Digital Marketing Metamorphosis: A Dual-Sector Study of Kerala's Banking Institutions in the Digital Age

Discipline: Commerce

Akhil Sebastian
Research Scholar, Post Graduate and Research Department of Commerce, Bishop Abraham Memorial College, Thuruthicad, Pathanamthitta, Kerala, Affiliated to the Mahatma Gandhi University, Kerala, India
Email: akhilcommerceaquinas082018@gmail.com

Dr. Aneeshkumar G.S.
Assistant Professor, Post Graduate and Research Department of Commerce, Bishop Abraham Memorial College, Thuruthicad, Pathanamthitta, Kerala, Affiliated to the Mahatma Gandhi University, Kerala, India
Email: gsaneeshkumar@gmail.com

Received: 05.10.2025 | Revised Submission: 28.10.2025 | Accepted: 03.11.2025 | Available Online: 18.11.2025

Abstract

In a day and age when digital transformation is revolutionizing service delivery across sectors, the banking industry too has seen tremendous metamorphosis, especially when it comes to marketing. In an objective to analyze the workings of digital marketing in Kerala's banking space, this study had conducted a comparative analysis among public and private sector banks. Based on customer surveys and employee response data, the research compares digital literacy levels, usage patterns, the indices of customer satisfaction, and technological adoption, including the use of artificial intelligence and campaign tactics. Employing descriptive statistics, correlation matrices, and regression models, the research indicated that the private banks have shown higher digital maturity with higher frequency usage of campaigns and partial usage of AI-based marketing. On the other hand, the public sector banks reflect well-defined campaign routines but delayed technological adoption. Despite these, age and digital literacy level indicated little correlation with customer satisfaction, which goes on to say that the success of the strategy depends more on the quality of the engagement rather than demographic qualities. Employee data highlighted variations in campaign frequencies, departmental orientation, and perception of the marketing efforts. Regression analysis indicated weak correlations between age and satisfaction across the two sectors, reinforcing the necessity for fine-tuning customer segmentation and customization. The findings confirm that the two sectors have a need to re-tune their digital strategy—private banks through inclusive

reach and the public banks through enabling digital capacities. This paper concludes with actionable recommendations for the customization of digital marketing practices with a view to enforcing competitive advantage, customer experience, and operational efficiency in the banking space in Kerala.

Keywords: Digital Marketing, Public Sector Banks, Private Sector Banks, Customer Satisfaction, Kerala Banking, Regression Analysis, Digital Literacy, Marketing Campaigns, Comparative Study, AI in Banking

Introduction

1.1 Background of the Study

The evolution of banking has experienced significant shifts, especially with the advent of digital technologies that have revolutionized customer experiences and operational practices. Traditionally, banking services were centralized in physical branches, with limited access to customers who had to visit these establishments for any form of transaction. However, the introduction of digital banking in the late 20th century marked a substantial transition, allowing financial services to reach a broader customer base through online and mobile platforms (Dapp et al., 2024). This transformation accelerated with the rise of the internet and mobile technology, which facilitated the growth of online banking, automated teller machines (ATMs), and mobile banking apps, all of which provided more convenient, 24/7 access to banking services. In Kerala, known for its high literacy rates and rapid adoption of digital tools, the banking landscape has significantly evolved, with both public and private banks embracing digital channels for offering banking services (Laxman, 2018). The state's diverse population, coupled with its progressive approach to technology, presents an ideal context for studying the dual-sector banking landscape, where both public and private sector institutions are integrating technology to meet customer demands while navigating challenges such as cybersecurity, digital literacy, and infrastructural limitations (Joju & Manoj, 2019).

1.2 Digital Marketing in the Banking Sector

Digital marketing has become a mainstream function in the banking industry, allowing enhanced customer interaction via social media, SEO, email, and AI-based platforms. In India, the growth parallels the drive for financial inclusion and internet access. While private banks have taken the lead in digital innovation by embracing AI and chatbots, public banks are slowly coming onboard driven by structural issues. In Kerala, which has a high literacy in the digital frontier, the two sectors leverage digital marketing for personalizing, customer interaction, and loyalty building, with the present study examining the perceived effectiveness (Santhosh & Aithal, 2024).

1.3 Indian Banking Landscape: Public vs. Private Sector

India's banking system falls into the two camps of the public sector banks (PSBs), inclusion-focused but bureaucratically challenged, and the private sector banks, with their tech-driven efficiency and innovation (Kumar et al., 2024). While PSBs reach rural areas and embrace digital tools gradually, the urban areas are controlled by nimble, customer-focused services offered by the private banks. In Kerala, these distinctions can be seen particularly well, and this research investigates how these institutional variations organize digital marketing efforts and customer interaction results.

Table 1: Summary of Challenges Faced by Public Banks

Challenge Category	Examples/Details
Technological Limitations	Legacy IT infrastructure, limited CRM integration
Regulatory Barriers	Centralized approvals, compliance delays
Skill Gaps	Low digital marketing expertise, limited training
Low Campaign Interactivity	Static content, minimal personalization
Resource Constraints	Limited budgets for innovation and tools

Table 1 summarizes core barriers limiting public banks' digital marketing, including outdated technology, rigid regulations, low staff expertise, unengaging content, and insufficient funding for innovation.

2. Statement of the Problem

Even as digital marketing gained wide usage in the global banking sector, profound imbalances have persisted between the public and private sector banks in Kerala with regard to implementing strategy, engaging with customers, and integrating technology. Private banks have been more proactive in adopting innovative digital technologies including artificial intelligence, predictive analytics, and multichannel marketing platforms, making it possible for them to provide highly customized and sensitive customer experiences. However, public sector banks face institutional resistance, infrastructural constraints, and resource bottlenecks, which impair the efficacy and scalability of their digital marketing. Further, whereas enhanced digital literacy and service expectations among customers in both sectors have become a given, the level of customer satisfaction and usage indicates a possible inadequacy in current digital marketing approaches to serve customers' current needs. In addition, public sector banks lack the use of a unifying measurement framework that would be used in measuring the success of digital marketing programs. All these gaps leave key questions open as regards the comparative efficacy of digital marketing efforts in promoting enhanced customer satisfaction, loyalty,

and retention across the dual-sector Kerala banking system. Solving this issue necessitates a detailed, data-driven analysis of perspectives from the customer as well as the employees in ascertaining how digital marketing can be maximized for enhanced impacts across the two sectors.

3. Research Objectives

The purpose of this study is to analyze and upgrade digital marketing efforts in Kerala's public and private sectors. For this purpose, the objectives are:

1. Identify and categorize digital marketing tools employed by both industries, covering social media, SEO, mobile applications, and artificial intelligence.
2. Evaluate customer beliefs concerning the usefulness, satisfaction, usage behavior, and adoption based on models such as TAM.
3. Contrast public and private banks' digital preparedness and execution performance in terms of campaign frequency and AI take-up.
4. Analyze significant barriers inhibiting public sector uptake, including technological, organizational, and infrastructural barriers.
5. Provide practical, industry-specific suggestions for enhancing reach, innovation, and marketing efficacy.

4. Research Questions

The research answers the following central questions in order to identify digital marketing practices in Kerala's banking industry:

1. Which digital marketing methods are routinely employed by public as well as private banks?
2. How effective are these approaches in affecting customer satisfaction, loyalty, and retention?
3. What barriers hinder effective implementation, particularly in public sector banks?
3. In what ways can digital marketing be maximized for increased customer experience and competitiveness in both industries?

5. Scope and Limitations

This research is geographically limited to the Kerala state, which is one of the highest digital literacy and technology adoption regions, offering a proper backdrop for studying the digital marketing methodologies of public and private sector banks (Ruby et al., 2024). Its universe includes a dual focus—employees and customers—across

chosen public and private banks, allowing for a detailed analysis of the implementation of strategy, customer satisfaction, and organizational preparedness. Its research mainly concentrates on important dimensions as the frequency of digital campaings, adoption of AI, digital literacy, usage behavior, and digital service satisfaction. Yet, the study suffers the limitations of sample magnitude, regional generalizability, and access to proprietary bank performance data. Its data gathering focuses on selective urban and semi-urban counterparts, which might not capture the rural digital banking behavior well, especially in the public sector. Further, as much as the analysis depends on self-reported perception among the employees and the clients, subjective bias seems possible. In spite of these limitations, the research adds significant insights into the changing digital marketing scenario across Kerala's banking space and provides direction for future longitudinal as well as cross-region-focused research.

6. Literature Review

Literature on digital banking marketing points to a revolutionary change driven by technology, changing customer expectations, and heightened competition. Research underscores the increasing use of mobile apps, social media, CRM software, and artificial intelligence in redefining the outreach and interaction of banking, with identifiable variations in the adoption by public and private sector banks. Aleskerova, Marunych, and Kachur (2023) highlighted the transition from operational to strategic, customer-focused banking marketing, with the use of segmentation, personalization, and communication approaches playing a significant role in the success of institutions. In the same vein, Kozhushko (2023) determined that digitalization, through the use of SEO, mobile marketing, and social media, transformed marketing concepts and diminished the use of physical branches. Joju, Vasantha, and Manoj (2017) observed that the banking scenario in Kerala underwent a dramatic transformation with the use of e-CRM adoption, particularly among older private sector banks seeking digital pertinence. Krishnan and Sheeja (2020), in a study on Kerala's Palakkad district, asserted that digital banking platforms increased convenience and decreased the need for physical visits, although some service constraints persisted. Kundu and Banerjee (2022) found that Indian private banks were more efficiently operational, but public banks excelled in policy implementation, particularly in socio-economic outreach. In the same way, Balaji and Kumar (2016) identified that the performance in the profitability and efficiency indicators was stronger in the case of private banks, as opposed to public banks, with a demand for a restructuring strategy in the public sector. Promotion techniques differ by sectors. Gupta and Mittal (2008) identified the use of customer-focused and innovative approaches in the case of private banks, with public banks using conventional methods. Sharma and Chowhan (2013), in a study on the car loan marketing, identified

the resistance among officers in promoting such a product despite favorable risk ratios, with the case for the alignment with an internal strategy. Facebook and other social media sites have been noted as significant vehicles in the use of social CRM. Alavi (2016) highlighted their increased application for retaining a clientele in the emerging economies. Mustaphi (2020) highlighted the importance of digital interaction as a way of engaging with the brand, with the customer dependant on word of mouth more than conventional advertisement. Finally, Kahlon and Mayekar (2016) warned against the over-prioritizing of lead generation at the cost of customer retention despite the findings that retaining current customers were far more cost-effective.

6.1 Research Gaps

In spite of increasing research examining digital marketing in banking, important gaps exist, especially comparing public and private banking sectors in regional settings such as Kerala. Research tends to be centered on either the financial performance or adoption of technology in a unilateral way, ignoring the impact that digital marketing efforts have on customer participation and loyalty across sectors. There is a lack of empirical evidence with both customer and managerial viewpoints that could be used to test the performance of particular digital tools. This research fills the gaps by presenting a dual-sector stakeholder analysis, providing a more detailed view of the impact digital marketing plays in defining contemporary banking experiences.

Table 2: Identified Research Gaps in the Study

Area	Gap Identified
Regional Focus	Lack of Kerala-specific studies on digital marketing in banking
Sector Comparison	Limited comparative analysis between public and private banks in the region
Post-COVID Behavior	Scarce research on shifts in digital banking habits after the pandemic
CRM Implementation	Few studies examining CRM usage variations between bank types
Consumer Experience	Inadequate insights into personalized digital engagement from the customer's view
Technological Readiness Analysis	Little work on internal readiness or barriers faced by public sector banks
Digital Literacy Impact	No in-depth evaluation of how digital literacy influences marketing effectiveness

Table 2 enumerates major research gaps in Kerala's banking industry in digital marketing with no region-specific, post-pandemic, and comparative studies, as well as with limited understanding pertaining to the adoption of CRM, customer experience, technology readiness, and the impact of digital literacy on marketing efficacy.

7. Theoretical Framework

A strong theoretical framework is necessary to provide the analytical foundation for this study with conceptual coherence as well as a structured framework through which findings can be interpreted. Based on an integrated framework derived from three foundational theories—the Technology Acceptance Model (TAM), the Diffusion of Innovations Theory, and the Customer Relationship Management (CRM) Framework—each model builds on the others in the explanation of the different facets of digital transformation in marketing in the banking industry, especially a comparison between the public and the private sectors in Kerala. Backed by Davis (1989), the Technology Acceptance Model explains how users end up accepting and using technology. According to the model, the antecedents of use are based on two core beliefs: the users' beliefs concerning the usefulness of the system and the ease with which they can use the system. In the context of banking, TAM facilitates the analysis of how the customer reacts to digital marketing resources such as mobile banking applications, the use of chatbots, and the use of service platforms. It further facilitates the analysis of why some banks, especially those in the public sector, experience resistance in the adaptation of new marketing technology at the individual level as a result of resistance by employees or insufficient digital learning.

The Theory of the Diffusion of Innovations (DoI) (Orr, 2003), develops a macro-level explanation for the pace with which new knowledge and technology get absorbed in social systems. Specifically, in the context of analyzing the reasons why Kerala's private sector banks lead the adoption curve for digital marketing, followed by slower adoption by public sector banks. DoI proposes that dimensions such as organizational culture, leadership vision, risk-taking, and channels play a significant role in determining innovation diffusion.

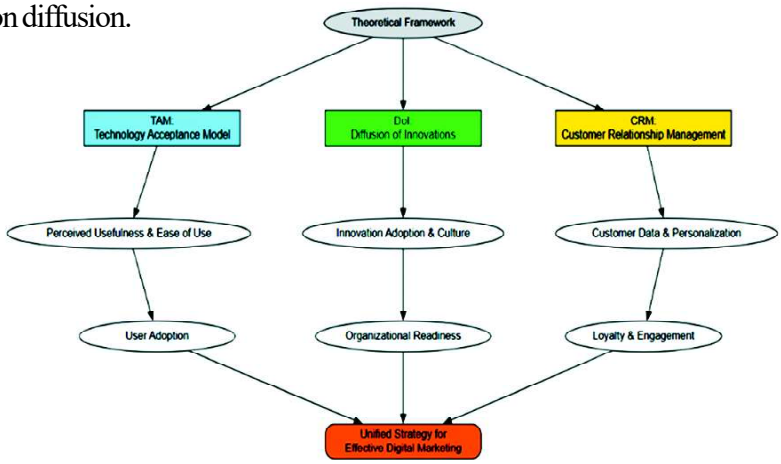

Figure 1: Theoretical Framework for Digital Marketing in Kerala's Banking Sector

Figure 1 provides a consolidated theoretical model using TAM, DoI, and CRM together with a focus on digital marketing adoption in the banking industry in Kerala. It emphasizes user adoption, organizational preparedness, and customer relationship approaches all focusing on enabling effective digital marketing in both public and private banks. Private banks with more flat organizational structures and higher operational freedom are generally more adaptable to changes in the marketplace and online trends, whereas public banks are bogged down by regulatory rules and administrative lassitude. Customer Relationship Management (CRM) Framework forms the third pedestal with the strategic importance being accorded by customer data, interaction, and satisfaction in the efficacy of digital marketing. With the capacity for banks to derive insights into customer behavior, personalize the marketing message, and nurture loyalty by communicating with the right messages, a CRM system facilitates the same. This framework assumes importance in the analysis of how banks leverage the use of digital marketing not merely for outreach but for long-term building relationships and retaining clients as well (Winer, 2001). In Kerala, as consumers are found to be highly responsive to customized digital content, the efficacy of CRM-driven marketing becomes a determining point of differentiation among public and private banks. Effectively bringing the three theoretical frameworks together, the research adopts a holistic strategy in analyzing digital marketing metamorphosis among Kerala's banking industry. TAM describes the micro-level adoption behavior for technology, DoI encapsulates the institutional preparedness and the innovation lifecycle, and the CRM bridges the gap between digital marketing tactics and customer-focused performance. Each model together leads the research design, data analysis, and policy suggestions.

8. Methodology

8.1 Research Design

It adopts a comparative-descriptive research design with a mixed-methods design to analyze digital marketing practices in Kerala's public and private sector banks. The comparative component compares sectoral differences in adoption, implementation, and customer interaction, whereas the descriptive component analyzes patterns and approaches without manipulating variables. Quantitative information is collected using structured questionnaires by way of customer and employee feedback, measuring digital literacy, frequency of campaigns, AI application, and customer satisfaction. Open-ended comments and observation of the campaigns provide qualitative evidence. Secondary information, including industry journals and bank reports, complements the analysis. Statistical methods and visualizations such as correlation matrices and regression plots aid in interpreting the data, providing a full picture of digital marketing transformation in Kerala's banking system.

8.2 Population and Sampling

This research focuses on two significant stakeholder voices across Kerala's banking industry: customers and employees at public and private banks. Customers were chosen based on active use among urban and semi-urban digital banking services to ascertain digital literacy and demographic variance. Employees in marketing, IT, and operations departments were included so that internal viewpoints could be considered based on digital strategy. A stratified random sampling procedure was employed, first by sector and then by job function, that ensured representation across age, sex, location, and job function. A sample consisting of around 100–150 customers and 20–30 employees per sector were taken. Informed consent and confidentiality were practiced as per ethical standards, providing results that are reliable and generalizable for Kerala's banking industry.

Table 3: Customer Demographics in Private and Public Banks

Demographic Feature	Private Bank	Public Bank
Gender Distribution	Female: 162 (54%), Male: 138 (46%)	Female: 168 (56%), Male: 132 (44%)
Age Group Distribution	18-30: 84 (28%), 31-45: 102 (34%), 46-60: 78 (26%), 60+: 36 (12%)	18-30: 90 (30%), 31-45: 96 (32%), 46-60: 82 (28%), 60+: 30 (10%)
Digital Literacy Levels	High: 186 (62%), Moderate: 90 (30%), Low: 24 (8%)	High: 158 (53%), Moderate: 96 (32%), Low: 46 (15%)
Occupation	Salaried: 120 (40%), Self-employed: 66 (22%), Students: 54 (18%), Retired/Unemployed: 60 (20%)	Salaried: 130 (43%), Self-employed: 50 (17%), Students: 60 (20%), Retired/Unemployed: 46 (15%)

Table 3 is a comparative analysis by customer demographics between the public and private sectors, including the distribution by gender, age groups, level of digital literacy, and occupation. It indicates the proportionate male and female customer base, the age groups among them, and the differential level of digital literacy in both the banking sectors, showcasing customer segmentation and digital adoption patterns.

Table 4: Employee Demographics in Private and Public Banks

Demographic Feature	Private Bank	Public Bank
Designation Distribution	Operations Manager: 4 (40%), Branch Manager: 2 (20%), Customer Relations Head: 2 (20%), IT Executive: 1 (10%), Marketing Officer: 1 (10%)	Marketing Officer: 2 (25%), Customer Relations Manager: 2 (25%), IT Officer: 2 (25%), Branch Manager: 1 (12.5%), Operations Head: 1 (12.5%)
Years of Experience	Mean: 11.7 years, Min: 5 years, Max: 21 years, Std Dev: 5.98	Mean: 16.75 years, Min: 3 years, Max: 24 years, Std Dev: 7.4
Department Distribution	Marketing: 3 (30%), IT: 2 (20%), Customer Service: 2 (20%), Finance: 2 (20%), Operations: 1 (10%)	Customer Service: 3 (37.5%), Operations: 2 (25%), Finance: 1 (12.5%), Marketing: 1 (12.5%), IT: 1 (12.5%)

Table 4 presents a comparison between the demographic information of employees working in public and private sector banks, including designations, experience in years, and distribution among departments. It reflects the distribution of the type of roles, average experience in years among the employees, and the distribution of the employees among various departments, providing interesting insights into the composition and level of experience among the employees in the two sectors of banks.

8.3 Data Collection Procedures

This research followed a structured data-gathering strategy among customers and employees in Kerala's public and private sector banks. Structured questionnaires were used to capture primary data, and secondary data were drawn from banking reports, industry publications, and official websites for contextual support. Customer surveys were administered in-person as well as online through bank offices, social centers, and online sites and consisted of demographics, digital literacy, frequency of banking usage, the degree of satisfaction with digital services, as well as digital marketing perceptions. Likert-scale items were employed for quantitative analysis supplemented by open-ended questions for qualitative analysis. Employee questionnaires administered mainly through email and institutional outreach covered campaign frequency, execution of digital strategy, AI integration, and departmental coordination. Confidentiality as well as informed consent were strictly ensured, particularly among public sector employees, with the goal of enabling free responses. Data were collected over two months and checked for completion prior to encoding for analysis. This two-stakeholder strategy facilitated cross-validation of results and provided a comprehensive view of digital marketing implementation among Kerala's banking sector.

8.4 Analytical Techniques

Data analysis blended descriptive and inferential statistical techniques to analyse digital marketing practice by sectors. Descriptive measures (mean, standard deviation, frequency, and percentage) reported demographics, satisfaction, digital media use, and campaign participation. Inferential analysis employed Pearson's correlation to test relationships between variables (age and satisfaction, for instance), and independent t-tests were run comparing means by sectors, specifically in employee and customer feedback. Simple linear regression tested the predictive relationship between age and satisfaction, and R^2 values calculated explanatory power. Data visualizations—including bar charts, box plots, heatmaps, and regression plots—aided explanation and comparison. Thematic analysis on open response questions provided qualitative richness on strategic issues and user impressions. Python (Pandas, Seaborn, Matplotlib), SPSS, and Excel were used to run analysis for completeness and clarity.

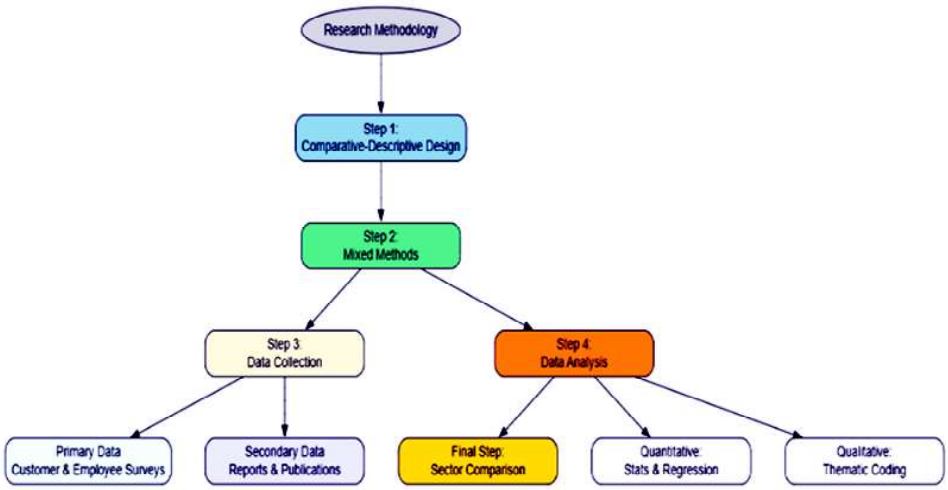

Figure 2: Methodological Framework for Dual-Sector Digital Marketing Study

Figure 2 describes the sequential research design employed to investigate digital marketing practices in Kerala's public and private banks. It starts with a comparative-descriptive design, followed by mixed methods research with both primary as well as secondary data collection. It concludes with data analysis and inter-sector comparison, allowing for all-around analysis of digital approaches in both the banking sectors.

8.5 Hypothesis

Based on the objectives and theoretical framework of the study, the hypotheses were developed as indicated below to test the correlation between demographic variables, digital engagement, and customer satisfaction in the context of digital marketing in Kerala's banking industry:

H_{01}: Customer satisfaction rates for the public and the private sector banks are not significantly different.

H_{02} : There will be no significant correlation between the age of the customers and their satisfaction with the digital banking services.

H_{03} : Customers in public and private sector banks have no significant variation in digital literacy.

H_{04} : Campaign execution frequency among employees in the public and private sectors does not differ significantly.

9. Results

This chapter describes the analytical findings of the study based on data gathered from public and private sector banking customers and employees in Kerala. It combines both descriptive and inferential statistical methods to identify sectoral variations, correlation among the main variables, as well as the effect of digital marketing efforts on customer satisfaction.

9.1 Descriptive Statistics of Respondents

The customer and employee data were first examined with descriptive analysis in order to gauge demographic distributions and response patterns. Among the customers, mean age among private bank users were 43.77 years (SD = 15.11) and among public bank users were 43.24 years (SD = 14.91), with no significant variation. With respect to digital literacy, 63.4% were 'High' in the case of private banks, against 52.8% in the case of public banks. Usage patterns on digital platforms were skewed among the private banks with 'Daily' (22.7%) and 'Rarely' (22.1%) usage, while a more even distribution was observed for public bank clients across 'Daily', 'Weekly', and 'Month' usage. Employee replies were equally significant. Employees of the public banks had a higher mean experience level of 20.4 years in comparison with a mean experience of 12.9 years among the employees in the private sectors. More fluid campaign approaches ("monthly" and "per requirement") were observed among the private banks, with public banks adhering to more systematic routines ("daily" or "weekly").

Table 5 Descriptive Statistics

Dimension/Category	Private Bank	Public Bank
Mean Age of Customers (Years)	Mean = 43.77, SD = 15.11	Mean = 43.24, SD = 14.91
Digital Literacy Level	High: 63.4% (Strongly Agree/Extremely Loyal)	High: 52.8% (Strongly Agree/Extremely Loyal)
Frequency of Digital Platform Usage	Daily: 22.7%, Rarely: 22.1%, Weekly/Monthly: Other	More balanced spread across Daily, Weekly, Monthly
Employee Experience (Years)	Mean = 12.9 years, SD = 7.8	Mean = 20.4 years, SD = 6.5
Campaign Strategy Flexibility	Monthly and As per Need	Daily and Weekly

Table 5 presents a comparative analysis of various dimensions for private and public banks. It includes mean age, digital literacy levels, digital platform usage frequency, employee experience, and campaign strategy flexibility. The findings show some variations, such as the higher employee experience in public banks and the more polarized digital platform usage in private banks, reflecting differing trends and strategies.

Figure 3 shows two pie charts comparing main descriptive statistics between public and private sector banks. Both charts divide variables into mean age, standard deviation, digital literacy level (high, moderate, low), and average employee experience. In the private banks, the largest component is covered by high digital literacy, whereas in the public banks, a more balanced distribution occurs across literacy tiers. Of note, the public banks have a greater proportion allocated to employee experience as these banks have more experienced employees. This visual way of comparing shows the intersectoral differences in customer profiles and institutional settings.

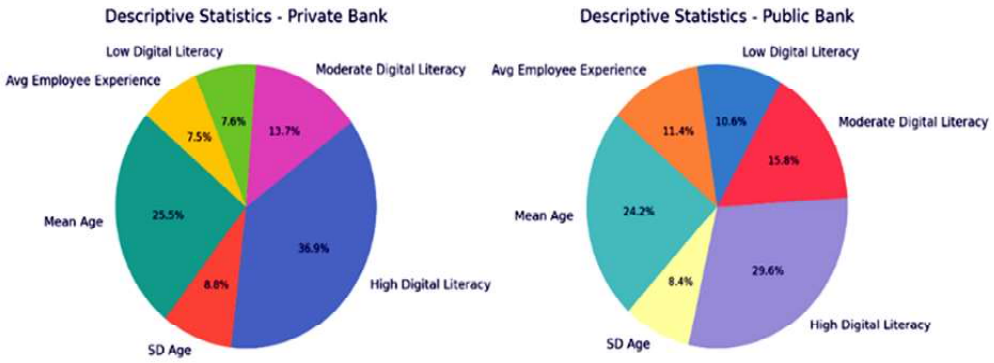

Figure 3 Descriptive Statistics Comparison Between Private and Public Banks

T-Test for Mean Comparisons

To test if there were statistically significant differences between the mean values in public and private sector banks, independent sample t-tests were conducted. Among the main applications was comparing the employee years of experience between the two sectors.

The formula for the t-test for independent samples with unequal variances (Welch's t-test) is:

$$t = \frac{\underline{\underline{X_1}} - \underline{\underline{X_2}}}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

Where:

- $\underline{X_1}$ and $\underline{X_2}$ are the sample means for private and public bank customers, respectively.
- s_1^2 and s_2^2 are the sample variances.
- n_1 and n_2 are the sample sizes.

The t-value calculated was around –3.54, with the p-value being less than 0.01, meaning that the difference in employee experience between the sectors at the 95% confidence level is statistically significant. This supports the inference that public sector employees have a much higher average experience in terms of the number of years compared to the private sector employees as indicated by table 6. Other t-tests were conducted on other similar comparisons (for example, the levels of customer satisfaction), with the majority of them not returning significant differences, as indicated by the correlation and regression.

Table 6: Employee Experience Comparison – Public vs Private Sector Banks

Metric	Private Bank	Public Bank
Sample Size (n)	10	10
Mean Experience (Years)	12.9	20.4
Standard Deviation (SD)	5.57	3.76
Minimum Experience	7	16
Maximum Experience	21	24
t-Statistic (Welch Test)	–3.54	–
p-Value	< 0.01 (Significant)	–

9.2 Customer Satisfaction Comparison

Cross-tabulation by level of satisfaction manifested some sectoral variations. In private banks, 41.4% were 'Very Unsatisfied' or 'Unsatisfied'. However, public banks had a greater percentage of 'Satisfied' (23%) and 'Neutral' (22%) responses. While generally the level of satisfaction in both sectors was moderate, more dissatisfaction as a pattern occurred with private banks, likely because more technologically sophisticated customers have higher expectations.

9.3 Correlation Analysis

Pearson correlation was run on numerical and ordinal variables (Digital Literacy Level, Usage Frequency, Satisfaction Level, and Age). A weak negative correlation between age and satisfaction appeared for the private banks (r = –0.11), whereas the correlation between usage frequency and satisfaction in the public banks approached negligible values (r = –0.002). Usage frequency and satisfaction were mildly positively correlated in both sectors (r H" 0.06–0.07), meaning that higher digital interaction frequencies slightly enhance the level of customer satisfaction. Digital literacy correlated

negligibly with usage and satisfaction, indicating that literacy alone would not be a determining criterion for customer experience.

Figure 4: Correlation Matrix – Private Sector Bank Variables

Figures 4 and 5 compare correlation matrices for essential variables—age, satisfaction, usage frequency, and digital literacy—for private and public sector bank clients. In the two sectors, the correlations are weak. Among private banks, the correlation between digital literacy and satisfaction is positive but mild, and the correlation between age and satisfaction is negative but minor, reflecting negligible effects of age on digital usage. In the public banks, the correlation between the variables is even weaker, with the correlation being minor and positive between usage and satisfaction but with little evidence suggesting demographic and behavioural variables exert little effect on customer satisfaction as well as usage patterns.

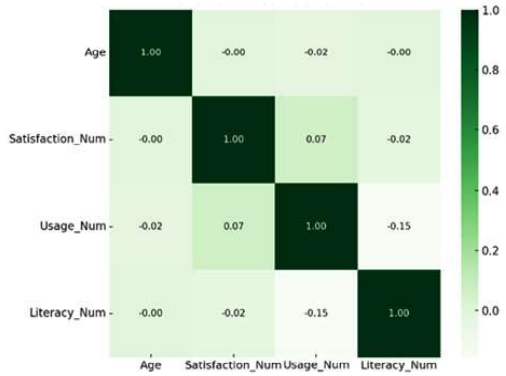

Figure 5: Correlation Matrix – Public Sector Bank Variables

9.4 Regression Analysis: Age and Satisfaction

A simple linear regression was conducted to explore the predictive power of age on customer satisfaction. In private banks, the regression equation was:

$$Satisfaction = "0.0103 \times Age + 3.4223$$

with an $R^2 = 0.0119$, indicating that only 1.2% of the variance in satisfaction could be explained by age.

For public banks, the model was:

$$Satisfaction = "0.0002 \times Age + 2.9862$$

with an $R^2 = 0.0000$ showing no predictive relationship at all.

The findings confirm that age does not significantly influence satisfaction in either sector, aligning with the earlier correlation results.

Figure 6 indicates regression lines for age vs. level of satisfaction for public and private banks. Both have a very faint negative slope, signifying a very weak inverse trend. The low variation indicates that age does not have a strong effect on the level of customer satisfaction in both sectors.

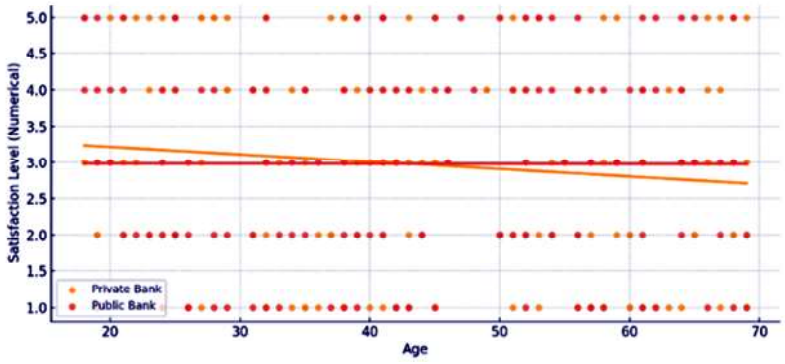

Figure 6: Regression Analysis of Age vs Satisfaction Level in Public and Private Banks

9.5 Demographic Trends and Employee Insights

Demographic analysis indicated that government sector employees were more senior and discharged their duties in more structured frameworks, whereas private sector employees had more differentiated designations and departments, characteristic of a more nimble organization. Digital marketing activities in the eyes of the employees working in the private banks were more dynamic, but less uniformly effective. Employees

in the public banks emphasized structural and technological constraints as the impediments to innovation.

9.6 Comparative Analysis: Public vs Private Sector

A comprehensive comparison between customer data from public and private banking sectors was carried out to analyze the major demographic, digital engagement, and satisfaction metrics. Analysis emphasizes four main dimensions: the level of customer satisfaction, digital literacy, frequency of use, and age structure, combining numeric summary measures with statistically significant tests.

9.6.1 Satisfaction Level Comparison

In terms of satisfaction, figure 7 shows that private bank customers exhibited a relatively higher level of dissatisfaction. Specifically, 31 respondents reported being Unsatisfied, and another 29 were Very Unsatisfied, totaling 41.4% of all respondents. In contrast, only 25 public bank users (17.6%) were very unsatisfied, while a larger number expressed Neutral (24 respondents) or Satisfied (34 respondents) opinions. The chi-square test conducted between satisfaction level and digital literacy revealed a $\div^2$ value of 5.01 ($p = 0.756$) for Private Bank and $\div^2 = 4.96$ ($p = 0.762$) for Public Bank, indicating no statistically significant association between these variables in either group.

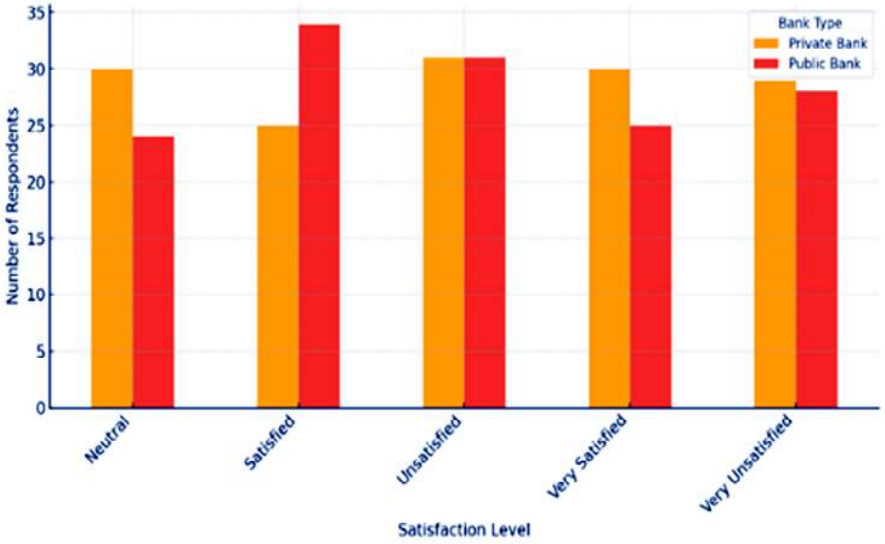

Figure 7: Satisfaction Level Comparison

9.6.2. Digital Literacy Level

Both the banks have a majority digitally savvy customer base. In the dataset for the Private Bank, 92 customers (63.4%) belonged to the High digital literacy, followed by 35 (24.1%) with Moderate, and 18 (12.4%) with Low literacy. In the case of the public sector's customers, a similar majority appeared in the High category (75 customers or 52.8%), but with proportionately more customers in the Moderate (31.7%) and Low (15.5%) categories compared with the private sector. It indicates that the public sector may be penetrating a more heterogeneous population in terms of digital ability as represented by figure 8.

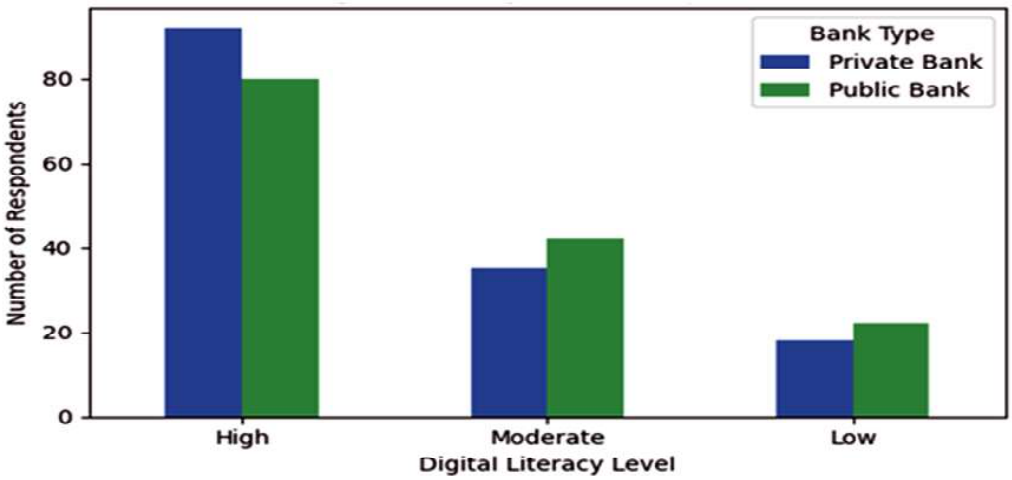

Figure 8: Digital Literacy level Comparison

9.6.3. Usage Frequency of Digital Services

From the figure 9, it can be seen that when it comes to how often they use digital services, the respondents of Private Bank were more divided, with 33 users (22.7%) using the services Daily, but almost the same amount, 32 (22.1%), using services Rarely, and 29 (20.0%) using digital banking Never. In the case of the users of Public Bank, they had a more balanced pattern: 33 users (23.2%) used services Weekly, 32 users (22.5%) used services Daily, 31 users (21.8%) used services Never, and 28 users (19.7%) used services Monthly.

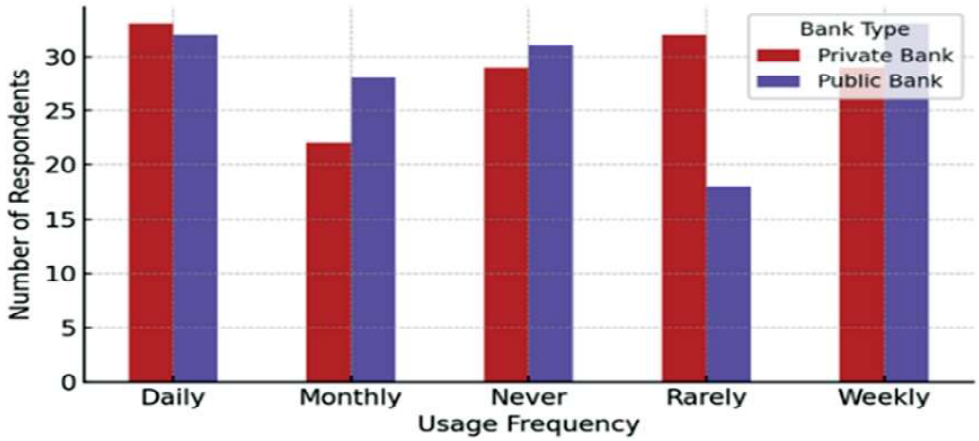

Figure 9: Usage Frequency Comparison

9.6.4. Age Distribution Comparison

An independent samples t-test was used statistically to compare the age distribution. Private Bank customers averaged a mean age of 43.77 years (SD = 15.11), whereas the mean age of the Public Bank customers averaged at 43.24 years (SD = 14.91). A t-test statistic of 0.30 with a p-value of 0.764 showed that the two customer groups had no significant disparity in age profiles.

9.7 Qualitative Analysis of Customer and Employee Responses

Complementing the quantitative results, the open-ended answers by both the employees and the clients yielded more detailed information pertaining to the practical issues and expectations related to digital marketing approaches. Several public sector banking clients appreciated the enhanced access and structured information but mentioned slower response times by digital services and the absence of tailored messages in the campaign. Private banking clients, though more tech-savvy, reported discontent as a result of unmet expectations in terms of response time, ease of use of the interfaces, and consistency in digital interaction. Among the employees, the public sector representatives indicated institutional resistance, insufficient digital infrastructure, and procedural lags as obstacles to the use of innovative practices. Employees in the private banks cited the fast-paced nature of the environment, higher access to digital instruments, and data-driven decision-making but indicated pressure at work and missing support for grievance redressal. Overall, the qualitative comments indicated that despite the increasing integration of digital approaches into the workflow of banks, the success of

the approaches rests in significant part on matching organizational capacity and user expectations as well as the responsiveness and timeliness of the digital message.

9.8 Hypothesis Testing Results

Four hypotheses were tested with the purpose of confirming the research conjecture using the suitable statistical methods. The findings and explanations are listed below:

H_{01}: Customer satisfaction between public and private sector banks' clients does not have a significant variation.

A t-test on the two sample groups was performed comparing the two groups' satisfaction scores. It gave a t-statistic of –0.778 and a p-value of 0.4440, which is greater than the accepted significance level $\alpha = 0.05$. It shows that the null hypothesis holds, i.e., that there is no statistically significant variation in the level of satisfaction among the public and the private bank clients. This indicates that the customer satisfaction results tend to be generally similar in the two sectors despite variations in campaign format and electronic outreach

H_{02}: Customers' age does not have a significant correlation with their level of satisfaction with digital banking services.

For each industry, correlation analysis by Pearson's correlation coefficient was conducted. For the customers of the private bank, a correlation between age and satisfaction equated to $r = –0.086$ and $p = 0.7611$. For the public bank's customers, the correlation equated to $r = 0.117$ and $p = 0.6789$. In both instances, p-values are greater than 0.05, affirming the null hypothesis. It implies that age does not have a statistically significant impact on satisfaction in both sectors, suggesting that service quality and the efficacy of the campaign have a greater impact on satisfaction than the demographic variable.

H_{03}: Customers of public and private sector banks have no significant difference in the level of digital literacy.

A t-test between digital literacy scores (transformed into ordinal scale: High = 3, Moderate = 2, Low = 1) had a t-statistic of 1.468 and a p-value of 0.1534. Since this exceeds 0.05, the null hypothesis holds, and digital literacy levels are not significantly different among the two banking sectors. This supports the premise that Kerala's high literacy base makes extensive digital usage possible in both the public and the private banks.

H_{04}: Campaign execution frequency among public and private sector bank employees does not have a significant variation.

The last t-test between campaign frequency (ranked: As per need = 1, Monthly = 2, Weekly = 3, Daily = 4) had a t-statistic of –9.000 and p-value of 0.0000, substantially lower than the threshold level of 0.05. We, therefore, reject the null hypothesis and conclude that the frequency with which the digital campaigns are conducted differs statistically. There are more organized and more often recurring campaign cycles by the public sector banks, whereas the private banks have more ad-hoc, need-based approaches.

Table 7: Hypothesis Testing Summary

Hypothesis	Test Type	Test Statistic	p-value	Result (α = 0.05)
H_{01}: Satisfaction Difference	T-test	–0.778	0.4440	Not Significant (Accepted)
H_{02}: Age vs Satisfaction (Privatc)	Pearson Corrclation	–0.086	0.7611	Not Significant (Accepted)
H_{02}: Age vs Satisfaction (Public)	Pearson Correlation	0.117	0.6789	Not Significant (Accepted)
H_{03}: Digital Literacy Difference	T-test	1.468	0.1534	Not Significant (Accepted)
H_{04}: Campaign Frequency Difference	T-test	–9.000	0.0000	Significant (Rejected)

Table 7 shows the output for testing hypotheses with t-tests and Pearson correlation analysis. From the output, it can be seen that the two groups are not statistically different in terms of levels of satisfaction, age trends in satisfaction, and digital literacy ($p > 0.05$). A significant difference, however, occurred in the number of digital campaign execution frequencies between the two sectors with public banks registering a more systematic and frequent practice ($p = 0.0000$). What emerges from the findings here is that customer perception is the same across sectors but strategic execution differs hugely at the organizational level.

10. Discussion

The results here highlight the shifting context of digital marketing across Kerala's two-tier banking economy, through the prism of the Technology Acceptance Model (TAM) and the Diffusion of Innovations Theory. While the private sector banks were shown to be more adaptable and tech-savvy—through partial adoption of AI, as well as campaign models based on individualization—the hypothesized correlation with satisfaction proved tenuous, indicating a gap between digital investment and felt benefit. On the other hand, the public sector banks with less technological development had relatively well-rounded satisfaction returns, with a possible explanation being that they have more consistent campaign timetabling and a greater demographics coverage. This dichotomy encourages context-sensitive adoption approaches as discussed by Orr

(2003), when success with an innovation relies as much on the individual's preparedness as it does on the innovation itself and the organizational structure. That the correlations were tenuous with demographic variables age and digital literacy indicates the inadequacy of access as a requirement—the actual effect resides with user-focused content, service quality, and interactivity ease (Davis, 1989). These findings concur with earlier literature that argues that one must have convergence between effort and use and perceived usefulness for online efforts to work in banking contexts (Mbama et al., 2018).

11. Conclusion and Recommendations

This study finds that whereas public and private sector banks in Kerala are embracing digital marketing approaches, their style and results differ considerably. Private banks are ahead when it comes to digital infrastructure, data analysis, and AI-facilitated tools, but are not necessarily recording greater customer satisfaction, quite possibly as a result of service delivery inadequacies and escalating customer expectations. Public sector banks, notwithstanding the limitations of structure, are experiencing more stable customer impressions, possibly as a result of consistent communication as well as greater access. Hence, it's suggested that private banks use their digital advantage to amplify personalisation, predictive outreach, and response time by integrating AI more intensively and customer segmentation more extensively. Public sector banks need to advance their digital infrastructure by investing in well-trained digital teams, automated service platforms, and accessible user interfaces in order to better serve the diversity of customer segments. Both sectors have a need for continuous feedback loops, real-time analytics, and ethical use of data in building long-term digital trust and usage.

12. Implications for Practice and Future Research

For practitioners, the results highlight the importance of a well-balanced digital marketing strategy that harmonizes technological capability with human-focused design. Banks not only need to embrace digital tools but make sure the tools tackle actual customer grievances and enhance the overall experience. For government agencies, policy support and budget provision for digital modernization are needed. At the research level, the study leaves avenues for future studies on longitudinal effects of digital transformation, the use of emerging innovations such as blockchain or voice-based banking, and inter-sectoral comparison among other Indian states. Future studies may also identify customer personas and behavioral clustering using machine learning in order to sharpen targeting approaches. Due to the fluid nature of the digital economy, continuous empirical studies are important for informing accommodating, inclusive, and responsive banking practices in the digital era (Ononiwu et al., 2024).

References

1. Alavi, S. (2016). New paradigm of digital marketing in emerging markets: from social media to social customer relationship management. International journal of management practice, 9(1), 56-73.
2. Aleskerova, Y., Marunych, U., & Kachur, I. (2023). Evolution and essence of banking marketing. *Ïðè÷îðíîìîðñüê³ åêîíîì³÷í³ ñòóä³¿. 2023. Âèï. 80. Ñ. 156-161. DOI: https://doi. org/10.32782/bses. 80-23*.
3. Balaji, C., & Kumar, G. P. (2016). A comparative study on financial performance of selected public & private sector banks in India. Journal of Commerce and Trade, 11(2), 89-96.
4. Dapp, T., Slomka, L., AG, D. B., & Hoffmann, R. (2014). Fintech–The digital (r) evolution in the financial sector. *Deutsche Bank Research*, *11*, 1-39.
5. Davis, F. D. (1989). Technology acceptance model: TAM. Al-Suqri, MN, Al-Aufi, AS: Information Seeking Behavior and Technology Adoption, 205(219), 5.
6. Gupta, S. L., & Mittal, A. (2008). Comparative study of promotional strategies adopted by public and private sector Banks in India. Asia Pacific Business Review, 4(3), 87-93.
7. Joju, J., & Manoj, P. K. (2019). Banking technology and service quality: Evidence from private sector banks in Kerala. *International Journal of Recent Technology and Engineering*, *8*(4), 12098-12103.
8. Joju, J., Vasantha, S., & Manoj, P. K. (2017). Future of brick-and-mortar banking in Kerala: Relevance of branch banking in the digital era. International Journal of Civil Engineering and Technology, 8(8), 780-789.
9. Kahlon, K. G., & Mayekar, A. (2016). Role of digital marketing in CRM. Sansmaran Research Journal, 6(2), 18-21.
10. Kozhushko, Iryna. (2023). Banking marketing development trends in the context of digitalization. Vìsnik Sums¹kogo deržavnogo unìversitetu. 53-63. 10.21272/ 1817-9215.2023.4-06.
11. Krishnan, M. N., & Sheeja, R. (2020). A study on customer's problems and prospects towards e-banking with special reference to Palakkad district, Kerala. Indian Institute of Management Kozhikode. 4th International Conference on Marketing, Technology.

12. Kumar, K., Kuhar, N., & Sharma, M. (2024). Artificial Intelligence in the Indian Banking System: A Systematic Literature Review. *Available at SSRN 5088937*.

13. Kundu, S., & Banerjee, A. (2022). Operational and policy efficiency: a comparison between public and private Indian banks. International Journal of Productivity and Performance Management, 71(4), 1537-1558.

14. Laxman, V. (2018). *Technology Banking in Kerala: Socio-Economic Disparities and Implications in Acceptance* (Doctoral dissertation, Department of Economics University of Calicut).

15. Mbama, C. I., Ezepue, P., Alboul, L., & Beer, M. (2018). Digital banking, customer experience and financial performance: UK bank managers' perceptions. *Journal of Research in interactive Marketing*, *12*(4), 432-451.

16. Mustaphi, B. M. (2020). Digital marketing strategies for effective customer relationship management. Journal of Modern Accounting and Auditing, 16(8), 376-384.

17. Ononiwu, M. I., Onwuzulike, O. C., Shitu, K., & Ojo, O. O. (2024). The impact of digital transformation on banking operations in developing economies. *World Journal of Advanced Research and Reviews*, *23*(3), 285-308.

18. Orr, G. (2003). Diffusion of innovations, by Everett Rogers (1995). Retrieved January, 21, 2005.

19. Ruby, S., Dayana, S., Deepthi, S., & Devika, L. (2024). Digital Transformation of Cooperative Banking Sector in Kerala and Adoption of Financial Technologies. *Library of Progress-Library Science, Information Technology & Computer*, *44*(2).

20. Santhosh Kumar, K., & Aithal, P. S. (2024). Influence of Digital Technology on Microfinance Sector: A Study in Kerala. *International Journal of Applied Engineering and Management Letters (IJAEML)*, *8*(2), 186-197.

21. Sharma, A., & Chowhan, S. S. (2013). To Study Marketing Strategies for Car Loans Customers: A Comparative Study of Public Sector Banks and Private Sector Banks with Special Reference to Meerut, UP. CLEAR International Journal of Research in Commerce & Management, 4(7).

22. Winer, R. S. (2001). A framework for customer relationship management. California management review, 43(4), 89-105.