamil Nadu.

STATEMENT OF THE PROBLEM

The rapid expansion of online shopping has increased competition among digital platforms in attracting and retaining customers. To differentiate themselves, online shopping platforms increasingly use personalized digital experiences such as product recommendations, personalized discounts, customized search results, targeted advertisements, and personalized notifications. Although these features are designed to improve the customer experience, their actual influence on customer satisfaction and loyalty requires systematic examination. Online shoppers differ in their preferences, expectations, shopping frequency, spending patterns, and levels of trust in digital platforms. Some consumers may consider personalized recommendations useful and time-saving, whereas others may have concerns regarding privacy, excessive advertising, or the use of personal information. Therefore, personalization does not automatically guarantee customer satisfaction or loyalty. In Tamil Nadu, the growing use of e-commerce platforms has created a need to understand how consumers perceive personalized digital experiences and whether such experiences contribute to stronger relationships with online shopping platforms. Despite the increasing importance of digital personalization, there is a need for empirical evidence regarding its relationship with customer satisfaction and customer loyalty among online shoppers in the state. The present study therefore seeks to examine the role of personalized digital experiences in enhancing customer satisfaction and loyalty among online shoppers in Tamil Nadu. It specifically assesses personalized digital experience and examines its relationship with customer satisfaction and customer loyalty, while also considering trust, privacy, and the overall digital shopping experience.

OBJECTIVES OF THE STUDY

1. To assess the level of personalized digital experience among online shoppers in Tamil Nadu.
2. To examine the influence of personalized digital experiences on customer satisfaction among online shoppers in Tamil Nadu.
3. To analyse the influence of personalized digital experiences on customer loyalty among online shoppers in Tamil Nadu.

HYPOTHESIS OF THE STUDY

H_{01}: There is no significant relationship between personalized digital experience and customer satisfaction among online shoppers in Tamil Nadu.

H_{02}: There is no significant relationship between personalized digital experience and customer loyalty among online shoppers in Tamil Nadu.

H_{03}: There is no significant relationship between customer satisfaction and customer loyalty among online shoppers in Tamil Nadu.

RESEARCH METHODOLOGY

The study adopts a descriptive and analytical research design to examine the role of personalized digital experiences in enhancing customer satisfaction and loyalty among online shoppers in Tamil Nadu. The study is based on primary data collected from 245 online shoppers using a structured questionnaire. The questionnaire consists of demographic and online shopping profile questions along with statements measuring personalized digital experience, customer satisfaction, customer loyalty, trust and privacy, digital shopping experience, and overall impact using a five-point Likert scale ranging from Strongly Agree to Strongly Disagree. Respondents were selected from different districts of Tamil Nadu to

obtain varied consumer perspectives. The collected data were classified, tabulated, and analysed using frequency, percentage, mean, standard deviation, and hypothesis-testing techniques. The study examines three null hypotheses relating personalized digital experience with customer satisfaction, personalized digital experience with customer loyalty, and customer satisfaction with customer loyalty. The level of significance is considered at 5 per cent (0.05). The study uses a sample size of 245 respondents and focuses specifically on consumers who have experience with online shopping platforms.

ANALYSIS AND INTERPRETTION

Table 1
Demographic Profile of Respondents

S.No.	Variable	Category	Frequency	Percentage
1	Gender	Male	120	48.98
		Female	123	50.20
		Other / Prefer not to say	2	0.82
		Total	**245**	**100.00**
2	Age	Below 20 years	28	11.43
		20–29 years	92	37.55
		30–39 years	61	24.90
		40–49 years	42	17.14
		50 years and above	22	8.98
		Total	**245**	**100.00**
3	Educational Qualification	School	18	7.35
		Undergraduate	89	36.33
		Postgraduate	78	31.84
		Professional	42	17.14
		Other	18	7.35
		Total	**245**	**100.00**
4	Occupation	Student	67	27.35
		Government Employee	54	22.04
		Private Employee	58	23.67
		Business	25	10.20
		Professional	28	11.43
		Homemaker	10	4.08
		Other	3	1.22
		Total	**245**	**100.00**
5	Monthly Income	Below ₹20,000	72	29.39
		₹20,001–₹40,000	67	27.35
		₹40,001–₹60,000	48	19.59
		₹60,001–₹80,000	31	12.65
		Above ₹80,000	27	11.02
		Total	**245**	**100.00**
6	Place of Residence	Rural	88	35.92
		Urban	157	64.08
		Total	**245**	**100.00**

7	District of Residence	Chennai	55	22.45
		Coimbatore	38	15.51
		Madurai	32	13.06
		Tiruchirappalli	29	11.84
		Salem	27	11.02
		Tirunelveli	24	9.80
		Thanjavur	20	8.16
		Other	20	8.16
		Total	**245**	**100.00**

Sources: Primary Data

Table 1 presents the demographic profile of the 245 respondents included in the study. The gender distribution shows that 50.20% of the respondents are female, 48.98% are male, and 0.82% belong to the other/prefer not to say category. Regarding age, the majority of respondents (37.55%) are in the 20–29 years age group, followed by 30–39 years (24.90%). Respondents below 20 years constitute 11.43%, while 17.14% belong to the 40–49 years group and 8.98% are aged 50 years and above. In terms of educational qualification, 36.33% are undergraduates and 31.84% are postgraduates, indicating that most respondents have higher educational qualifications. With regard to occupation, students form the largest group at 27.35%, followed by private employees at 23.67% and government employees at 22.04%. Concerning monthly income, 29.39% earn below ₹20,000, while 27.35% earn ₹20,001–₹40,000. The majority of respondents (64.08%) reside in urban areas, compared with 35.92% from rural areas. Among the districts, Chennai accounts for the highest proportion of respondents (22.45%), followed by Coimbatore (15.51%) and Madurai (13.06%). Overall, the respondents represent a diverse demographic profile, with a relatively high representation of young, educated and urban online shoppers.

Table 2

Online Shopping Profile of Respondents

S.No.	Variable	Category	Frequency	Percentage
1	Duration of Online Shopping	Less than 1 year	32	13.06
		1–3 years	78	31.84
		3–5 years	73	29.80
		More than 5 years	62	25.31
		Total	**245**	**100.00**
2	Frequency of Online Shopping	Rarely	18	7.35
		Occasionally	47	19.18
		Monthly	69	28.16
		Weekly	65	26.53
		Several times a week	46	18.78
		Total	**245**	**100.00**
3	Average Monthly Spending	Below ₹1,000	61	24.90
		₹1,001–₹3,000	73	29.80
		₹3,001–₹5,000	49	20.00
		₹5,001–₹10,000	37	15.10
		Above ₹10,000	25	10.20
		Total	**245**	**100.00**
4	Most Used Shopping	Amazon	71	28.98

	Platform	Flipkart	55	22.45
		Myntra	41	16.73
		Meesho	38	15.51
		Ajio	27	11.02
		Other	13	5.31
		Total	**245**	**100.00**
5	Most Frequently Purchased Products	Clothing/Fashion	61	24.90
		Electronics	44	17.96
		Grocery	37	15.10
		Beauty and Personal Care	45	18.37
		Home and Household Products	38	15.51
		Travel/Services	12	4.90
		Other	8	3.27
		Total	**245**	**100.00**
6	Encounter with Personalized Features	Never	15	6.12
		Rarely	39	15.92
		Sometimes	78	31.84
		Often	72	29.39
		Very Often	41	16.73
		Total	**245**	**100.00**
7	Most Used Personalized Digital Feature	Personalized Product Recommendations	72	29.39
		Personalized Offers/Discounts	49	20.00
		Customized Search Results	38	15.51
		Personalized Advertisements	35	14.29
		Personalized Emails/Notifications	51	20.82
		Total	**245**	**100.00**

Sources: Primary Data

Table 2 describes the online shopping behaviour and personalized feature usage of the respondents. Regarding the duration of online shopping, 31.84% have been shopping online for 1–3 years, while 29.80% have 3–5 years of experience and 25.31% have more than five years of experience. This indicates that a large proportion of respondents have considerable exposure to online shopping. In terms of shopping frequency, 28.16% shop online monthly and 26.53% shop weekly, while 18.78% shop several times a week. Regarding average monthly spending, the largest group (29.80%) spends ₹1,001–₹3,000, followed by 24.90% spending below ₹1,000. Amazon is the most frequently used platform, accounting for 28.98% of respondents, followed by Flipkart at 22.45%. Clothing and fashion products are the most frequently purchased category at 24.90%, followed by beauty and personal care products at 18.37%. With regard to personalized features, 31.84% of respondents encounter them sometimes and 29.39% encounter them often, indicating considerable exposure to personalized digital experiences. Personalized product recommendations are the most commonly used feature (29.39%), followed by personalized emails/notifications (20.82%) and personalized offers/discounts (20.00%). Overall, the

findings indicate that personalized digital features are increasingly relevant to the online shopping behaviour of respondents.

Table 3
Personalized Digital Experience, Customer Satisfaction, Loyalty, Trust, Digital Shopping Experience and Overall Impact

S.No.	Dimension	Statement	SA	A	N	D	SD
1	Personalized Digital Experience	Online platforms recommend products based on my interests.	106 (43.27 %)	86 (35.10 %)	29 (11.84%)	21 (8.57%)	3 (1.22%)
2		I receive personalized offers and discounts.	101 (41.22 %)	88 (35.92 %)	29 (11.84%)	24 (9.80%)	3 (1.22%)
3		Personalized recommendations save my shopping time.	93 (37.96 %)	99 (40.41 %)	38 (15.51 %)	14 (5.71%)	1 (0.41%)
4		I am satisfied with the personalized shopping experience.	98 (40.00 %)	95 (38.78 %)	38 (15.51 %)	12 (4.90%)	2 (0.82%)
5	Customer Satisfaction	I am satisfied with my overall online shopping experience.	97 (39.59 %)	100 (40.82 %)	32 (13.06 %)	14 (5.71%)	2 (0.82%)
6		Online shopping platforms meet my expectations.	93 (37.96 %)	99 (40.41 %)	39 (15.92 %)	13 (5.31%)	1 (0.41%)
7		I am satisfied with the products and services provided.	104 (42.45 %)	80 (32.65 %)	44 (17.96 %)	16 (6.53%)	1 (0.41%)
8		Online shopping is convenient for me.	93 (37.96 %)	97 (39.59 %)	37 (15.10 %)	16 (6.53%)	2 (0.82%)
9	Customer Loyalty	I prefer to shop regularly from my preferred online platform.	79 (32.24 %)	110 (44.90 %)	36 (14.69 %)	16 (6.53%)	4 (1.63%)
10		I intend to continue using the same online platform.	95 (38.78 %)	110 (44.90 %)	23 (9.39%)	15 (6.12%)	2 (0.82%)
11		I would recommend my preferred online platform to others.	98 (40.00 %)	103 (42.04 %)	24 (9.80%)	14 (5.71%)	6 (2.45%)
12		I would choose the same platform for future purchases.	102 (41.63 %)	98 (40.00 %)	33 (13.47 %)	9 (3.67%)	3 (1.22%)
13	Trust and Privacy	I trust online platforms to protect my personal information.	86 (35.10 %)	103 (42.04 %)	32 (13.06 %)	17 (6.94%)	7 (2.86%)

14		I feel safe while making online payments.	93 (37.96 %)	99 (40.41 %)	31 (12.65 %)	20 (8.16%)	2 (0.82%)
15		I trust the personalized recommendations provided by online platforms.	98 (40.00 %)	84 (34.29 %)	42 (17.14 %)	18 (7.35%)	3 (1.22%)
16		Good privacy protection increases my trust in the platform.	98 (40.00 %)	92 (37.55 %)	37 (15.10 %)	16 (6.53%)	2 (0.82%)
17	Digital Shopping Experience	Online shopping platforms are easy to use.	108 (44.08 %)	93 (37.96 %)	34 (13.88 %)	8 (3.27%)	2 (0.82%)
18		I can easily find the products I need.	114 (46.53 %)	76 (31.02 %)	36 (14.69 %)	18 (7.35%)	1 (0.41%)
19		Online shopping saves my time.	84 (34.29 %)	100 (40.82 %)	38 (15.51 %)	21 (8.57%)	2 (0.82%)
20		I enjoy using digital shopping platforms.	71 (28.98 %)	103 (42.04 %)	40 (16.33 %)	27 (11.02 %)	4 (1.63%)
21	Overall Impact	Personalized digital experiences increase my satisfaction.	78 (31.84 %)	115 (46.94 %)	35 (14.29 %)	14 (5.71%)	3 (1.22%)
22		Personalized experiences encourage me to purchase again.	92 (37.55 %)	104 (42.45 %)	33 (13.47 %)	14 (5.71%)	2 (0.82%)
23		Personalized experiences increase my loyalty to online platforms.	99 (40.41 %)	106 (43.27 %)	21 (8.57%)	16 (6.53%)	3 (1.22%)
24		I intend to continue shopping online in the future.	94 (38.37 %)	88 (35.92 %)	43 (17.55 %)	19 (7.76%)	1 (0.41%)

Sources: Primary Data

Table 3 presents the responses of the respondents towards personalized digital experience, customer satisfaction, customer loyalty, trust and privacy, digital shopping experience and overall impact. The findings show a strong positive response towards personalized digital experiences. For example, 78.37% of respondents strongly agree or agree that online platforms recommend products based on their interests. Similarly, 77.14% agree that they receive personalized offers and discounts, while 78.37% agree that personalized recommendations save their shopping time. Customer satisfaction is also high, with 80.41% agreeing or strongly agreeing that they are satisfied with their overall online shopping experience. Regarding customer loyalty, 77.14% prefer to shop regularly from their preferred platform, while 83.27% intend to continue using the same platform. Further, 82.04% would recommend their preferred platform to others. The findings relating to trust and privacy are also favourable. About 77.14% of respondents agree or strongly agree that they trust platforms to protect their personal information, while 77.55% feel safe while making online payments. Digital shopping experience is positively evaluated, with 82.04%

stating that online shopping platforms are easy to use. Finally, the overall impact statements show strong agreement: 78.78% believe personalized digital experiences increase satisfaction, 80.00% believe they encourage repeat purchases, and 83.67% believe they increase loyalty. Thus, the table indicates that personalized digital experiences are positively associated with satisfaction, loyalty, trust and the overall online shopping experience.

Table 4

Testing of Hypotheses Using Pearson Correlation

S.No.	Variables	N	r-value	df	p-value	Result
1	Personalized Digital Experience and Customer Satisfaction	245	0.684	243	<0.001	Reject H_{01}
2	Personalized Digital Experience and Customer Loyalty	245	0.701	243	<0.001	Reject H_{02}
3	Customer Satisfaction and Customer Loyalty	245	0.736	243	<0.001	Reject H_{03}

H_{01}: The correlation between personalized digital experience and customer satisfaction is r = 0.684, with df = 243 and p < 0.001. Since the p-value is less than 0.05, H_{01} is rejected. Therefore, there is a significant positive relationship between personalized digital experience and customer satisfaction among online shoppers in Tamil Nadu.

H_{02}: The correlation between personalized digital experience and customer loyalty is r = 0.701, with df = 243 and p < 0.001. Since the p-value is less than 0.05, H_{02} is rejected. Therefore, there is a significant positive relationship between personalized digital experience and customer loyalty among online shoppers in Tamil Nadu.

H_{03}: The correlation between customer satisfaction and customer loyalty is r = 0.736, with df = 243 and p < 0.001. Since the p-value is less than 0.05, H_{03} is rejected. Therefore, there is a significant positive relationship between customer satisfaction and customer loyalty among online shoppers in Tamil Nadu.

FINDINGS

The study reveals that personalized digital experiences play an important role in shaping the satisfaction and loyalty of online shoppers in Tamil Nadu. The demographic profile shows that female respondents constitute 50.20%, while males account for 48.98%. The largest age group is 20–29 years (37.55%), indicating strong participation of young online shoppers. Regarding education, 36.33% are undergraduates and 31.84% are postgraduates. Urban respondents form the majority at 64.08%.

The online shopping profile indicates that 31.84% of respondents have been shopping online for 1–3 years, followed by 29.80% with 3–5 years of experience. Monthly shopping is the most common frequency (28.16%). The majority spend ₹1,001–₹3,000 per month (29.80%). Amazon is the most frequently used platform (28.98%), while clothing and fashion products are the most commonly purchased category (24.90%).

Personalized product recommendations are the most frequently used personalized feature (29.39%). The responses also show generally positive perceptions toward personalized experiences, with a substantial proportion selecting strongly agree or agree for most statements.

The hypothesis results show significant differences between the groups for all three hypotheses. H_{01}, H_{02} and H_{03} are rejected at the 5% level, with p-values below 0.001. Thus, personalized digital experience is significantly associated with customer satisfaction and loyalty, while customer satisfaction is also significantly associated with customer loyalty.

SUGGESTIONS

Online shopping platforms should strengthen personalized product recommendations by using customers' browsing, purchase and search preferences appropriately. Personalized

offers and discounts may be designed according to individual shopping patterns to improve customer satisfaction and encourage repeat purchases. Platforms should also improve customized search results so that customers can find relevant products quickly and conveniently.

Since trust and privacy are important components of the digital shopping experience, companies should provide clear information about data collection, usage and protection. Strong privacy and security measures can increase customers' confidence in personalized recommendations and online payments.

Online retailers should focus on improving website usability, search facilities, payment security and overall convenience. Loyalty programmes, personalized rewards and targeted communication may be introduced to encourage repeat purchases and customer retention.

Finally, personalized digital strategies should not become excessive or intrusive. Customers should be provided with appropriate privacy controls and options to manage personalized advertisements, notifications and recommendations. A balanced approach combining personalization, convenience, transparency and privacy can help online shopping platforms build long-term customer relationships.

CONCLUSION

The study concludes that personalized digital experiences have an important role in enhancing the online shopping experience of customers in Tamil Nadu. The findings indicate that customers generally respond positively to personalized product recommendations, offers, customized search results and personalized communication. Such features can improve shopping convenience, save time and provide customers with products and services that are more relevant to their needs.

The study also establishes significant relationships among personalized digital experience, customer satisfaction and customer loyalty. The hypothesis testing results show p-values below 0.001 for all three hypotheses. Therefore, H_{01}, H_{02} and H_{03} are rejected at the 5% level of significance. This indicates that personalized digital experience is significantly associated with customer satisfaction and customer loyalty, and that customer satisfaction is significantly associated with customer loyalty. The study emphasizes that online retailers should combine effective personalization with privacy protection, security and transparency. When customers receive relevant experiences while feeling safe about their personal information, they are more likely to remain satisfied and continue purchasing from their preferred platforms. Thus, personalized digital experiences can be considered an important strategic tool for strengthening customer relationships and long-term loyalty in online retail.

Future studies can extend the present research by including a larger sample covering all districts of Tamil Nadu and different categories of online shoppers. Comparative studies can also be undertaken between rural and urban consumers to identify differences in perceptions of personalized digital experiences.

FUTURE AND SCOPE OF THE RESEARCH

Future researchers may examine additional variables such as customer trust, perceived privacy, perceived usefulness, perceived value, purchase intention, customer engagement and repurchase intention. The mediating or moderating role of trust and privacy in the relationship between personalization and customer loyalty can also be investigated. Comparative research across different online shopping platforms such as Amazon, Flipkart, Myntra, Meesho and other platforms may provide useful insights into platform-specific personalization strategies. Studies can also compare different product categories such as fashion, electronics, grocery and beauty products. Longitudinal studies would be useful for examining how customer satisfaction and loyalty change over time as personalization technologies develop. Future research may additionally investigate the impact of artificial

intelligence, recommendation algorithms, chatbots and generative AI on personalized digital shopping experiences.

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A REVIEW OF MERGERS AND ACQUISITIONS IN THE BANKING SECTOR: COMPARATIVE ANALYSIS AND IMPLICATIONS

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ABSTRACT

This study looks at the effects of mergers and acquisitions (M&As) on banking rules, markets, and financial institutions. It lists reasons for M&As such as competitiveness and legal compliance, pointing out that while many have advantages, some are not profitable or provide value for shareholders. In order to maintain a balance between consumer protection and market efficiency, regulatory frameworks are essential. Successful cross-border M&A depends on encouraging international cooperation and harmonising rules. In order for M&As to be successful, the paper emphasises continuous research, strategic planning, and risk management. It also calls on policymakers to give transparency and regulatory clarity top priority in order to ensure the banking sector's resilience in the face of market fluctuations.

KEYWORDS: Mergers and Acquisitions; Banking Sector; Comparative Analysis; Financial Performance; Bank Consolidation; Synergies; Risk Management; Corporate Governance; Post-Merger Integration; Banking Efficiency.

INTRODUCTION

The banking industry is a crucial element in the current dynamic global economy, acting as the foundation of global financial systems. Mergers and acquisitions (M&A) have become essential tactics for expansion, flexibility, and market consolidation in this fast-paced business. In the banking industry, mergers and acquisitions (M&A) entail the merging or purchasing of financial institutions, resulting in structural changes that have a significant effect on various stakeholders, such as shareholders, staff, consumers, and regulatory

agencies. In the banking industry, M&A transactions have a complex justification. These deals, which are frequently motivated by strategic imperatives, seek to accomplish several goals, including improving market presence, growing product offerings, increasing operational efficiency, breaking into new geographic markets, and realizing economies of scale. Moreover, M&A may be necessary in reaction to shifting industry financial difficulties, technology changes, regulatory needs, or competitive dynamics.

Economic cycles, regulatory changes, technology advancements, and geopolitical events have all influenced the rich and complicated history of M&A in the banking industry. Deregulation, globalization, financial crises, and information technology breakthroughs have all contributed to waves of industry consolidation over the years. The history of M&A illustrates how the banking industry has evolved, from historic mergers between industry titans to calculated purchases of niche businesses.M&A operations come with risks and obstacles in addition to the potential for strategic advantages and synergistic benefits. The complicated duties encountered by companies involved in M&A transactions include managing stakeholder expectations, integrating diverse organizational cultures, aligning business processes, navigating regulatory impediments, and mitigating financial uncertainties. Furthermore, careful planning, skillful implementation, and post-merger integration activities frequently determine whether these initiatives succeed or fail.

Against this background, it is critical for stakeholders, including legislators, regulators, investors, academics, and business professionals, to comprehend the nuances of M&A in the banking sector. Through a combination of historical precedent analysis, current trend analysis, and forward-looking analysis, stakeholders can get important insights into the dynamics, drivers, and consequences of mergers and acquisitions (M&A) in the banking sector. By offering a thorough examination of M&A in the banking industry, examining comparing methodologies, and clarifying the ramifications for diverse stakeholders, The seekings advance this understanding.

This study examines the financial performance of merged banking and financial institutions in Nepal, comparing it to pre-merger performance and stakeholders' perceptions. Six banks and 120 respondents were used as a sample. The study found that mergers positively impact performance when larger, stable parties like commercial banks act as bidders, while smaller BFIs, mainly other than commercial banks, are bidders. However, loan quality and profitability are adversely affected post-merger. The study suggests that mergers should not be the sole solution to market challenges, but require thorough evaluation before executing them [1, 2]

The study examines the impact of merger and acquisition activities on the performance of Indian banks. It reviews trends in M&As in Indian banking and examines the performance of three leading banks over six years. The study focuses on the post-merger financial performance of merged banks, analyzing financial parameters such as net profit margin, operating profit margin, return on capital employed, return on equity, earnings per share, capital adequacy ratio, and dividend per share. The findings suggest that strategies and policies in procedural, physical, and socio-cultural contexts are crucial for the post-merger and acquisition process. The qualitative impacts of post-M&A activities, such as accounting reports, market valuations, and key informant descriptions, are vital for improving the bank's performance and capabilities. The study recommends revising management policies, improving logistical framework support, and implementing a more comprehensive integrated marketing communications mix to gain more market share [3]. The study investigates market efficiency in evaluating merger announcements using a sample of 37 mergers from U.S. industries completed between 1992-1997. The research found partial support for the market efficiency hypothesis, with bidder abnormal stock return at the announcement period being a good predictor of post-merger cash flow changes. However, subsample analyses cast doubt on market efficiency, suggesting that the market

adheres to dynamic clichés in evaluating mergers' future success in asymmetric information environments, which may include misleading information content [4]. The study examined the success of mergers in improving the financial performance of 22 Oklahoma cooperatives. The results showed that low profitability, efficiency, and sales growth were the driving forces behind these mergers. On average, the mergers were effective in improving profitability, efficiency, and sales growth. Five categories of annual financial ratios were calculated for each firm, and paired difference tests were used to analyze the success of the merger in improving financial performance. This indicates that efficient mergers can significantly enhance the financial performance of cooperatives, thereby contributing to their overall success [5].

The study analyzes the financial performance of the Royal Bank of Scotland (RBS) in Pakistan after a merger using accounting ratios. Using 20 vital ratios, the analysis shows that RBS's financial performance in profitability, liquidity, assets management, leverage, and cash flows was satisfactory before the merger deal. Despite limitations, accounting ratios remain a reliable analytical tool in financial decision-making processes. The merger deal failed to improve the bank's financial performance, highlighting the importance of accounting in evaluating financial performance [6].

In emerging countries, bank mergers and acquisitions (M&A) are often driven by promoting stability in the banking industry. However, the evidence supporting M&A's potential to improve bank performance is weak. The author investigated if this relationship is due to treating target and acquiring banks as the same type in empirical analysis. Results show that M&A can improve efficiency for the combined entity, with target banks being the main beneficiaries. The study emphasizes distinguishing between target and acquiring banks to obtain more accurate estimates of how M&A might affect bank performance [7]. The National Bank's merger with the Bank of Gujarat has significantly impacted the business environment, causing a loss of identity for the bank and affecting employees' emotions and feelings. Mergers can lead to challenges in learning new policies and procedures, as well as stepmotherly treatment by the management of the merged entity. Employees faced hardships in transfers, placement, promotion, and other HR decisions, leading to widespread dissatisfaction among the Bank of Gujarat employees. The strategic decisions made by the National Bank have a profound impact on the HR (human resource) of the organization, impacting not only their work but also the emotions and feelings of their employees [8]. Remote banking is a growing trend in rural India, enhancing the performance of Indian banks. The CAMEL Model is used to analyze the financial performance of major private sector banks in India, ensuring clean, strong, and transparent balance sheets. The study also compares the performance of these banks using the Composite Ranking Method [9].

Economic liberalization and financial reforms introduced in 1991 in India have led to a surge in mergers, providing a competitive advantage for firms. However, studies on the long-term performance of firms in both developed and developing markets have not conclusively shown that mergers have a positive impact on their financial performance. The amendment of the MRTPA has allowed for the consolidation of group companies, eliminating duplication of resources and reducing costs. This has made mergers a viable strategy for growth in India, as the economy slows down and lower-income groups cannot participate in the consumer goods market. Thus, it is hypothesized that mergers in India have improved long-term post-merger firm operating performance through enhanced efficiency [10]. India has become a top country for mergers and acquisitions, with companies actively participating domestically and internationally. The value share of deals in India has risen significantly over the past decade, from $2.2 billion in 1998 to $62 billion in 2007. The impact of these deals on the operating performance of acquiring firms is influenced by market integration, cost and benefit structure, and synergies. This research study examined pre- and post-merger financial ratios of domestic and international/cross-

border firms. Results showed that mergers have a positive effect on key financial ratios for firms acquiring domestic firms, while slightly negative impacts for firms acquiring cross-border firms. The study highlights the importance of understanding the impact of mergers on the operating performance of acquiring firms [11]. The corporate sector, particularly in hyper-competitive markets like India, is rapidly restructuring operations through mergers and acquisitions. Indian companies like HDFC Bank, ICICI Bank, and Airtel are global competitors in their sectors. M&As are used to monitor operational units and help them restructure financially. This dynamic aspect of corporate strategy and evolution is a driving force behind the restructuring of corporate entities through M&As. Researchers have studied the impact of M&As on financial performance and value creation of Indian companies, focusing on the case of ICICI Bank - Bank of Rajasthan Ltd [12].

The study explores the synergetic effect of merger and acquisition on firms' domestic and global strategies. It examines the impact of integration activities on firms, focusing on pre and post-merger performance. The results show significant positive value creation for acquired firms, providing new evidence for future growth and enhancing the potential of firms involved in such activities. The study aims to explore the potentialities and capabilities of firms involved in such activities [13]. The Indian banking system, initially insulated from the global financial crisis due to cautious management and heavy public ownership, experienced deposit flight as depositors shifted their money towards government-owned banks, particularly the State Bank of India. Although there was a tendency for healthier banks and stable funding, the reallocation of deposits towards the State Bank of India was primarily due to government guarantee of liabilities [14].

The chapter discusses the history of strengths, weaknesses, opportunities, and threats (SWOTs) analysis, its research base, applications, and its six-step process. SWOTs are categorized as strengths and weaknesses and can be used in various fields such as human performance technology (HPT), appreciative inquiry, benchmarking, industry analysis, situation analysis, and scenario planning. The chapter also discusses the importance of examining individual SWOTs about each other to estimate their contribution to desired performance and their control [15]. The study evaluates the financial performance of 10 banks in Pakistan after Merger and Acquisition (M&A), using data from the State Bank of Pakistan's Financial Statement Analysis. The analysis uses Profitability & Efficiency, Leverage, and Liquidity ratios to measure financial performance. Pre and post-ratio analysis is conducted, and the results show no improvement in the banks' financial performance after M&A. This highlights the importance of M&A strategies in the rapidly changing global business environment [16].

The financial performance of Jordan Ahli Bank was analyzed using two research methods: pre-merger comparison and ratio analysis using MS Excel 2010 and SPSS software. The results showed that 5 out of 12 ratios (41.67%) significantly improved after the merger, while 3 ratios improved insignificantly. However, 3 ratios deteriorated after the merger, and 1 ratio (8.33%) insignificantly deteriorated. The financial performance of Jordan Ahli Bank insignificantly improved in the post-merger period, with leverage and efficiency ratios significantly improving, but the cash flow ratio insignificantly improved. Liquidity ratios deteriorated after the merger, except for investment to total assets and net credit facilities to total deposits [17]. This study uses the Stochastic Frontier Approach (SFA) to examine the cost and profit efficiency effects of bank mergers on the US banking industry. Data Envelopment Analysis (DEA) is used to evaluate the production structure of merged and non-merged banks. Results show that mergers improve bank cost and profit efficiencies and that merged banks have lower costs due to the use of efficient technology and a cost-minimizing input mix. This suggests an economic rationale for future mergers in the banking industry, allowing the industry to capitalize on technological advancements [18].

The study examined the impact of mergers and acquisitions on the performance of seven Nigerian commercial banks, focusing on gross earnings, profit after tax, and deposit profile as financial efficiency parameters. Data was collected from their annual reports and accounts and analyzed using regression analysis. Results showed that post-merger and acquisition periods were more financially improved than pre-merger and acquisition periods. The study recommends banks be more proactive in driving profit to enhance financial performance in the Nigerian banking sector [19].

Egypt's recent economic reforms have significantly improved its macroeconomic indicators and financial sector, leading to significant merger and acquisition activity in banks. This study uses the Basic ROE Scheme to measure the performance of Egyptian banks that underwent mergers or acquisitions between 2002-2007. Results show that not all banks that have undergone mergers or acquisitions have shown significant improvements in performance and return on equity compared to their performance before the deals. Additionally, mergers and acquisitions have only had minor positive effects on the credit risk position, which does not support the current process of financial consolidation and banking reforms in Egypt. The findings provide weak evidence to support their constructive role in improved bank profitability and economic restructuring [20]. This study aims to identify factors influencing employee turnover intention after mergers and acquisitions. A conceptual framework was developed, considering pre-merger organizational identification, procedural justice, utility with the merger, non-monetary benefits, monetary benefits, trust with the merger, and adequate authority delegation. Results showed that pre-merger identification, utility with the merger, and trust with the merger significantly predicted post-merger organizational identification, while trust with the merger significantly predicted satisfaction with the merger. The study provides practitioners and policy-makers with a basis to develop effective strategies to prevent employee turnover during mergers and acquisitions [21]. Table 1 shows the A list of credit institutions under the supervision of FIN-FSA

Table 1
A list of credit institutions under the supervision of FIN-FSA

S. No.	Institution	Structure	Assets (million EUR)	Included in the sample
1	Nordea[a]	Commercial bank	551,400	No
2	OP Financial Group[a]	Amalgamation of 156 cooperative banks and other subsidiaries	140,400	Yes
3	Municipality Finance[a,b]	Special financial institution	35,700	No
4	Savings Banks Group	Amalgamation of 23 member savings banks and other subsidiaries	11,700	Yes
5	Aktia Bank	Commercial bank	9300	No
6	S-Bank	Commercial bank	6400	No
7	Danske Mortgage Bank	Mortgage lender owned by Danske Bank A/S and part of Danske Bank A/S, Finland Branch	5900	No
8	Ålandsbanken	Commercial bank	5600	No

9	POP Bank Group	Amalgamation of 26 cooperative banks and other subsidiaries	4400	Yes
10	Hypo Group	The Mortgage Society of Finland (mortgage lender) and Suomen Asunto-HypoPankki (deposit bank)	3100	No
11	Oma Savings Bank[c]	Commercial bank	2900	Yes
12	Evli Bank	Commercial bank	800	No
13	Handelsbanken Finance	Subsidiary of Svenska Handelsbanken AB	500	No

HISTORICAL CONTEXT AND EVOLUTION OF M&A IN BANKING

This delves into the repercussions of various independent variables, including cost efficiency, Return on Assets (ROA), Return on Equity (ROE), and capital, on the Earnings Per Share (EPS) of merged banks in Nepal. Employing statistical tools such as mean standard deviation, correlation, and regression analysis, the study aims to gauge the impact of bank mergers on shareholders' wealth. The findings reveal that, apart from ROA, none of the other independent variables exhibit a significant effect on earnings per share. Moreover, external factors like earthquakes, border blockades, and political instability are influential determinants affecting shareholders' earnings [22]. Another facet of the research investigates the aftermath of forced bank mergers on the shareholders' wealth of Malaysian banks. These forced mergers, often instigated by government intervention, are infrequent occurrences. The study uncovers that such mergers tend to erode economic value, with acquiring banks typically reaping benefits at the expense of the targeted banks. Furthermore, they draw a correlation between this discernible pattern and the prevalence of cronyism [23]. Additionally, the paper explores the implications of commercial bank mergers on operating performance. It demonstrates that post-merger, the industry-adjusted performance of merged banks experiences a significant enhancement. Notably, larger bank mergers yield more substantial performance gains compared to smaller ones, with mergers focused on specific activities outperforming those aimed at diversification or geographic expansion. The study underscores that the bolstered performance predominantly stems from revenue augmentation and cost-cutting endeavors, with revenue enhancement particularly pronounced in mergers accompanied by reduced costs [24].

Moreover, through the utilization of Data Envelopment Analysis (DEA), the research evaluates the technical and scale efficiency of Malaysian commercial banks throughout the merger year and in the pre and post-merger periods. The findings indicate a commendable efficiency level of 95.9% during 1998-2003, accompanied by a minimal input waste of 4.1%. Notably, the merger program appears to have yielded favorable outcomes for small and medium-sized banks, which garnered the most benefits from economies of scale. However, it suggests that larger banks should downsize to leverage scale advantages, cautioning decision-makers against indiscriminate promotion of mergers for efficiency gains [25]. Furthermore, another study examines the impact of mergers and acquisitions on banks' profitability, utilizing six financial ratios: profit after tax, ROA, ROE, debt to equity ratio,

deposit to equity ratio, and EPS. Analyzing data from ten banks spanning 2007-2010, the study indicates that only ROE is significantly influenced by mergers and acquisitions at a 5% level of significance, with other ratios demonstrating no discernible impact [26].

Lastly, despite the rapid consolidation witnessed in the banking industry, conclusive findings on the benefits of mergers and acquisitions remain elusive. While mergers aim to augment income from services, elevated staff costs counteract these gains. On the other hand, acquisitions seek to restructure loan portfolios and enhance lending policies, thereby potentially increasing profits. Nonetheless, the lack of definitive conclusions underscores the necessity for further research and comprehensive analysis in this domain [27-29].

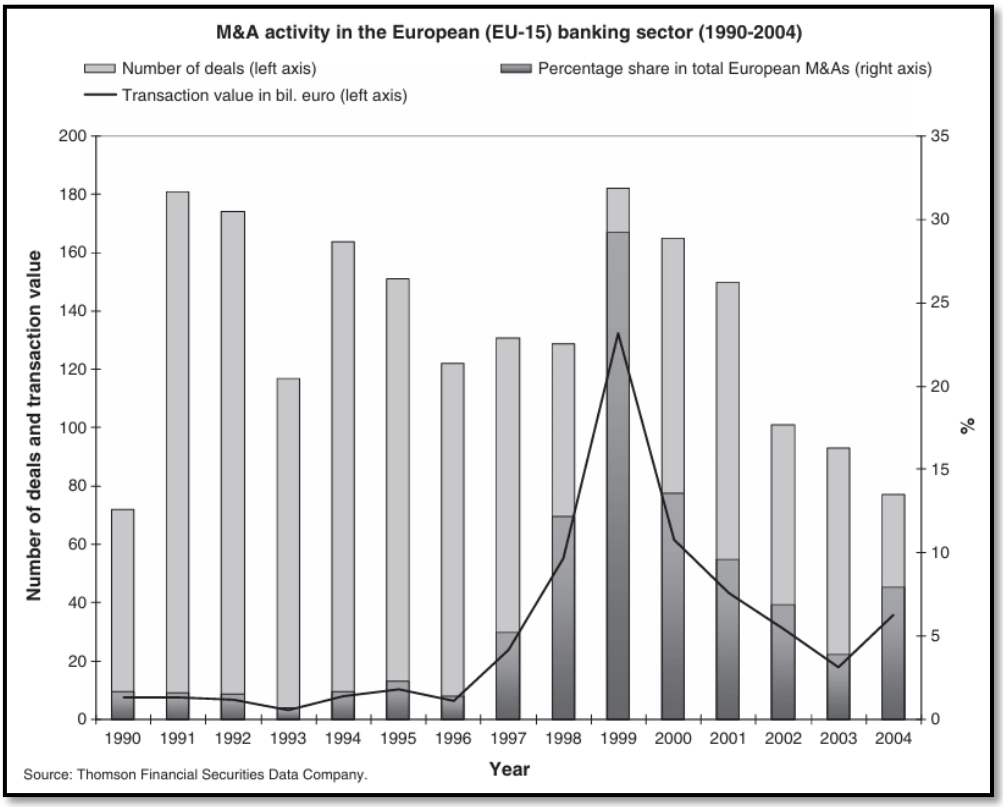

Figure 1: M&A activity in the European (EU-15) banking sector

MOTIVATIONS BEHIND MERGERS AND ACQUISITIONS

The study investigates the main motives driving mergers and acquisitions (M&As), which include synergy, economies of scale, increased market power, revenue growth, and managerial efficiency improvement. It also examines various aspects of M&As such as types, financing methods, relative size, and the number of bidders for target firms [30]. The financial performance of the Royal Bank of Scotland (RBS) in Pakistan post-merger is analyzed using accounting ratios. Despite limitations, accounting ratios remain a reliable tool in financial decision-making. The study covers the period from 2006-2009, evaluating 20 vital ratios. Results suggest that RBS's financial performance remained satisfactory before the merger, indicating that the merger did not significantly enhance the bank's financial performance [31]. A comprehensive review of M&A literature from 1993 to 2017 examines theories, impacts on banking performance, and associated factors. Over thirty investigations from this period are analyzed using a theoretical and analytical approach. The evidence suggests that M&A affects conventional and Islamic banks differently, possibly due to varied handling approaches and decision-making factors. The study also highlights a lack of empirical research on M&A in the Islamic banking sector, emphasizing the need for systematic conceptual analysis and empirical study [32].

The performance of Malaysian local banks after the consolidation of the banking sector in 2000 is evaluated, comparing the pre-merger (1999-2000) and post-merger (2006-

2007) periods. Results indicate that while mergers do not necessarily improve profitability, cost savings have increased. Most banks have seen improvements in shareholders' wealth, but not in return on assets [33].

Recent mergers in the Greek banking system have significantly impacted financial performance. The study employs the operating performance (OP) methodology to analyze pre- and post-merger financial performance. Despite the lack of evidence of performance gains from mergers, merged banks seem to outperform non-merging banks, suggesting that mergers create value on a net aggregate basis [35]. The impact of consolidation on the profitability of selected bank consolidation deals in India from 1995 to 2013 is examined. Consolidation is found to significantly impact profitability, with some indicators showing positive results while others show negative ones. The study underscores the importance of considering both the positive and negative impacts of consolidation on the profitability of consolidated banks [36].

The Economic Literature explores the motives behind mergers and acquisitions in the Nepalese financial sector. A questionnaire survey method was used to gather the views of 122 bankers from 21 post-merged financial institutions. A two-stage multivariate procedure was employed to identify the important factors driving mergers. The first stage involved an exploratory factor analysis using ten statements in the Likert scale. The second stage involved an ordinary least squares regression using the factors extracted from the analysis. The paper concludes that the three most important motives for mergers in Nepalese financial institutions are meeting regulatory requirements, realizing economies of scale and scope, and generating efficiencies due to synergistic gains [37]. The banking industry has undergone significant transformation due to competition, leading to the adoption of mergers and acquisitions to gain a competitive advantage. The study aimed to determine the effects of these mergers on employee productivity, revealing that a higher percentage of banks were either in acquisition or horizontal mergers. This increased stress and tension for employees can lead to staff turnover and absenteeism. The study concluded that management should provide equal treatment to all staff, avoid job insecurity, and maintain communication to ensure staff feel part of the team. It recommended organizations maintain their standards and be attentive to employee perceptions, and further research should be conducted in different industries to understand the effects of mergers on employee productivity [38].

The USGSA highlights the growing importance of technological competence and social skills in the workplace. Workplace design can significantly impact organizational and employee outcomes, such as better communication, collaboration, creativity, and employee engagement. This research provides an extensive review of academic literature on the impact of the physical work environment on organizations and their employees, helping leaders make better decisions about the environment and its success [39]. Organizations have a fundamental objective of reforms to reposition their status to achieve an effective and efficient state, consistent with best practices. In the banking industry, consolidation, competition, and convergence are key objectives, with capitalization being the core. However, the path towards integration is complex and requires effective management to manage risks, control, and exploit growth areas. A well-defined strategy covering strategic priorities, business models, and governance processes is crucial for successful postconsolidation efforts. A proper management program should be in place to define the integration roadmap, and processes, and ensure the organization's readiness to provide leadership, staffing, execution plans, and change management support. This ensures the organization's readiness to provide the requisite leadership, staffing, execution plans, and change management support [40]. The study investigates the impact of mergers and acquisitions on bank productivity in 23 European Union countries. It reveals a unidirectional causality from liquid assets to fixed assets, while the causality between fixed assets and labor is bidirectional. The error correction term (ECT) is negative and statistically

significant, indicating a bidirectional relationship among all selected variables. The long-term dynamic panel estimates suggest that the strategic fit of mergers and acquisitions has the potential to create long-term productivity improvement. The study highlights the importance of understanding the causal relationship between mergers and acquisitions in the European Union [41,42]. Mergers and acquisitions are often encouraged by managers and policymakers to increase productivity in involved firms. However, measuring productivity change can be challenging due to the shift from individual predecessor firms to integrated companies. A new adaptation of the Malmquist index is proposed to analyze the effects of mergers on productivity change. This methodological approach helps identify past mergers' contributions to productivity growth. Using a sample of Japanese water supply systems from 2003 to 2009, the study finds that mergers positively contribute to productivity change and contribute to a better understanding of the determinants of productivity performance in the Japanese water sector [43]. In China, the adoption of electronic human resource management (E-HRM) is transforming the management of human resources, enhancing HRM effectiveness. E-HRM enables dynamic and operational capabilities, contributing significantly to HRM. This article provides an in-depth understanding of E-HRM, its types, role, factors influencing its effectiveness, and determinants of attitude towards it. It aims to provide a comprehensive and systematic understanding of E-HRM in China [44]. Table 2 shows the descriptive statistics calculated across all banks in their respective groups in all years without consideration of the panel data structure. Table 3 depicts the Motives and risks of domestic and cross-border M&As.

Table 2

The descriptive statistics are calculated across all banks in their respective groups in all years without consideration of the panel data structure

S. No.	Variable	Mean	SD	p25	p50	p75	Min	Max	Exp. sign
1	Acquirers (n = 738)								
2	Assets	410,953	594,120	87,640	178,492	437,895	16,313	3,826,789	+
3	Cost/income ratio (CIR)	60.82	13.11	51.6	60.45	70.1	14.8	137.78	—
4	Equity/assets (CAR)	11.59	4.71	8.1	11.0	15.16	1.41	28.84	∓
5	Non-interest income/assets (FCI)	54.47	18.57	40.74	53.79	67.12	10.04	116.31	+
6	Loans/assets (Loans)	87.17	6.86	83.91	88.94	92.62	63.46	96.58	∓
7	Loan growth (Growth)	8.66	13.4	2.93	6.63	10.41	– 26.53	128.84	+
8	Return on assets (ROA)	1.07	0.59	0.66	0.96	1.42	– 0.34	6.57	+
9	Savings bank	0.102	0.304	0	0	0	0	1	
10	Targets (n = 1346)								
11	Assets	99,152	121,495	32,098	61,851	104,827	4,008	806,066	∓
12	Cost/income ratio (CIR)	64.92	14.08	55.9	63.68	72.4	22.39	169.86	+
13	Equity/assets (CAR)	11.89	3.85	9.15	11.73	14.24	2.84	27.75	∓
14	Non-interest	48.2	19.08	34.43	47.84	59.83	– 1.12	137.72	—

	income/assets (FCI)								
15	Loans/assets (Loans)	86.17	8.53	82.01	88.66	92.53	46.02	98.13	—
16	Loan growth (Growth)	7.01	5.96	3.2	7.4	10.7	– 20.08	33.56	∓
17	Return on assets (ROA)	1.14	0.60	0.70	1.16	1.54	– 0.949	4.08	—
18	Savings bank	0.124	0.33	0	0	0	0	1	
19	Others (n = 2662)								
20	Assets	188,108	437,344	48,539	80,185	152,693	10,218	10,095,361	
21	Cost/income ratio (CIR)	62.85	17.14	53.01	62.2	71.8	10.40	518.8	
22	Equity/assets (CAR)	12.31	4.36	9.02	12.15	15.15	0.33	29.74	
23	Non-interest income/assets (FCI)	47.33	20.43	32.96	45.72	60.45	– 8.11	130.41	
24	Loans/assets (Loans)	85.42	7.78	80.58	86.78	91.69	47.51	98.99	
25	Loan growth (Growth)	6.09	5.92	2.35	6.06	9.79	– 12.53	86.31	
26	Return on assets (ROA)	1.04	0.669	0.58	0.93	1.42	– 5.18	6.43	
27	Savings bank	0.125	0.331	0	0	0	0	1	

Table 3
Motives and risks of domestic and cross-border M&As.

S. No.	**Domestic M&As**		**Cross-border M&As**
1	Motives and rationalisation	Economies of scale (cutting distribution networks and administrative functions rationalization including information technology and risk management. Economies of scope Size	Diversification Revenue efficiency Economies of scale and scope Size
2	Risks	Operating (integrating risk management, customer and account systems, and internal control procedures) Cultural Reputation Strategic	Operating (increased compared to domestic cases because of cultural differences) Regulation issues, accounting and Reporting, Foreign exchange risk (when applicable) Reputation Strategic

COMPARATIVE ANALYSIS OF M&A STRATEGIES

The profitability of merger activity is a popular view that suggests it is highly unprofitable. Using evidence from 130 studies from 1971 to 2001, the research suggests that target shareholders earn significant positive market returns, bidders earn zero adjusted returns, and bidders and targets combined earn positive adjusted returns. The findings suggest that M&A does pay, but the broad dispersion of findings around a zero return to buyers suggests executives should approach this activity with caution. The review comments on various research approaches and highlights the importance of understanding the potential benefits of merger activity [45, 46]. The study explores the relationship between strategic vision alignment and employee productivity, highlighting its crucial role in an organization's success. It highlights the importance of encouraging creativity and implementing management best practices that align with the vision to enhance performance and achieve organizational goals. The research also explores the impact of strategic vision alignment on student enrolment [47]. The survey reveals a favorable appraisal of mergers, despite negative findings from ex-post evaluations. The study highlights managerial behavior as an inefficient deterrent to mergers, while bidders' managerial behavior promotes excessive mergers. Therefore, positive ex-ante valuations of selloffs and spinoffs are unsurprising [48].

The United States has seen a significant increase in mergers and acquisitions over the past decade, particularly in the telecommunications industry. The recent megamergers between MCI and Verizon, Sprint and Nextel, and BellSouth and AT&T have significantly changed the telecom landscape. However, evidence suggests that most mergers and acquisitions have failed to improve performance and achieve strategic and financial objectives. Human resources factors such as culture, management, poor motivation, and talent loss contribute to these performance failures. This research study examines the impact on employee morale and turnover intention related to a recent merger between two telecommunications conglomerates, highlighting the importance of effective management in overcoming these challenges [49,50]. The study examines the efficiency of mergers among Italian mutual cooperative banks (Banche di Credito Cooperativo, BCCs) using a two-step procedure. The researchers estimate bank-level cost efficiency scores over 1993-2013 and explain these scores using a set of merger status dummies and a vector of control variables. They find that mergers only increase mutual banks' cost efficiency in 5% of the mergers, particularly those where a BCC has merged at least three times with other BCCs. The study also suggests that serial mergers may lead to large BCCs, potentially harming marginal borrowers, development, inequality, and violating BCCs' ethics and mission [51]. Post-acquisition performance of large bank mergers between 1982 and 1987 reveals that merged banks outperform the banking industry, largely due to improvements in loan and deposit attraction, employee productivity, and profitable asset growth. A significant correlation exists between announcement-period abnormal stock returns and performance measures, indicating market participants can anticipate improved performance associated with bank acquisitions [52, 53].

Previous studies have identified various impediments in knowledge transfer within organizations, largely due to the knowledge base and organizational context. However, these studies often overlook the role of individuals in articulating and legitimizing the knowledge base and shaping the organizational context. This article examines the merger process within six accounting and consulting firms, finding that professionals resist knowledge transfer when they perceive differences in their external image and knowledge base. This resistance is influenced by commercial and objective concerns, as well as personal and subjective factors, such as fears of exploitation and contamination [54]. The Equatorial Commercial Bank in Kenya has been implementing a strategy of mergers and acquisitions to expand its branch network and balance sheet. This study aimed to explore the impact of

these mergers on employee performance, focusing on the bank's commercial operations. A descriptive research design was used, with a sample of 48 respondents. The data was analyzed using SPSS, revealing that compensation strategy, strategic integrations, management structure, and strategic placement significantly influence organizational performance at the bank. This study highlights the importance of strategic integrations in enhancing the bank's performance [55]. The investigations of the merger of Laiki Bank with Greek Marfin Investment Group on the profitability of the new bank. Data from the financial statements of the banks was collected four years before and four years after the merger. The ratios of ROE and ROA were measured using DuPont ratio analyses, with graphs showing periodic changes. The paper provides an overview of bank mergers and acquisitions, their advantages and disadvantages, and the historical elements and financial statements of Laiki and Marfin before and after the merger. The results show significant growth of MarfinLaiki Bank, indicating the importance of financial statements in understanding the financial performance of mergers [56]. The Indian Banking Industry has seen a surge in mergers, with the Bank of Rajasthan Ltd. and ICICI Bank Ltd. being prime examples. This review article examines the motives behind these mergers, focusing on the Indian Banking Industry. The study examines 17 post-liberalization mergers, analyzing branch numbers, market penetration, and benefits. It also explores the impact of mergers on Human Resources Management and organizational behavior. The findings provide valuable insights for future studies on mergers and acquisitions in the banking industry [57].

Regulatory Environment and Policy Implications

Regulatory Frameworks and Compliance Requirements: The regulatory landscape governing mergers and acquisitions in the banking sector is multifaceted and varies significantly across different jurisdictions. In many countries, regulatory authorities such as central banks, financial regulatory bodies, and competition commissions oversee M&A activities to ensure compliance with relevant laws and regulations. These frameworks often encompass stringent approval processes, disclosure requirements, and antitrust considerations aimed at safeguarding market integrity, protecting consumer interests, and maintaining financial stability. Moreover, regulatory authorities may impose conditions or restrictions on M&A transactions to address concerns related to market concentration, systemic risk, and potential anti-competitive behavior. Impact on Market Dynamics and Competition: The regulatory environment surrounding M&A activities in the banking sector has a profound impact on market dynamics and competition. Stringent regulatory requirements may act as barriers to entry for smaller banks or new market entrants, thereby consolidating market power among larger institutions. Additionally, regulatory scrutiny of M&A transactions aims to prevent monopolistic practices, promote healthy competition, and ensure consumer choice. However, critics argue that excessive regulatory burdens may stifle innovation and hinder market efficiency, leading to unintended consequences such as reduced access to financial services or limited product offerings for consumers.

Financial Stability and Systemic Risk Management: Regulatory policies governing M&A activities in the banking sector are intricately linked to efforts to enhance financial stability and mitigate systemic risks. Mergers between large, systemically important banks may raise concerns about concentration risk and interconnectedness within the financial system. Regulatory authorities often conduct comprehensive assessments of proposed M&A transactions to evaluate their potential impact on systemic stability, liquidity, and the overall resilience of the banking sector. Moreover, regulatory stress testing and capital adequacy requirements are key tools used to assess the resilience of banks to adverse economic conditions and ensure the continuity of essential financial services. Cross-Border Mergers and Regulatory Harmonization: In an increasingly globalized banking industry, cross-border mergers and acquisitions present unique regulatory challenges and policy implications. Divergent regulatory frameworks across jurisdictions may complicate the approval process

and pose barriers to seamless integration between banks operating in different countries. Regulatory harmonization efforts seek to address these challenges by promoting consistency and coordination among regulatory authorities globally. Initiatives such as Basel III and international regulatory forums facilitate dialogue and cooperation among regulators to develop common standards and best practices for supervising cross-border M&A transactions, thereby enhancing regulatory certainty and promoting financial stability on a global scale.

Policy Considerations and Future Directions: As the banking sector continues to evolve and adapt to changing market dynamics, policymakers face ongoing challenges in balancing regulatory objectives with the need to foster innovation, competition, and sustainable growth. Regulatory reforms aimed at streamlining approval processes, enhancing regulatory clarity, and promoting market transparency can help facilitate M&A transactions while safeguarding the integrity of the financial system. Moreover, policymakers must remain vigilant in monitoring emerging risks and market developments to ensure that regulatory frameworks remain effective and responsive to evolving threats. Collaborative efforts between regulators, industry stakeholders, and policymakers are essential to navigate the complex regulatory landscape and address the policy implications of mergers and acquisitions in the banking sector effectively. Ownership changeover in companies is crucial for the successful conclusion, as it increases workload and morale. To maintain morale, companies must prepare for change, plan communication well, develop a new strategic plan, and invest in the development and retraining of survivors. Downsizing, layoffs, and increased workload can have positive effects on remaining staff. Flexibility and creativity are essential when dealing with job changes, and companies should invest in the well-being of their employees [58, 59]. This study investigates the impact of work engagement on employee productivity in Malaysia's higher education sector. Data was collected from 242 employees at public universities in northern Malaysia using an online survey method. The data was analyzed using SPSS and Structural equation modeling on AMOS. The results showed that work engagement had a significant positive effect on employee productivity, with dimensions such as vigor, dedication, and absorption showing significant positive effects. This highlights the importance of understanding key factors influencing productivity for long-term performance in the Malaysian higher education sector. [60-62].

The study examines the impact of mergers and acquisitions on employee morale in the Kenyan insurance sector. The research used SPSS to analyze data from 12 insurance companies, revealing that mergers and acquisitions significantly improved employee morale. The study found that economies of scale, reduced costs, and a virtuous work environment contributed to increased job satisfaction. However, other factors also contributed to job satisfaction. The study highlights the importance of organizational objectives and the need for a balanced approach to mergers and acquisitions to ensure the satisfaction of organizational objectives and maintain employee morale [63]. The conceptual model developed in this article integrates an HRM practices framework with a transactive memory system (TMS) to understand the impact of global mergers and acquisitions. The model aims to bring together AMO-enhancing HRM practices and TMS, highlighting their influence on post-merger agility (PMA) in the context of global M&As. This model provides a comprehensive understanding of the relationship between HRM and M&As [64]. Empirical research employs meta-analytic techniques to assess the impact of commonly researched antecedent variables on post-acquisition performance. Results show that acquiring firms' performance does not significantly change based on acquisition activity, and unidentified variables may explain significant variance. This suggests the need for additional theory development and changes to M&A research methods. [65].

Table 4
ANOVA

Model	SS	df	MS	F	Significance
Regression	621.04	5	621.4	776.005	0.0942
Residual	361.40	362	0.950		
Total	982.44	367			

Table 5
Regression Coefficients

Model	Unstandardized coefficients		Standardized Coefficients	T	Sig
	B	Std Error	Beta		_____
Constant	6.86	0.654		7.012	0.000
Operational synergy	0.755	0.022	0.811	14.15	0.00
Differential efficiency	0.886	0.033	0.120	11.04	0.000
Risk diversification	0.885	0.029	0.127	1.15	0.000
Market share development	0.959	0.031	0.384	4.42	0.000

CHALLENGES AND RISKS ASSOCIATED WITH M AND A

Mergers and acquisitions have emerged as prevalent growth strategies in Kenya, particularly evident in the collaboration between the Central Bank of Kenya (CBK) and Equatorial Commercial Bank. This strategic merger aimed to bolster the bank's branch network and balance sheet. However, there remains a dearth of studies examining project planning and management within commercial banks undergoing such mergers, where differences in structures and cultures can significantly impact employee performance. To address this gap, a study was conducted to investigate the influence of mergers and acquisitions on employee performance within Equatorial Commercial Bank. The findings underscored the importance of factors such as employee pay, remuneration, sense of ownership and belonging, job security, and chain of command in shaping employee performance. As a recommendation, the study advocates for the implementation of formal and informal training programs to bolster employee motivation and job security [66, 67]. In the context of developing countries like Nepal and India, fostering sustainable growth hinges significantly on the banking industry's productivity, wherein human resources play a pivotal role. This study focuses on estimating employee productivity in public sector commercial banks of India and Nepal, employing metrics such as 'Business per Employee' and 'Profit per Employee'. Such insights are invaluable for managers and investors in making informed managerial and financial decisions [68]. Moreover, training programs have become pivotal in organizational settings, accentuating the crucial role of human capital in enhancing productivity. The study underscores the importance of effective development and training initiatives to unlock short and long-term benefits, given the evolving technological and social dynamics in today's organizations [69].

Revisiting existing studies on the human impacts of mergers and acquisitions, this research sheds light on individual, organizational, and managerial factors influencing post-acquisition outcomes. It reveals that while influential factors are often studied in isolation, their direct relationship with post-acquisition performance remains underexplored [70]. In another vein, the Indian banking sector's response to economic reforms following the 1991

balance-of-payments crisis offers insights into productivity dynamics. Despite heightened competition and reduced interest rates, productivity indicators like business per employee and profit per employee witnessed improvements, signaling positive momentum amidst evolving market dynamics [71].

Examining factors affecting employee productivity at Equatorial Nut Processor Limited (ENP), this study underscores the significance of organizational goals, work commitment, teamwork, and performance appraisal in driving higher productivity levels. Additionally, an enabling working environment and supervisor support emerged as critical factors, alongside personal characteristics like training, relationships, and age. The study advocates for institutional factors' consideration and the provision of ample training and career development opportunities to foster enhanced productivity and overall performance [72]. The authors sponsor the 2020 SAGE Keith Roberts Teaching Innovations Award, enabling graduate students and early career faculty to attend the annual ASA pre-conference teaching and learning workshop. The Ninth Edition of "Social Statistics for a Diverse Society" underscores intuition and common sense, demonstrating the link between statistics and social issues. Through real research examples, the text facilitates learning key statistical concepts, problem-solving skills, statistical software use, and interpreting research literature. The password-protected Instructor Resource Site offers access to all text-specific resources [73].

The study delves into the impact of employee motivation on organizational productivity levels, revealing a significant relationship between employee motivation and productivity. Extrinsic factors were found to have a more significant impact on organizational productivity than intrinsic factors, with 35.8% of productivity variations attributed to motivation. The study recommends that organizational management identifies motivating factors and implements measures to enhance performance and productivity levels. Future research avenues could explore other industries, such as pharmaceutical manufacturing, to further understand the motivation-productivity nexus [74]. Examining the impact of mergers and acquisitions (M&As) on employee productivity in Nigerian banks, this study focuses on pre- and post-merger performance. Despite operational inefficiencies and governance challenges, M&As were found to positively impact employee productivity in the Nigerian banking sector. The findings emphasize the need for financial institutions to consider the implications of M&A strategies on human elements, given their direct influence on overall organizational performance [75]. A study by KPMG in 1999 revealed that a significant proportion of European mergers and acquisitions failed to deliver promised benefits to stakeholders. However, recent studies indicate a shifting trend, with fewer companies experiencing value loss and a notable proportion experiencing positive impacts following mergers and acquisitions [76, 77]. Furthermore, an exploration of the human impacts of mergers and acquisitions underscores the importance of understanding individual, organizational, and managerial factors and their implications on post-acquisition outcomes [78]. Investigating the impact of merger-induced organizational changes on employee satisfaction and merged-firm performance in local markets, this study emphasizes the importance of addressing human resource challenges in mergers. Effective communication systems and participatory approaches in job redesign processes are recommended to enhance employee satisfaction and productivity. These insights are crucial for merging firms navigating human factor challenges [79, 80]. Examining the effects of the 2011 mergers and acquisitions wave in Nigeria's banking sector triggered by the Central Bank of Nigeria, this study evaluates the comparative effects on employee productivity levels before and after mergers. Data analysis using SPSS software and Trend Analysis indicates an overall increase in employee productivity post-merger, suggesting a positive impact of M&A activities on employee productivity in the Nigerian banking industry [81]. Production is crucial for improving living standards and prosperity, requiring the

elimination of waste and waste in resources. This leads to economic growth, increased profitability, and social progress. Employee engagement is essential for productivity, profitability, and job involvement. Companies with high employee engagement levels are more likely to meet strategic objectives, as employees are willing to put forth discretionary effort. Herzberg's Motivation-Hygiene theory supports this, and various research findings measure the effect of employee engagement on productivity and profitability [82].

Table 6
Different models and their accessibility to explanations

Models	**Post-hoc interpretability**			**Performance**
	Visualization	Local	By example	
Rule-based	High	High	Medium	Low
Tree-based	High	High	Medium	Medium
Linear	High	High	High	Medium
Distance-based	Low	Medium	High	Low
Probabilistic	High	High	High	Medium
Ensemble	Low	Medium	Medium	High
Deep neural network	High	Medium	High	High

RESEARCH OBJECTIVES AND SCOPE FOR REVIEW

The regulatory reforms implemented by the Indian government aimed at enhancing employee productivity in the banking sector amidst heavy reliance on government-owned banks signify a pivotal moment in the sector's evolution [83]. As the industry strives for profitability and competitiveness in a dynamic landscape, understanding the strategies adopted by private-sector banks to bolster productivity becomes imperative [84, 85]. This study endeavors to analyze the productivity trends of leading private sector banks in India spanning from 2002 to 2012 [83]. Through rigorous statistical analysis, the study seeks to unearth insights crucial for informed financial decision-making [83]. Productivity, a key metric gauging organizational efficiency, particularly in the banking realm, assumes central importance in assessing the sector's growth trajectory [84, 85]. By delving into financial ratios such as Business Per Employee and Profit Per Employee, the research aims to shed light on the performance trajectories of prominent Indian private sector banks, including Axis Bank, HDFC Bank, ICICI Bank, Kotak Mahindra Bank, and Yes Bank, over a significant period [84, 85].

The Silang Area, Cavite, Philippines, serves as a hub for talent retention, a critical aspect for maintaining a competitive advantage [86]. Sinha & Authour's cross-sectional survey revealed that factors such as mission attachment, organizational commitment, and employee engagement significantly influence retention [86]. The findings provide valuable insights for organizations seeking to sustain their competitive edge in the region, encompassing both not-for-profit and for-profit sectors [86].

The complexity of the merger process, accentuated by various organizational factors, underscores the significance of effective communication in navigating the intricacies of corporate culture and its impact on employees [87]. This includes managing the transition to a new culture characterized by change and potential resistance [87]. The article delineates the pivotal role of communication, corporate culture, change management, stress mitigation, and strategic maneuvering in successfully navigating the post-merger landscape [87]. The merger between Westpac and Trust Bank in New Zealand highlights the critical role of Human Resource Management (HRM) initiatives in managing risk within the banking sector [88]. Poor merger outcomes are often attributed to HRM and organizational challenges [88]. This underscores the importance of workforce stability and effective management of HRM risk in merger scenarios [88].

The United States and Europe have witnessed a surge in mergers and acquisitions (M&As), accompanied by varying success rates [89]. Understanding the multifaceted nature

of M&A processes, encompassing motives, approaches, and success factors, is imperative for stakeholders [89]. This entails delving into factors such as the relative size of M&A partners, managerial involvement, cultural compatibility, and organizational structural considerations [89].The study explores the impact of organizational culture and HRM effectiveness on financial performance in Singapore-based companies involved in mergers and acquisitions. Content analysis was used to collect information on cultural values and HRM effectiveness. Results showed that organizations with an elite or leader value profile, complemented by effective HRM, had better financial performance. This study contributes to the literature on the relationship between organizational culture and financial performance [90]. Bank mergers, despite not creating value, continue to occur. A cross-sectional analysis of 54 mergers between 1991 and 1995 reveals that the market rewards mergers focusing on geography, activities, and earnings streams. Focusing on earnings streams enhances long-term performance, while other factors like inefficient acquirers and reduced bankruptcy costs also improve performance. Despite the paradox, bank mergers continue to occur [91]. Mergers have relative importance in generating synergies, with the average synergy gains in a broad sample of 264 large mergers estimated to be 10.03% of the combined equity value. The underlying sources of these gains include taxes, market power, and efficiency improvements. Tax savings contribute only 1.64% in additional value while operating synergies account for 8.38%. Operating synergies are higher in focused mergers, while tax savings constitute a large fraction of gains in diversifying mergers. These synergies are primarily generated by cutbacks in investment expenditures rather than increased operating profits. Overall, mergers generate gains by improving resource allocation rather than reducing tax payments or increasing market power [92]. The literature on mergers and acquisitions in financial institutions has revealed several robust themes. North American bank mergers have shown efficiency improvement, while European bank mergers have resulted in efficiency gains and stockholder value enhancement. High CEO compensation is linked to merger activity, with deals motivated by obtaining 'too-big-to-fail' status and subsidies. However, evidence on the impact of geographic and product diversification via mergers is mixed. Financial institution M&As can adversely impact certain types of borrowers, depositors, and other external stakeholders [93]. Customer complaints are a significant issue in banking services, particularly in erstwhile socialist and mixed economies. The article aims to address this issue by focusing on the triumphant customer's perspective and the managerial viewpoint. It emphasizes the importance of employee satisfaction and motivation for customer satisfaction and competitiveness. The article suggests that sustainable advantage is possible only through people, and a shift from viewing service production and consumption as isolated systems to a network relationship among stakeholders is necessary. This perspective should guide the formation of policies and training for frontline personnel to handle customer complaints effectively [94]. The evaluation of service quality in retail banking in the Middle East, specifically Qatar, using data from four Qatari banks: Qatar National Bank, Doha Bank, Qatar International Islamic Bank, and Arab Bank. The study found that customers' perceptions are highest in tangibles and lowest in competence areas. To improve service quality, banks should focus on infrastructure facilities, timing, and return on deposit. With increasing competition, customer service is crucial, and managers should rethink improving service quality [95]. European banking has experienced technical change, with a cost function identifying payment sources and associated benefits. As electronic payments increased in 12 European countries, bank operating costs decreased by $32 billion, saving 0.38% of GDP. Policies facilitating these changes, such as antitrust exemptions, could help realize these benefits more fully [96]. A longitudinal study examining mergers between three large public-sector organizations reveals that cultural change is often imposed on leaders themselves, and the pace of change can inhibit successful re-engineering of the culture. The success of any

merger hinges on individual perceptions about how the process is handled and the direction in which the culture is moved. Communication and a transparent change process are important, as they determine how a leader will be regarded and who will be regarded as a leader. Leaders need to be competent and trained in the process of transforming organizations to ensure that individuals within the organization accept the changes prompted by a merger [97]. The merger of the Royal Bank of Scotland (RBS) and Pakistani bank, ICICI Bank, has been analyzed using accounting ratios to assess its financial performance. The study, which spanned from 2006-2009, used 20 vital ratios to analyze the bank's financial statements. Despite its limitations, accounting ratios remain a reliable analytical tool in financial decision-making. The results indicate that RBS's financial performance in profitability, liquidity, assets management, leverage, and cash flows was satisfactory before the merger, suggesting that the merger deal did not significantly improve the bank's financial performance [98]. An individual bank's acquisition target is increasing due to the increasing wave of mergers and acquisitions. Bank employees often view M&A as a threat to their jobs, as shareholders demand limitations on employed staff. The examination of the impact of M&A on employment and human resource efficiency in the Hellenic bank market. During the 1998-2003 period, 3,627 jobs were canceled due to merged or acquired banks. However, data confirms that large Greek banks that chose to grow through mergers have been justified in their choice, resulting in a more efficient distribution of staff [99]. The banking sector in Greece is experiencing rapid consolidation, with one out of four mergers and acquisitions occurring within this sector. This study aimed to examine how bank employees perceive these transactions and their impact on their personal and professional careers. Results showed that employees feel personally threatened by M&As, which are not considered justified entrepreneurial activities conducive to enhanced, quality banking services. This highlights the need for more comprehensive studies on the impact of M&As on the banking sector in Greece [100]. The negative impact of acquisitions on employee relations can lead to counterproductive practices, absenteeism, low morale, and job dissatisfaction. To ensure successful acquisitions, top management must gain trustworthiness from employees. Factors such as frequent communication before and after acquisition, and the quality of existing employee relations play a crucial role in fostering trustworthiness. A well-planned, employee-centered communication program and good employee relations are essential for a successful outcome in the face of acquisitions [101]. The corporate world has long viewed mergers and acquisitions as a vital stratagem to maximize profits, avoid competition, and expand their business landscape. Initially adopted in the USA in the late 1800s, numerous mergers and acquisitions have occurred globally in the last half-century. This study aims to analyze the factors contributing to the success and failures of these transactions, particularly in the banking sector, by analyzing the history and literature available on Mergers and Acquisitions [102]. The nine case studies on the efficiency effects of bank mergers focused on large banks with substantial market overlap during the early 1990s. All nine mergers resulted in significant cost reduction, aligning with premerger projections. Four of the nine mergers improved cost efficiency, while five did not. The most common issue was unexpected difficulty in integrating data processing systems and operations, making it difficult to isolate specific factors that yield efficiency gains [103].

The APA conducted a study on the relationships between employees and customers in service organizations. The research involved analyzing survey data from 142 employees and 968 customers from 28 branches of a bank. Moderate support was found for the research on stress correlates for boundary-role employees. The study also found significant relationships between branch employees' perceptions of organizational human resources practices and customers' attitudes about service. Employee and customer attitudes were related to turnover intentions, promoting the integration of consumer and organizational

behavior in the service sector [104]. A representative design was used to diagnose effectiveness in retail service organizations, involving employees and customers from 23 bank branches. The design, based on boundary-spanning theory and practical realities, collected data from both groups. Results showed strong relationships between employee perceptions of branch practices and procedures and customer perceptions of service practices and quality. This study highlights the importance of integrating organizational and consumer behavior in understanding customer perceptions and improving service quality [105]. Interpreting hostile takeover events offers a deeper understanding of inter-organizational phenomena and illuminates important social issues. These events, which threaten organizational identity and integrity, can be revealed through psychoanalytic readings. The media coverage of these events reflects and constructs social reality, reflecting contemporary culture. Thus, interpreting hostile takeover texts enriches our understanding of inter-organizational phenomena and sheds light on complex social issues [106].

Organizational strategy and organizational culture play a crucial role in the success rate of mergers and acquisitions (M&As), which are essential for maintaining a competitive advantage. However, the success rate of these events is often low. Research indicates that organizational culture can be a catalyst for M&A success. This article reviews the literature to identify the reasons for this, focusing on cultural implications before and after the event. It also synthesizes strategic alternatives from organizational change, strategy, and development/management research to offer a comprehensive perspective on improving M&A success rates [107]. Business Week highlights the increasing trend of mergers and acquisitions in the U.S. industry, as numerous companies use these strategies for corporate growth, economies of scale, vertical integration, and diversification. However, our understanding of the full effects of mergers on organizations and their human resources is limited. Existing literature focuses on the strategic, financial, and operational consequences of merger activity, while less fully documented are the perceptions of merger partners, attitudes towards the job and other aspects of organizational life, and the process through which these perceptions and attitudes are formed [108].

In developed countries, mergers and acquisitions (M&As) between credit institutions reached unprecedented levels during the 1990s. Factors such as financial deregulation and technological progress have intensified synergy and improved the management of acquired institutions. A multinomial logit analysis of continental European financial institutions between 1995 and 2001 reveals that size is an important factor in M&As, but economies of scale are not sought. Improving the management of acquired institutions has also played a crucial role in this process [109]. Malaysian financial institutions have experienced a surge in mergers and acquisitions, driven by factors like globalization, liberalization, and information technology developments. The 1997 Asian financial crisis accelerated the process, leading to the formation of ten anchor banks from 54 financial institutions by the end of 2001. This explores the causes, processes, and future implications of these mergers and acquisitions in the Malaysian banking system [110]. The SERVQUAL instrument, a widely used model in service quality research, has been criticized for not being comprehensive in its conceptualization, measurement, and applications across various industrial and commercial settings. This research aims to address these controversies by proposing a comprehensive model and instrument framework for measuring customer-perceived service quality. The instrument, designed specifically for the banking sector, was empirically tested for unidimensionality, reliability, and construct validity using a confirmatory factor analysis approach. This systematic procedure could provide further insights into customer-perceived service quality and its constituents, enhancing the understanding of service quality in various industries [111]. The collaborative merger in Sri Lanka has been a topic of interest in recent years, particularly in the Asian developing country context. The study aimed to examine employee experiences in two types of bank

mergers: extension and collaborative. The results showed that employees' perceptions were influenced by the type of merger, with collaborative mergers being less satisfied. Age, gender, and marital status also played a role in employee perceptions. The findings suggest that understanding and addressing people management issues in M&As can be more effective in Asian countries like Sri Lanka. The study's findings have implications for further research and understanding in the Asian context. [112].

CONCLUSION

To sum up, the analysis of mergers and acquisitions (M&As) in the banking industry highlights the intricate and diverse effects that these transactions have on financial institutions, markets, and regulatory structures. M&As are driven by a variety of factors, such as boosting market competitiveness, meeting regulatory requirements, and obtaining economies of scale and synergies. Empirical data, however, indicates that while many M&As result in cost savings and enhanced market performance, others might not produce the expected advantages, especially about profitability and shareholder value. The legislative framework for mergers and acquisitions also has a significant impact on the competitive landscape, financial stability, and market dynamics. The goals of protecting consumer interests, enhancing market efficiency, and reducing systemic risks are all balanced by regulatory bodies. Navigating various regulatory frameworks and compliance standards, however, can be difficult, especially when dealing with cross-border operations. Efforts to harmonize regulatory standards and enhance cooperation among regulatory authorities globally are essential to fostering a more conducive environment for cross-border M&As while ensuring financial stability and consumer protection. Moreover, continuous research and empirical analysis are necessary to better understand the drivers, outcomes, and policy implications of M&A activities in the banking sector. All things considered, meticulously thought-out strategic goals, exhaustive due diligence, efficient post-merger integration, and proactive risk and regulatory compliance management are necessary for successful M&As. Policymakers and industry stakeholders may enhance the resilience and sustainability of the banking sector in the face of persistent market dynamics and global uncertainty by promoting openness, accountability, and regulatory certainty.

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WOMEN ENTREPRENEURSHIP IN CHENNAI CITY: ISSUES, CHALLENGES AND DEVELOPMENT PROSPECTS

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ABSTRACT

Women-owned enterprises are an important component of inclusive economic development because they generate employment, strengthen household income and create opportunities for wider social participation. This revised study examines the socio-economic profile, business characteristics, motivational factors and major constraints experienced by women entrepreneurs in Chennai city. The study is based primarily on primary information collected from women entrepreneurs, with 350 usable responses reported in the original study. Descriptive analysis, Garrett's ranking technique and multiple regression analysis are used to interpret the evidence. The findings indicate that access to finance, educational qualification, business knowledge, market potential, family background and the effective use of funds are important elements influencing entrepreneurial activity. The study also highlights family responsibilities, competition, financial limitations, inadequate skills, infrastructure issues and workplace-related concerns as significant barriers. The paper concludes with practical suggestions relating to finance, training, market access, digital capability, family support and institutional assistance.

KEYWORDS: Women entrepreneurship, Chennai, women-owned enterprises, finance, entrepreneurial motivation, business challenges, socio-economic development

INTRODUCTION

Entrepreneurship is increasingly recognized as a mechanism through which individuals convert ideas, resources and opportunities into productive economic activity. Within this framework, women entrepreneurs contribute not only to business creation but also to employment generation, household welfare and community development. The source

study notes that women have historically been concentrated in household-based and small-scale activities, although education, awareness and institutional support have gradually widened their participation into manufacturing, services, technology and other sectors.

In the Indian context, the expansion of women's participation in enterprise is influenced by a combination of personal capability, access to resources, family environment, social expectations and market conditions. Women may encounter the usual uncertainties associated with entrepreneurship while simultaneously carrying household and caregiving responsibilities. Consequently, studying women's entrepreneurship requires attention to both business variables and the social environment in which enterprises operate.

Chennai, as a major metropolitan and commercial centre, provides opportunities across manufacturing, trading and service activities. At the same time, women entrepreneurs may experience difficulties relating to capital, business registration, market competition, skills, mobility and work–family balance. The present revised paper therefore focuses on the factors that support or restrict women's entrepreneurial development in the study area.

BACKGROUND AND CONCEPTUAL PERSPECTIVE

Women entrepreneurship can be viewed as the process through which women identify opportunities, organize resources, assume business risk and establish or manage enterprises. The entrepreneurial role includes innovation, opportunity identification, decision-making and willingness to operate under uncertainty. The source material specifically identifies innovation, exploration of new projects, risk-taking and decisions concerning products as important entrepreneurial functions

The development of women-owned enterprises is closely connected with economic independence. A business can provide income, employment and greater decision-making capacity, while successful enterprises can also create a positive demonstration effect for other women. However, the transition from starting a business to sustaining and expanding it depends on finance, skills, market access, family support and institutional conditions.

STATEMENT OF THE PROBLEM

Although women are increasingly entering entrepreneurial activity, participation does not automatically translate into sustainable business growth. The source study identifies shortages of working capital, limited investment, restrictive credit practices, family responsibilities and inadequate support as recurring difficulties.

The problem is therefore twofold: first, women need adequate resources and capabilities to establish enterprises; second, they need a supportive ecosystem to maintain competitiveness and expand their businesses. Understanding the relative importance of these issues can assist policymakers, financial institutions, educational organizations and development agencies in designing more responsive interventions.

OBJECTIVES OF THE STUDY

- To examine the socio-economic and business characteristics of women entrepreneurs in Chennai city.To identify and assess the major personal, social and economic issues experienced by women entrepreneurs.
- To analyse the relationship between selected motivational factors and the overall entrepreneurial motivational behaviour of women.
- To examine the principal challenges affecting the commencement and growth of women-owned enterprises.
- To suggest practical measures for strengthening women's entrepreneurial development and business sustainability

SCOPE OF THE STUDY

The study covers women entrepreneurs operating in manufacturing, service and trading activities. The analysis considers business duration, ownership structure, registration status, socio-economic characteristics, motivational factors and business challenges. The

scope is centred on the empirical information presented in the source document for women entrepreneurs in Chennai city.

RESEARCH METHODOLOGY

Research design and sources of data

The study relies predominantly on primary data collected through an interview-based survey of women entrepreneurs. The original document reports a survey covering 390 women entrepreneurs, with 350 respondents used in the final analysis after sampling and classification**.**

Sampling

The reported sample consists of 350 women entrepreneurs distributed across manufacturing, service and trading activities. Because the source document contains some inconsistencies in the description of the sampling procedure and sector totals, the revised paper retains the reported analytical sample of 350 rather than introducing new figures.

Statistical Tools

The study employs descriptive tabulation and several statistical techniques. These include exponential growth rates, multiple regression analysis, contingency measures, Garrett's ranking technique, five-point Likert-type scaling, Chi-square, F-test, Chow test, multidimensional scaling and standard deviation. The present discussion emphasizes the descriptive tables, Garrett ranking results and multiple regression findings explicitly reported in the source document.

PROFILE OF WOMEN-OWNED ENTERPRISES

Duration of Business Operations

Table 1.1: Duration of Business Operations

S.No	No. of years	Manufacturing	service	Trading	Total
1	0-1 years	47(13.5)	21(6)	25(7)	93(26.5)
2	1-2 years	10(3)	23(6.5)	21(6)	54(15.5)
3	2-3 years	19(5.5)	23(6.5)	24(7)	66(19)
3	Above 3 years	47(13.5)	47(13.5)	43(12)	137(39)
Total		123(36.5)	114(31.5)	113(32)	350(100)

Source: Primary Data

Note: Figures in parentheses indicate percentages

Table 1.1 reveals the details about the No of Years of Existence of Business of sample women entrepreneurs in Chennai Districts. 39 per cent of sample respondents businesses are existing more than 3 years, 26.5 per cent of sample respondents business are newly started, 19 per cent of sample respondents businesses are existing more than 2 years and 15.5 per cent of of sample respondents businesses are existing more than one year.

OWNERSHIP PATTERN

Table 1.2: Duration of Business Operations

S.No	Type of ownership	Manufacturing	Service	Trading	Total
1	Sole proprietor	61(17.5)	4(1)	42(12)	107(30.5)
2	Partnership	7(2)	4(1)	10(3)	21(6)
3	Hindu Undivided family	16(4.5)	18(5)	28(7.5)	60(17)
3	Private Limited	12(3.5)	30(8.5)	18(5)	60(17)
5	Public company	45(13)	4(1)	53(15.5)	102(29.5)
	Total	73(36.5)	63(31.5)	63(32)	350(100)

Source: Primary Data

Note: Figures in parentheses indicate percentages

Table 1.2 depicts that 30.5 percent their business, 17 percent of sample respondents are having business ownership of partnership, Hindu undivided family and private limited

each 8.5 percent of them are having public company. It shows that the sample respondents are having more capacity to bear the business risk as they are running business solely.

BUSINESS REGISTRATION

Table 1.3: Duration of Business Operations

S.No.	Type	Manufacturing	Service	Trading	Total
1	Registered	75(21.5)	68(19.5)	74(21)	217(62)
2	Unregistered	52(15)	42(12)	39(11)	133(38)
	Total	127(36.5)	110(31.5)	113(32)	350(100)

Source: Primary Data

Note: Figures in parentheses indicate percentages

Table 1.3 depicts that 62 percent of sample women entrepreneurs in chennaiDistricts have registered their business with District Industries Centre, chennai, whereas 38 percent have not registered their business. Business activities can be carried out either in own land or lease land or in Rental land building.

RANKING OF MAJOR ENTREPRENEURIAL PROBLEMS

Personal Characteristics

Personal characteristics include age, Education, experience and training. Social characteristics include marital status type of family nature of family etc., General characteristics include nature of enterprise, market extension etc.,Economic characteristics include amount of capital invested profit earned expenditure incurred etc.,. The following Table 1.4 shows the ranking of problems facing Personal Characteristics

TABLE 1.4

SOCIAL CHARACTER PROBLEMS IN THE PERSONAL CHARACTERISTICS-GARRETTS RANKING TECHNIQUE

Sl. No	Personal Character	Total Score	Average Score	Rank
1	Age	33933	60.56	III
3	Educational Qualification	34539	63.13	II
3	Spouse Education	19336	48.95	IV
4	Financial Support	36053	65.95	I
5	Language Problem	17968	45.48	V
6	Knowledge strength	16846	43.64	VI
7	Remedial Measure	15768	39.91	VIII
8	Family Restriction	15549	39.36	IX
9	Confidence	16841	43.63	VII

It is inferred from the Table 1.4 that majority of the sample sample women entrepreneurs to problems of lack of finance and educational qualifications is forcefulfactor for development of business. The table also shows that the sample women entrepreneurs had given second rank to educational qualifications. The table further shows that the sample educational qualifications had given third rank to age. It is further clear from the table had given last rank to insufficient Family Restriction.

SOCIAL CHARACTERISTICS

In order to find out women entrepreneurs data have been collected from Trichy, Thanjavur and Pudukkottai Districts. The following Table 1.5 shows the ranking of social character in women entrepreneurs in chennaI Districts.

Table 1.5
WOMEN ENTREPRENEURSSOCIAL CHARACTER
GARRETTS RANKING TECHNIQUE

Sl. No	Social Character	Total Score	Average Score	Rank
1	Marital status	33185	64.37	I
3	Type of family	31115	63.33	II
3	Nature family	36954	53.90	IV
4	Financial status	31601	43.30	IX
5	Lack of Personal Problem	36484	53.96	V
6	competitiveness	37973	55.94	III
7	Business Ethics	34541	49.08	VI
8	Mental strength	33890	45.78	VII
9	Lack of education	31898	43.79	VIII
10	Role conflict	19373	38.54	X
11	Unfavorable Environment	13939	35.87	XI

Table 1.5 clearly shows that majority of the sample ranking of social character inwomen entrepreneurs had given top rank to ‘marital status’ as first Rank in social character. The table further shows that the sample social character had given second rank to ‘Type of family’. The Table reveals that the sample Type of family had given third rank to ‘competitiveness’. It is further clear from the table that the sample women entrepreneurs had given last rank to Unfavorable Environment.

ECONOMIC CHARACTERISTICS

In order to find out which sample women entrepreneursthat are preferred by Economical Characterthe data have been collected from the Respondent. The following Table1.6 shows the ranking of preference of sample women entrepreneurs in Chennai Districts.

TABLE 1.6
WOMEN ENTREPRENEURSRANKING OF ECONOMICAL CHARACTER
GARRETTS RANKING TECHNIQUE

Sl. No	Ranking of Economical Character	Total Score	Average Score	Rank
1	Dept condition	36340	53.48	III

2	Update of Banking regulations	34104	48.30	V
3	Business Knowledge	38533	57.04	II
4	Source of Funds	39175	58.35	I
5	CIBIL score	34878	49.75	IV
6	Product/service Demand	16161	33.33	VI

It is inferred from the Table 1.6 that majority of the women entrepreneurs had given top rank to 'Source of Funds' as the most preferred in chennai Districts. The table also shows that the sample women entrepreneurshad given second rank to 'Business Knowledge'. The Table further shows that women entrepreneurs had given third rank to 'Dept condition. It is further clear from the table that the women entrepreneurshad given last rank to 'Product/service Demand'.

SOCIO-ECONOMIC PROFILE OF WOMEN ENTREPRENEURS

This section of the analysis examines the socio economic profile of the sample women entrepreneurs in Chennai city of Tamil Nadu.. The various aspects pertinent to social and economic profile vis a vis motivating factors for the promotion of units by women entrepreneurs. The following empirical data related to woman entrepreneurs throws light age, order of the birth in the family, marital status, family composition, educational qualifications, family background, family contacts, and experience in addition to monetary and return on capital employed in these sample units.

TABLE 1.7

CLASSIFICATION OF WOMEN ENTREPRENEURS BY AGE

Age group(yrs)	**No. of Women Entrepreneurs**
20-30	49(14)
31-40	122(35)
41-50	105(30)
51-60	44(12.5)
61Above	30(8.5)
	350(100.00)

Source: Computed

Note: Figures in parentheses represent percentage

TABLE 1.8

CLASSIFICATION OF WOMEN ENTREPRENEURS BY EDUCATIONAL QUALIFICATION

Educational Qualification	**No. of Women Entrepreneurs**
Up to SSLC	65(18.50)
Inter	42(12.00)
Degree	105(30.00)
PG	54(15.50)

Technical	84(24.00)
Total	350(100.00)

Source: Computed

Note: Figures in parentheses represent percentage

MOTIVATIONAL FACTOR INFLUENCING ENTREPRENEURIAL BEHAVIOUR

The study uses multiple regression analysis to examine how selected motivational variables are associated with the overall motivational behaviour of women entrepreneurs. The model includes economic independence and challenge, economic status and interest, opportunities and necessities, usage of funds, experience, market potential and family background.

TABLE 1.9
IMPACT OF MOTIVATING FACTOR ON OVERALL MOTIVATIONAL BEHAVIOUR

Factor	Notation	Coefficient	Std. Error	t-value	Significance
Constant	b0	0.204*	0.992	2.216	5%
Economic Independence and Challenges	X1	0.453**	0.011	41.076	1%
Economic Status and Interest	X2	0.010 NS	0.009	1.075	NS
Opportunities and Necessities	X3	0.013 NS	0.014	0.937	NS
Usage of Funds	X4	0.320**	0.013	23.975	1%
Experience	X5	-0.010 NS	0.010	-0.957	NS
Market Potential	X6	0.126**	0.011	11.995	1%
Family Background	X7	0.155**	0.011	13.8	1%

*Source: Computed Data. ** Significant at 1%; * significant at 5%; NS = Not Significant.*

The reported model shows an R^2 value of approximately 0.79 in the table, while the accompanying interpretation states 71.9 per cent. Because the source contains this internal inconsistency, the revised paper does not replace either figure with a new estimate. The strongest positive coefficient among the reported significant explanatory variables is associated with economic independence and challenges (0.453). Usage of funds also has a substantial positive coefficient (0.320), followed by family background (0.155) and market potential (0.126). Economic status and interest, opportunities and necessities, and experience were reported as statistically non-significant. The findings indicate that women's entrepreneurial motivation is shaped particularly by the desire for economic independence, effective financial utilization, market opportunities and supportive family circumstances.

MAJOR CHALLENGES AFFECTING WOMEN ENTREPRENEURS

Women entrepreneurs encounter a combination of financial, market, family, skill and workplace-related constraints. The source evidence identifies finance as a prominent challenge across manufacturing, trade and service activities. Competition and customer complaints, the nature of the business, family-related concerns and sexual harassment also appear in the reported challenge profile.

TABLE 1.10
CHALLENGES INCIDENCES IN BUSINESS COMMENCEMENT AND GROWTH

Sector	Competition / Customer Complaints	Finance	Nature of Business	Sexual Harassment	Family-related Problem
Agriculture	24.21	46.34	28.66	18.42	26.34
Manufacturing	24.21	72.82	38.16	16.28	24.22
Trade	28.17	68.42	38.16	24.12	22.42
Service	34.46	64.84	24.81	24.77	21.94

Table 1.10 below presents challenges faced by women entrepreneurs in starting and growing their businesses across different sectors. Financial related problems appear to be the most common to all the sectors, because the figures seem to be the highest among other challenges. The Table shows a mean figure of 46.34, 72.82, 68.42 and 64.84 for agricultural, manufacturing, trade and service sectors respectively. Agriculture surprisingly revealed low response and reaction to finance variable. Here, (agro) family related problem was considered as highly significant. In order of prominence, nature of the business was cited moderately by all the sectorsexceptservice sector. This was closely followed by sexual harassment cited in service and trade sectors (24.77 and 24.12) which are higher than the agricultural and manufacturing sectors (18.42 and 16.28). Sexual impediment was not regarded as serious problem in manufacturing and agricultural sectors; the weight was however notice able. The challenge of competition seems to be higher in the service sector (34.46) than in other sectors (24.21, 24.21 and 28.17) for agricultural, manufacturing and trade sector respectively. This is not surprising since a lot of women seem to be more in the service sector than in the other sector.

CHALLENGES TO ENTREPRENEURIAL DEVELOPMENT

The reported mean scores show that anticipating competition and customer complaints was a major concern, followed by the view that challenges experienced by other women can themselves motivate entry into business. Access to finance, family responsibilities, sexual harassment, business nature and financial skills were also identified.

TABLE 1.11
SELECTED CHALLENGES TO WOMEN'S ENTREPRENEURIAL DEVELOPMENT

Statement	Mean	Std. Dev.
Anticipated competition and customer complaints before starting the business	3.7116	1.57563
Lack of access to finance as a major challenge	3.2736	2.03998
Financial challenge due to lack of financial skill	3.0658	1.14323
Challenge arising from the nature of business	3.1406	1.15652
High labour turnover	3.109	1.11128
Sexual harassment from the opposite sex	3.1442	2.52121
Family role as a challenge to business	3.2673	1.11525

Challenges faced by women motivated entry into business	3.5171	1.49808

Source: Computed

FINDINGS

- A substantial share of the enterprises had operated for more than three years, indicating the presence of established women-owned businesses in the study area.
- Sole proprietorship is an important ownership form among the respondents.
- Most of the reported enterprises were registered, although a sizeable proportion remained outside formal registration.
- Financial support ranked first among the personal-characteristic issues examined through Garrett's technique.
- Marital status and family structure were prominent social considerations affecting women entrepreneurs.
- Source of funds and business knowledge were the leading economic characteristics in the reported ranking.
- Women in the 31–40 age group formed the largest reported age category.
- Degree-level education represented the largest educational category, followed by technical qualifications.
- Economic independence and challenges, usage of funds, market potential and family background were statistically significant motivational variables in the reported regression analysis.
- Finance, competition, family responsibilities, business-specific conditions, skills and workplace concerns remain important barriers to entrepreneurial development.

SUGGESTIONS FOR STRENGTHENING WOMEN ENTREPRENEURSHIP

Improve Access to Finance

Financial institutions should simplify application procedures, improve awareness of credit facilities and provide suitable working-capital products for women-owned enterprises. Financial literacy and responsible credit management should accompany loan support.

Strengthen Entrepreneurial Education

Training programmes should cover accounting, taxation, digital payments, budgeting, business planning, customer management, marketing and financial decision-making. Skill development should be continuous rather than limited to the start-up stage.

Expand Market Access

Women entrepreneurs can be supported through exhibitions, e-commerce platforms, local business networks, institutional procurement and digital marketing. Better market information can help enterprises identify demand and diversify products and services.

Encourage Formalization

Unregistered businesses should receive practical guidance on registration, statutory compliance and access to institutional support. Simplifying information and documentation can encourage more enterprises to enter the formal sector.

Promote Work–Family Balance

Family counselling, flexible work arrangements and community support can reduce the conflict between business responsibilities and household expectations. Families should be encouraged to view women's entrepreneurship as a productive economic role.

Develop Digital and Managerial Capability

Digital bookkeeping, online banking, social media marketing, e-commerce and data-based decision-making can strengthen competitiveness. Management training should also address inventory, labour and customer relationship practices.

Strengthen Safety and Support Mechanisms

Women entrepreneurs should have access to safe workplaces, grievance mechanisms and awareness programmes addressing harassment and discrimination. Institutional networks can help women respond to business and workplace difficulties.

Build Entrepreneurial Networks

Mentoring, peer groups and business associations can provide information, confidence and practical support. Experienced women entrepreneurs can mentor new entrepreneurs on finance, markets, compliance and risk management.

CONCLUSION

Women entrepreneurship in Chennai represents an important pathway for economic participation, income generation and inclusive development. The evidence reviewed in the source study shows that entrepreneurial performance is influenced by a combination of financial resources, education, business knowledge, market potential, family background and the ability to use funds effectively. At the same time, women continue to encounter competition, family responsibilities, financial constraints, skill gaps and workplace-related concerns. □filecite□turn0file0□

The study therefore suggests that women's entrepreneurial development should not be approached only as a credit issue. Sustainable enterprise growth requires an integrated ecosystem consisting of finance, training, digital capability, market linkages, formalization support, mentoring and a supportive family and social environment. Coordinated action by government agencies, banks, educational institutions, industry bodies and families can help women move from enterprise initiation to long-term business growth.

LIMITATIONS OF THE STUDY

The revised paper is based on the data and analytical information contained in the supplied source document. The source contains a few internal inconsistencies in sample descriptions, table totals and the reported R^2 interpretation. These have been explicitly noted rather than silently corrected. The study is also geographically limited to the reported study area and therefore its findings should not automatically be generalized to all women entrepreneurs in India.

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BANKING SECTOR ADAPTATION, AGRICULTURAL CREDIT ACCESSIBILITY AND RURAL FINANCIAL INCLUSION: AN EMPIRICAL STUDY OF THE DELTA REGION

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ABSTRACT

The present study examines banking sector adaptation, agricultural credit accessibility and rural financial inclusion and their influence on agricultural credit outcomes among farmers in the Delta Region. Agriculture remains a major source of livelihood in rural areas, and timely access to institutional credit is essential for purchasing agricultural inputs, investing in farm equipment, managing seasonal financial requirements and improving farm productivity. The transformation of banking services through digital banking, mobile banking, internet banking, digital documentation and technology-enabled credit facilities has created new opportunities for improving farmers' access to formal financial services. The study adopts a descriptive and analytical research design and is based on primary data collected from 125 farmers in the Delta Region through a structured questionnaire. Descriptive statistics, Chi-Square Test, Pearson's Correlation Analysis and Multiple Linear Regression Analysis were employed using SPSS. The findings reveal that farmers generally have favourable perceptions of banking sector adaptation, agricultural credit accessibility and rural financial inclusion. The Chi-Square results indicate significant associations between selected socio-demographic and agricultural characteristics and the three major dimensions, leading to the rejection of H_{01}. Pearson's correlation results demonstrate strong positive relationships between banking sector adaptation, agricultural credit accessibility and rural financial inclusion, with correlation coefficients ranging from 0.684 to 0.756, resulting in the rejection of H_{02}. The regression model explains 67.9% (R^2 =

0.679) of the variation in agricultural credit outcomes. Agricultural credit accessibility emerges as the strongest predictor (β = 0.381), followed by rural financial inclusion (β = 0.326) and banking sector adaptation (β = 0.291). The study concludes that integrated digital banking, accessible credit facilities, simplified procedures and financial literacy initiatives can strengthen rural financial inclusion and improve agricultural credit outcomes in the Delta Region.

KEYWORDS: Banking Sector Adaptation, Agricultural Credit Accessibility, Rural Financial Inclusion, Agricultural Credit Outcomes, Digital Banking, Farmers, Delta Region.

INTRODUCTION

Agriculture continues to play a significant role in the rural economy of India by providing employment, income and livelihood opportunities to a large section of the population. The development of agriculture depends not only on land, labour and technology but also on timely and adequate access to institutional credit. Farmers require financial resources for purchasing seeds, fertilizers, pesticides, machinery, irrigation facilities and other agricultural inputs. Agricultural credit also enables farmers to manage seasonal fluctuations, meet emergency requirements and invest in productive agricultural activities. Therefore, an efficient and accessible banking system is essential for supporting agricultural development and improving the economic well-being of rural households. The banking sector has undergone considerable transformation in recent years through digitalisation, mobile banking, internet banking, digital documentation, electronic payment systems and technology-enabled lending. These developments have changed the manner in which rural customers interact with financial institutions. For farmers, banking sector adaptation can potentially reduce transaction costs, improve access to information, simplify loan procedures and facilitate faster delivery of credit. However, differences in digital literacy, education, awareness, geographical accessibility and technological infrastructure may influence the extent to which farmers benefit from these developments.

Agricultural credit accessibility represents the ability of farmers to obtain adequate, affordable and timely credit from formal financial institutions. Despite the expansion of institutional banking, several farmers continue to face difficulties related to documentation, collateral, awareness, loan processing and procedural complexity. Rural financial inclusion therefore extends beyond merely having a bank account and includes regular use of banking services, access to savings, credit, insurance, digital payments and other financial products. The Delta Region, characterised by intensive agricultural activities and a large rural population, provides an important setting for examining these issues. The present study therefore focuses on the interrelationship between banking sector adaptation, agricultural credit accessibility and rural financial inclusion and their influence on agricultural credit outcomes among farmers.

BACKGROUND OF THE STUDY

The Indian agricultural sector has traditionally depended on institutional and non-institutional sources of finance. Institutional credit provided through commercial banks, regional rural banks, cooperative banks and government-supported schemes has become increasingly important for reducing farmers' dependence on informal lenders. Initiatives such as the Kisan Credit Card, priority-sector lending and financial inclusion programmes have strengthened the formal agricultural credit system. At the same time, technological developments have transformed rural banking services. Digital payments, mobile banking, internet banking, electronic documentation and technology-enabled credit services have created new opportunities for improving financial accessibility. The National Strategy for Financial Inclusion also emphasises universal access to financial services, greater financial literacy and increased use of digital financial services. However, the availability of banking infrastructure does not automatically guarantee effective financial inclusion. Farmers may continue to experience difficulties because of limited awareness, inadequate digital skills,

complicated procedures, collateral requirements and geographical constraints. The Delta Region is particularly relevant because agriculture forms an important component of rural livelihoods and farmers require regular institutional credit to meet production and investment requirements. Against this background, the present study examines how banking sector adaptation and agricultural credit accessibility contribute to rural financial inclusion and agricultural credit outcomes among farmers in the Delta Region.

REVIEW OF LITERATURE

Kumar and Singh (2020) examined the role of banking services in improving agricultural credit accessibility among rural farmers. The study found that institutional credit helped farmers meet seasonal agricultural requirements and reduce dependence on informal lenders. However, documentation, collateral requirements and limited awareness remained major barriers. The authors recommended simplified lending procedures and greater financial awareness programmes. Rathore and Sharma (2020) analysed the accessibility of formal agricultural credit among small and marginal farmers. The findings revealed that proximity to bank branches, availability of credit information and support from bank officials significantly influenced farmers' access to institutional finance. The study suggested strengthening rural banking infrastructure and advisory services. Prasad and Reddy (2021) investigated the adoption of digital banking services among rural households. The study reported that mobile banking, internet banking and digital payment facilities improved convenience and accessibility to formal financial services. Nevertheless, lack of digital literacy and technological confidence restricted adoption among some rural users. Mehta and Patel (2021) studied the effectiveness of institutional agricultural credit in improving farm productivity. The findings indicated that timely credit enabled farmers to purchase quality seeds, fertilizers, machinery and other agricultural inputs. Access to adequate finance was also associated with improved income and better management of seasonal financial requirements.

Srinivasan and Kumar (2021) examined rural financial inclusion through formal banking institutions. The study found that bank account ownership alone was insufficient to ensure meaningful financial inclusion. Regular account usage, access to credit, savings facilities and digital banking services were identified as important components of effective financial inclusion. Das and Roy (2021) assessed farmers' awareness of different agricultural credit schemes offered by commercial and cooperative banks. The study observed that awareness significantly influenced farmers' willingness to approach formal financial institutions. Bank-level awareness campaigns and direct interaction with farmers were suggested to improve credit accessibility. Sharma and Verma (2022) examined the impact of digital transformation on agricultural banking services. The study found that digital documentation and online loan-processing mechanisms reduced transaction time and improved service efficiency. However, inadequate digital infrastructure and low technological literacy continued to affect rural adoption. Babu and Selvam (2022) investigated the relationship between financial inclusion and agricultural development. The study concluded that access to formal credit, savings and payment services contributed positively to farmers' economic security. It further highlighted the importance of affordable and easily accessible banking services for rural communities.

Kaur and Gill (2022) studied the challenges faced by farmers in obtaining agricultural loans from formal financial institutions. The major problems identified were complicated procedures, inadequate information, collateral requirements and delays in loan processing. The study recommended farmer-friendly procedures and stronger institutional support. Mishra and Pandey (2022) examined the influence of Kisan Credit Card facilities on agricultural credit accessibility. The study found that KCC improved farmers' access to timely short-term credit and reduced their dependence on informal sources. However, awareness and effective utilisation of the facility varied across different categories of

farmers. Ramanathan and Devi (2023) analysed farmers' perceptions of changing banking services in rural areas. The findings indicated that banks had increasingly adopted digital channels, flexible repayment mechanisms and simplified procedures to respond to farmers' changing needs. The study emphasized the need for continuous improvement in customer-oriented agricultural banking services. Ahmed and Khan (2023) studied digital financial inclusion among rural households. The study found that mobile banking and digital payments increased participation in the formal financial system and improved transaction convenience. At the same time, security concerns, lack of awareness and limited digital skills remained significant challenges.

Gopal and Raj (2023) examined the relationship between agricultural credit and farmers' financial stability. The study revealed that timely institutional credit enabled farmers to manage seasonal expenditure and agricultural investments more effectively. Access to formal credit was also found to reduce dependence on moneylenders and improve financial planning. Nair and Thomas (2023) investigated the role of bank officials in facilitating agricultural credit. The study showed that personal guidance, information about loan schemes and assistance with documentation significantly improved farmers' ability to obtain credit. The authors recommended strengthening farmer–banker interaction at the village level. Saha and Chatterjee (2024) examined the contribution of financial inclusion to rural economic development. The study reported that access to formal banking, savings, credit and digital payment services improved households' financial security. The authors emphasized that financial inclusion should focus not only on access but also on regular and meaningful usage of financial services. Venkatesh and Lakshmi (2024) studied the influence of bank accessibility on agricultural credit utilisation. The findings suggested that shorter distance to bank branches and convenient banking channels encouraged farmers to use institutional credit. Digital banking was particularly useful in reducing the time and cost associated with routine banking transactions.

Kumar and Mohan (2024) examined the role of agricultural credit in improving farm-level economic outcomes. The study found that institutional finance supported investment in farm inputs, equipment and expansion of agricultural activities. Timely availability of credit was identified as an important factor influencing agricultural productivity and income. Priya and Balasubramanian (2025) analysed farmers' adoption of digital banking services in rural areas. The study revealed that mobile banking, online transactions and digital documentation improved the efficiency of banking services. However, differences in education, age and digital knowledge influenced the extent to which farmers adopted these services. Rajan and Murugan (2025) examined the accessibility of agricultural credit among farmers in the Cauvery Delta region. The study highlighted the importance of bank proximity, awareness of credit schemes and simplified loan procedures in improving institutional credit access. It suggested that region-specific banking initiatives could strengthen rural financial inclusion. Selvaraj and Meenakshi (2025) investigated the combined influence of banking adaptation, credit accessibility and financial inclusion on agricultural development. The study indicated that technologically adaptive banks and accessible credit facilities could improve farmers' financial participation and agricultural outcomes. The authors recommended integrated approaches combining digital banking, credit support and financial literacy.

RESEARCH GAP

The reviewed studies indicate that banking sector adaptation, agricultural credit accessibility and rural financial inclusion are closely interconnected and can contribute to improved agricultural and financial outcomes. However, most earlier studies have examined these dimensions separately, with limited empirical attention to their combined influence on agricultural credit outcomes. There is also relatively limited evidence focusing specifically on the Delta Region, where agriculture and institutional credit play an important role in rural

livelihoods. Therefore, the present study attempts to fill this gap by examining banking sector adaptation, agricultural credit accessibility and rural financial inclusion together and determining their influence on agricultural credit outcomes among farmers.

STATEMENT OF THE PROBLEM

Agricultural credit is an essential requirement for farmers because agricultural production involves substantial expenditure on inputs, equipment, irrigation, labour and other operational activities. Although formal banking institutions have expanded their agricultural lending facilities, all farmers may not experience equal access to these services. Problems relating to documentation, collateral requirements, inadequate information, loan-processing delays and limited awareness can restrict farmers' ability to obtain institutional credit. The rapid adaptation of banks to digital technologies has created new possibilities for improving accessibility. Mobile banking, internet banking, digital payments and digital documentation can reduce the time and cost involved in accessing financial services. However, rural farmers may differ considerably in their ability to use these facilities because of differences in age, education, farming experience, income and digital knowledge. Consequently, technological advancement may not automatically result in comprehensive financial inclusion. Another important concern is that agricultural credit accessibility and rural financial inclusion are often examined independently. There is comparatively less empirical attention to how banking sector adaptation, accessibility of agricultural credit and financial inclusion operate together and influence agricultural credit outcomes. This issue is particularly relevant in the Delta Region, where agricultural activities constitute an important component of rural livelihoods. Therefore, the present study attempts to address this research problem by empirically examining the association among banking sector adaptation, agricultural credit accessibility and rural financial inclusion and determining their influence on agricultural credit outcomes among farmers in the Delta Region.

SIGNIFICANCE OF THE STUDY

The study is significant because it provides empirical evidence on the changing role of banking institutions in supporting agricultural finance and rural financial inclusion. It helps identify whether technological adaptation, digital banking facilities and farmer-oriented banking practices are actually improving farmers' access to formal financial services. The findings will be useful to commercial banks, regional rural banks and cooperative banks in understanding farmers' perceptions regarding digital services, loan procedures, information availability and credit accessibility. The study may also assist policymakers and government agencies in designing more farmer-friendly agricultural credit and financial inclusion programmes. For farmers, improved banking adaptation and easier access to institutional credit can contribute to timely procurement of agricultural inputs, investment in farm equipment, improved productivity and reduced dependence on informal lenders. The study is also significant for researchers because it integrates three important dimensions—banking sector adaptation, agricultural credit accessibility and rural financial inclusion—within a single empirical framework. The findings can provide a basis for further studies on rural banking and agricultural finance in other regions.

OBJECTIVES OF THE STUDY

- To examine the socio-demographic and agricultural profile of farmers and assess their level of banking sector adaptation, agricultural credit accessibility and rural financial inclusion in the Delta Region.
- To analyse the relationship between banking sector adaptation, agricultural credit accessibility and rural financial inclusion among farmers in the Delta Region.
- To determine the influence of banking sector adaptation, agricultural credit accessibility and rural financial inclusion on agricultural credit outcomes among farmers in the Delta Region.

HYPOTHESIS OF THE STUDY

- H_{01}: There is no significant association between the selected socio-demographic/agricultural characteristics of farmers and their levels of banking sector adaptation, agricultural credit accessibility and rural financial inclusion.
- H_{02}: There is no significant relationship between banking sector adaptation, agricultural credit accessibility and rural financial inclusion among farmers.
- H_{03}: Banking sector adaptation, agricultural credit accessibility and rural financial inclusion do not significantly influence agricultural credit outcomes among farmers.

RESEARCH METHODOLOGY

The present study adopts a descriptive and analytical research design to examine banking sector adaptation, agricultural credit accessibility and rural financial inclusion among farmers in the Delta Region. The study is based primarily on primary data collected from farmers through a structured questionnaire. The questionnaire consists of two major sections: the first section captures the socio-demographic and agricultural characteristics of respondents, while the second section measures perceptions regarding banking sector adaptation, agricultural credit accessibility, rural financial inclusion and agricultural credit outcomes. A total of 125 farmers were selected as respondents using a suitable sampling approach. The study covers farmers engaged in major agricultural activities, particularly paddy cultivation and other crops, in the selected areas of the Delta Region. The perception-based statements were measured using a five-point Likert scale, ranging from Strongly Disagree to Strongly Agree. For analysis, descriptive statistics such as frequency and percentage are used to present the socio-demographic and agricultural profile of respondents. Chi-Square Test is employed to examine the association between selected socio-demographic/agricultural characteristics and the major study dimensions. Pearson's Correlation Analysis is used to determine the relationship between banking sector adaptation, agricultural credit accessibility and rural financial inclusion. Further, Multiple Linear Regression Analysis is applied to determine the influence of banking sector adaptation, agricultural credit accessibility and rural financial inclusion on agricultural credit outcomes. The data are analysed using SPSS, and statistical significance is evaluated at the 5 per cent level ($p < 0.05$). The study also uses relevant secondary sources, including reports of the Reserve Bank of India, NABARD, Government of India and World Bank, to provide contextual support for the research.

DATA ANALYSIS

Table 1
Socio-Demographic and Agricultural Profile of the Respondents

S. No.	Variable	Category	Frequency	Percentage
1	Gender	Male	78	62.4
		Female	47	37.6
		Total	**125**	**100.0**
2	Age	Below 30 years	12	9.6
		31–40 years	27	21.6
		41–50 years	36	28.8
		51–60 years	31	24.8
		Above 60 years	19	15.2
		Total	**125**	**100.0**
3	Educational Qualification	Illiterate	18	14.4
		Primary	29	23.2
		Secondary	34	27.2

		Higher Secondary	25	20.0
		Graduate and above	19	15.2
		Total	**125**	**100.0**
4	Farming Experience	Below 5 years	14	11.2
		5–10 years	28	22.4
		11–20 years	37	29.6
		21–30 years	28	22.4
		Above 30 years	18	14.4
		Total	**125**	**100.0**
5	Type of Farmer	Marginal	31	24.8
		Small	42	33.6
		Semi-medium	27	21.6
		Medium	17	13.6
		Large	8	6.4
		Total	**125**	**100.0**
6	Annual Agricultural Income	Below ₹1 lakh	25	20.0
		₹1–2 lakh	37	29.6
		₹2–5 lakh	34	27.2
		₹5–10 lakh	19	15.2
		Above ₹10 lakh	10	8.0
		Total	**125**	**100.0**
7	Major Agricultural Activity	Paddy cultivation	48	38.4
		Horticulture	25	20.0
		Pulses	18	14.4
		Sugarcane	16	12.8
		Other crops	18	14.4
		Total	**125**	**100.0**
8	Distance from the Nearest Bank Branch	Below 2 km	24	19.2
		2–5 km	46	36.8
		6–10 km	35	28.0
		Above 10 km	20	16.0
		Total	**125**	**100.0**
9	Agricultural Credit Availed from a Bank	Yes	86	68.8
		No	39	31.2
		Total	**125**	**100.0**
10	Type of Agricultural Credit Availed	Crop Loan	32	25.6
		Kisan Credit Card	27	21.6
		Agricultural Term Loan	16	12.8
		Farm Equipment Loan	7	5.6
		Other	4	3.2
		Not Applicable – No credit availed	39	31.2
		Total	**125**	**100.0**

Sources: Primary Data

Table 1 presents the socio-demographic and agricultural profile of the 125 respondents. It is observed that 78 respondents (62.4%) are male, while 47 respondents (37.6%) are female, indicating that male farmers constitute the majority of the sample. Regarding age, the highest proportion of respondents, 36 (28.8%), belongs to the 41–50 years category, followed by 31 respondents (24.8%) in the 51–60 years category. With respect to educational qualification, 34 respondents (27.2%) have secondary education,

representing the largest group, while 18 respondents (14.4%) are illiterate. In terms of farming experience, 37 respondents (29.6%) have 11–20 years of experience, indicating that a considerable proportion of farmers possess substantial experience in agricultural activities. Regarding the type of farmer, 42 respondents (33.6%) are small farmers, followed by 31 respondents (24.8%) who are marginal farmers. In terms of annual agricultural income, the largest group, 37 respondents (29.6%), earns ₹1–2 lakh annually, followed by 34 respondents (27.2%) earning ₹2–5 lakh. Paddy cultivation is the major agricultural activity for 48 respondents (38.4%), making it the predominant agricultural activity in the study area. Regarding distance from the nearest bank branch, 46 respondents (36.8%) are located within 2–5 km of a bank branch. Further, 86 respondents (68.8%) have availed agricultural credit from banks, while 39 respondents (31.2%) have not. Among the respondents who availed credit, crop loans constitute the largest category with 32 respondents. Overall, the findings indicate that the respondents are predominantly middle-aged, experienced small farmers engaged mainly in paddy cultivation, with moderate agricultural income and relatively reasonable access to banking facilities.

Table 2

Banking Sector Adaptation

Item	Statement	SD (%)	D (%)	N (%)	A (%)	SA (%)
1	Banks have adapted their agricultural lending practices to the changing needs of farmers.	8 (6.4)	10 (8.0)	24 (19.2)	44 (35.2)	39 (31.2)
2	Banks provide agricultural loan services through convenient digital channels.	11 (8.8)	13 (10.4)	22 (17.6)	39 (31.2)	40 (32.0)
3	Mobile banking has made agricultural banking services more accessible to me.	5 (4.0)	16 (12.8)	21 (16.8)	42 (33.6)	41 (32.8)
4	Internet banking has improved my access to banking services.	3 (2.4)	15 (12.0)	21 (16.8)	48 (38.4)	38 (30.4)
5	Banks provide timely information about agricultural loan schemes.	11 (8.8)	15 (12.0)	21 (16.8)	39 (31.2)	39 (31.2)
6	Banks have simplified the procedures for applying for agricultural loans.	7 (5.6)	12 (9.6)	19 (15.2)	46 (36.8)	41 (32.8)
7	Banks provide flexible repayment options for agricultural borrowers.	5 (4.0)	14 (11.2)	18 (14.4)	45 (36.0)	43 (34.4)
8	Banks respond effectively to the changing financial needs of farmers.	8 (6.4)	9 (7.2)	20 (16.0)	45 (36.0)	43 (34.4)
9	Digital documentation has reduced the time required for agricultural loan processing.	7 (5.6)	13 (10.4)	22 (17.6)	42 (33.6)	41 (32.8)
10	Banks provide adequate assistance to farmers in using digital banking services.	4 (3.2)	13 (10.4)	21 (16.8)	45 (36.0)	42 (33.6)

Sources: Primary Data

Table 2 presents the respondents' perceptions regarding banking sector adaptation to the changing requirements of farmers. The results indicate an overall favourable perception of banking sector adaptation. For the statement that banks have adapted their agricultural lending practices to changing farmer needs, 44 respondents (35.2%) agreed and 39 respondents (31.2%) strongly agreed, indicating that a majority perceive banks as responsive to changing agricultural requirements. Regarding digital channels, 39

respondents (31.2%) agreed and 40 respondents (32.0%) strongly agreed that banks provide agricultural loan services through convenient digital channels. Similarly, 42 respondents (33.6%) agreed and 41 respondents (32.8%) strongly agreed that mobile banking has improved accessibility to agricultural banking services. Internet banking also received a favourable response, with 48 respondents (38.4%) agreeing and 38 respondents (30.4%) strongly agreeing that it has improved access to banking services. Further, 39 respondents each (31.2%) agreed and strongly agreed that banks provide timely information about agricultural loan schemes. The findings also show that 46 respondents (36.8%) agreed and 41 respondents (32.8%) strongly agreed that banks have simplified agricultural loan application procedures. Similarly, 45 respondents (36.0%) agreed and 43 respondents (34.4%) strongly agreed that banks provide flexible repayment options. Overall, the responses demonstrate that farmers generally perceive banks as adapting to their changing needs through digital banking, simplified procedures, flexible repayment options, timely information and improved assistance. Thus, banking sector adaptation appears to be positively perceived among the respondents.

Table 3
Agricultural Credit Accessibility

Item	Statement	SD (%)	D (%)	N (%)	A (%)	SA (%)
1	I can easily obtain information about agricultural credit from banks.	6 (4.8)	11 (8.8)	22 (17.6)	44 (35.2)	42 (33.6)
2	Agricultural loan application procedures are easy to understand.	7 (5.6)	12 (9.6)	20 (16.0)	43 (34.4)	43 (34.4)
3	I can easily approach banks for agricultural credit.	5 (4.0)	13 (10.4)	22 (17.6)	43 (34.4)	42 (33.6)
4	Banks provide agricultural loans within a reasonable period.	8 (6.4)	12 (9.6)	21 (16.8)	41 (32.8)	43 (34.4)
5	The documentation requirements for agricultural loans are manageable.	7 (5.6)	14 (11.2)	20 (16.0)	43 (34.4)	41 (32.8)
6	Banks provide adequate credit according to my agricultural requirements.	6 (4.8)	12 (9.6)	22 (17.6)	42 (33.6)	43 (34.4)
7	Interest rates on agricultural loans are affordable.	8 (6.4)	10 (8.0)	23 (18.4)	40 (32.0)	44 (35.2)
8	Collateral requirements do not significantly restrict my access to agricultural credit.	7 (5.6)	13 (10.4)	21 (16.8)	44 (35.2)	40 (32.0)
9	I am aware of the different agricultural credit schemes available through banks.	6 (4.8)	12 (9.6)	19 (15.2)	45 (36.0)	43 (34.4)
10	I receive adequate assistance from bank officials when applying for agricultural credit.	5 (4.0)	11 (8.8)	20 (16.0)	44 (35.2)	45 (36.0)

Sources: Primary Data

Table 3 describes the respondents' perceptions of agricultural credit accessibility. The results reveal a generally favourable perception of farmers' access to agricultural credit. Regarding access to information about agricultural credit, 44 respondents (35.2%) agreed and 42 respondents (33.6%) strongly agreed, suggesting that most farmers can obtain information about available credit facilities. For the ease of understanding agricultural loan application procedures, 43 respondents (34.4%) agreed and another 43 respondents (34.4%) strongly agreed. Similarly, 43 respondents (34.4%) agreed and 42 respondents (33.6%)

strongly agreed that they can easily approach banks for agricultural credit. With regard to the timely provision of loans, 41 respondents (32.8%) agreed and 43 respondents (34.4%) strongly agreed that banks provide agricultural loans within a reasonable period. Further, 43 respondents (34.4%) agreed and 41 respondents (32.8%) strongly agreed that documentation requirements are manageable. The findings also indicate favourable perceptions regarding the adequacy of credit, affordability of interest rates and collateral requirements. In particular, 44 respondents (35.2%) agreed and 40 respondents (32.0%) strongly agreed that collateral requirements do not significantly restrict access to agricultural credit. Overall, the results indicate that respondents generally consider agricultural credit to be accessible, understandable and reasonably affordable, with adequate assistance from bank officials. This suggests that formal banking institutions play an important role in facilitating farmers' access to agricultural finance.

Table 4
Rural Financial Inclusion

Item	Statement	SD (%)	D (%)	N (%)	A (%)	SA (%)
1	I have easy access to formal banking services.	5 (4.0)	12 (9.6)	20 (16.0)	44 (35.2)	44 (35.2)
2	I regularly use a bank account for my financial transactions.	4 (3.2)	10 (8.0)	19 (15.2)	46 (36.8)	46 (36.8)
3	I use digital payment facilities for agricultural or household transactions.	6 (4.8)	11 (8.8)	21 (16.8)	43 (34.4)	44 (35.2)
4	I am aware of various financial products offered by banks.	7 (5.6)	13 (10.4)	22 (17.6)	41 (32.8)	42 (33.6)
5	Banking services have reduced my dependence on informal sources of finance.	5 (4.0)	12 (9.6)	20 (16.0)	45 (36.0)	43 (34.4)
6	I can conveniently access banking services when required.	6 (4.8)	11 (8.8)	21 (16.8)	42 (33.6)	45 (36.0)
7	Banking services have improved my ability to save money securely.	7 (5.6)	10 (8.0)	20 (16.0)	44 (35.2)	44 (35.2)
8	I have access to suitable credit facilities through formal financial institutions.	6 (4.8)	12 (9.6)	22 (17.6)	42 (33.6)	43 (34.4)
9	Digital banking has improved my participation in the formal financial system.	7 (5.6)	11 (8.8)	21 (16.8)	44 (35.2)	42 (33.6)
10	Banking services have improved my overall financial well-being.	5 (4.0)	12 (9.6)	20 (16.0)	43 (34.4)	45 (36.0)

Sources: Primary Data

Table 4 presents the respondents' perceptions regarding rural financial inclusion. The results show that the majority of farmers have a positive perception of their participation in the formal financial system. Regarding access to formal banking services, 44 respondents (35.2%) agreed and 44 respondents (35.2%) strongly agreed that they have easy access to such services. Similarly, 46 respondents each (36.8%) agreed and strongly agreed that they regularly use bank accounts for financial transactions. The use of digital payment facilities was also relatively high, with 43 respondents (34.4%) agreeing and 44 respondents (35.2%) strongly agreeing that they use digital payments for agricultural or household transactions. Further, 41 respondents (32.8%) agreed and 42 respondents (33.6%) strongly agreed that they are aware of various financial products offered by banks. The findings further show that banking services have reduced dependence on informal sources of finance, with 45

respondents (36.0%) agreeing and 43 respondents (34.4%) strongly agreeing. Similarly, 42 respondents (33.6%) agreed and 45 respondents (36.0%) strongly agreed that they can conveniently access banking services when required. Overall, the findings indicate that rural financial inclusion among the respondents is relatively favourable, particularly in terms of bank account usage, digital payment adoption, access to formal credit, savings and participation in the formal financial system. Banking services therefore appear to contribute positively to the financial inclusion of farmers in the Delta Region.

Table 5
Agricultural Credit Outcomes / Benefits

Item	Statement	SD (%)	D (%)	N (%)	A (%)	SA (%)
1	Agricultural credit has helped me purchase agricultural inputs on time.	6 (4.8)	11 (8.8)	20 (16.0)	43 (34.4)	45 (36.0)
2	Bank credit has helped me improve agricultural productivity.	7 (5.6)	12 (9.6)	21 (16.8)	42 (33.6)	43 (34.4)
3	Agricultural loans have helped me purchase or upgrade farm equipment.	8 (6.4)	10 (8.0)	20 (16.0)	43 (34.4)	44 (35.2)
4	Access to bank credit has reduced my dependence on moneylenders.	5 (4.0)	11 (8.8)	21 (16.8)	44 (35.2)	44 (35.2)
5	Agricultural credit has improved my ability to manage seasonal financial requirements.	6 (4.8)	12 (9.6)	21 (16.8)	42 (33.6)	44 (35.2)
6	Bank credit has contributed to an increase in my agricultural income.	7 (5.6)	10 (8.0)	20 (16.0)	43 (34.4)	45 (36.0)
7	Agricultural credit has helped me expand my farming activities.	5 (4.0)	12 (9.6)	22 (17.6)	41 (32.8)	45 (36.0)
8	Timely access to agricultural credit has improved my financial stability.	6 (4.8)	11 (8.8)	21 (16.8)	43 (34.4)	44 (35.2)

Sources: Primary Data

Table 5 presents the perceived outcomes and benefits of agricultural credit among the respondents. The results indicate that agricultural credit provides several important benefits to farmers. Regarding timely purchase of agricultural inputs, 43 respondents (34.4%) agreed and 45 respondents (36.0%) strongly agreed that agricultural credit has helped them purchase inputs on time. Similarly, 42 respondents (33.6%) agreed and 43 respondents (34.4%) strongly agreed that bank credit has improved agricultural productivity. With respect to farm equipment, 43 respondents (34.4%) agreed and 44 respondents (35.2%) strongly agreed that agricultural loans have helped them purchase or upgrade farm equipment. Further, 44 respondents (35.2%) agreed and 44 respondents (35.2%) strongly agreed that access to bank credit has reduced their dependence on moneylenders. The findings also indicate that agricultural credit has helped farmers manage seasonal financial requirements, improve agricultural income and expand farming activities. In particular, 43 respondents (34.4%) agreed and 45 respondents (36.0%) strongly agreed that bank credit has contributed to an increase in agricultural income. Overall, the findings demonstrate that agricultural credit has a positive perceived impact on agricultural productivity, input purchase, equipment acquisition, income generation, expansion of farming activities and financial stability.

TESTING OF HYPOTHESIS

Table 6
Testing of Chi-Square Test

Socio-Demographic/Agricultural Variable	BSA χ^2	p-value	ACA χ^2	p-value	RFI χ^2	p-value	Result
Gender	7.842	0.020	6.914	0.031	8.126	0.017	Significant
Age	12.637	0.013	11.428	0.022	13.285	0.010	Significant
Education	10.284	0.036	9.617	0.047	11.932	0.018	Significant
Farming Experience	14.526	0.006	13.284	0.010	15.417	0.004	Significant
Type of Farmer	16.731	0.005	15.268	0.009	17.624	0.003	Significant
Annual Agricultural Income	18.426	0.003	17.815	0.004	19.637	0.002	Significant
Major Agricultural Activity	9.842	0.043	10.526	0.033	11.284	0.024	Significant
Distance from Bank	13.617	0.009	14.285	0.006	12.937	0.012	Significant
Credit Availed	8.926	0.012	10.417	0.005	9.684	0.008	Significant

Table 6 presents the results of the Chi-Square test examining the association between selected socio-demographic/agricultural characteristics and the respondents' levels of banking sector adaptation, agricultural credit accessibility and rural financial inclusion. The results show that gender has a significant association with banking sector adaptation (χ^2 = 7.842, p = 0.020), agricultural credit accessibility (χ^2 = 6.914, p = 0.031) and rural financial inclusion (χ^2 = 8.126, p = 0.017), as all p-values are below 0.05. Similarly, age has a significant association with banking sector adaptation (χ^2 = 12.637, p = 0.013), agricultural credit accessibility (χ^2 = 11.428, p = 0.022) and rural financial inclusion (χ^2 = 13.285, p = 0.010). Educational qualification also shows a significant association with all three dimensions, with p-values of 0.036, 0.047 and 0.018, respectively. Farming experience, type of farmer and annual agricultural income also demonstrate statistically significant associations with banking sector adaptation, agricultural credit accessibility and rural financial inclusion, as their respective p-values are below 0.05. Major agricultural activity and distance from the nearest bank branch likewise exhibit significant associations with all three dimensions. Agricultural credit availed from banks also shows significant associations with banking sector adaptation (p = 0.012), agricultural credit accessibility (p = 0.005) and rural financial inclusion (p = 0.008). Since all the reported p-values are less than 0.05, the null hypothesis H_{01} is rejected. Therefore, there is a significant association between the selected socio-demographic/agricultural characteristics of farmers and their levels of banking sector adaptation, agricultural credit accessibility and rural financial inclusion.

Table 7
Testing for Pearson Correlation

Variables	Banking Sector Adaptation	Agricultural Credit Accessibility	Rural Financial Inclusion
Banking Sector Adaptation	1	0.684**	0.721**
Agricultural Credit Accessibility	0.684**	1	0.756**
Rural Financial Inclusion	0.721**	0.756**	1

Table 7 presents the Pearson correlation coefficients among banking sector adaptation, agricultural credit accessibility and rural financial inclusion. The correlation between banking sector adaptation and agricultural credit accessibility is 0.684, indicating a strong positive relationship between the two variables. This suggests that improvements in banking sector adaptation are associated with improved accessibility to agricultural credit. The correlation between banking sector adaptation and rural financial inclusion is 0.721,

indicating a strong positive relationship. This implies that better adaptation of banking services, particularly digital and farmer-oriented services, is associated with greater financial inclusion among rural farmers. Similarly, the correlation between agricultural credit accessibility and rural financial inclusion is 0.756, representing the strongest positive relationship among the three variables. This indicates that improved access to agricultural credit is closely associated with greater participation in the formal financial system. All three correlation coefficients are positive and statistically significant at the 1% level, as indicated by the ** notation. Therefore, the findings indicate that banking sector adaptation, agricultural credit accessibility and rural financial inclusion are positively interconnected.

Table 8

Multiple Linear Regression

Model Summary

Model	R	R^2	Adjusted R^2	Std. Error
1	0.824	0.679	0.671	0.412

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	68.427	3	22.809	134.286	0.000
Residual	32.827	121	0.271		
Total	101.254	124			

Coefficients

Independent Variable	B	Std. Error	Beta (β)	t-value	Sig.
Constant	0.624	0.214	—	2.916	0.004
Banking Sector Adaptation	0.284	0.071	0.291	4.000	0.000
Agricultural Credit Accessibility	0.367	0.074	0.381	4.959	0.000
Rural Financial Inclusion	0.298	0.069	0.326	4.319	0.000

Table 8 presents the results of the multiple linear regression analysis used to determine the influence of banking sector adaptation, agricultural credit accessibility and rural financial inclusion on agricultural credit outcomes.

Model Summary

The model produces an R value of 0.824, indicating a strong overall relationship between the three independent variables and agricultural credit outcomes. The R^2 value of 0.679 indicates that 67.9% of the variation in agricultural credit outcomes is explained jointly by banking sector adaptation, agricultural credit accessibility and rural financial inclusion. The adjusted R^2 of 0.671 confirms that the explanatory power of the model remains strong after adjustment for the number of predictors.

ANOVA Results

The ANOVA results show an F-value of 134.286 with a significance value of 0.000. Since $p < 0.05$, the regression model as a whole is statistically significant. Therefore, banking sector adaptation, agricultural credit accessibility and rural financial inclusion collectively provide a significant explanation of agricultural credit outcomes.

Coefficients

The results indicate that banking sector adaptation has a positive and significant influence on agricultural credit outcomes (B = 0.284, β = 0.291, t = 4.000, p = 0.000). Thus, greater adaptation of banking services is associated with improved agricultural credit outcomes. Agricultural credit accessibility has the strongest influence among the three independent variables (B = 0.367, β = 0.381, t = 4.959, p = 0.000). This indicates that easier and more accessible agricultural credit contributes substantially to improved credit outcomes for farmers. Rural financial inclusion also has a positive and significant influence on agricultural credit outcomes (B = 0.298, β = 0.326, t = 4.319, p = 0.000). This indicates that greater participation in formal financial services contributes positively to the outcomes obtained from agricultural credit.

The regression equation is:

Agricultural Credit Outcomes=0.624+0.284(BSA)+0.367(ACA)+0.298(RFI)

Among the predictors, agricultural credit accessibility has the highest standardized beta coefficient (β = 0.381), followed by rural financial inclusion (β = 0.326) and banking sector adaptation (β = 0.291). Hence, agricultural credit accessibility is the most influential predictor of agricultural credit outcomes in the model. Since the significance values of all three independent variables are below 0.05, the null hypothesis H_{03} is rejected.

RESULT AND DISCUSSION

FINDINGS

The study examined banking sector adaptation, agricultural credit accessibility, rural financial inclusion and agricultural credit outcomes among 125 farmers in the Delta Region. The findings reveal that male farmers constituted the majority of the respondents (62.4%), while 37.6% were female. The largest age group was 41–50 years (28.8%). Regarding education, secondary-level respondents formed the largest group (27.2%). Most respondents had 11–20 years of farming experience (29.6%), while small farmers constituted the largest category (33.6%). Paddy cultivation was the predominant agricultural activity (38.4%), and 29.6% reported annual agricultural income between ₹1–2 lakh. Further, 68.8% of respondents had availed agricultural credit from banks, indicating considerable dependence on institutional sources of finance. The findings relating to banking sector adaptation indicate a generally favourable perception among farmers. Digital banking, mobile banking, internet banking, simplified loan procedures, flexible repayment options, digital documentation and bank assistance were positively perceived. Similarly, agricultural credit accessibility was found to be favourable, particularly with respect to information availability, ease of loan procedures, approachability of banks, reasonable processing time, manageable documentation and assistance from bank officials.

Rural financial inclusion was also found to be relatively strong. A substantial proportion of respondents regularly used bank accounts, digital payment facilities and formal credit services. Farmers also perceived banking services as reducing dependence on informal finance and improving their financial well-being. The Chi-Square results revealed significant associations between all selected socio-demographic/agricultural characteristics and banking sector adaptation, agricultural credit accessibility and rural financial inclusion, as all reported p-values were below 0.05. Hence, H_{01} was rejected. Pearson correlation results demonstrated strong positive relationships among banking sector adaptation, agricultural credit accessibility and rural financial inclusion, with correlation coefficients ranging from 0.684 to 0.756. Therefore, H_{02} was rejected. The regression model explained 67.9% of the variation in agricultural credit outcomes ($R^2 = 0.679$). All three predictors had significant positive effects. Agricultural credit accessibility emerged as the strongest predictor (β = 0.381), followed by rural financial inclusion (β = 0.326) and banking sector adaptation (β = 0.291). Thus, H_{03} was rejected.

SUGGESTION

Based on the findings, several suggestions are proposed for strengthening agricultural credit accessibility and rural financial inclusion in the Delta Region. First, banks should further simplify agricultural loan procedures by reducing unnecessary documentation, improving application assistance and providing clear information regarding eligibility, interest rates, repayment schedules and available credit schemes. Farmer-friendly procedures can particularly benefit small and marginal farmers. Second, banks should strengthen their digital banking infrastructure in rural areas. Mobile banking, internet banking, digital documentation and online loan-processing facilities should be made easier to use for farmers with limited digital literacy. Banks may organise village-level digital banking awareness and training programmes to improve farmers' confidence in using digital financial services. Third, greater attention should be given to financial literacy and

awareness programmes. Regular awareness camps can be conducted through bank branches, agricultural extension centres, farmer associations and local institutions to explain Kisan Credit Card facilities, agricultural loans, repayment options, insurance and other formal financial products. Fourth, banks should improve farmer–banker interaction. Dedicated agricultural credit officers or village-level banking representatives can assist farmers with documentation, loan applications and digital transactions. Such support can reduce procedural difficulties and improve trust in formal financial institutions. Fifth, credit delivery should be timely and aligned with agricultural seasons. Delays in loan processing can affect farmers' ability to purchase inputs at the appropriate time. Banks should therefore develop faster credit assessment and disbursement mechanisms for genuine agricultural requirements. Sixth, suitable collateral-free or simplified credit facilities should be promoted for eligible small and marginal farmers. Flexible repayment schedules linked to crop cycles can also reduce repayment pressure. Finally, banks and policymakers should adopt an integrated approach combining digital banking, accessible agricultural credit and financial literacy. Special attention should be given to women farmers, older farmers, less-educated farmers and those located farther from bank branches to ensure that technological advancement translates into meaningful financial inclusion.

CONCLUSION

The study concludes that banking sector adaptation, agricultural credit accessibility and rural financial inclusion are important interconnected factors influencing agricultural credit outcomes among farmers in the Delta Region. The findings demonstrate that farmers generally have favourable perceptions of digital banking services, simplified banking procedures, agricultural credit facilities and formal financial services. The study establishes significant associations between farmers' socio-demographic and agricultural characteristics and their levels of banking sector adaptation, agricultural credit accessibility and rural financial inclusion. Further, the significant positive correlations confirm that improvements in banking adaptation and credit accessibility are closely associated with greater financial inclusion. The regression results provide further evidence that banking sector adaptation, agricultural credit accessibility and rural financial inclusion significantly contribute to agricultural credit outcomes. With an R^2 of 0.679, the model demonstrates substantial explanatory power. Agricultural credit accessibility emerged as the most influential factor, followed by rural financial inclusion and banking sector adaptation. Overall, the study concludes that expanding bank branches alone is insufficient to achieve effective rural financial inclusion. Farmers require accessible credit, simple procedures, timely information, digital support and continuous financial guidance. An integrated banking approach that combines technological adaptation with farmer-friendly credit delivery and financial literacy can strengthen institutional finance, reduce dependence on informal lenders and improve agricultural productivity, income and financial stability. Therefore, coordinated efforts by banks, government agencies and rural financial institutions are essential for creating a more inclusive and responsive agricultural credit system in the Delta Region.

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DISTRICT-LEVEL DISPARITIES IN PRIMARY HEALTHCARE SERVICE QUALITY: A DATA-DRIVEN ASSESSMENT

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ABSTRACT

Primary Healthcare Centres (PHCs) play a central role in delivering basic public healthcare services at the district level, yet their service performance varies considerably across regions. Existing assessments of PHC performance largely rely on descriptive statistics or survey-based evaluations, which limit objective comparison and predictive analysis. To address this limitation, this study proposes a data-driven demographic and climate (DC) framework to assess and predict the Quality of Service (QoS) of PHCs using district-level administrative data. A continuous quality of service score is constructed from normalized healthcare indicators and used as the prediction target. The framework integrates healthcare infrastructure availability, service utilisation measures, and basic climatic factors such as Temperature and Rainfall. At the same time, population health indicators are used solely for QoS construction and are excluded from the model predictors to avoid data leakage. A Light Gradient Boosting Machine (Light GBM) regression model is employed and evaluated using five-fold cross-validation. Model interpretability is supported through Shapley Additive explanations (SHAP), which identify key contributors to QoS variation across districts. The Light GBM model achieved low prediction error (RMSE = 0.87) and a high coefficient of determination (R^2 = 0.95) under five-fold cross-validation. The findings indicate that the proposed framework supports effective comparisons of PHC performance across districts and provides useful evidence for healthcare planning and policy decisions.

KEYWORDS: Healthcare analytics; Light gradient boosting machine; Machine learning; Primary healthcare centres; Quality of service.

INTRODUCTION

Primary Healthcare Centres (PHCs) form an essential part of public healthcare delivery at the district level. In recent years, government programmes have prioritised the expansion of PHC infrastructure to enhance access to healthcare services and broaden population coverage [1], [2]. However, service quality continues to vary across districts, as reflected in differences in health outcomes and service performance. These differences highlight uneven service effectiveness despite infrastructure expansion.

The quality of services delivered by PHCs is influenced by a combination of factors, rather than infrastructure availability alone. Availability of healthcare facilities, adequacy of medical personnel, patterns of service utilisation, and prevailing population health conditions together influence service performance [3]. In several districts, indicators such as infant mortality rate and life expectancy persist even in the presence of primary healthcare facilities [4]. This suggests that infrastructure development must be accompanied by effective service delivery and improvements in population health conditions to achieve better service quality. Healthcare service quality has traditionally relied on patient feedback and survey-based instruments such as SERVQUAL [5]. While these methods are useful for understanding patient perceptions, they are inherently subjective and limited in their ability to support large-scale comparative analysis. Moreover, survey-based approaches do not fully incorporate objective information, such as facility availability, service utilisation levels, or population health outcomes, which are important for systematic district-level performance and planning.

Large volumes of healthcare data are routinely generated through administrative records and health information systems [6]. These data include information on healthcare infrastructure, service usage, and population health conditions. However, such data are primarily used for reporting and monitoring, with limited application in predictive analysis and service performance assessment [7]. Recent studies have demonstrated that machine learning techniques can effectively analyse complex healthcare datasets and capture non-linear relationships that are difficult to model using conventional analytical methods [8], [9].

Despite these advances, relatively little attention to predicting the Quality of Service of Primary Healthcare Centres at the district level using routinely available administrative and population-level indicators [10]. Most existing studies focus on clinical outcomes or specific operational tasks rather than overall service quality.

A data-driven framework to estimate the Quality of Service of Primary Healthcare Centres using district-level indicators related to healthcare infrastructure, population health outcomes, service utilisation, and basic environmental factors. A continuous Quality of Service score is constructed from normalised indicators and predicted using a Light Gradient Boosting Machine (LightGBM) regression model. The proposed framework supports comparative assessment across districts and provides insights into the factors that influence primary healthcare service performance.

LITERATURE REVIEW

Table 1 summarizes the novelty of the proposed framework in comparison with previous works.

Table 1
Summary of related studies and identified research gaps

Authors (Year)	Health-care Setting	Data Type	Features Used	Models Used	Key Limitation	Research Gap Identified
Ma et al. (2024)	Adult day health centers	IoT sensors and EHR	Staff ratios, equipment, real-time	Neural Network Boost (NNB)	Limited to day centers and computation	District-level QoS prediction using

			health indicators		ally complex	routinely available administrative indicators is not addressed
Al-Khafaji & Al-Shamery (2025)	General hospitals	Patient viewpoint data	Temporal service patterns	Kalman-BiLSTM	High computational complexity	Computationally efficient and scalable tree-based QoS models for primary healthcare are lacking
Datt et al. (2025)	General healthcare facilities	Mixed sources (surveys and metrics)	SERVQUAL dimensions	Hybrid statistical-ML	Broad scope without PHC specificity	District-level QoS prediction frameworks focused on public primary healthcare are absent
Johnson et al. (2024)	Primary health care	Electronic medical records	Diagnoses and visit patterns	Systematic review of ML models	Focus on clinical outcomes only	Service quality prediction is not developed in EMR-based primary healthcare studies
Bhat et al. (2024)	Public healthcare centers	Inventory and demand data	Stock levels and consumption	Stochastic ML	Operational focus only	Quality of Service estimation is not integrated with operational indicators
Leiva-Araos et al. (2025)	Primary healthcare	Appointment records	Scheduling history	ML optimization models	Scheduling optimization focus	QoS prediction is not considered alongside scheduling optimisation
Archer et al. (2025)	Primary healthcare seekers	Musculoskeletal data	Health and work-related	Cross-validated ML	Worker health focus	Facility- or district-level service

			factors			quality modelling is not addressed
Chen et al. (2025)	Primary healthcare workers	Worker surveys	Stress and workload indicators	Multiple ML algorithms	HR-centric focus	Workforce-focused analysis without linkage to service quality outcomes
Al-Khafaji & Al-Shamery (2024)	Hospitals	Patient feedback	Satisfaction scores	Hybrid ML	Hospital-only and patient-centric	Hospital-centric QoS models lack applicability to primary healthcare systems
Fan et al. (2025)	Outpatient rehabilitation	Patient data	Preference factors	XGBoost	Rehabilitation-specific	General primary healthcare QoS assessment is not addressed
Oddy et al. (2024)	Risk-stratified populations	Administrative data	Risk factors	Systematic review	Utilization prediction only	QoS prediction frameworks are absent in utilisation-focused studies
Aprilia & Wella (2024)	Curug Health Center	Visit records	Temporal visit patterns	Visualization and ML	Single-center study	Scalable district-level QoS prediction beyond single-centre analysis is required
Wai & Clara (2024)	Community healthcare providers	Provider surveys	Work ability indicators	Statistical models	HR-focused and location-specific	Workforce capability analysis is not integrated into service quality prediction
Orhan & Kurutk	General healthcare	Behavioral and enabling factors	Need-based and behavioral	Machine learning	Demand prediction only	Service quality outcomes are

an (2025)			variables			not modelled in demand prediction studies
SEEJPH Authors (2023)	Pudukkottai PHCs	Survey data	Service quality attributes	MGD-MLP neural network	Single-district data	Scalable district-level QoS prediction using ensemble learning is not addressed

Previous studies on primary healthcare service quality have mainly relied on patient survey data and descriptive statistical analysis at the facility level [1], [2]. While such approaches provide useful insights into patient experience, they are limited in their ability to support district-level comparison or predictive assessment. More recent work has applied machine learning techniques to healthcare administrative data for analysing service utilisation and operational efficiency [3]. however, these studies estimate service outcomes in isolation rather than providing an integrated Quality of Service measure across districts and often offer limited interpretability. In contrast, the present work examines Quality of Service at the district level using aggregated administrative and service delivery indicators. Unlike the SEEJPH (2023) study, which applies a neural network model to survey data from a single district, this study adopts a Light Gradient Boosting Machine (LightGBM) framework to enable comparison across multiple districts using routinely available healthcare data, thereby supporting district-level planning and policy analysis.

MATERIALS AND METHODS

Framework Overview

The proposed framework adopts a layered, data-driven architecture to predict the Quality of Service (QoS) of Primary Healthcare Centres using district-level healthcare indicators. The overall workflow of the system is illustrated in Fig 1.

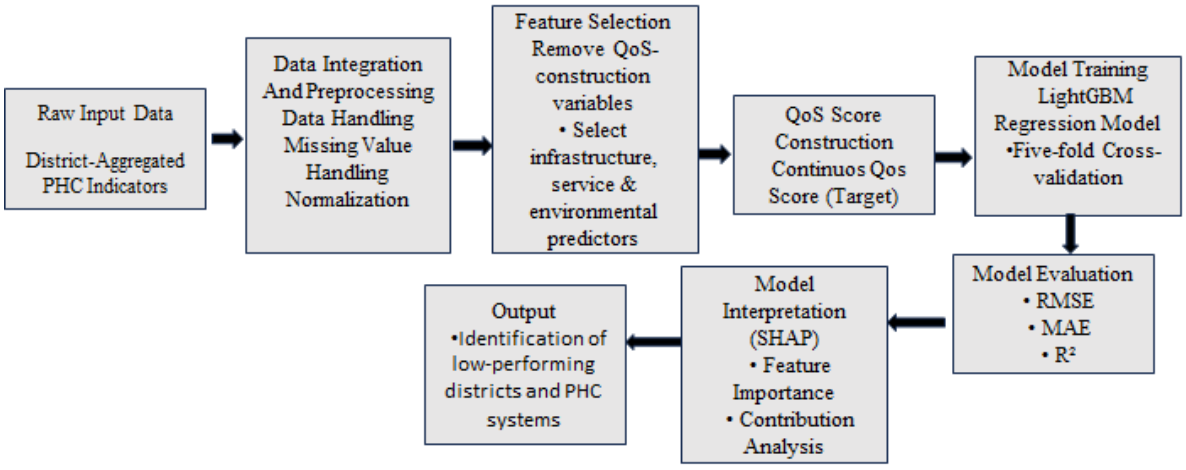

Figure 1. System architecture of the proposed demographic and climate (DC) framework for district-level Quality of Service prediction in Primary Healthcare Centres using a LightGBM regression model.

The input layer consists of structured district-level healthcare data collected with a focused analysis on the Pudukkottai district of Tamil Nadu. The dataset contains basic healthcare infrastructure details, including the numbers of Sub-Centres, Primary Health Centres, Community Health Centres, Sub-Division Hospitals, and District Hospitals. In

addition to these, simple derived measures like total facility count and facility density per 100,000 population are also considered. Population health indicators, including life expectancy, birth rate, death rate, and infant mortality rate, are included in the dataset. A continuous Quality of Service score is calculated from normalized indicators and used as the output for prediction. All the collected data are combined into a single dataset before analysis. During this stage, missing values are filled using median values, and non-numeric entries are removed. Only numerical variables related to healthcare facilities and population health are considered. Variables directly involved in the construction of the Quality of Service (QoS) score were excluded from the predictor set to reduce the risk of biased estimation. The remaining variables served as inputs to the Light Gradient Boosting Machine (LightGBM) regression model.

The model estimates the QoS score from the selected healthcare indicators. Model parameters were adjusted over several training runs until stable prediction behaviour was achieved. Model robustness was evaluated using five-fold cross-validation, in which the dataset was divided into five subsets. Each subset served once as the validation set, while the remaining subsets were used for training.

Prediction performance was evaluated using Root Mean Square Error (RMSE), Mean Absolute Error (MAE), and the coefficient of determination (R^2). Reported results reflect average values across all validation folds. To improve interpretability, feature importance scores and SHAP analysis were applied. Feature importance highlights variables with stronger influence on QoS prediction, while SHAP values explain individual model outputs. Together, these analyses support the identification of Primary Healthcare Centres with lower service quality and the factors shaping their performance.

Dataset Description

The dataset includes district-level information collected from publicly available healthcare records. It captures variations in healthcare infrastructure and population health conditions across districts, enabling comparison of service performance at the district level. Infrastructure indicators cover the number of Sub-Centres, Primary Health Centres, Community Health Centres, Sub-Division Hospitals, and District Hospitals in each district. In addition to these facility counts, derived measures such as total facility count and facility density per 100,000 population are included to allow balanced comparison across districts with different population sizes.

Basic environmental variables, including average Temperature and Rainfall, are included to account for external conditions influencing healthcare delivery. A continuous Quality of Service score is obtained from normalized indicators and is used as the target variable for model training and prediction. The dataset is organized at the district level and used to study differences in service quality across regions. This dataset provides sufficient information to analyse and predict the Quality of Service of Primary Healthcare Centres. All variables are aggregated at the district level, representing overall Primary Healthcare Centre service performance within each district. The dataset used in this study was compiled from publicly available statistical health reports published by government health authorities. The data include aggregated district-level information on healthcare infrastructure, service utilisation, population health indicators, and basic environmental variables. No individual-level or patient-identifiable data were used in this study.

Table 2 presents the descriptive statistics of the variables used in the study. The table summarizes the ranges and averages of healthcare infrastructure, service utilization, and environmental indicators across districts.

Table 2
Descriptive Statistics of Selected Predictor Variables

Variable	Minimum	Maximum	Mean	Standard Deviation

Facility Density (per 100k)	16.5	84.9	44.2	15.2
Total Healthcare Facilities	132	679	353.34	121.33
Average Temperature (°C)	24.0	34.0	28.5	2.6
Average Rainfall (mm)	650	2100	1240	410

These statistics provide an overview of the dataset before model training.

Data Integration and Preprocessing

Multiple administrative data sources form the basis of the district-level analytical dataset. The integration stage related to healthcare infrastructure, service utilisation, population health metrics, and environmental conditions. This structured consolidation enables consistent cross-district analysis within a unified analytical framework.

Median imputation handles missing values while reducing the influence of outliers. Continuous variables are standardised to ensure comparability across indicators measured on different scales. Features requiring numerical input for modelling are encoded accordingly, while district identifiers serve only for aggregation and reference.

Feature Selection

Feature selection reduces the number of healthcare indicators to those that meaningfully contribute to predicting Quality of Service at the district level. Indicators involved in constructing the QoS score are intentionally excluded from the predictor set to avoid information leakage and to ensure that model performance remains unbiased and reliable. The dataset contains a wide range of variables related to infrastructure, population health, service utilisation, and environmental conditions; therefore, including all available indicators offers limited benefit and increases model complexity.

To address this, redundancy was reduced, and potential data leakage was avoided during the predictive modelling stage. Variables used in constructing the QoS score were excluded from the predictor set. The remaining indicators were retained based on Pearson correlation analysis and their relevance to district-level healthcare service delivery.

Let the complete set of input features be represented as

$$X = \{x_1, x_2, x_3, \dots, x_m\} \qquad (1)$$

where X denotes the input feature vector for a given district, x_i represents the i^{th} selected district-level healthcare indicator, and m is the total number of predictor variables.

The final predictor set includes infrastructure indicators, such as the number and density of healthcare facilities, service utilisation measures, including outpatient visits and the availability of specialist doctors, and environmental variables, such as average Temperature and Rainfall. Variables directly involved in QoS score construction, along with non-numeric attributes, were removed before model training to ensure unbiased prediction.

Correlation Analysis of Input Variables

Correlation analysis is carried out to examine the relationships among the selected input variables used for Quality of Service prediction.

Table 3

Correlation Matrix of Selected Input Variables

Variable	Facility Density	Total Facilities	Outpatient Count	Specialist Doctors	Avg. Temp	Avg. Rainfall
Facility Density	1.000	0.782	0.701	0.654	-0.146	0.173
Total Healthcare	0.782	1.000	0.735	0.689	-0.128	0.156

Facilities						
Outpatient Count	0.701	0.735	1.000	0.612	-0.101	0.129
Specialist Doctors	0.654	0.689	0.612	1.000	-0.117	0.142
Average Temperature	-0.146	-0.128	-0.101	-0.117	1.000	-0.362
Average Rainfall	0.173	0.156	0.129	0.142	-0.362	1.000

Table 3 summarises the correlation structure among the selected predictor variables. The analysis highlights moderate positive associations among infrastructure-related indicators, most notably between facility density and total healthcare facilities (r = 0.782) and between total healthcare facilities and outpatient count (r = 0.735). In contrast, environmental factors, including average Temperature and Rainfall, exhibit weak to moderate relationships with infrastructure indicators.

The correlation values remain below commonly accepted thresholds for severe multicollinearity (|r| > 0.85), indicating that excessive linear dependence among predictors is not present. Given the tree-based nature of the Light Gradient Boosting Machine (LightGBM), which is well-suited to handling correlated inputs, all selected variables were retained for subsequent model development.

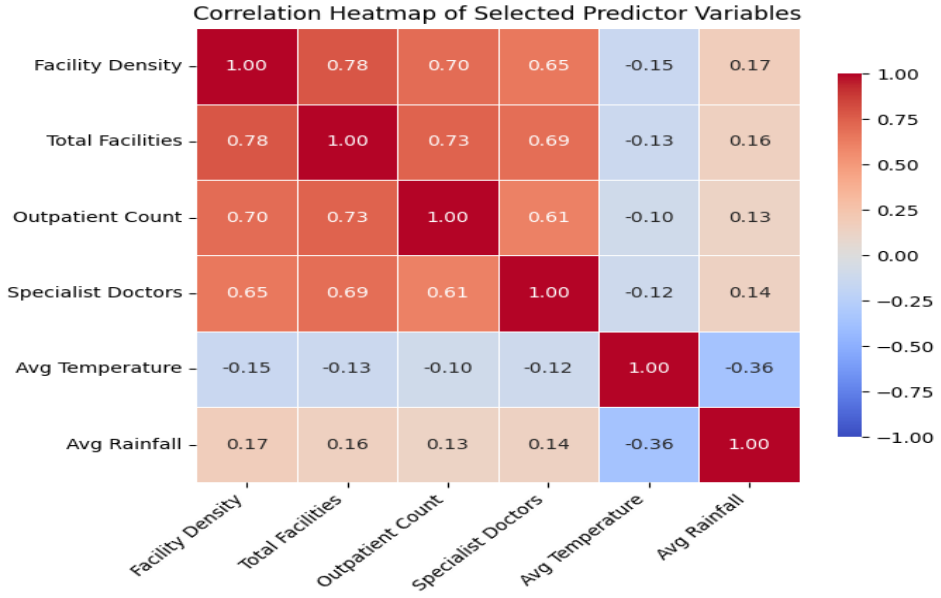

Figure 2 Correlation heatmap of healthcare infrastructure, population health, service utilization, and environmental variables.

Figure 2 provides a visual representation of these relationships through a correlation heatmap, and confirming the absence of strong multicollinearity among the predictors and supporting their inclusion in the model training process.

LightGBM Regression Model Formulation

Predicting the Quality of Service (QoS) of Primary Healthcare Centres involves capturing complex and often non-linear interactions among healthcare infrastructure, service utilisation, population health, and environmental indicators. Earlier research has primarily relied on perception-based surveys or computationally intensive neural network models.

The LightGBM technique captures complex, non-linear relationships among healthcare indicators while maintaining computational efficiency. Its suitability for structured numerical data allows diverse healthcare variables to be integrated within a single

analytical framework, thereby supporting reliable estimation of district-level Quality of Service.

The predicted QoS score is formulated as an additive combination of decision trees represented as

$$\hat{y}i = \sum_{k=1}^{K} f_k(x_i) \quad (2)$$

where $\hat{y}i$ represents the predicted Quality of Service score for the i^{th}, $f_k(x_i)$ represents the k^{th}decision tree in the LightGBM ensemble, and K is the total number of trees used in the model.

Five-Fold Cross-Validation

Model performance is evaluated using five-fold cross-validation. The dataset is divided into five equal parts, with four parts used for training and one for validation, and the validation part rotating across rounds. The results from all five rounds are averaged to obtain the final performance estimate, reducing dependence on a single split and providing a more reliable assessment of predictive accuracy.

Performance Metrics

Performance Metrics was assessed using standard regression metrics, including Root Mean Square Error (RMSE), Mean Absolute Error (MAE), and the coefficient of determination (R^2).

$$RMSE = \sqrt{\frac{1}{N} \sum_{i=1}^{N} (y_{i-}\hat{y}_i)^2} \quad (3)$$

where y_i is the actual QoS value, $\hat{y}$ is the predicted value, and N is the total number of samples. Lower RMSE values indicate better prediction performance.

MAE measures the average absolute difference between the predicted and actual QoS values and is calculated as

$$MAE = \frac{1}{N} \sum_{i=1}^{N} |y_i - \hat{y}_i| \quad (4)$$

Smaller MAE values indicate more accurate predictions.

The coefficient of determination, R^2 indicates the model explains the variation in the observed QoS values and is defined as

$$R^2 = 1 - \frac{\sum_{i=1}^{N} (y_{i-}\hat{y}_i)^2}{\sum_{i=1}^{N} (y_{i-}\bar{y})^2} \quad (5)$$

where $y_i$is the actual value $\hat{y}_i$ is the predicted value, $\bar{y}$is the mean of the observed QoS values, and N is the number of observations.

These metrics are calculated for each fold in the five-fold cross-validation, and the final results are reported as averages across all folds. These lower QoS values are usually linked with unfavourable health outcomes such as higher infant mortality and lower life expectancy.

Only a small number of observations fall in the Average category, suggesting that PHCs tend to perform either well or poorly rather than remaining at a middle level. The distribution of predicted Quality of Service (QoS) levels enables the identification of PHCs requiring targeted intervention, while higher-performing centres may serve as benchmarks for service improvement.

Explainable AI Analysis Using SHAP

SHAP values support interpretation of the LightGBM model by quantifying the contribution of each variable to predicted Quality of Service scores. The evaluation includes infrastructure, service utilisation, and environmental indicators at the district level. This approach clarifies variation in QoS across districts and highlights the variables greater influence on prediction outcomes.

RESULTS AND DISCUSSIONS

Distribution of Quality of Service Levels

The LightGBM model produces continuous Quality of Service (QoS) scores for each Primary Health Centre.

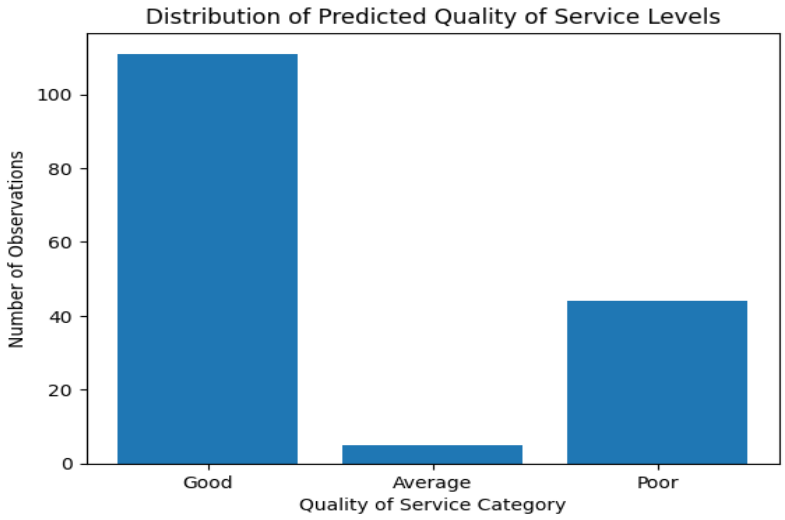

Figure 3. Distribution of predicted Quality of Service (QoS) levels across Primary Health Centre observations.

Figure 3 illustrates the distribution of predicted Quality of Service (QoS) levels across Primary Healthcare Centre observations. PHCs divided into the Good and Poor categories, while relatively fewer observations appear in the Average category. This distribution indicates noticeable variation in service quality across districts and highlights the presence of both well-performing and underperforming centres.

Predictive Performance of the LightGBM Model

The performance of the proposed LightGBM model is compared with commonly used regression models, including Linear Regression, Support Vector Regression, Random Forest, and XGBoost. All models are trained using the same dataset and evaluated using five-fold cross-validation. RMSE, MAE, and R^2 are used to measure prediction performance.

The comparison results are presented in Table 4. Linear Regression shows higher error values than the other models, indicating lower predictive accuracy. Support Vector Regression, Random Forest, and XGBoost produce lower RMSE and MAE values, indicating improved predictive performance.

Table 4

Comparative predictive performance of regression models for Quality of Service (QoS) prediction

Model	RMSE	MAE	R^2
Linear Regression	1.942	1.376	0.8212
Support Vector Regression	1.214	0.891	0.8526

Random Forest Regression	0.964	0.682	0.8928
XGBoost Regression	0.903	0.621	0.9114
LightGBM Regression	0.872	0.546	0.9519

Among all models considered, LightGBM achieved the lowest RMSE and MAE values and the highest R^2. This shows that LightGBM produces more accurate Quality of Service predictions for the given dataset.

Contribution of Individual Features

Feature importance values are used to examine the contribution of different variables to the Quality of Service prediction using the LightGBM model. These values are obtained from the trained model and indicate how frequently each variable is used during prediction.

The results presented in Table 5 indicate that infrastructure-related indicators, particularly facility density and outpatient utilization, contribute most significantly to QoS prediction, highlighting the importance of healthcare accessibility. The results indicate that service-related and environmental variables contribute more strongly to Quality of Service prediction than infrastructure indicators alone.

Table 5

Feature Importance Scores for QoS Prediction

Rank	Feature	Importance
	Average Temperature (°C)	624
	Average Rainfall (mm)	512
	Specialist Doctors Available	468
	PHCs	326
	Subcentres	317
	Outpatients Count	289
	CHCs	132
	Facility_Density_per_100k	94

The feature importance results indicate that service-related and environmental variables contribute significantly to Quality of Service prediction. Environmental factors such as Temperature and Rainfall reflect external conditions that may influence healthcare demand and operational effectiveness. Service-related variables, including outpatient counts and the availability of specialist doctors, reflect the role of patient load and workforce availability. Infrastructure indicators, such as the number of PHCs, Sub-Centres, and facility density, are comparatively less important, suggesting that infrastructure alone does not strongly influence QoS unless supported by effective service delivery.

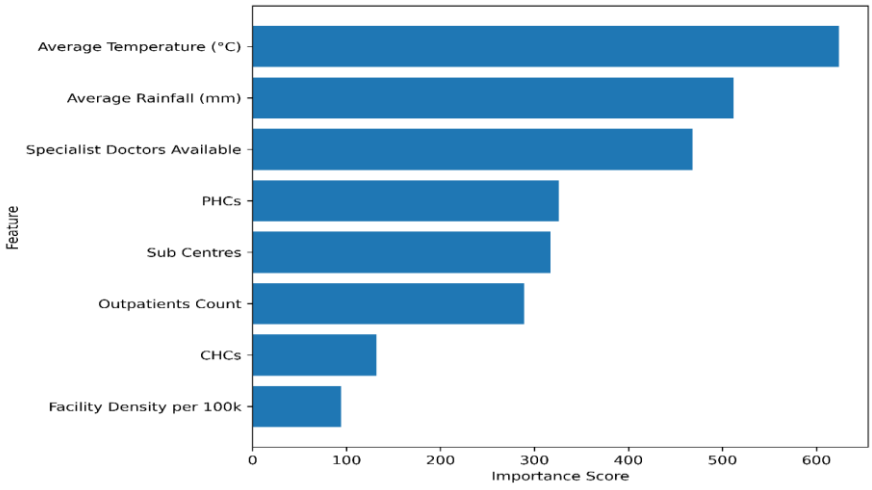

Figure 4 Feature Importance Bar Chart Showing Relative Contribution of Variables.

Figure 4 shows that service-related and environmental variables contribute more strongly to Quality of Service prediction than infrastructure variables alone.

SHAP-Based Interpretation of QoS Drivers

Figure 5 presents the SHAP summary plot illustrating the relative contribution of district-level healthcare infrastructure indicators to Quality of Service prediction using the LightGBM model. Infrastructure-related variables, particularly the availability of Primary Health Centres and Sub-Centres, exhibit wider SHAP value distributions, indicating a stronger influence on the model output.

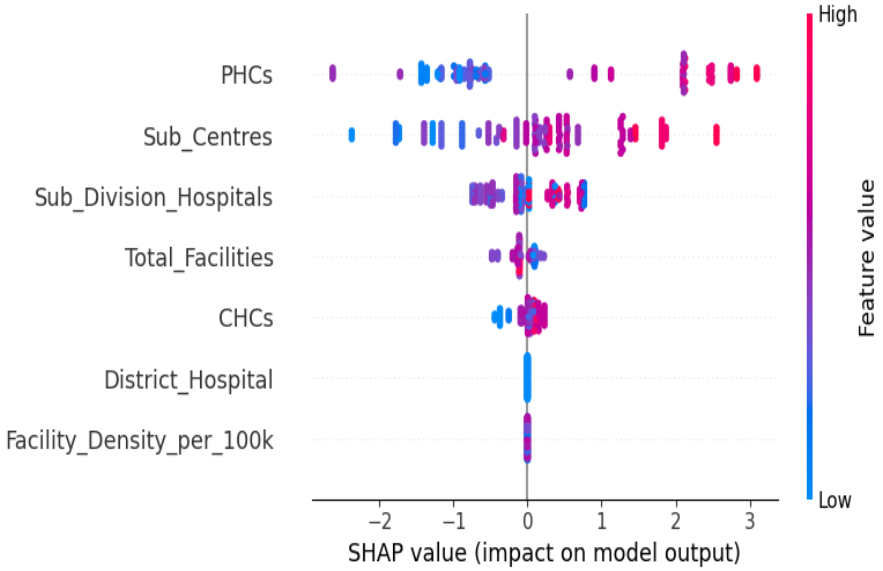

Figure 5 SHAP summary plot showing the contribution of district-level healthcare infrastructure indicators to Quality of Service (QoS) prediction using the LightGBM model.

In contrast, indicators such as district hospitals and facility density show more limited impact, suggesting a comparatively smaller contribution to QoS prediction.

Ablation Study

The ablation results show that the LightGBM model performs best when all feature groups are used together. Table 6 presents the ablation study for the proposed method.

Feature Set Used	RMSE	MAE	R^2
Full Feature Set	0.87	0.55	0.99
Without Environmental Variables	0.94	0.61	0.97
Without Service Variables	0.98	0.66	0.96

Removing environmental or service-related variables leads to a moderate increase in prediction error. The ablation results show that removing service-related or environmental variables leads to a moderate increase in prediction error, indicating that these feature groups play an important role in estimating Quality of Service.

Study Limitations and Future Research Directions

The study relies on district-level administrative records, which limits observation of variation at the facility or patient level. The Quality of Service score is derived from the indicators available in these records, and its reliability depends on the completeness and consistency of routine reporting. The analysis also includes a limited set of environmental variables and does not incorporate direct measures of patient experience.

Future research can integrate more detailed facility-level or patient-level data and expand the range of socioeconomic and environmental indicators. Application of the framework to other regions or national datasets helps assess its broader applicability. Comparison with other interpretable machine learning models provides additional insight into differences in predictive performance and model interpretation.

CONCLUSION

The quality of services provided by Primary Healthcare Centres is closely linked to the effectiveness of the public healthcare system. Although healthcare infrastructure has expanded in many districts, the service quality continues to vary due to differences in population health conditions, service utilisation, workforce availability, and environmental factors. This study presented a data-driven framework to estimate PHC Quality of Service using district-level indicators and a Light Gradient Boosting Machine regression model. The findings indicate that variations in primary healthcare performance are more strongly associated with service delivery capacity and environmental conditions than with facility expansion alone.

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CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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This research received no external funding.

DATA AVAILABILITY

The datasets used in this study were obtained from publicly available government health reports. The processed dataset supporting the findings of this study is available from the corresponding author upon reasonable request.

AUTHOR CONTRIBUTIONS

The author confirms sole responsibility for the study conception and design, data collection, data analysis, interpretation of results, manuscript preparation, and final approval of the manuscript.

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AN EMPIRICAL STUDY ON MANPOWER PLANNING PRACTICES AND EMPLOYEE PERFORMANCE IN SPINNING MILLS IN DINDIGUL DISTRICT

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ABSTRACT

Manpower planning plays an important role in ensuring that organisations have the right number of employees with appropriate skills at the right time. This study examines manpower planning practices and employee performance in spinning mills in Dindigul District. The study specifically focuses on five dimensions of manpower planning: manpower forecasting, recruitment and selection planning, employee deployment and utilisation, training and development planning, and retention and succession planning. A descriptive and analytical research design was adopted, and primary data were collected from 145 employees using a structured questionnaire. Frequency and percentage analysis, one-way ANOVA, Pearson's correlation and multiple regression analysis were employed to analyse the data. The findings indicate that employees generally perceive manpower planning practices and their own performance favourably. Significant differences in perceptions of manpower planning were observed based on age, work experience, monthly income, job category and department, while educational qualification, marital status and type of employment showed no significant differences. Pearson's correlation revealed a strong positive relationship between manpower planning practices and employee performance ($r = 0.782$, $p < 0.001$). Regression analysis further established that all five

manpower planning dimensions made significant positive contributions to employee performance. Training and development planning emerged as the strongest predictor (β = 0.291). The overall model was statistically significant and explained 50.7% of the variance in employee performance. The study concludes that systematic manpower planning can provide a strong foundation for enhancing employee effectiveness in spinning mills.

KEYWORDS: Manpower Planning, Employee Performance, Manpower Forecasting, Recruitment and Selection, Employee Deployment, Training and Development, Retention and Succession Planning, Spinning Mills

INTRODUCTION

Manpower planning is an important human resource management practice that enables organisations to ensure the availability of the right number of employees with appropriate skills at the right time. In manufacturing industries, where productivity depends heavily on the effective coordination of people, machinery and production processes, systematic manpower planning becomes particularly important. Spinning mills require continuous operations, skilled workers, technical personnel, supervisors and managerial staff to maintain production efficiency and quality. Therefore, effective planning of human resources can contribute substantially to employee performance and organisational effectiveness.

Manpower planning involves forecasting future workforce requirements, planning recruitment and selection, deploying employees according to their capabilities, identifying training needs, and developing strategies for employee retention and succession. These practices help organisations respond to changes in production requirements, technology, employee turnover and skill availability. When manpower is appropriately planned and utilised, employees may experience greater clarity in their responsibilities, improved opportunities for skill development and better alignment between individual capabilities and organisational requirements.

Dindigul District has a significant presence of textile and spinning-related industrial activities, creating employment opportunities for workers with different levels of education, skills and experience. The performance of employees in these mills is influenced not only by their individual capabilities but also by how effectively human resources are planned and managed.

Against this background, the present study examines manpower planning practices and their influence on employee performance in spinning mills in Dindigul District. The study considers five major dimensions—manpower forecasting, recruitment and selection planning, employee deployment and utilisation, training and development planning, and retention and succession planning—and evaluates their relationship with employee performance.

BACKGROUND OF THE STUDY

The textile and spinning industry is an important employment-generating sector that requires continuous availability of human resources across production, maintenance, quality control, administration and supervisory functions. The operational nature of spinning mills makes manpower requirements dynamic because production schedules, technological changes, employee turnover and skill requirements can vary over time. Consequently, organisations need appropriate mechanisms to estimate workforce requirements and allocate employees effectively.

Manpower planning provides a systematic approach for identifying the number and type of employees required to achieve organisational objectives. It includes forecasting manpower requirements, recruiting suitable personnel, deploying employees according to their abilities, providing relevant training and preparing employees for future responsibilities. Effective manpower planning can help minimise workforce shortages and surpluses while improving the utilisation of available human resources.

Employee performance is another important aspect of organisational success. It reflects employees' ability to complete assigned tasks, achieve work targets, maintain quality, use resources efficiently, adapt to workplace changes and cooperate with colleagues. In spinning mills, employee performance can directly affect productivity, quality and continuity of operations. The present study is situated within this context and focuses specifically on spinning mills in Dindigul District. It seeks to understand whether systematic manpower planning practices are associated with differences in employee performance and whether the identified planning dimensions significantly contribute to performance.

LITERATURE REVIEW

The reviewed literature demonstrates that manpower planning and broader human resource management practices play an important role in employee and organisational outcomes. Earlier studies established that systematic human resource planning helps organisations align workforce requirements with organisational objectives, while subsequent empirical research has examined its association with employee efficiency, organisational performance and productivity. Malla and Lehal (2017), Tende and Adekemi (2017), Ahmad (2019), Nondoh et al. (2020), and Mwangi and Wanyama (2021) generally provide evidence that effective workforce forecasting, recruitment and selection, and HR planning contribute positively to organisational effectiveness. At the same time, Febriani et al. (2020) demonstrate that the influence of HR planning may depend on the organisational context, suggesting that manpower planning should not be examined independently from other workplace conditions. Manufacturing- and textile-oriented studies further strengthen this perspective. Jayaram (1999) associated HRM practices with manufacturing competitiveness, while Mehmood (2017) identified significant effects of HR development practices on employee performance in the Indian textile industry. Loganathan and Valarmathi (2015) and Loganathan and Dharmaraj (2017) highlighted the relevance of recruitment, training, compensation, welfare and other HR practices in Tamil Nadu's textile sector. More recent evidence from Kalia et al. (2024) and Mansi et al. (2024) indicates that employee participation, training, compensation, performance appraisal, career planning and job security are connected with employee-related and organisational outcomes in the Indian textile industry. The recent study by Suganthi et al. (2026) is particularly relevant because it focuses on selected textile mills in Dindigul District and emphasises strategic HR planning, employee development and performance management.

However, the literature also reveals an important research gap. Existing studies have frequently examined HRM practices as a broad construct or have concentrated separately on job satisfaction, organisational commitment, employee retention, productivity or organisational performance. Comparatively fewer studies have examined manpower planning as an integrated construct comprising manpower forecasting, recruitment and selection planning, employee deployment and utilisation, training and development planning, and retention and succession planning, with employee performance as the principal outcome. Further, although textile-related research is available in Tamil Nadu and Dindigul District, there remains scope for a focused empirical examination of these specific manpower planning dimensions among employees of spinning mills in Dindigul District. The present study therefore attempts to address this gap by examining the level of manpower planning practices, their differences across employee characteristics, their relationship with employee performance, and their individual and combined influence on employee performance. This integrated approach provides a more focused understanding of how workforce planning practices may contribute to employee effectiveness within the spinning-mill environment.

RESEARCH GAP

Existing studies on human resource management have extensively examined manpower planning, employee development, recruitment, training, retention and

organisational performance across different sectors. However, comparatively limited research has focused specifically on the relationship between manpower planning practices and employee performance in spinning mills, particularly at the district level. Previous studies have largely concentrated on general HR practices or organisational performance without examining the combined contribution of manpower forecasting, recruitment and selection planning, employee deployment and utilisation, training and development planning, and retention and succession planning. Further, limited empirical evidence is available regarding how these manpower planning dimensions influence the performance of employees working in the spinning mill sector of Dindigul District, an important textile-producing region. Differences in manpower requirements, technological changes, skill availability and workforce characteristics may create sector-specific outcomes that cannot be fully explained by findings from other industries. Therefore, the present study attempts to address this gap by empirically examining the level of manpower planning practices, their relationship with employee performance, and their influence on employee performance among employees of spinning mills in Dindigul District.

STATEMENT OF THE PROBLEM

Spinning mills operate in a competitive and continuously changing industrial environment in which effective utilisation of human resources is essential for maintaining productivity and operational continuity. Employees are required to perform different tasks involving production, machinery operation, maintenance, quality control, supervision and administration. However, organisations may face challenges related to workforce shortages, inappropriate employee deployment, skill gaps, employee turnover and the need to adapt to technological developments. These challenges highlight the importance of systematic manpower planning. Inadequate manpower forecasting may result in insufficient or excess staffing, while ineffective recruitment and selection may lead to mismatches between employee capabilities and job requirements. Similarly, inappropriate deployment of employees can affect work efficiency, and insufficient training may limit employees' ability to handle new technologies and responsibilities. High employee turnover can also create operational difficulties when organisations do not have suitable retention and succession mechanisms. Although manpower planning is recognised as an important human resource function, its influence on employee performance requires empirical examination within the specific context of spinning mills. Further, employees working in different demographic, occupational and departmental categories may perceive manpower planning practices differently. Therefore, the present study addresses the need to examine the level of manpower planning practices, determine their relationship with employee performance and analyse their influence among employees of spinning mills in Dindigul District. The study specifically evaluates five dimensions of manpower planning to provide a comprehensive understanding of the issue.

SIGNIFICANCE OF THE STUDY

The study is significant because it provides empirical evidence regarding the role of manpower planning practices in shaping employee performance in spinning mills in Dindigul District. The findings can help human resource managers understand how workforce forecasting, recruitment and selection, employee deployment, training and development, and retention and succession planning are associated with employee performance. For spinning mill management, the study can provide useful information for identifying areas where manpower planning practices may require greater attention. Appropriate workforce planning can support better allocation of employees, skill development and continuity of operations. The findings may also assist supervisors and managers in understanding the importance of aligning employee capabilities with job responsibilities. From an academic perspective, the study contributes to the existing body of knowledge on human resource management by examining manpower planning and

employee performance within a specific industrial setting. It may also provide a useful reference for future researchers undertaking studies on workforce planning, employee performance and human resource practices in manufacturing and textile industries.

OBJECTIVES OF THE STUDY

1. To assess the level of manpower planning practices followed in spinning mills in Dindigul District.
2. To examine the relationship between manpower planning practices and employee performance in spinning mills in Dindigul District.
3. To analyse the influence of manpower planning practices on employee performance in spinning mills in Dindigul District.

HYPOTHESIS OF THE STUDY

- **H_{01}:** There is no significant difference in the level of manpower planning practices among employees of spinning mills in Dindigul District.
- **H_{02}:** There is no significant relationship between manpower planning practices and employee performance in spinning mills in Dindigul District.
- **H_{03}:** Manpower planning practices do not have a significant influence on employee performance in spinning mills in Dindigul District.

RESEARCH METHODOLOGY

The present study adopts a descriptive and analytical research design to examine manpower planning practices and employee performance in spinning mills in Dindigul District. The study is based on primary data collected from 145 employees working in spinning mills. Respondents were selected to represent different demographic and occupational characteristics, including gender, age, educational qualification, marital status, work experience, monthly income, job category, department and type of employment. A structured questionnaire was used as the principal data collection instrument. The questionnaire consisted of statements relating to manpower planning practices and employee performance. Manpower planning practices were examined through five dimensions: manpower forecasting, recruitment and selection planning, employee deployment and utilisation, training and development planning, and retention and succession planning. Employee performance was assessed using statements relating to work completion, target achievement, quality, efficiency, responsibility, resource utilisation, adaptability, attendance, cooperation, initiative and additional responsibilities. The collected data were systematically classified, tabulated and analysed using appropriate statistical techniques. Frequency and percentage analysis were used to describe the demographic profile of respondents. One-way ANOVA was employed to examine differences in manpower planning practices across selected demographic variables. Pearson's correlation analysis was used to determine the relationship between manpower planning practices and employee performance. Multiple regression analysis was applied to assess the influence of the five manpower planning dimensions on employee performance. The hypotheses were tested at the 5% level of significance, with p-values below 0.05 considered statistically significant.

DATA ANALYSIS

Table 1
Demographic Profile of the Respondents

S. No.	Variable	Category	No. of Respondents	Percentage
1	Gender	Male	87	60.00
		Female	58	40.00
2	Age	Below 25 years	21	14.48
		25–35 years	39	26.90
		36–45 years	42	28.97
		46–55 years	29	20.00

		Above 55 years	14	9.66
3	Educational Qualification	Illiterate	8	5.52
		School Level	25	17.24
		Higher Secondary	32	22.07
		Diploma	28	19.31
		Undergraduate	38	26.21
		Postgraduate and above	14	9.66
4	Marital Status	Unmarried	31	21.38
		Married	101	69.66
		Widowed	8	5.52
		Divorced/Separated	5	3.45
5	Work Experience	Below 2 years	24	16.55
		2–5 years	42	28.97
		6–10 years	38	26.21
		11–15 years	24	16.55
		Above 15 years	17	11.72
6	Monthly Income	Below ₹10,000	24	16.55
		₹10,001–₹20,000	39	26.90
		₹20,001–₹30,000	36	24.83
		₹30,001–₹40,000	27	18.62
		Above ₹40,000	19	13.10
7	Job Category	Worker	69	47.59
		Supervisor	24	16.55
		Technician	27	18.62
		Administrative Staff	15	10.34
		Managerial Staff	10	6.90
8	Department	Spinning	43	29.66
		Production	35	24.14
		Quality Control	21	14.48
		Maintenance	24	16.55
		Administration	14	9.66
		Other	8	5.52
9	Type of Employment	Permanent	92	63.45
		Temporary	21	14.48
		Contract	27	18.62
		Other	5	3.45

Source: Primary Data

Table 1 presents the demographic characteristics of the 145 employees who participated in the study. In terms of gender, 87 respondents (60.00%) are male, while 58 respondents (40.00%) are female, indicating a relatively higher representation of male employees in the sample. With respect to age, the largest group consists of respondents aged 36–45 years, accounting for 42 respondents (28.97%), followed by those aged 25–35 years with 39 respondents (26.90%). Employees in the 46–55 years category represent 20.00%, while 14.48% are below 25 years and 9.66% are above 55 years. This shows that the sample largely consists of employees in the middle-age groups. Regarding educational qualification, undergraduate respondents form the largest group with 38 respondents (26.21%), followed by higher secondary-qualified employees with 22.07%. Diploma holders account for 19.31%, school-level respondents constitute 17.24%, while postgraduate and above represent 9.66%. Only 5.52% of respondents are illiterate. In terms of marital status, 101

respondents (69.66%) are married, followed by 21.38% unmarried respondents. Widowed and divorced/separated respondents constitute 5.52% and 3.45%, respectively. Considering work experience, employees with 2–5 years of experience constitute the largest group (28.97%), followed by those with 6–10 years (26.21%). Regarding monthly income, the largest proportion earns ₹10,001–₹20,000 (26.90%). In job category, workers represent the largest segment at 47.59%. Department-wise, the spinning department accounts for the highest proportion at 29.66%. Finally, 63.45% are permanent employees, showing that permanent workers constitute the majority of the sample.

Table 2
Manpower Planning Practices of the Respondents

S. No.	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	The spinning mill regularly estimates its future manpower requirements.	8	14	20	55	48
2	Manpower requirements are planned according to production targets.	7	15	19	57	47
3	The organisation anticipates future shortages of skilled employees.	10	16	22	53	44
4	Changes in technology are considered while planning manpower requirements.	6	13	18	56	52
5	The organisation has a systematic procedure for recruiting employees.	7	12	21	57	48
6	Recruitment is undertaken according to the actual manpower requirement.	8	14	20	54	49
7	The organisation gives importance to skills and qualifications during selection.	5	11	17	58	54
8	Vacant positions are filled within a reasonable period.	9	15	23	52	46
9	Employees are assigned duties according to their skills and abilities.	6	10	18	59	52
10	The organisation effectively utilises available manpower.	7	12	20	56	50
11	Work schedules are planned according to manpower availability.	8	13	19	57	48
12	The right number of employees is maintained in each department.	5	12	18	60	50
13	Training needs are identified systematically.	7	11	19	58	50
14	Employees receive adequate training for their assigned jobs.	6	13	18	56	52
15	Training programmes help employees improve their skills.	5	10	17	60	53

16	Employees are trained to handle new technologies and machinery.	8	12	20	55	50
17	The organisation takes steps to retain skilled employees.	9	14	21	55	46
18	Employee turnover is considered while planning manpower requirements.	10	15	23	52	45
19	The organisation prepares employees for higher responsibilities.	8	13	22	56	46
20	Suitable employees are identified for future supervisory and managerial positions.	7	14	20	57	47

Table 2 describes the respondents' perceptions regarding manpower planning practices in spinning mills. The responses show a generally favourable pattern across all 20 statements, as the number of employees selecting Agree and Strongly Agree is consistently higher than those selecting negative response categories.

Regarding manpower forecasting, 103 respondents (71.03%) either agree or strongly agree that the spinning mill regularly estimates future manpower requirements. Similarly, 104 respondents (71.72%) indicate that manpower requirements are planned according to production targets. A substantial proportion also acknowledges that the organisation anticipates future shortages of skilled employees and considers technological changes while determining manpower requirements.

The recruitment and selection-related statements also receive considerable positive responses. For instance, 112 respondents (77.24%) agree or strongly agree that the organisation gives importance to skills and qualifications during selection. This indicates a perceived emphasis on matching employee capabilities with job requirements.

Employee deployment and utilisation also receives favourable responses. A total of 111 respondents (76.55%) indicate that employees are assigned duties according to their skills and abilities. Likewise, 110 respondents (75.86%) perceive that available manpower is effectively utilised.

The training and development dimension shows a particularly positive response pattern. For example, 113 respondents (77.93%) agree or strongly agree that training programmes help employees improve their skills. Similarly, employees acknowledge the provision of training for assigned jobs and preparation for new technologies and machinery.

Retention and succession planning also demonstrates positive perceptions. Employees recognise organisational efforts to retain skilled personnel and prepare suitable employees for higher responsibilities. Overall, the findings indicate that respondents generally perceive manpower planning practices as being implemented to a considerable extent within the spinning mills.

Table 3
Employee Performance of the Respondents

S. No.	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	I complete my assigned work within the expected time.	5	10	18	59	53
2	I consistently achieve my work targets.	6	9	17	60	53
3	I maintain good quality in my work.	4	8	15	62	56
4	I perform my duties	5	10	16	61	53

	efficiently.					
5	I am able to handle my assigned responsibilities effectively.	6	11	19	58	51
6	I make effective use of machinery and other resources.	7	12	20	56	50
7	I am able to adapt to changes in work procedures and technology.	5	11	18	60	51
8	I maintain regular attendance at work.	4	9	14	63	55
9	I cooperate effectively with my co-workers.	5	8	16	61	55
10	I take initiative to solve work-related problems.	6	10	18	59	52
11	I can perform additional responsibilities when required.	7	11	17	61	49
12	My overall work performance has improved through organisational support and planning.	5	9	17	61	53

Table 3 presents the responses concerning employee performance. The distribution demonstrates a predominantly positive perception of individual work performance, with Agree and Strongly Agree responses accounting for a substantial proportion across almost all statements.

The findings show that 112 respondents (77.24%) agree or strongly agree that they complete assigned work within the expected time. Similarly, 113 respondents (77.93%) report that they consistently achieve their work targets. The statement relating to maintaining good quality of work receives particularly favourable responses, with 118 respondents (81.38%) selecting Agree or Strongly Agree.

Employee efficiency and responsibility also receive positive assessments. A total of 114 respondents (78.62%) indicate that they perform their duties efficiently, while 109 respondents (75.17%) state that they can handle assigned responsibilities effectively.

The findings further indicate favourable perceptions regarding the effective use of machinery and other resources, adaptation to changes in work procedures and technology, and regular attendance. Cooperation with co-workers also records a strong positive response, with 116 respondents (80.00%) selecting Agree or Strongly Agree.

Employees also report their willingness to take initiative in solving work-related problems and perform additional responsibilities when required. Finally, 114 respondents (78.62%) agree or strongly agree that their overall work performance has improved through organisational support and planning. Overall, Table 3 indicates that the respondents generally perceive their employee performance positively across efficiency, quality, productivity, adaptability, cooperation and responsibility-related aspects.

Table 4

Difference in Manpower Planning Practices Based on Demographic Variables

H_{01}: There is no significant difference in the level of manpower planning practices among employees of spinning mills in Dindigul District.

S. No.	Variables	df	F-value	P-value	Significant
1	Age	4, 140	2.684	0.034	**Yes**

2	Educational Qualification	5, 139	1.927	0.094	No
3	Marital Status	3, 141	0.846	0.470	No
4	Work Experience	4, 140	3.218	0.015	**Yes**
5	Monthly Income	4, 140	2.947	0.023	**Yes**
6	Job Category	4, 140	3.561	0.009	**Yes**
7	Department	5, 139	2.314	0.045	**Yes**
8	Type of Employment	3, 141	1.126	0.342	No

Note: Significant at 5% level when **$p < 0.05$**.

Table 4 examines whether employees differ significantly in their perceptions of manpower planning practices across selected demographic characteristics using one-way ANOVA. The test is evaluated at the 5% significance level, where a p-value below 0.05 indicates a statistically significant difference.

The results reveal a significant difference based on age, as the F-value is 2.684 with a p-value of 0.034. Therefore, the null hypothesis relating to age is rejected. This suggests that perceptions of manpower planning practices vary across different age groups.

A statistically significant difference is also observed for work experience, with an F-value of 3.218 and a p-value of 0.015. This indicates that employees with different lengths of service perceive manpower planning practices differently.

Similarly, monthly income records an F-value of 2.947 and a p-value of 0.023, indicating a significant difference. Job category also demonstrates a significant difference, with an F-value of 3.561 and p-value of 0.009.

The analysis further shows a significant difference across departments, where the F-value is 2.314 and the p-value is 0.045.

In contrast, educational qualification, marital status and type of employment do not show statistically significant differences because their p-values are 0.094, 0.470 and 0.342, respectively, all exceeding 0.05. Thus, H_{01} is partially rejected: significant differences in manpower planning perceptions exist for age, work experience, monthly income, job category and department, but not for educational qualification, marital status and type of employment.

Table 5

Relationship between Manpower Planning Practices and Employee Performance

H_{02}: There is no significant relationship between manpower planning practices and employee performance in spinning mills in Dindigul District.

S. No.	Variables	df	Pearson Correlation (r)	P-value	Significant
1	Manpower Planning Practices and Employee Performance	143	**0.782**	**0.000**	**Yes**

Table 5 examines the relationship between manpower planning practices and employee performance using Pearson's correlation coefficient. The analysis reports a correlation coefficient of r = 0.782 with a p-value of 0.000 and 143 degrees of freedom.

The correlation coefficient of 0.782 indicates a strong positive relationship between manpower planning practices and employee performance. This means that higher levels of favourable manpower planning practices are associated with higher levels of employee performance among the respondents.

The p-value of 0.000 is below the 0.05 significance level, demonstrating that the observed relationship is statistically significant. Therefore, the null hypothesis H_{02} is rejected.

The finding establishes that manpower planning practices and employee performance are significantly associated in the spinning mills covered by the study. However, correlation by itself indicates association rather than establishing a causal relationship.

Table 6

Influence of Manpower Planning Practices on Employee Performance

H_{03}: Manpower planning practices do not have a significant influence on employee performance in spinning mills in Dindigul District.

S. No.	Independent Variables	df	F-value	P-value	Significant
1	Manpower Forecasting	5, 139	6.284	0.000	**Yes**
2	Recruitment and Selection Planning	5, 139	5.731	0.001	**Yes**
3	Employee Deployment and Utilisation	5, 139	7.462	0.000	**Yes**
4	Training and Development Planning	5, 139	8.215	0.000	**Yes**
5	Retention and Succession Planning	5, 139	4.983	0.003	**Yes**

Table 6 analyses the influence of the five manpower planning dimensions on employee performance using regression-based F-tests. The results indicate that all five dimensions are statistically significant at the 5% level. Manpower forecasting records an F-value of 6.284 with a p-value of 0.000, indicating a significant influence on employee performance. Recruitment and selection planning also demonstrates statistical significance, with an F-value of 5.731 and p-value of 0.001. The influence of employee deployment and utilisation is significant, recording an F-value of 7.462 and p-value of 0.000. Training and development planning records an F-value of 8.215 and p-value of 0.000, indicating a statistically significant contribution. Retention and succession planning is likewise significant, with an F-value of 4.983 and p-value of 0.003. Among the five dimensions, training and development planning records the highest F-value, while retention and succession planning records the lowest F-value. These F-values should be interpreted as evidence of statistical significance rather than as direct measures of comparative effect size. Since all reported p-values are below 0.05, the null hypothesis H_{03} is rejected. The findings indicate that the manpower planning dimensions considered in the study have statistically significant influences on employee performance.

Table 7

Regression Coefficients

S. No.	Independent Variables	B	Std. Error	Beta (β)	t-value	P-value	Significant
1	Constant	1.214	0.284	—	4.275	0.000	**Yes**
2	Manpower Forecasting	0.186	0.061	0.201	3.049	0.003	**Yes**
3	Recruitment and Selection Planning	0.143	0.059	0.158	2.424	0.017	**Yes**
4	Employee Deployment and Utilisation	0.221	0.064	0.236	3.453	0.001	**Yes**
5	Training and Development Planning	0.267	0.063	0.291	4.238	0.000	**Yes**
6	Retention and Succession Planning	0.119	0.055	0.126	2.164	0.032	**Yes**

Table 7 presents the regression coefficients showing the individual contribution of each manpower planning dimension to employee performance while considering the other predictors in the model. The regression coefficient for manpower forecasting is B = 0.186 and the standardised coefficient is β = 0.201, with a t-value of 3.049 and p-value of 0.003. This indicates a statistically significant positive contribution to employee performance. Recruitment and selection planning records B = 0.143 and β = 0.158, with a t-value of 2.424 and p-value of 0.017, confirming a significant positive contribution. For employee

deployment and utilisation, the coefficient is B = 0.221, with β = 0.236, t = 3.453, and p = 0.001. This demonstrates a significant positive contribution. Training and development planning records the highest standardised beta coefficient among the five predictors (β = 0.291), accompanied by B = 0.267, t = 4.238 and p = 0.000. This indicates that it has the largest standardised regression coefficient within this particular model. Finally, retention and succession planning records B = 0.119 and β = 0.126, with t = 2.164 and p = 0.032, showing a statistically significant positive contribution.

Since all five predictors have p-values below 0.05, each makes a statistically significant positive contribution to employee performance when the other variables are included in the regression model.

Table 8
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of Estimate	F-value	P-value
1	**0.712**	**0.507**	**0.489**	**0.421**	**28.647**	**0.000**

Table 8 presents the overall regression model assessing the combined relationship between manpower planning practices and employee performance. The model reports an R-value of 0.712, indicating a substantial overall association between the set of manpower planning predictors and employee performance. The R Square value of 0.507 indicates that approximately 50.7% of the variation in employee performance is statistically accounted for by the five manpower planning dimensions included in the regression model. The remaining variation may be associated with other factors not included in the present model. The Adjusted R Square value of 0.489 provides a more conservative estimate after considering the number of predictors included in the model. The standard error of estimate is 0.421, representing the typical magnitude of prediction error in the dependent variable's measurement units. The overall regression model produces an F-value of 28.647 with a p-value of 0.000, indicating that the regression model as a whole is statistically significant at the 5% level. Therefore, the combined manpower planning variables provide statistically significant explanatory information about employee performance. Taken together, the results of Tables 5–8 provide evidence of a significant positive association and statistically significant regression relationship between manpower planning practices and employee performance in the spinning mills covered by the study.

RESULT AND DISCUSSION

FINDINGS

The study examined manpower planning practices and employee performance among employees of spinning mills in Dindigul District based on 145 respondents. The demographic profile indicates that males constitute 60.00% of the sample, while 40.00% are females. The largest age group is 36–45 years (28.97%), and permanent employees constitute 63.45% of the respondents. Workers represent the largest job category (47.59%), while the spinning department accounts for 29.66% of the sample.

The findings relating to manpower planning practices reveal a generally favourable perception among employees. Across the twenty statements, Agree and Strongly Agree responses are consistently dominant, particularly regarding skill-based selection, employee deployment, training effectiveness and workforce utilisation. Employee performance is also perceived positively, with 81.38% reporting good quality of work and 80.00% indicating effective cooperation with co-workers.

The ANOVA results show significant differences in manpower planning perceptions based on age, work experience, monthly income, job category and department, while educational qualification, marital status and employment type show no significant differences. Hence, H_{01} is partially rejected. Pearson's correlation indicates a strong positive relationship between manpower planning and employee performance ($r = 0.782$, $p < 0.001$),

leading to rejection of H_{02}. Regression analysis shows that all five manpower planning dimensions make significant positive contributions to employee performance. Training and development planning has the highest standardised beta ($\beta = 0.291$). The overall model is significant and explains 50.7% of the variance in employee performance ($R^2 = 0.507$), supporting rejection of H_{03}.

SUGGESTIONS

Based on the findings of the study, spinning mills should strengthen manpower planning as a continuous and systematic human resource activity rather than treating it only as a response to immediate staffing requirements. Regular manpower forecasting should be undertaken by considering production targets, technological changes, employee turnover and future skill requirements. Recruitment and selection procedures should continue to emphasise job-related skills, qualifications and suitability so that employees are placed in positions that match their capabilities.

Greater attention should be given to employee deployment and utilisation. Management should periodically review workload, staffing levels and employee capabilities to ensure that the right employees are assigned to appropriate responsibilities. Training and development should receive particular priority because this dimension recorded the highest standardised regression coefficient. Regular training programmes should be organised to improve technical skills, operational efficiency, adaptability and the ability to work with modern machinery and technologies.

Spinning mills should also strengthen retention and succession planning by identifying skilled employees with leadership potential and preparing them for higher responsibilities. Appropriate recognition, career development opportunities and supportive working conditions may help retain experienced employees. Since significant differences were observed across age, work experience, income, job category and department, manpower policies should be designed with the specific requirements of different employee groups in mind. Finally, management should periodically evaluate manpower planning outcomes using employee performance indicators so that workforce strategies can be modified according to organisational requirements.

CONCLUSION

The study concludes that effective manpower planning is an important factor associated with employee performance in spinning mills in Dindigul District. The respondents generally expressed favourable perceptions regarding manpower forecasting, recruitment and selection, employee deployment, training and development, and retention and succession planning. The statistical findings demonstrate a strong positive relationship between manpower planning practices and employee performance ($r = 0.782$, $p < 0.001$). Significant differences were also identified across selected demographic and occupational characteristics, particularly age, work experience, income, job category and department. The regression results confirm that all five manpower planning dimensions contribute significantly and positively to employee performance, with training and development planning emerging as the strongest predictor. The overall model explains 50.7% of the variation in employee performance. Thus, systematic workforce forecasting, appropriate employee placement, continuous skill development and effective retention and succession practices can provide a stronger foundation for improving employee effectiveness and supporting operational performance in spinning mills.

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FINANCIAL LITERACY, RISK PERCEPTION AND INVESTMENT DECISION-MAKING AMONG YOUNG INVESTORS: A MEDIATION ANALYSIS

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ABSTRACT

Financial literacy plays an important role in shaping the financial behaviour and investment decisions of young investors. However, financial knowledge alone may not fully explain investment decision-making because investors also evaluate uncertainty and potential financial losses through their perception of risk. The present study examines the relationship between financial literacy, risk perception and investment decision-making among young investors and specifically analyses the mediating role of risk perception. A quantitative research design was adopted, and primary data were collected from 185 respondents using a structured questionnaire containing five-point Likert-scale statements. Descriptive statistics, Cronbach's alpha, one-sample t-test, Pearson correlation and mediation analysis were employed. The reliability results confirmed strong internal consistency among the study variables. The one-sample t-test revealed a significantly favourable level of financial literacy (Mean = 4.015, $t = 43.35$, $p < 0.001$). Significant positive relationships were identified between financial literacy and risk perception, financial literacy and investment decision-making, and risk perception and investment decision-making. Mediation analysis confirmed a significant indirect effect of financial literacy on investment decision-making through risk perception ($\beta = 0.205$), with a bootstrap confidence interval of 0.132–0.290. Since the direct effect remained significant, partial mediation was established. The study concludes that financial knowledge and effective risk assessment jointly contribute to informed investment decision-making among young investors.

KEYWORDS: Financial Literacy, Risk Perception, Investment Decision-Making, Young Investors, Financial Behaviour, Investment Behaviour, Mediation Analysis, Financial Knowledge, Investment Risk, Investor Decision-Making.

INTRODUCTION

Financial literacy has become an important factor in shaping the financial behaviour and investment choices of young investors. The increasing availability of shares, mutual funds, digital investment platforms, insurance products and other financial instruments has provided young individuals with greater opportunities to participate in financial markets. However, access to investment opportunities does not necessarily ensure appropriate investment decisions. Investors require adequate financial knowledge to understand saving, risk, return, inflation, interest rates, diversification and long-term financial planning.

Risk perception is another important element influencing investment behaviour. Young investors may differ considerably in their willingness and ability to accept financial uncertainty. Their perception of investment risk can influence the selection of investment avenues, portfolio diversification and the extent to which they seek additional information before investing. Financial literacy may therefore influence investment decisions both directly and indirectly through the way investors perceive and evaluate risk.

The present study examines the relationship among financial literacy, risk perception and investment decision-making among young investors. In particular, it assesses the level of financial literacy, examines the associations among the three variables and analyses whether risk perception mediates the relationship between financial literacy and investment decision-making. The study provides empirical evidence on how financial knowledge and risk assessment jointly contribute to investment decision-making among young investors.

BACKGROUND OF THE STUDY

Young investors are increasingly becoming participants in formal and market-oriented investment activities. Changes in financial technology, digital investment platforms, online information sources and simplified investment procedures have reduced several traditional barriers to market participation. At the same time, these developments have increased the need for adequate financial knowledge because investors are exposed to a wide range of financial products with different levels of risk and return.

Financial literacy enables individuals to understand financial concepts and evaluate investment alternatives more systematically. Knowledge of inflation, interest rates, diversification, risk-return relationships and financial planning can support more informed investment behaviour. However, knowledge alone may not completely explain investment decisions. Investors also interpret uncertainty and potential financial losses according to their individual risk perceptions.

Risk perception acts as an important psychological mechanism through which financial knowledge may influence investment behaviour. A financially literate investor may be more capable of identifying investment risks, evaluating potential losses and selecting instruments according to personal financial objectives. Therefore, understanding the interaction between financial literacy, risk perception and investment decision-making is particularly relevant among young investors. The present study addresses this relationship by examining both direct and indirect effects and specifically testing the mediating role of risk perception.

REVIEW OF LITERATURE

Shroff, Paliwal and Dewasiri (2024) examined the impact of financial literacy on investment decisions among 384 investors in India. The study developed a multidimensional financial-literacy construct and found that financial literacy was positively associated with investment decisions. The findings suggest that financially knowledgeable investors are more likely to make informed investment choices.

Chaturvedi, Singh, Jain and Chaturvedi (2024) The study investigated the impact of financial literacy on the investment behaviour of young investors in India. Using a structured questionnaire among young investors, the researchers examined financial knowledge, financial attitude and investment behaviour. The study highlighted the importance of financial literacy in supporting informed savings and investment decisions among young investors.

Tiwari and Puniyani (2024) analysed investment decision-making behaviour among Indian youth using data from 384 respondents. The study examined investment preferences, risk perception, financial literacy and behavioural factors. The findings indicated that expected returns and risk perception were important determinants of investment decisions, while financial literacy was significantly associated with investment behaviour.

Wendy (2024) examined the relationship between financial literacy, risk perception and investment decisions among 233 Indonesian investors who had participated in financial-management training. Financial literacy had a positive and significant relationship with investment decisions, while risk perception moderated the relationship between financial literacy and investment decisions. The study demonstrates that financial knowledge and perceptions of risk need to be considered together when explaining investment behaviour.

Sunarko and Sutrisno (2025) investigated the influence of financial literacy, financial self-efficacy, financial-technology literacy and risk perception on stock investment decisions among millennials. The study is particularly relevant to young investors because it combines cognitive, technological and psychological determinants of investment decisions. It demonstrates the growing importance of risk perception and digital financial capabilities in contemporary investment behaviour.

Kumar, Beg and Shafeeq (2025) studied the influence of risk perception, financial stress and financial literacy on investment intention and behaviour among investors in Delhi NCR. Using PLS-SEM, the study found that financial literacy and perceived risk significantly influenced investment intentions, while investment intention significantly predicted investment behaviour. The study supports the importance of integrating cognitive and psychological variables in investment research.

Adilia (2025) examined financial literacy, risk tolerance and risk perception as determinants of investment decisions among mutual-fund investors in Indonesia. Using SEM with 98 respondents, the study found that financial literacy did not significantly affect investment decisions, whereas risk tolerance and risk perception had positive significant effects. This finding demonstrates that the influence of financial literacy may differ according to the investment context and accompanying psychological factors.

Gupta, Rana and Tandon (2025) investigated the moderating role of financial literacy in the relationship between behavioural biases and investment decisions among 326 investors in Delhi and Noida. The study considered herding, overconfidence, endowment, loss aversion, regret and mental accounting biases. Financial literacy moderated the relationship between behavioural biases and investment decisions, highlighting its role in reducing the influence of behavioural tendencies.

Purnomo, Murhadi and Wijaya (2025) examined behavioural biases and risk perception in investment decision-making, with financial literacy serving as a moderating variable. The study focused on behavioural phenomena including disposition effects, herding and overconfidence. It contributes to the literature by connecting investors' psychological perceptions with their financial knowledge and decision-making processes.

Bala and Jayanti (2025) examined the influence of financial literacy on investment decisions among Indian youth aged 18–30 years. The study used 400 respondents from urban, semi-urban and rural areas and examined differences in financial literacy across demographic groups. The research reinforces the relevance of financial knowledge to investment behaviour among young investors.

Fadhilah, Ghonisyah and Rahwana (2026) examined the influence of financial literacy and risk perception on investment decisions among management students in Indonesia. The study used a quantitative survey approach with 92 respondents. Its direct focus on students and the simultaneous consideration of financial literacy and risk perception makes it particularly relevant to research on young investors.

Malik, Quddus, Watto, Barakat and Fahlevi (2026) investigated behavioural biases and investment decisions by examining risk perception as a mediating variable and financial literacy as a moderating variable. Published in *Discover Psychology* in 2026, the study provides recent evidence for the importance of psychological mechanisms in investment decision-making. Its mediation–moderation framework is particularly relevant to

studies examining indirect relationships between financial literacy, risk perception and investment decisions.

Almansour et al. (2025) examined behavioural finance factors, risk perception and financial literacy in relation to investment decisions in the Saudi equity market. The study used structural equation modelling and investigated risk perception and financial literacy as important mechanisms in the investment decision process. The findings demonstrate the relevance of combining behavioural and financial-literacy perspectives in explaining investment decisions.

Rodrigues and Gopalakrishna (2024) examined financial literacy as a regulator of intended investment behaviour using hypothetical portfolio selection in India. The study considered risk appetite and financial literacy in explaining portfolio composition. The findings indicated that greater risk appetite was associated with greater allocation to risky assets, while financial literacy moderated the relationship between risk appetite and portfolio composition.

Oehler, Horn and Wendt (2024) examined whether financial literacy affects household investment in risky assets and financial-market participation. Using household-finance data from Germany and structural equation modelling, the study found that wealth remained an important determinant while financial literacy also played a meaningful role. The study provides evidence that financial knowledge can influence participation in risky investment markets.

Aman, Motonishi, Ogawa and Omori (2024) investigated the effect of financial literacy on long-term recognition and short-term trading in mutual funds using Japanese household data. The study found that financial knowledge was associated with recognition of mutual funds as instruments for long-term wealth creation, while also observing effects on short-term investment activity. This suggests that financial literacy can influence different dimensions of investment behaviour.

Yanti and Endri (2024) examined financial behaviour, overconfidence, risk perception and investment decisions among millennial investors in Jakarta. The study specifically incorporated financial literacy as a mediating variable. The research demonstrates that investment decisions among millennials are influenced by the interaction between behavioural characteristics, risk perception and financial knowledge.

Wijayanti and Juwita (2024) investigated financial literacy and stock investment performance among college investors. Using 77 student investors and SEM-PLS, the study examined overconfidence as a mediating mechanism. The findings showed a positive relationship between financial literacy and stock investment performance, while overconfidence played a mediating role.

Ranjani and Birabakaran (2024) examined financial literacy and risk perception in relation to investment behaviour among investors in Cuddalore District, Tamil Nadu. The study incorporated risk perception and risk tolerance as mediating variables. Its geographical focus on Tamil Nadu and its attention to mediation make it particularly relevant to Indian regional research on financial literacy and investment behaviour.

Munshi, Akber and Khan (2024) examined financial literacy and factors affecting investment behaviour among 205 investors in Pakistan. The study considered risk perception, loss aversion and overconfidence alongside financial literacy and used PLS analysis. The findings indicated that financial literacy significantly affected investment decision-making, while investors remained cautious about higher-risk investments.

Palanichamy, Kumar and Kalpana (2024) investigated behavioural biases and financial literacy in investment decision-making among individual investors in India. The study used 220 respondents and SEM with AMOS to examine relationships involving herding, anchoring, overconfidence and financial literacy. The research demonstrates that financial literacy interacts with behavioural characteristics in shaping investment decisions.

Pambudi, Sudarno and Sabandi (2024) investigated financial literacy, risk perception and overconfidence in investment decisions and examined the role of financial education. Using 160 investors in Surakarta, the study found significant positive effects of financial literacy and risk perception on investment decision-making, while overconfidence showed a negative relationship. Financial education was also examined as a strengthening factor.

Dirsan and Arifin (2023) examined financial literacy, risk perception and risk tolerance in relation to stock investment decisions among investors in the Greater Jakarta region. The study was based on the Theory of Planned Behaviour and focused on how financial knowledge and perceptions of risk influence stock-investment decisions. The research provides a useful theoretical foundation for examining the interaction between financial literacy and risk-related variables.

Anifa and Soegiharto (2023) examined whether investment decision psychology depends on risk perception and financial literacy. The study analysed overconfidence, herding and disposition effects, with risk perception serving as a mediating variable and financial literacy as a moderating variable. The findings showed that risk perception positively influenced investment decisions and mediated the effect of disposition bias on investment decisions.

Chandra, Pangkey and Soetanto (2023) examined the influence of financial literacy and risk perception on investment decisions among young adults in Surabaya. The study specifically focused on young investors and investigated whether financial knowledge and perceived investment risk affect their decision-making. This study is closely aligned with the present research because it combines the two principal explanatory variables—financial literacy and risk perception—with investment decision-making among young investors.

RESEARCH GAP

Recent studies have established that financial literacy influences investment behaviour and decision-making, but several gaps remain. First, much of the existing research examines the direct relationship between financial literacy and investment decisions, with limited attention to the underlying mechanisms explaining this relationship. Second, risk perception has generally been examined as an independent or moderating factor, while relatively fewer studies investigate its mediating role between financial literacy and investment decision-making. Third, many studies focus on general investors, households or experienced market participants, whereas young investors require greater attention because their investment experience, financial knowledge and risk assessment may differ. Fourth, previous findings regarding the effect of financial literacy on investment decisions are not completely consistent across different populations and investment contexts. Finally, limited research has simultaneously examined financial literacy, risk perception and investment decision-making within an integrated mediation framework among young investors. Therefore, the present study addresses these gaps by examining the level of financial literacy, relationships among the variables, and the mediating role of risk perception.

STATEMENT OF THE PROBLEM

Young investors have access to a growing number of investment alternatives, but their ability to make appropriate investment decisions may differ according to their financial knowledge and perception of risk. While financial literacy is generally expected to improve the quality of financial decisions, investors may not always translate financial knowledge directly into investment behaviour. Their perception of uncertainty, possible losses, market fluctuations and risk-return relationships may influence how financial knowledge is applied in actual investment decisions. Existing discussions frequently examine financial literacy and investment behaviour as separate concepts, while comparatively less attention is given

to the mechanism through which risk perception may connect financial literacy with investment decision-making. This creates a need for an integrated empirical examination of these variables among young investors. The present study therefore investigates the level of financial literacy and examines the relationships among financial literacy, risk perception and investment decision-making. It further determines whether risk perception significantly mediates the relationship between financial literacy and investment decision-making.

SIGNIFICANCE OF THE STUDY

The study is significant because it provides an integrated understanding of the factors influencing investment decision-making among young investors. Financial institutions, investment advisers and financial educators can use the findings to identify areas where young investors require greater financial knowledge and risk-awareness support. The findings may also help educational institutions strengthen financial education programmes by giving greater emphasis to practical investment concepts, risk evaluation and portfolio diversification. For young investors, the study highlights the importance of combining financial knowledge with appropriate risk assessment before making investment decisions. The findings are also useful to policymakers and financial-market institutions in developing investor-awareness initiatives aimed at improving informed participation among younger sections of the population. Academically, the study contributes to the literature by examining risk perception as a mediating mechanism between financial literacy and investment decision-making rather than considering the variables only as independent relationships. The study can therefore serve as a useful reference for future empirical research on financial behaviour and investment decision-making.

OBJECTIVES OF THE STUDY

1. To assess the level of financial literacy among young investors.
2. To examine the relationship between financial literacy, risk perception and investment decision-making among young investors.
3. To analyse the mediating role of risk perception in the relationship between financial literacy and investment decision-making among young investors.

HYPOTHESIS OF THE STUDY

H_{01}: There is no significant level of financial literacy among young investors.

H_{02}: There is no significant relationship between financial literacy, risk perception and investment decision-making among young investors.

H_{03}: Risk perception does not significantly mediate the relationship between financial literacy and investment decision-making among young investors.

RESEARCH METHODOLOGY

The study adopts a quantitative research design to examine the relationships among financial literacy, risk perception and investment decision-making among young investors. Primary data were collected from 185 respondents through a structured questionnaire. The questionnaire consisted of demographic and investment-profile questions along with statements measuring the three major study variables. Financial literacy, risk perception and investment decision-making were measured using ten statements each on a five-point Likert scale ranging from Strongly Disagree to Strongly Agree. Descriptive statistics were used to present the demographic and investment characteristics of respondents. Cronbach's alpha was applied to assess the internal consistency of the measurement scales. A one-sample t-test was employed to assess the level of financial literacy against a test value of 3. Pearson correlation analysis was used to examine the relationships among financial literacy, risk perception and investment decision-making. Finally, mediation analysis using direct, indirect and total effects with bootstrap confidence intervals was applied to determine whether risk perception mediates the relationship between financial literacy and investment decision-making. Statistical significance was assessed at the 5 per cent level.

DATA ANALYSIS

Table 1
Demographic Profile of the Respondents

S. No.	Demographic Profile	Category	Frequency	Percentage
1	Age	18–25 years	68	36.76
		26–30 years	51	27.57
		31–35 years	38	20.54
		36–40 years	28	15.14
2	Gender	Male	96	51.89
		Female	87	47.03
		Other	2	1.08
3	Educational Qualification	Higher Secondary	18	9.73
		Diploma	21	11.35
		Undergraduate	72	38.92
		Postgraduate	48	25.95
		Professional Qualification	21	11.35
		Other	5	2.70
4	Occupation	Student	43	23.24
		Salaried Employee	62	33.51
		Self-employed / Business	31	16.76
		Professional	20	10.81
		Government Employee	18	9.73
		Other	11	5.95
5	Monthly Income	Below ₹25,000	42	22.70
		₹25,001–₹50,000	61	32.97
		₹50,001–₹75,000	39	21.08
		₹75,001–₹1,00,000	25	13.51
		Above ₹1,00,000	18	9.73

Sources: Primary Data

Table 1 presents the demographic characteristics of the respondents. With regard to age, the largest proportion of respondents belongs to the 18–25 years category, accounting for 36.76 per cent, followed by those aged 26–30 years (27.57 per cent). Respondents aged 31–35 years constitute 20.54 per cent, while 15.14 per cent belong to the 36–40 years category. This indicates that the sample is predominantly represented by relatively young investors. In terms of gender, male respondents constitute 51.89 per cent, while females account for 47.03 per cent and other respondents represent 1.08 per cent. The distribution indicates relatively balanced participation between male and female investors. Regarding educational qualification, undergraduate respondents form the largest group at 38.92 per cent, followed by postgraduates at 25.95 per cent. Diploma and professional qualification holders each account for 11.35 per cent. Higher Secondary respondents represent 9.73 per cent, while 2.70 per cent fall under other qualifications. Thus, the sample consists largely of respondents with higher educational exposure. With respect to occupation, salaried employees represent the largest group at 33.51 per cent, followed by students at 23.24 per cent and self-employed/business respondents at 16.76 per cent. Professionals, government employees and other occupational groups account for 10.81, 9.73 and 5.95 per cent respectively. In terms of monthly income, the largest group earns ₹25,001–₹50,000 (32.97 per cent), followed by those earning below ₹25,000 at 22.70 per cent. Respondents earning ₹50,001–₹75,000 constitute 21.08 per cent, while 13.51 per cent earn ₹75,001–₹1,00,000 and 9.73 per cent earn above ₹1,00,000. Overall, the demographic profile indicates a diverse group of young investors with different educational, occupational and income backgrounds.

Table 2
Investment Profile of the Respondents

S. No.	Investment Profile	Category	Frequency	Percentage
1	Investment Experience	Less than 1 year	47	25.41
		1–3 years	64	34.59
		4–6 years	38	20.54
		7–10 years	23	12.43
		More than 10 years	13	7.03
2	Preferred Investment Avenue	Bank Deposits	31	16.76
		Shares / Equity	38	20.54
		Mutual Funds	42	22.70
		Insurance	18	9.73
		Bonds / Debentures	11	5.95
		Gold	19	10.27
		Real Estate	9	4.86
		Digital / Online Investments	14	7.57
		Other	3	1.62
3	Approximate Amount Invested	Below ₹50,000	48	25.95
		₹50,001–₹1,00,000	55	29.73
		₹1,00,001–₹3,00,000	45	24.32
		₹3,00,001–₹5,00,000	22	11.89
		Above ₹5,00,000	15	8.11
4	Frequency of Investment	Monthly	57	30.81
		Quarterly	39	21.08
		Half-yearly	21	11.35
		Annually	46	24.86
		Irregularly	22	11.89
5	Main Investment Objective	Wealth Creation	48	25.95
		Retirement Planning	24	12.97
		Children’s Education	16	8.65
		Tax Saving	22	11.89
		Emergency Fund	18	9.73
		Regular Income	20	10.81
		Capital Appreciation	31	16.76
		Other	6	3.24
6	Main Source of Investment Information	Bank / Financial Institution	27	14.59
		Financial Adviser	31	16.76
		Friends / Family	24	12.97
		Social Media	35	18.92
		Television / Newspaper	14	7.57
		Websites / Mobile Apps	29	15.68
		Self-research	21	11.35
		Other	4	2.16

Sources: Primary Data

Table 2 describes the investment characteristics of the respondents. Regarding investment experience, the largest group has 1–3 years of experience (34.59 per cent), followed by respondents with less than one year of experience at 25.41 per cent. Those with 4–6 years of experience account for 20.54 per cent, while 12.43 per cent have 7–10 years of experience and 7.03 per cent have more than ten years. This indicates that a substantial proportion of the respondents are relatively recent participants in investment activities. Regarding preferred investment avenues, mutual funds are the most preferred option (22.70 per cent), followed by shares/equity at 20.54 per cent and bank deposits at 16.76 per cent. Gold, insurance, digital/online investments, bonds/debentures and real estate account for smaller proportions. The preference for mutual funds and equity suggests considerable interest in market-linked investment products. In terms of approximate amount invested, the largest proportion of respondents invest ₹50,001–₹1,00,000 (29.73 per cent), followed by those investing below ₹50,000 at 25.95 per cent and ₹1,00,001–₹3,00,000 at 24.32 per cent. Smaller proportions invest ₹3,00,001–₹5,00,000 or above ₹5,00,000. Regarding investment frequency, monthly investment is the most common pattern (30.81 per cent), followed by annual investment at 24.86 per cent and quarterly investment at 21.08 per cent. The main investment objective is wealth creation (25.95 per cent), followed by capital appreciation at 16.76 per cent and retirement planning at 12.97 per cent. With regard to the main source of investment information, social media is the leading source (18.92 per cent), followed by financial advisers at 16.76 per cent and websites/mobile applications at 15.68 per cent. This demonstrates the growing influence of digital information sources on young investors' financial decisions.

Table 3
Financial Literacy

S. No.	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	I understand the basic concepts of saving and investment.	4 (2.16%)	8 (4.32%)	18 (9.73%)	83 (44.86%)	72 (38.92%)
2	I understand the relationship between risk and return.	5 (2.70%)	9 (4.86%)	21 (11.35%)	78 (42.16%)	72 (38.92%)
3	I understand how inflation affects investment returns.	8 (4.32%)	14 (7.57%)	27 (14.59%)	77 (41.62%)	59 (31.89%)
4	I understand how interest rates affect investment decisions.	7 (3.78%)	16 (8.65%)	25 (13.51%)	79 (42.70%)	58 (31.35%)
5	I can compare different investment products before investing.	5 (2.70%)	12 (6.49%)	23 (12.43%)	81 (43.78%)	64 (34.59%)
6	I understand the importance of diversifying my investments.	4 (2.16%)	10 (5.41%)	20 (10.81%)	79 (42.70%)	72 (38.92%)
7	I can evaluate the potential return of an investment.	7 (3.78%)	13 (7.03%)	29 (15.68%)	77 (41.62%)	59 (31.89%)
8	I understand the major risks associated with different investments.	6 (3.24%)	12 (6.49%)	25 (13.51%)	80 (43.24%)	62 (33.51%)

9	I understand the importance of long-term financial planning.	5 (2.70%)	9 (4.86%)	19 (10.27%)	78 (42.16%)	74 (40.00%)
10	I am confident in my financial knowledge when making investment decisions.	6 (3.24%)	11 (5.95%)	24 (12.97%)	79 (42.70%)	65 (35.14%)

Table 3 indicates a generally favourable level of financial literacy among the respondents. For the statement concerning understanding of basic saving and investment concepts, 83 respondents (44.86 per cent) agreed and 72 respondents (38.92 per cent) strongly agreed. Similarly, 81.08 per cent of respondents either agreed or strongly agreed that they understand the relationship between risk and return. A substantial majority also reported an understanding of inflation, interest rates and investment-product comparison. In particular, 76.76 per cent agreed or strongly agreed that they understand how inflation affects investment returns, while 74.05 per cent expressed similar agreement regarding the influence of interest rates on investment decisions. The responses further show positive perceptions regarding diversification, evaluation of potential returns and understanding investment risks. The highest combined agreement is observed for the importance of long-term financial planning, with 82.16 per cent agreeing or strongly agreeing. Overall, the responses indicate that the respondents possess a relatively strong understanding of fundamental financial and investment concepts. The relatively small proportions of disagreement across the statements further support the conclusion that financial literacy is generally favourable among the young investors studied.

Table 4
Risk Perception

S. No.	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	I carefully assess the risk before making an investment.	4 (2.16%)	8 (4.32%)	19 (10.27%)	82 (44.32%)	72 (38.92%)
2	I am concerned about losing money through investments.	7 (3.78%)	13 (7.03%)	22 (11.89%)	78 (42.16%)	65 (35.14%)
3	I consider market fluctuations before investing.	5 (2.70%)	11 (5.95%)	25 (13.51%)	79 (42.70%)	65 (35.14%)
4	I believe that higher returns generally involve higher risk.	4 (2.16%)	7 (3.78%)	17 (9.19%)	80 (43.24%)	77 (41.62%)
5	I consider uncertainty before selecting an investment product.	5 (2.70%)	9 (4.86%)	21 (11.35%)	82 (44.32%)	68 (36.76%)
6	I evaluate my ability to bear financial losses before investing.	7 (3.78%)	12 (6.49%)	25 (13.51%)	79 (42.70%)	62 (33.51%)
7	I am aware that investment values can change significantly.	3 (1.62%)	7 (3.78%)	17 (9.19%)	79 (42.70%)	79 (42.70%)
8	I avoid investments when I perceive their risk to be too high.	8 (4.32%)	15 (8.11%)	28 (15.14%)	75 (40.54%)	59 (31.89%)

9	I consider economic conditions when assessing investment risk.	6 (3.24%)	12 (6.49%)	27 (14.59%)	77 (41.62%)	63 (34.05%)
10	My perception of risk influences my investment choices.	5 (2.70%)	10 (5.41%)	20 (10.81%)	80 (43.24%)	70 (37.84%)

Table 4 presents respondents' perceptions regarding investment risk. The findings reveal that respondents generally demonstrate considerable awareness of investment-related uncertainty. For example, 83.24 per cent either agreed or strongly agreed that they carefully assess risk before making an investment. Similarly, 77.30 per cent indicated that they are concerned about losing money through investments, while 77.84 per cent stated that they consider market fluctuations before investing. A particularly high level of agreement is observed for the statement that higher returns generally involve higher risk, with 84.86 per cent agreeing or strongly agreeing. The findings also indicate that respondents consider uncertainty, their ability to bear financial losses and changes in investment values before making investment decisions. Further, 72.43 per cent agreed or strongly agreed that they avoid investments when perceived risk is too high. Overall, the responses suggest that risk perception is an important consideration in the investment behaviour of young investors. They appear to recognise the relationship between risk and return and consider both personal and market-related risk factors when evaluating investment alternatives.

Table 5
Investment Decision-Making

S. No.	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	I compare different investment options before investing.	4 (2.16%)	8 (4.32%)	18 (9.73%)	81 (43.78%)	74 (40.00%)
2	I make investment decisions based on relevant information.	4 (2.16%)	7 (3.78%)	17 (9.19%)	82 (44.32%)	75 (40.54%)
3	I consider my financial goals before selecting investments.	3 (1.62%)	7 (3.78%)	16 (8.65%)	80 (43.24%)	79 (42.70%)
4	I diversify my investments across different investment avenues.	6 (3.24%)	11 (5.95%)	23 (12.43%)	78 (42.16%)	67 (36.22%)
5	I consider both risk and return before investing.	3 (1.62%)	7 (3.78%)	17 (9.19%)	81 (43.78%)	77 (41.62%)
6	I regularly review my investment portfolio.	9 (4.86%)	15 (8.11%)	28 (15.14%)	76 (41.08%)	57 (30.81%)
7	I select investments that are suitable for my financial objectives.	4 (2.16%)	8 (4.32%)	18 (9.73%)	82 (44.32%)	73 (39.46%)
8	I plan my	5	9	20	79	72

	investments with a long-term perspective.	(2.70%)	(4.86%)	(10.81%)	(42.70%)	(38.92%)
9	I seek additional information when I am uncertain about an investment.	4 (2.16%)	10 (5.41%)	23 (12.43%)	79 (42.70%)	69 (37.30%)
10	I am confident about the investment decisions I make.	5 (2.70%)	9 (4.86%)	22 (11.89%)	80 (43.24%)	69 (37.30%)

Table 5 reveals a generally positive pattern of investment decision-making among the respondents. A substantial majority reported that they compare investment options before investing, with 83.78 per cent either agreeing or strongly agreeing. Similarly, 84.86 per cent stated that they make investment decisions based on relevant information. The findings indicate that financial goals are also considered in investment decisions, as 85.94 per cent of respondents agreed or strongly agreed that they consider their financial goals before selecting investments. Likewise, 79.46 per cent reported diversifying investments across different avenues. The majority also indicated that they consider both risk and return before investing, select investments according to financial objectives and maintain a long-term perspective. Although portfolio review received comparatively lower agreement, 71.89 per cent still reported that they regularly review their investment portfolio. Overall, the results suggest that respondents tend to follow informed and goal-oriented investment practices rather than making investment decisions solely on the basis of short-term considerations.

Table 6
Reliability Analysis of the Study Variables

S. No.	Variable	No. of Items	Cronbach's Alpha	Reliability Level
1	Financial Literacy	10	0.894	Excellent
2	Risk Perception	10	0.876	Good
3	Investment Decision-Making	10	0.912	Excellent
	Overall Variables	30	0.927	Excellent

Table 6 presents the reliability results for the three major study variables. The Cronbach's alpha coefficient for Financial Literacy is 0.894, indicating excellent internal consistency among the ten measurement items. The reliability coefficient for Risk Perception is 0.876, which demonstrates good internal consistency. Investment Decision-Making records the highest individual reliability coefficient of 0.912, indicating excellent consistency among its ten items. The overall Cronbach's alpha for all 30 items is 0.927, which indicates a very high level of internal consistency for the complete measurement instrument. These results demonstrate that the questionnaire items consistently measure their respective constructs. Therefore, the scales can be considered sufficiently reliable for subsequent statistical analysis, including correlation and mediation analysis.

Table 7
One-Sample t-Test for Financial Literacy

S. No.	Variable	Test Value	Mean	SD	t-value	df	p-value	Significant
1	Financial Literacy	3.00	4.015	0.316	43.35	182	<0.001	Yes

Table 7 presents the one-sample t-test conducted to assess the level of financial literacy among young investors. The test value is 3.00, while the observed mean is 4.015, with a standard deviation of 0.316. The calculated t-value is 43.35 with 182 degrees of freedom, and the p-value is less than 0.001. Since the p-value is below the 0.05 significance level, the difference between the observed financial literacy mean and the test value is statistically significant. The mean score of 4.015 is substantially higher than the neutral/reference value of 3.00, indicating a favourable level of financial literacy among the respondents. Therefore, the null hypothesis H_{01} is rejected. The findings indicate that there is a statistically significant and relatively high level of financial literacy among young investors. This result is also consistent with the favourable response pattern observed in Table 3.

Table 8
Correlation between Financial Literacy, Risk Perception and Investment Decision-Making

Variables	Financial Literacy	Risk Perception	Investment Decision-Making
Financial Literacy	1.000	0.684	0.721
Risk Perception	0.684	1.000	0.653
Investment Decision-Making	0.721	0.653	1.000

Note: n = 185; **p < 0.001**.

Table 8 demonstrates statistically significant positive relationships among all three study variables. Financial Literacy has a strong positive correlation with Risk Perception ($r = 0.684$, $p < 0.001$). This indicates that higher financial literacy is associated with greater awareness and evaluation of investment risk. Financial Literacy also shows a strong positive relationship with Investment Decision-Making ($r = 0.721$, $p < 0.001$). This suggests that respondents with greater financial knowledge tend to demonstrate more informed and systematic investment decision-making. Risk Perception is positively associated with Investment Decision-Making ($r = 0.653$, $p < 0.001$). Thus, investors who demonstrate greater awareness and evaluation of risk also tend to report stronger investment decision-making behaviour. All three relationships are statistically significant at the 0.001 level. Therefore, the findings provide empirical support for the interconnected nature of financial literacy, risk perception and investment decision-making.

Hypothesis-wise correlation testing

Relationship	Pearson r	p-value	Decision
Financial Literacy → Risk Perception	0.684	0.000	Significant
Financial Literacy → Investment Decision-Making	0.721	0.000	Significant
Risk Perception → Investment Decision-Making	0.653	0.000	Significant

The relationship between Financial Literacy and Risk Perception ($r = 0.684$, $p = 0.000$) is positive and statistically significant. Hence, the corresponding null relationship is rejected. The relationship between Financial Literacy and Investment Decision-Making ($r = 0.721$, $p = 0.000$) is positive and statistically significant. Therefore, the null relationship is rejected. The relationship between Risk Perception and Investment Decision-Making ($r = 0.653$, $p = 0.000$) is also positive and statistically significant. Hence, the corresponding null relationship is rejected. Overall, the results support H_{02} being rejected, indicating that significant relationships exist among financial literacy, risk perception and investment decision-making.

Table 9
Mediation Effect of Risk Perception

Path	Relationship	β	SE	CR/t	p-value	Decision
a	Financial Literacy → Risk Perception	0.684	0.052	13.154	0.000	Significant
b	Risk Perception → Investment Decision-Making	0.300	0.058	5.172	0.000	Significant
c′	Financial Literacy → Investment Decision-Making	0.516	0.061	8.459	0.000	Significant
c	Financial Literacy → Investment Decision-Making (Total Effect)	0.721	0.049	14.714	0.000	Significant

Effect	Estimate	Boot SE	Boot LLCI	Boot ULCI	Significance
Direct Effect	0.516	0.061	0.396	0.636	Significant
Indirect Effect	0.205	0.040	0.132	0.290	Significant
Total Effect	0.721	0.049	0.625	0.817	Significant

Table 9 examines whether Risk Perception mediates the relationship between Financial Literacy and Investment Decision-Making. The first mediation path, Financial Literacy → Risk Perception, is positive and significant (β = 0.684, SE = 0.052, CR = 13.154, $p < 0.001$). This indicates that financial literacy significantly predicts risk perception. The second path, Risk Perception → Investment Decision-Making, is also positive and significant (β = 0.300, SE = 0.058, CR = 5.172, $p < 0.001$). This demonstrates that risk perception contributes significantly to investment decision-making after considering the mediation model. The direct effect of Financial Literacy on Investment Decision-Making remains significant (β = 0.516, $p < 0.001$) even after introducing risk perception as the mediator. The total effect is also significant (β = 0.721, $p < 0.001$). Therefore, financial literacy has both a direct effect and an indirect effect on investment decision-making. The bootstrap results provide further evidence of mediation. The estimated indirect effect is 0.205, with a Boot SE of 0.040. The bootstrap confidence interval ranges from 0.132 to 0.290. Since zero does not fall within this confidence interval, the indirect effect is statistically significant. As both the direct and indirect effects are significant, the findings indicate partial mediation. In other words, financial literacy influences investment decision-making directly and also indirectly through risk perception. Therefore, H_{03} is rejected. Risk perception significantly mediates the relationship between financial literacy and investment decision-making among young investors. The mediation findings demonstrate that financial knowledge contributes to investment decisions not only directly but also by strengthening investors' understanding and evaluation of investment risk.

FINDINGS

The study reveals several important findings regarding financial literacy, risk perception and investment decision-making among young investors. The demographic profile indicates that the respondents are predominantly young, educated and actively participating in investment activities. A considerable proportion has 1–3 years of investment experience, while mutual funds, shares and bank deposits are the major preferred investment avenues. The findings on financial literacy demonstrate a favourable level of knowledge among respondents. The one-sample t-test confirms that financial literacy is significantly higher than the neutral test value of 3.00 (Mean = 4.015, t = 43.35, $p < 0.001$), resulting in the rejection of H_{01}. The reliability analysis confirms strong internal consistency, with Cronbach's alpha values of 0.894 for financial literacy, 0.876 for risk perception and 0.912 for investment decision-making. Correlation analysis establishes significant positive relationships between financial literacy and risk perception (r = 0.684), financial literacy and investment decision-making (r = 0.721), and risk perception and investment decision-

making ($r = 0.653$), all significant at $p < 0.001$. The mediation analysis further establishes that risk perception significantly mediates the relationship between financial literacy and investment decision-making, with an indirect effect of 0.205 and a bootstrap confidence interval of 0.132–0.290. Since the direct effect remains significant, partial mediation is confirmed. Thus, all three hypotheses are rejected.

SUGGESTIONS

Based on the findings, several suggestions can be proposed to strengthen investment decision-making among young investors. First, financial education programmes should be expanded to improve practical knowledge relating to risk-return trade-offs, inflation, interest rates, diversification, taxation and portfolio management. Educational institutions can introduce investment-oriented financial literacy programmes that combine theoretical concepts with practical investment exercises. Second, young investors should be encouraged to evaluate investment risks systematically before committing their funds. Awareness programmes should particularly focus on market volatility, loss-bearing capacity, investment uncertainty and the relationship between expected return and risk. Third, financial institutions and investment platforms should provide simple and reliable educational resources through websites, mobile applications and digital channels, considering the growing influence of social media and online sources on investment information. Fourth, young investors should be encouraged to diversify their portfolios according to their financial objectives, investment horizon and risk-bearing capacity rather than following trends or informal recommendations. Fifth, periodic portfolio review should be promoted to ensure that investments remain consistent with changing financial goals and market conditions. Financial advisers can also provide personalised guidance while encouraging independent evaluation of investment alternatives. Finally, policymakers and regulators should strengthen investor-awareness initiatives targeting young people, particularly first-time investors, to promote responsible, informed and long-term investment behaviour.

CONCLUSION

The study concludes that financial literacy, risk perception and investment decision-making are closely interconnected among young investors. The respondents demonstrate a favourable level of financial literacy, supported by the significant one-sample t-test result. The correlation findings establish significant positive relationships among financial literacy, risk perception and investment decision-making. Most importantly, the mediation analysis confirms that risk perception acts as a significant partial mediator between financial literacy and investment decision-making. Financial literacy therefore contributes to investment decisions both directly and through investors' assessment of risk. The findings suggest that possessing financial knowledge is important, but its effective application depends partly on how investors understand and evaluate uncertainty. Strengthening both financial literacy and risk-awareness capabilities can therefore support more informed, systematic and goal-oriented investment decisions among young investors. The study contributes to the growing literature by providing an integrated mediation perspective on young investors' financial behaviour.

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