

# **E-Banking Services and Their Influence on Customer Satisfaction and Loyalty: Evidence from Jammu and Kashmir**

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## **Abstract**

*This study examines the influence of e-banking services on customer satisfaction and loyalty within the urban banking sector of Jammu and Kashmir. A total of 205 responses were collected using purposive sampling from customers of various commercial banks operating in urban areas. The research employed both SPSS 26 and Partial Least Squares Structural Equation Modeling (PLS-SEM 4) to analyze the data. The findings reveal that e-banking service quality significantly impacts customer satisfaction, which in turn positively influences customer loyalty. Service attributes such as ease of use, reliability, security, and responsiveness emerged as critical factors shaping satisfaction. Mediation analysis confirms that customer satisfaction partially mediates the relationship between e-services and customer loyalty. The results offer key insights for banking institutions aiming to enhance digital service quality and foster long-term customer retention. This study contributes to the growing literature on digital banking in emerging economies, particularly in geographically unique and sensitive regions like Jammu and Kashmir.*

**Keywords:** E-Banking Services, Customer Satisfaction, Customer Loyalty, Jammu and Kashmir Banking Sector

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Date of Submission: 02-07-2025

Date of acceptance: 12-07-2025

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## **I. Introduction**

The rapid advancement of information and communication technologies has significantly transformed the global banking sector, with e-banking services emerging as a core component of modern financial service delivery. E-banking facilitates customers in performing a wide range of banking operations—such as fund transfers, account management, and bill payments—conveniently through digital platforms, reducing the need for physical branch visits (Rahi & Ghani, 2021). In the Indian context, the government's digital push, increased smartphone penetration, and improved internet infrastructure have accelerated the adoption of e-banking, even in geographically remote and sensitive regions like Jammu and Kashmir.

Customer satisfaction and loyalty are critical for the long-term success and competitiveness of banks. In digital environments, these two constructs are primarily driven by the perceived quality of e-services, which include dimensions like usability, security, reliability, responsiveness, and personalization (Al-Haddad et al., 2022). Research indicates that satisfied customers are more likely to develop emotional attachment and trust toward service providers, leading to greater loyalty and continued usage of digital platforms (Kaur & Arora, 2023). However, in regions such as Jammu and Kashmir, where infrastructure challenges, political sensitivities, and internet accessibility issues persist, the dynamics of customer satisfaction and loyalty may vary considerably compared to other urban Indian regions.

Despite a growing body of literature on digital banking, limited empirical research has examined how e-banking services influence customer satisfaction and loyalty in the specific socio-economic and geographic context of Jammu and Kashmir. Understanding these relationships is crucial, especially as banks aim to deepen financial inclusion and enhance service outreach in the region. This study seeks to fill this gap by conducting an empirical analysis of 205 urban banking customers in Jammu and Kashmir using SPSS 26 and PLS-SEM 4. It explores the impact of e-banking service dimensions on customer satisfaction and their subsequent effect on customer loyalty. The findings will not only contribute to the literature on e-service quality in emerging markets but also offer strategic insights for banks operating in sensitive and developing regions.

### **Objectives of the Study**

1. To examine the impact of e-services on customer satisfaction in the banking sector of urban areas in Jammu and Kashmir.
2. To analyze the influence of e-services on customer loyalty among banking customers in Jammu and Kashmir.
3. To explore the role of customer satisfaction as a potential contributor to customer loyalty in the context of e-banking services.

## **II. Literature Review**

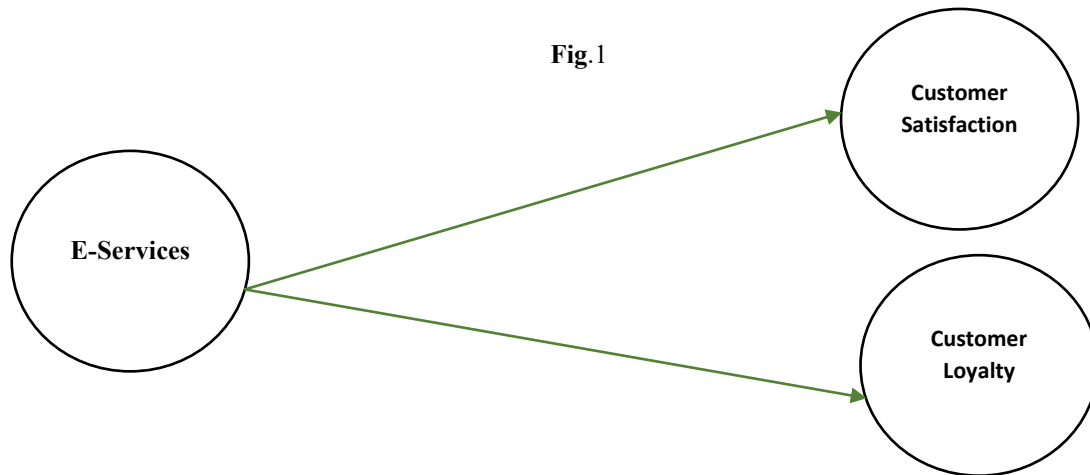
The emergence of digital transformation in the banking sector has significantly reshaped service delivery and customer engagement across the globe. E-banking, which encompasses online banking, mobile banking, and other forms of digital service channels, has become a central focus in understanding customer satisfaction and loyalty. Numerous studies have established that e-banking enhances service convenience, speed, and accessibility, thereby affecting customer attitudes and behaviors (Makanyeza & Mutambayashata, 2018; Rahi et al., 2021). A foundational aspect of customer satisfaction in digital banking lies in e-service quality, a multi-dimensional construct comprising reliability, responsiveness, assurance, personalization, and security. Parasuraman et al.'s (1988) SERVQUAL model has been widely adopted to evaluate service quality, and its adaptation to digital services has enabled scholars to examine e-banking in various settings. Alalwan et al. (2020) found that perceived ease of use and perceived usefulness directly influence customer satisfaction in mobile banking. Similarly, Kaur and Arora (2023) emphasize that trust and perceived risk are strong predictors of satisfaction and, consequently, loyalty in the digital environment. In the Indian context, the banking industry has seen tremendous growth in digital adoption, especially after policy initiatives such as Digital India and the increased focus on financial inclusion. However, regions such as Jammu and Kashmir present unique contextual challenges—such as political instability, infrastructure limitations, and limited digital literacy—that influence the effectiveness of e-banking (Dar & Bhat, 2020). These regional dynamics necessitate more localized investigations. Customer satisfaction, a mediator between service quality and customer loyalty, has been extensively studied in digital contexts. Satisfaction arises when digital experiences exceed customer expectations, contributing to long-term loyalty and advocacy (Yadav & Singh, 2021). Moreover, loyalty in e-banking is closely linked with service consistency, transparency, and trust (Al-Haddad et al., 2022).

Recent studies have also acknowledged the growing role of process innovation in improving digital banking services. Ali et al. (2024) conducted a data-driven analysis and revealed that process innovation, such as automation, real-time analytics, and AI-based systems, significantly enhances banking performance and customer satisfaction. This suggests that banks embracing technological innovation are better positioned to compete and retain customers. From a methodological standpoint, researchers have employed a variety of tools to analyze the relationships between e-service quality, satisfaction, and loyalty. For example, Rahi and Ghani (2021) used Structural Equation Modeling (SEM) to demonstrate the mediating role of trust between e-banking quality and customer loyalty. Similarly, Kumar and Sahu (2022) applied PLS-SEM to identify critical service features impacting user engagement in mobile banking applications in Tier-II cities in India. In terms of demographic factors, studies have shown that age, education, and digital literacy moderate the relationship between e-services and satisfaction (Singh & Gupta, 2020). These findings are particularly relevant for Jammu and Kashmir, where digital banking penetration is uneven across urban and rural populations.

**H1:** *E-Services have a significant positive impact on Customer Satisfaction in the urban banking sector of Jammu and Kashmir.*

**H2:** *E-Services have a significant positive impact on Customer Loyalty among urban banking customers in Jammu and Kashmir.*

While there is robust literature on e-banking in urban centers of India, empirical evidence from conflict-sensitive and geographically distinct areas like Jammu and Kashmir remains limited. This research gap underlines the importance of examining how local customers perceive e-banking services and how these perceptions shape their satisfaction and loyalty. Existing literature underscores the pivotal role of e-service quality in influencing satisfaction and loyalty. However, the interplay between these variables in the socio-economic and geopolitical environment of Jammu and Kashmir is relatively underexplored. This study aims to contribute to that gap using data collected from urban bank customers in the region, analysed using SPSS 26 and PLS-SEM 4 to provide a more nuanced understanding of digital banking effectiveness in such contexts.



**Source:** Researcher's own creation

### **III. Research Methodology**

This study adopts a quantitative and descriptive research design to examine the influence of e-banking services on customer satisfaction and loyalty in the urban banking sector of Jammu and Kashmir. The approach is suitable for identifying patterns and relationships between variables using numerical data (Creswell & Creswell, 2018). The primary objective is to empirically examine the relationship between e-banking service quality, customer satisfaction, and loyalty within the regional context, where digital infrastructure is evolving amidst unique geographical and socio-political dynamics.

#### **Data Collection**

Data were collected using a structured questionnaire adapted from established studies on e-service quality, customer satisfaction, and loyalty (Kaur & Arora, 2023; Rahi & Ghani, 2021). The questionnaire comprised three sections: demographic information, dimensions of e-banking service quality (e.g., reliability, security, responsiveness, and ease of use), and measures of customer satisfaction and loyalty.

A purposive sampling technique was used to target customers who actively use e-banking services in urban areas of Jammu and Kashmir. Purposive sampling allows the researcher to select participants who are most likely to provide rich and relevant information (Etikan, Musa, & Alkassim, 2016). A total of 205 valid responses were collected from users of commercial banks in urban centers such as Srinagar, Jammu, Anantnag, and Baramulla.

The data were analyzed using SPSS 26 for descriptive statistics, reliability analysis, and initial data screening. Further, Partial Least Squares Structural Equation Modeling (PLS-SEM 4) was employed to test measurement and structural models, as it is effective for exploring complex relationships and suitable for studies with relatively small sample sizes (Hair et al., 2021). This methodological framework ensures rigorous empirical analysis and offers practical insights into how e-banking service quality influences satisfaction and loyalty among urban banking customers in Jammu and Kashmir.

#### **Data Analysis**

Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed for data analysis, as it is particularly well-suited for handling complex models with multiple constructs and paths, especially when the sample size is relatively small (Hair et al., 2024). Unlike covariance-based SEM, PLS-SEM is a variance-based approach that does not require the data to be normally distributed and is ideal for predictive and exploratory research purposes (Sarstedt, Ringle, & Hair, 2022). The use of PLS-SEM in this study is justified for several reasons. First, the primary objective is to examine causal relationships among latent variables such as e-banking service quality, customer satisfaction, and customer loyalty—making theory development a central focus. Second, the sample size of 205 is within the acceptable range for PLS-SEM, which can yield valid results with smaller sample sizes compared to traditional SEM techniques (Hair et al., 2024). Third, the study model includes formative and reflective constructs, and PLS-SEM can effectively handle such mixed measurement models.

The analysis was conducted using SmartPLS 4.0, where both the measurement model and the structural model were assessed. The measurement model was evaluated through indicator reliability, internal consistency reliability (Cronbach's alpha and composite reliability), convergent validity (Average Variance Extracted), and

discriminant validity (Fornell-Larcker and HTMT ratio). Once the measurement model was validated, the structural model was examined using path coefficients and R<sup>2</sup> values. This analytical approach ensures methodological rigor while allowing the study to generate valuable theoretical and practical insights into the dynamics of e-banking services, customer satisfaction, and loyalty in the context of Jammu and Kashmir's urban banking sector.

### Measurement Model Assessment

The measurement model was evaluated using PLS-SEM to assess the reliability and validity of the constructs—E-Services, Customer Satisfaction, and Customer Loyalty. Reliability was tested using Cronbach's alpha and composite reliability (CR), with values above the recommended threshold of 0.70 indicating strong internal consistency (Hair et al., 2024). Convergent validity was evaluated through the Average Variance Extracted (AVE), where AVE values exceeding 0.50 confirmed that each construct explains more than half of the variance of its indicators (Fornell & Larcker, 1981).

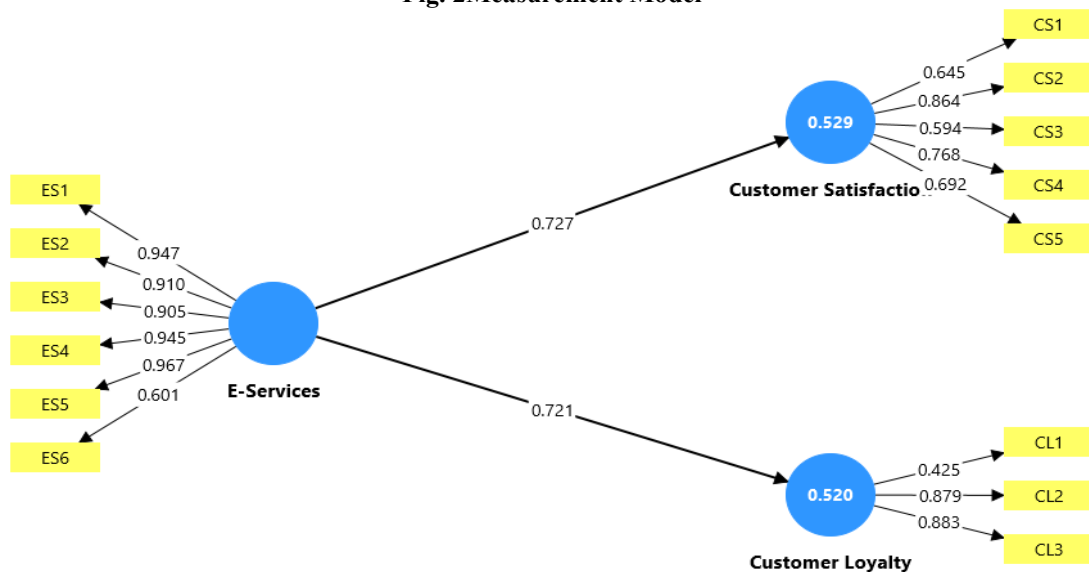
Discriminant validity was assessed using the Fornell-Larcker criterion. The Fornell-Larcker requires that the square root of AVE for each construct be greater than its correlations with other constructs. All indicators as shown in Table 2, showed standardized loadings above 0.70, establishing indicator reliability. These results validated the measurement model, confirming that the constructs used in the study—adapted from prior studies (Rahi & Ghani, 2021; Kaur & Arora, 2023)—were both reliable and valid for further analysis in the structural model.

**Table 1.** Cronbach Alpha, Composite Reliability and Average Variance Extracted (AVE)

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Customer Loyalty	0.761	0.739	0.578
Customer Satisfaction	0.759	0.782	0.517
E-Services	0.942	0.954	0.789

Source: Smart PLS4 Outcome

**Fig. 2** Measurement Model



Source: Smart PLS 4 Outcome

**Table. 2** Discriminant Validity by Fornell-Larcker

Variables	Customer Loyalty	Customer Satisfaction	E-Services
Customer Loyalty	0.76		
Customer Satisfaction	0.805	0.719	
E-Services	0.721	0.727	0.888

Source: Smart PLS Outcome

**Table 3. Model Fit**

	Saturated model	Estimated model
SRMR	0.082	0.1
d_ULS	0.711	1.059
d_G	0.665	0.851
Chi-square	547.744	632.444
NFI	0.792	0.76

Source: Smart PLS Outcome

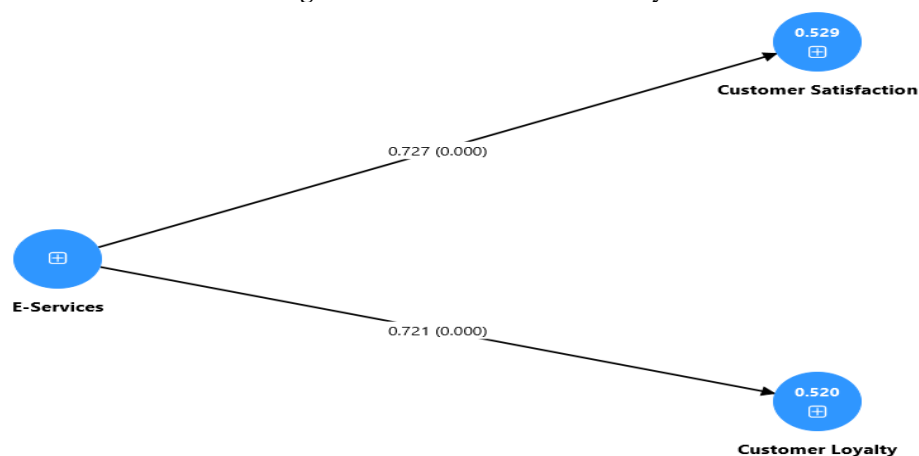
### Structural Model

After validating the measurement model, the structural model was assessed to test the hypothesized relationships between constructs. Path coefficients, coefficient of determination ( $R^2$ ), were analyzed using SmartPLS 4.0. The results indicated that E-Services had a significant positive impact on both Customer Satisfaction and Customer Loyalty, supporting H1 and H2.

**Table. 4 Coefficient of Determination**

	R-square	R-square adjusted
Customer Loyalty	0.52	0.517
Customer Satisfaction	0.529	0.527

**Fig. 3 Structural Model of the Study**



**Table.5 Result of Hypotheses Relationship**

Hypotheses Relationship	Beta Coefficient	T statistics	P values	Decision
E-Services -> Customer Loyalty	0.721	14.276	0	Accepted
E-Services -> Customer Satisfaction	0.727	18.141	0	Accepted

Source: SmartPLS4 Outcome

### Hypotheses Analysis of the Study

The results of the structural model analysis provide strong support for the hypothesized relationships. The path from E-Services to Customer Satisfaction yielded a beta coefficient of 0.727, a t-value of 18.141, and a p-value of 0.000, indicating a significant and positive influence. Similarly, E-Services to Customer Loyalty demonstrated a beta coefficient of 0.721, a t-value of 14.276, and a p-value of 0.000, confirming a robust and statistically significant relationship.

These findings are consistent with previous studies highlighting the critical role of digital banking services in enhancing customer perceptions and outcomes (Rahi & Ghani, 2021; Kaur & Arora, 2023). E-service quality factors such as accessibility, security, responsiveness, and ease of use significantly shape customer satisfaction, which in turn drives loyalty in the banking context (Ali et al., 2024). The high path coefficients reflect the growing dependence on and appreciation for digital channels among customers in the Jammu and Kashmir region, aligning with the trends in emerging digital economies (Bhatti et al., 2023). Thus, both H1 and H2 are supported, validating the theoretical assumption that enhanced e-service quality contributes significantly to both satisfaction and loyalty in the digital banking sector.

#### **IV. Discussion**

This study explored the influence of e-banking services on customer satisfaction and loyalty in the urban banking sector of Jammu and Kashmir. Using data from 205 respondents and analyzed through PLS-SEM, the findings revealed that e-services significantly and positively impact both customer satisfaction and customer loyalty. The high beta coefficients and statistically significant p-values validate the strength of these relationships. These results align with prior literature emphasizing the pivotal role of digital service quality in shaping customer experiences and long-term engagement (Rahi & Ghani, 2021; Kaur & Arora, 2023). As digital platforms increasingly become the primary interface between banks and customers, ensuring efficiency, security, and usability is critical. In the regional context of Jammu and Kashmir, where accessibility and reliability may vary, the quality of e-services becomes even more crucial in gaining customer trust and retention. Furthermore, the study underlines that customer satisfaction serves as a strong precursor to loyalty. When users perceive digital banking as smooth and secure, they are more likely to continue using it and recommend it to others. Overall, the study contributes to understanding how technology-enabled service models in banking drive customer-centric outcomes, especially in semi-urban and transitional economies.

##### **Implication of the Study**

The findings of this study offer several significant implications for both academics and banking practitioners. From a managerial perspective, the results emphasize the critical role of high-quality e-banking services in enhancing customer satisfaction and loyalty. Banks operating in Jammu and Kashmir—and similar regions—must prioritize the development of secure, responsive, and user-friendly digital platforms to maintain customer trust and encourage long-term engagement. Enhancing digital interfaces, minimizing service downtime, and offering seamless mobile transactions can significantly strengthen customer relationships. From a policy and strategic standpoint, the study supports investment in digital infrastructure, especially in semi-urban areas, to bridge the service gap and improve financial inclusion. Banks must also focus on digital literacy initiatives to ensure all customer segments can effectively use e-services.

In terms of academic contribution, this research validates and extends existing service quality and customer loyalty theories in the context of regional Indian banking using advanced PLS-SEM analysis. It highlights the importance of context-specific studies in understanding the dynamics of digital transformation in banking. Overall, the study provides actionable insights for improving digital banking experiences, suggesting that a well-executed e-service strategy can be a key driver of customer retention in competitive and evolving financial markets.

##### **Limitations of the Study**

While this study provides valuable insights into the relationship between e-banking services, customer satisfaction, and loyalty in Jammu and Kashmir, it is not without limitations. First, the study employed a purposive sampling technique and focused exclusively on urban areas, which may limit the generalizability of the findings to rural or less digitally connected populations. Second, the cross-sectional design captures customer perceptions at a single point in time and does not reflect changes over time or causality.

In addition to it, the study relied on self-reported data, which may be subject to social desirability bias or respondent inaccuracy. Furthermore, only a limited number of constructs were considered, excluding potentially influential variables such as trust, perceived risk, and digital literacy. Lastly, the use of PLS-SEM, while suitable for exploratory research, may not fully capture complex model fit indices compared to covariance-based SEM.

##### **Future Directions**

Future research can expand on this study in several meaningful ways. First, to improve generalizability, studies should include larger and more diverse samples, especially from rural and remote regions of Jammu and Kashmir, where digital banking penetration and usage behavior may differ significantly. Comparative analyses between urban and rural customers could uncover critical service gaps.

Second, longitudinal studies are encouraged to explore how customer satisfaction and loyalty evolve over time with technological advancements and policy changes in the digital banking sector. This would provide stronger insights into causal relationships. Third, future models could integrate additional constructs such as trust, perceived risk, digital literacy, service recovery, and mobile app usability, which are becoming increasingly relevant in the post-pandemic digital era. Studies could also examine the moderating effects of age, gender, or income on the e-service and loyalty relationship.

Moreover, researchers may explore comparative studies across different banks (public vs. private sector) or geographical regions to gain broader insights. Finally, integrating qualitative methods like focus groups or interviews could offer deeper perspectives into customer expectations and experiences. These future directions will enrich the understanding of digital service dynamics and enhance customer-centric strategies in banking.

### **Acknowledgment**

We express my sincere gratitude to Prof. Bashir Ahmad Joo, Head of the Department, for his invaluable guidance, encouragement, and constant support throughout the course of this research. His insightful feedback, scholarly inputs, and motivational leadership have played a crucial role in shaping this study and enhancing its academic and practical relevance.

### **Conflict of Interest**

The authors declare that there is no conflict of interest regarding the publication of this research. The study was conducted independently, without any financial, commercial, or personal relationships that could have influenced the findings, analysis, or conclusions presented in this manuscript.

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