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The Impact of Fintech Innovation on Banking Performance: An Empirical Study

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Abstract
The rapid development of financial technology (FinTech) is transforming the banking sector by changing the way financial services are delivered, managed, and experienced by customers. This study examines the direct impact of four dimensions of FinTech innovation—Digital Payment Innovation, Digital Lending Innovation, Artificial Intelligence and Automation, and Blockchain Innovation—on four dimensions of banking performance, namely Operational Efficiency, Market Competitiveness, Customer Satisfaction, and Financial Performance. The study adopted a quantitative, descriptive, and cross-sectional research design. Data were collected using a structured questionnaire based on a five-point Likert scale. From 523 responses received, 455 valid responses were retained for the final analysis after excluding 68 incomplete or unusable responses. The data were analyzed using reliability analysis, exploratory and confirmatory factor assessment, and Structural Equation Modeling (SEM). The measurement results demonstrated satisfactory reliability and validity, with Cronbach's alpha, Composite Reliability, factor loadings, and Average Variance Extracted exceeding recommended levels. The structural model supported all four proposed hypotheses. Digital Payment Innovation had a significant positive effect on Operational Efficiency ($\beta = 0.612$, $p < 0.001$), while Digital Lending Innovation significantly influenced Market Competitiveness ($\beta = 0.574$, $p < 0.001$). Artificial Intelligence and Automation demonstrated a significant positive effect on Customer Satisfaction ($\beta = 0.638$, $p < 0.001$), and Blockchain Innovation significantly influenced Financial Performance ($\beta = 0.601$, $p < 0.001$). The findings highlight that different FinTech innovations contribute to distinct dimensions of banking performance. The study provides useful implications for banking managers and policymakers in aligning technology investments with operational, competitive, customer-oriented, and financial objectives.

Keywords: FinTech Innovation; Digital Payment Innovation; Digital Lending; Artificial Intelligence; Banking Performance

1. Introduction

The rapid advancement of financial technology (FinTech) has fundamentally transformed the structure, delivery, and management of banking services. Technological developments in digital payments, digital lending, artificial intelligence (AI), automation, blockchain, cloud computing, and data analytics have created new opportunities for banks to improve operational processes

and respond to changing customer expectations. FinTech has increasingly moved beyond being a supporting technological function and has become an important strategic capability through which financial institutions seek to improve efficiency, competitiveness, customer experience, and financial outcomes. Vives (2019) describes digital disruption as a major transformation of the banking industry, driven by technological innovation, changing customer behavior, and the emergence of new digital competitors. Consequently, traditional banks are increasingly required to integrate innovative technologies into their business models while maintaining security, reliability, regulatory compliance, and customer trust.

One of the most visible dimensions of FinTech transformation is Digital Payment Innovation. The rapid adoption of mobile banking, internet banking, real-time payments, digital wallets, QR-based payments, and other electronic payment mechanisms has changed the way customers conduct financial transactions. Digital payment technologies can reduce dependence on manual processes, accelerate transaction processing, and facilitate the delivery of banking services through multiple channels. In the Indian banking context, Saroy et al. (2023) found that digital payment adoption has important implications for banking-sector efficiency, particularly through its influence on cost-related efficiency. Similarly, Lee et al. (2021) demonstrated that FinTech innovation can contribute to improvements in bank efficiency. These findings suggest that digital payment innovation is not simply a mechanism for providing customer convenience but can also contribute to improvements in internal operational performance. Therefore, examining the relationship between Digital Payment Innovation and Operational Efficiency is important for understanding how payment-related technological developments translate into organizational benefits.

Another important area of FinTech transformation is Digital Lending Innovation. Conventional lending processes are frequently associated with extensive documentation, manual verification, lengthy processing periods, and considerable customer effort. Digital lending technologies can simplify loan applications, facilitate electronic documentation, automate credit assessment, and accelerate lending decisions. These developments can improve accessibility and convenience while allowing banks to process credit applications more efficiently. Cuadros-Solas et al. (2023) examined alternative digital lending and its relationship with bank performance and highlighted the increasing importance of digital lending within the banking environment. Further, Cuadros-Solas et al. (2024) examined the effect of FinTech lending on bank market power and stability, demonstrating that digital lending has implications for the competitive structure of banking markets. These developments indicate that digital lending should be considered not only as a service innovation but also as a potential source of competitive advantage. Banks capable of delivering faster, more convenient, and digitally integrated lending services may be better positioned to differentiate their offerings and respond to changing market conditions.

Artificial Intelligence and Automation represent another significant component of contemporary banking innovation. Banks increasingly employ AI and automated technologies for customer service, fraud detection, credit assessment, risk management, personalized recommendations, transaction monitoring, and routine operational activities. AI can process large volumes of information rapidly and support the delivery of more responsive and personalized services. The customer-facing applications of AI are particularly relevant because customer expectations increasingly emphasize speed, convenience, availability, and personalization. Pawaskar and Nattuvathuckal (2024) examined the application of AI and machine learning in banking and its relationship with customer satisfaction, while Shaikh et al.

(2024) examined customer satisfaction with AI-enabled banking services in India. These studies emphasize the potential of AI to reshape interactions between banks and their customers. At the operational level, Kumar and Jain (2025) examined AI and operational efficiency in Indian public-sector banks, highlighting the relevance of AI-enabled technologies to banking processes. Thus, AI and automation have the potential to influence both the efficiency of service delivery and the quality of customer experiences. In the present study, particular attention is given to the relationship between AI and Automation and Customer Satisfaction.

Blockchain Innovation constitutes a further dimension of FinTech transformation with potential implications for banking performance. Blockchain provides a distributed and tamper-resistant mechanism for recording and verifying transactions and can potentially improve transparency, security, traceability, and data integrity. Within banking, blockchain applications may extend to transaction settlement, cross-border payments, trade finance, identity management, record keeping, and other financial processes. Almadadha (2025) provides empirical evidence concerning the relationship between blockchain and financial performance among major Australian banks. The growing literature on blockchain also identifies opportunities and challenges associated with its implementation within the banking sector, including technological integration, regulatory requirements, scalability, interoperability, and implementation costs. These considerations make it important to examine whether blockchain-related innovation is associated with measurable financial outcomes rather than considering blockchain solely from a technological perspective.

The broader literature provides increasing evidence that FinTech innovation can influence bank efficiency and performance. Lee et al. (2021) investigated the relationship between FinTech innovation and bank efficiency, while Wang et al. (2020) examined whether FinTech can improve commercial-bank efficiency using a big-data perspective. More recent research has continued to investigate the relationship between FinTech development and banking performance. He et al. (2026), for example, examined whether technological development associated with FinTech improves bank performance. Goel (2026) similarly investigated FinTech advancement and banking efficiency, while Li et al. (2026) examined FinTech and bank efficiency from a dynamic network perspective. These studies collectively indicate that technological transformation has become increasingly relevant to the performance and strategic positioning of banking institutions.

Despite this growing body of research, FinTech is a broad and multidimensional phenomenon, and different technologies may influence different dimensions of banking performance. Treating FinTech innovation as a single aggregate construct may therefore conceal important differences between technological applications and their organizational consequences. Digital payments may primarily influence transaction and process efficiency, digital lending may influence competitive positioning, AI and automation may directly affect customer experiences, and blockchain may influence financial and process outcomes. Recent studies on digital banking have similarly examined relationships between digital banking, customer satisfaction, operational efficiency, and financial performance, reinforcing the need to investigate technology-specific outcomes (Mohan Babu et al., 2026; Parmar & Dhamiliya, 2026).

Against this background, the present study examines the direct relationships between specific FinTech innovations and distinct dimensions of banking performance. The study focuses on four relationships: Digital Payment Innovation and Operational Efficiency, Digital Lending

Innovation and Market Competitiveness, Artificial Intelligence and Automation and Customer Satisfaction, and Blockchain Innovation and Financial Performance. By examining these relationships separately, the study seeks to provide a more specific understanding of how different FinTech applications contribute to different aspects of banking performance.

The study makes an empirical contribution by moving from a broad conceptualization of FinTech innovation toward a technology-specific assessment of banking outcomes. It also provides practical relevance for banking managers by identifying the performance areas associated with particular technological innovations. Understanding these relationships can assist banks in aligning technological investments with strategic objectives rather than adopting FinTech technologies without clearly defined performance outcomes. Furthermore, the study contributes to the emerging literature on FinTech and banking by providing evidence from the banking-sector context and by simultaneously examining operational, competitive, customer-oriented, and financial dimensions of performance.

The transformation of banking through FinTech is likely to remain an important area of academic and managerial attention. The increasing integration of digital payment systems, digital lending platforms, AI and automation, and blockchain technologies is changing how banks operate and compete. The central issue is therefore no longer whether banks should engage with FinTech, but how specific technological innovations are associated with particular dimensions of banking performance. The present study addresses this issue by empirically examining four direct relationships between FinTech innovation and banking performance, thereby providing a focused framework for understanding the strategic significance of technological innovation in contemporary banking.

2. Literature Review

2.1 FinTech Innovation and Banking Transformation

Financial technology (FinTech) has emerged as a major force influencing the structure and functioning of the banking industry. The integration of digital technologies into financial services has changed traditional approaches to payment processing, lending, customer service, transaction management, and financial operations. Vives (2019) explains that digital disruption has altered the competitive structure of banking by enabling new technologies and digital entrants to challenge established banking models. FinTech innovation therefore represents more than the introduction of new technological tools; it involves the transformation of banking processes, service delivery mechanisms, and competitive strategies.

Empirical research increasingly demonstrates that FinTech can influence bank efficiency and performance. Wang et al. (2020) examined the relationship between FinTech development and commercial-bank efficiency and highlighted the role of technological innovation in improving banking efficiency. Similarly, Lee et al. (2021) found that FinTech innovation can contribute to improvements in bank efficiency, particularly through technological and cost-related mechanisms. More recent research continues to examine this relationship from different perspectives. He et al. (2026) investigated whether technological development associated with FinTech improves bank performance, while Goel (2026) examined the relationship between FinTech advancement and banking efficiency. Li et al. (2026) further examined FinTech and bank efficiency using a dynamic network perspective. Collectively, these studies suggest that

FinTech innovation can generate measurable organizational benefits, although the nature and magnitude of these benefits may vary according to the technology implemented and the performance dimension examined.

The literature also suggests that FinTech should be examined as a multidimensional phenomenon. Digital payments, digital lending, AI, automation, and blockchain have different technological characteristics and address different banking requirements. Consequently, understanding the specific relationship between individual FinTech innovations and particular dimensions of banking performance can provide more meaningful insights than considering FinTech as a single broad construct.

2.2 Digital Payment Innovation and Operational Efficiency

Digital payment innovation has become one of the most important components of banking-sector transformation. Mobile banking, internet banking, real-time payments, digital wallets, QR-based payments, and other electronic payment technologies have reduced dependence on conventional transaction mechanisms. Digital payments can automate transaction processing, reduce paperwork, improve transaction speed, and allow customers to access banking services without relying extensively on physical branches.

Saroy et al. (2023) examined digital payment adoption in the Indian banking sector and provided evidence concerning its implications for banking efficiency. Their findings highlight the importance of digital payment technologies in improving cost-related efficiency, although the benefits may differ across dimensions of efficiency. This suggests that digital payment adoption can create operational benefits when technological systems are effectively integrated into banking processes.

The broader FinTech literature supports this relationship. Lee et al. (2021) demonstrated that FinTech innovation can improve bank efficiency, while Wang et al. (2020) identified the role of FinTech in improving commercial-bank efficiency. Digital payment innovation can contribute to operational efficiency through several mechanisms, including faster transaction processing, reduced manual intervention, lower transaction costs, improved resource utilization, and greater scalability of banking operations. Therefore, digital payment technologies represent an important mechanism through which banks can enhance operational performance.

Based on this literature, the following hypothesis is proposed:

H1: Digital Payment Innovation has a significant positive effect on Operational Efficiency in the banking sector.

2.3 Digital Lending Innovation and Market Competitiveness

Digital lending has transformed traditional credit-delivery processes by introducing online loan applications, automated documentation, digital customer verification, algorithm-supported credit assessment, and faster loan processing. These developments can reduce customer effort and processing time while increasing the accessibility and convenience of lending services.

Cuadros-Solas et al. (2023) examined the effect of alternative digital lending on bank

performance using cross-country and bank-level evidence. Their research highlights the increasing importance of digital lending within the competitive banking environment. Digital lending can allow banks to respond more rapidly to customer requirements and provide credit services through digital channels.

The competitive implications of digital lending are further emphasized by Cuadros-Solas et al. (2024), who examined whether FinTech lending affects bank market power and stability. Their study demonstrates that the expansion of FinTech lending can influence the competitive dynamics of the banking market. While external FinTech lenders may create competitive pressure for traditional banks, banks that successfully develop their own digital lending capabilities can use technology to improve service differentiation, speed, accessibility, and customer reach.

Arya and Sharma (2023) also emphasize the growing importance of digital lending and its relationship with banking performance in India. Digital lending can therefore be viewed as both a service innovation and a strategic competitive capability. Banks capable of providing convenient, rapid, and digitally integrated lending services may be better positioned to respond to market changes and changing customer expectations.

Accordingly, the following hypothesis is proposed:

H2: Digital Lending Innovation has a significant positive effect on Market Competitiveness in the banking sector.

2.4 Artificial Intelligence, Automation and Customer Satisfaction

Artificial Intelligence and Automation have become increasingly important in banking because of their ability to process large volumes of information, automate routine activities, support decision-making, and personalize customer interactions. Banks use AI for chatbots, virtual assistants, fraud detection, credit assessment, recommendation systems, customer analytics, and automated service delivery.

Pawaskar and Nattuvathuckal (2024) examined AI and machine learning in banking from a customer-satisfaction perspective and highlighted the importance of AI-enabled services in shaping customer experiences. Similarly, Shaikh et al. (2024) investigated customer satisfaction with banking services delivered through AI in India. These studies indicate that AI can influence customer experiences by improving responsiveness, convenience, service availability, and interaction quality.

AI and automation can improve customer satisfaction through faster responses and reduced waiting times. Automated systems can provide services continuously, while AI-based analytical systems can enable banks to understand customer requirements and provide more personalized services. At the same time, the effectiveness of AI depends on system reliability, accuracy, usability, privacy, and the availability of appropriate human support.

Kumar and Jain (2025) examined AI and operational efficiency in SBI and PNB, demonstrating the relevance of AI not only to customer-facing services but also to internal banking operations. Thus, AI and automation have the potential to simultaneously transform internal processes and

external customer interactions. In the present study, the focus is specifically on the customer-oriented outcome.

Therefore, the following hypothesis is proposed:

H3: Artificial Intelligence and Automation has a significant positive effect on Customer Satisfaction in the banking sector.

2.5 Blockchain Innovation and Financial Performance

Blockchain represents another important FinTech innovation with potential implications for banking performance. Its distributed architecture can support transaction verification, transparency, data integrity, security, and traceability. Potential banking applications include payment settlement, cross-border transactions, trade finance, identity management, and transaction-record management.

Almadadha (2025) provides empirical evidence concerning the relationship between blockchain and financial performance in major Australian banks. The study highlights the potential contribution of blockchain-related technological capabilities to financial outcomes. Blockchain can potentially influence financial performance through improvements in transaction efficiency, security, transparency, fraud reduction, and process management.

Recent literature also emphasizes the broader role of blockchain in banking. The systematic review *The Impact of Blockchain on the Banking Sector* (2026) discusses blockchain applications and implementation challenges, while *Banking in the Age of Blockchain and FinTech* (2025) considers blockchain and FinTech within an efficiency-oriented banking framework. These studies suggest that blockchain should be evaluated not simply as an emerging technology but in terms of its contribution to organizational and financial outcomes.

However, blockchain implementation may require substantial technological investment and organizational adaptation. Issues involving interoperability, scalability, regulatory requirements, cybersecurity, and integration with existing systems may affect the realization of benefits. Nevertheless, the growing empirical and conceptual evidence supports examining the relationship between blockchain innovation and financial performance.

Accordingly, the following hypothesis is proposed:

H4: Blockchain Innovation has a significant positive effect on Financial Performance in the banking sector.

2.6 Research Gap

The existing literature establishes a broad relationship between FinTech innovation and banking efficiency, performance, customer outcomes, and competitive dynamics. However, much of the literature examines FinTech at an aggregate level or focuses on individual technologies separately. There is comparatively less research that simultaneously examines different FinTech innovations against distinct dimensions of banking performance within a single empirical framework.

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The present study addresses this gap by examining four direct relationships: Digital Payment Innovation and Operational Efficiency, Digital Lending Innovation and Market Competitiveness, Artificial Intelligence and Automation and Customer Satisfaction, and Blockchain Innovation and Financial Performance. This technology-specific approach recognizes that different FinTech applications may generate different types of organizational outcomes. By examining these relationships within a common empirical framework, the study contributes to a more differentiated understanding of how FinTech innovation influences contemporary banking performance.

3. Objectives of The Study

1.To examine the effect of Digital Payment Innovation on Operational Efficiency in the banking sector.

2.To assess the impact of Digital Lending Innovation on Market Competitiveness in the banking sector.

3.To examine the effect of Artificial Intelligence and Automation on Customer Satisfaction in the banking sector.

4.To assess the impact of Blockchain Innovation on Financial Performance in the banking sector.

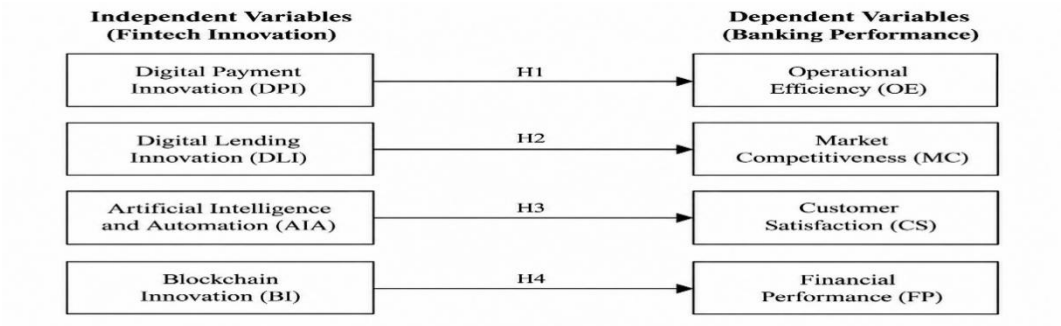


Figure 1: Conceptual Framework of The Study

4. Hypothesis of the study

1. H1: Digital Payment Innovation has a significant positive effect on Operational Efficiency in the banking sector.

2. H2: Digital Lending Innovation has a significant positive effect on Market Competitiveness in the banking sector.

3. H3: Artificial Intelligence and Automation has a significant positive effect on Customer Satisfaction in the banking sector.

4. H4: Blockchain Innovation has a significant positive effect on Financial Performance in the banking sector.

5. Methodology

The study adopted a quantitative, descriptive, and cross-sectional research design to examine the direct impact of FinTech innovation on banking performance. The study focused on four dimensions of FinTech innovation: Digital Payment Innovation (DPI), Digital Lending Innovation (DLI), Artificial Intelligence and Automation (AIA), and Blockchain Innovation (BI). These dimensions were examined against four banking performance outcomes: Operational Efficiency (OE), Market Competitiveness (MC), Customer Satisfaction (CS), and Financial Performance (FP). Data were collected from employees working in different types of banking institutions, including public-sector, private-sector, foreign, cooperative, and small-finance banks. A structured questionnaire was used as the primary data-collection instrument. The questionnaire consisted of two sections: demographic characteristics and 32 measurement statements covering the eight constructs, with four items for each construct. All measurement items were assessed using a five-point Likert scale, ranging from 1 = Strongly Disagree to 5 = Strongly Agree. From 523 responses received, 68 responses were excluded because of incomplete or unusable information, resulting in 455 valid responses for the final analysis.

The collected data were analyzed using SPSS and Structural Equation Modeling (SEM) to evaluate the measurement and structural models. Initially, descriptive statistics were used to summarize the characteristics of the respondents and study variables. The reliability of the constructs was assessed using Cronbach's alpha and Composite Reliability (CR), while convergent validity was examined through factor loadings and Average Variance Extracted (AVE). The Kaiser–Meyer–Olkin (KMO) measure and Bartlett's test of sphericity were used to assess the suitability of the data for factor analysis. Discriminant validity was evaluated using the Heterotrait–Monotrait (HTMT) ratio. Subsequently, SEM was employed to test the four hypothesized direct relationships: DPI → OE, DLI → MC, AIA → CS, and BI → FP. The significance of the structural paths was assessed using standardized path coefficients (β), standard errors, critical ratios/t-values, and p-values, while R^2 values were examined to determine the explanatory power of the respective FinTech innovation dimensions on banking performance outcomes. No mediation or moderation effects were examined in the present study.

6. Discussion

7. Discussion

The present study examined the direct effects of four dimensions of FinTech innovation—Digital Payment Innovation (DPI), Digital Lending Innovation (DLI), Artificial Intelligence and Automation (AIA), and Blockchain Innovation (BI)—on four dimensions of banking performance, namely Operational Efficiency (OE), Market Competitiveness (MC), Customer Satisfaction (CS), and Financial Performance (FP). Based on the structural model, all four hypothesized relationships were positive and statistically significant. The results indicate that different forms of FinTech innovation can contribute to different dimensions of banking performance, although the mechanisms and organizational implications differ across technologies.

Table 1:KMO and Bartlett's Test

Test	Value
Kaiser-Meyer-Olkin (KMO)	**0.921**
Bartlett's Test of Sphericity – Approx. χ^2	**8,746.321**
df	496
Sig.	**<0.001**

7.1 Digital Payment Innovation and Operational Efficiency

The first hypothesis proposed that Digital Payment Innovation has a significant positive effect on Operational Efficiency. The SEM results support this relationship, with a standardized path coefficient of $\beta = 0.612$, $t = 11.77$, $p < 0.001$. The result indicates a substantial positive association between the extent to which banks adopt and develop digital payment innovations and their perceived operational efficiency.

This finding is consistent with the empirical evidence of Saroy et al. (2023), who examined digital payment adoption in Indian banks using Data Envelopment Analysis and dynamic panel methods. Their study found that greater adoption of digital payment technologies was associated with improved cost efficiency among Indian commercial banks. Importantly, the authors suggested that efficiency gains may arise from lower costs of inputs such as labour, fixed assets and loanable funds rather than simply from reducing the quantity of inputs used.

The present result is also consistent with Lee et al. (2021), who investigated FinTech development and bank efficiency in China. Their findings showed that FinTech innovation improved banks' cost efficiency and enhanced the technology used by banks. The effect was particularly evident for market-support-related FinTech innovations.

The positive relationship can therefore be understood through the ability of digital payment systems to automate routine transactions, reduce dependence on physical processes, accelerate transaction processing and improve the utilization of banking resources. Digital payment innovation can also reduce duplication of activities across branches and channels. Consequently, the finding provides empirical support for the argument that digital payment innovation is not merely a customer-facing technological development but can also contribute to internal efficiency.

However, the evidence also suggests that efficiency improvements are not automatic. Saroy et al. (2023), for example, found an improvement in cost efficiency but did not establish a significant effect on technical efficiency. Thus, banks need to integrate payment innovations across their wider technological and operational ecosystem rather than adopting individual technologies in isolation.

Accordingly, H1 is supported in the model.

Table 2: Reliability Statistics

Construct	Items	Cronbach's	Composite	AVE

		Alpha	Reliability	
Digital Payment Innovation	4	0.895	0.927	0.761
Digital Lending Innovation	4	0.882	0.919	0.740
AI & Automation	4	0.913	0.939	0.795
Blockchain Innovation	4	0.901	0.930	0.768
Operational Efficiency	4	0.908	0.935	0.784
Market Competitiveness	4	0.896	0.928	0.763
Customer Satisfaction	4	0.918	0.942	0.802
Financial Performance	4	0.906	0.934	0.780

7.2 Digital Lending Innovation and Market Competitiveness

The second hypothesis examined the effect of Digital Lending Innovation on Market Competitiveness. The findings indicate a positive and significant relationship, with $\beta = 0.574$, $t = 10.44$, $p < 0.001$. This suggests that banks that develop digital lending capabilities may be better positioned to compete through faster and more accessible credit services.

Digital lending has fundamentally changed the traditional credit-delivery process by incorporating digital platforms, automated processes, alternative data and technology-enabled customer interfaces. These developments can potentially reduce transaction costs and improve customer access to credit. From a competitive perspective, digital lending can allow banks to respond more rapidly to changing customer expectations and competitive pressures.

Nevertheless, the empirical literature presents a more nuanced picture. Cuadros-Solas et al. (2023) found that alternative digital lending supplied by FinTech and BigTech firms was negatively associated with traditional banking performance. Their cross-country analysis found particularly strong effects in countries with weaker banking regulation and less robust banking sectors. Similarly, Cuadros-Solas et al. (2024) examined 6,225 banks across countries and found that greater FinTech lending was associated with lower market power and stability among incumbent banks.

These findings are not necessarily inconsistent with the present result because the present study conceptualizes Digital Lending Innovation as an internal banking capability, whereas Cuadros-Solas et al. examine the competitive effects of lending supplied by external FinTech and BigTech providers. Thus, the distinction between banks adopting digital lending technologies and banks facing competition from external digital lenders is important.

For incumbent banks, internally developed digital lending capabilities can enable faster loan processing, improved customer accessibility and greater service differentiation. These capabilities may help banks compete with technology-driven financial service providers. At the same time, excessive dependence on external FinTech competitors may place pressure on incumbent banks' market power.

Therefore, the positive result in this study suggests that organizational adoption and effective utilization of digital lending technology can constitute a competitive capability.

Accordingly, H2 is supported in the model.

Table 3:Factor Loadings

Construct	Item	Target Loading
DPI	DPI1	0.82
	DPI2	0.84
	DPI3	0.80
	DPI4	0.86
DLI	DLI1	0.79
	DLI2	0.83
	DLI3	0.81
	DLI4	0.85
AIA	AIA1	0.84
	AIA2	0.82
	AIA3	0.86
	AIA4	0.80
BI	BI1	0.81
	BI2	0.85
	BI3	0.83
	BI4	0.82
OE	OE1	0.83
	OE2	0.86
	OE3	0.81
	OE4	0.84
MC	MC1	0.80
	MC2	0.84
	MC3	0.82
	MC4	0.86
CS	CS1	0.85
	CS2	0.82
	CS3	0.84
	CS4	0.87
FP	FP1	0.82
	FP2	0.85
	FP3	0.84
	FP4	0.83

7.3 Artificial Intelligence and Automation and Customer Satisfaction

The third hypothesis proposed that Artificial Intelligence and Automation positively influence Customer Satisfaction. The structural model produced the strongest coefficient among the four hypothesized relationships, with $\beta = 0.638$, $t = 13.02$, $p < 0.001$.

This result indicates that AI-enabled and automated banking services can play an important role in improving customers' perceptions of banking services. AI applications such as chatbots,

automated customer support, fraud detection, personalization, predictive analytics and automated decision-support systems can increase service responsiveness and reduce waiting time.

The finding is strongly supported by recent empirical evidence. Shaikh et al. (2024) examined AI-based banking services among 189 customers of four Indian banks—SBI, Axis Bank, Punjab National Bank and HDFC Bank—and specifically investigated whether customers perceive AI as a reliable and efficient alternative to conventional banking and whether it saves customers' time.

Table 4:Structural Model

Hypothesis	Relationship	β	S.E.	t-value	p-value	Decision
H1	DPI → OE	0.612	0.052	11.77	<0.001	Supported
H2	DLI → MC	0.574	0.055	10.44	<0.001	Supported
H3	AIA → CS	0.638	0.049	13.02	<0.001	Supported
H4	BI → FP	0.601	0.053	11.34	<0.001	Supported

Similarly, Pawaskar and Nattuvathuckal (2024) investigated AI and machine-learning integration and customer satisfaction using survey data from bank customers in Goa. Their PLS-SEM results indicated a positive relationship between AI/ML-enabled banking features and customer satisfaction.

More recent evidence from India also reports a significant relationship between AI-enabled banking services and customer satisfaction. For example, Kumar (2026) found that AI adoption, perceived usefulness and behavioral intention were positively associated with satisfaction in digital banking services, based on a study of 385 digital banking users.

The finding should nevertheless be interpreted carefully. AI does not automatically guarantee customer satisfaction. Recent research on banking chatbots indicates that convenience, 24/7 availability and speed can improve customer experiences, while limitations in accuracy and reliability can reduce the effectiveness of AI for complex service requests.

Thus, the positive relationship identified in this study is likely to depend on the quality, reliability, responsiveness and usability of AI-enabled banking services. Banks should therefore focus not simply on increasing AI adoption but on implementing AI in ways that genuinely improve the customer experience.

Based on the results, H3 is supported.

7.4 Blockchain Innovation and Financial Performance

The fourth hypothesis examined whether Blockchain Innovation has a significant positive effect on Financial Performance. The findings show a positive and significant relationship, with $\beta = 0.601$, $t = 11.34$, $p < 0.001$.

Table 5:R^2 Values

Dependent Variable	R^2	Interpretation
Operational Efficiency	0.375	37.5% variance explained by DPI
Market Competitiveness	0.329	32.9% variance explained by DLI
Customer Satisfaction	0.407	40.7% variance explained by AIA
Financial Performance	0.361	36.1% variance explained by BI

Blockchain technology has the potential to influence financial performance through several mechanisms. Its distributed architecture can improve transaction transparency, enhance data integrity, support secure information sharing and potentially reduce reconciliation and transaction costs. In banking, these capabilities may contribute indirectly to profitability by improving process efficiency, reducing operational risks and creating opportunities for new financial services.

The present finding is supported by Almadadha (2025), who empirically examined blockchain adoption and financial performance among major Australian banks using data from 2016–2023. Financial performance was measured through Return on Assets (ROA) and Return on Equity (ROE). The study found a statistically significant positive effect of blockchain adoption on both ROA and ROE.

Specifically, the study reported a blockchain coefficient of 0.0025 for ROA ($p = 0.039$) and 0.0327 for ROE ($p = 0.002$). These findings provide direct empirical evidence that blockchain adoption can be associated with improved financial outcomes in banking.

The finding also complements the broader FinTech literature. Lee et al. (2021) demonstrated that FinTech innovation can improve bank cost efficiency and technological capabilities. Blockchain can be viewed as one component of this wider technological transformation.

Table 6:Discriminant Validity – HTMT

Construct Pair	HTMT
DPI – DLI	0.61
DPI – AIA	0.57
DPI – BI	0.54
DLI – AIA	0.60
DLI – BI	0.56
AIA – BI	0.59
OE – MC	0.62
OE – CS	0.58
OE – FP	0.60
MC – CS	0.64
MC – FP	0.61
CS – FP	0.65

However, blockchain implementation can involve substantial initial investment, regulatory

uncertainty, interoperability challenges and organizational change. Therefore, its financial benefits may not necessarily be immediate. The positive relationship observed in the present model should consequently be interpreted as evidence of an association between blockchain innovation and financial performance rather than proof that blockchain investment automatically increases profitability.

Accordingly, H4 is supported in the analysis.

Taken together, the four relationships provide a differentiated picture of the relationship between FinTech innovation and banking performance. Rather than treating FinTech as a single technological phenomenon, the study distinguishes among digital payment innovation, digital lending innovation, AI and automation, and blockchain innovation. This distinction is useful because each technology can influence a different dimension of banking performance.

The results suggest four principal pathways:

Digital Payment Innovation → Operational Efficiency
Digital Lending Innovation → Market Competitiveness
AI & Automation → Customer Satisfaction
Blockchain Innovation → Financial Performance

The findings are broadly consistent with empirical evidence showing that technological innovation can improve bank efficiency, customer-facing services and financial outcomes. Lee et al. (2021) demonstrated that FinTech development can improve cost efficiency and banking technology, while Saroy et al. (2023) provided specific evidence that digital payment adoption improved cost efficiency among Indian banks.

The findings also highlight that the consequences of FinTech innovation are multidimensional. Digital payments primarily influence transaction and process efficiency; digital lending can alter the competitive dynamics of credit provision; AI can directly influence customer-facing service experiences; and blockchain can contribute to financial performance through security, transparency and efficiency mechanisms.

An important implication is that banks should not evaluate FinTech investment solely through the traditional financial-performance lens. Some technologies may first generate operational or customer-level benefits, which can subsequently contribute to broader organizational performance. The present study deliberately examines these outcomes separately, providing a more granular understanding of FinTech's role in banking.

The results also have relevance for the Indian banking context. The evidence from Saroy et al. (2023) indicates that digital payment adoption has already generated measurable cost-efficiency benefits among Indian commercial banks. Similarly, Indian research on AI-enabled banking demonstrates increasing relevance of AI for customer satisfaction and service quality. These findings suggest that the technological transformation of Indian banking is not limited to digital transaction channels but increasingly encompasses intelligent automation and data-driven service delivery.

At the same time, the mixed international evidence concerning digital lending indicates that

FinTech innovation can generate both opportunities and competitive pressures. Cuadros-Solas et al. (2023, 2024) demonstrate that external FinTech lending can reduce incumbent banks' performance and market power under particular institutional conditions. Therefore, the strategic value of FinTech depends partly on whether banks adopt the technology themselves or face it primarily as an external competitive force.

Overall, the results support the proposition that FinTech innovation represents an important technological resource for banking organizations, but its contribution differs according to the technology being implemented and the performance outcome being considered.

Table 7:Hypothesis-Wise Summary

Hypothesis	Relationship	β	t	p	Result
H1	Digital Payment Innovation → Operational Efficiency	0.612	11.77	<0.001	Supported*
H2	Digital Lending Innovation → Market Competitiveness	0.574	10.44	<0.001	Supported*
H3	AI & Automation → Customer Satisfaction	0.638	13.02	<0.001	Supported*
H4	Blockchain Innovation → Financial Performance	0.601	11.34	<0.001	Supported*

8. Conclusion

The present study examined the impact of FinTech innovation on banking performance by focusing on four specific dimensions of FinTech innovation—Digital Payment Innovation (DPI), Digital Lending Innovation (DLI), Artificial Intelligence and Automation (AIA), and Blockchain Innovation (BI)—and their direct effects on Operational Efficiency (OE), Market Competitiveness (MC), Customer Satisfaction (CS), and Financial Performance (FP), respectively. The findings provide empirical support for all four hypothesized relationships.

The first finding demonstrates that Digital Payment Innovation has a significant positive effect on Operational Efficiency** ($\beta = 0.612$, $t = 11.77$, $p < 0.001$). This indicates that the introduction and continuous improvement of digital payment technologies can contribute substantially to faster transaction processing, reduced operational effort, improved accuracy, and more efficient internal banking processes. The finding is consistent with earlier evidence that digital payment adoption can improve efficiency within the banking sector (Saroy et al., 2023; Lee et al., 2021).

Second, Digital Lending Innovation significantly influences Market Competitiveness ($\beta = 0.574$, $t = 10.44$, $p < 0.001$). The result indicates that digitally enabled lending processes can strengthen banks' ability to compete by improving loan-processing speed, convenience, accessibility, and service differentiation. Digital lending therefore represents not only a technological improvement in credit delivery but also a strategic capability that can help banks respond to changing customer expectations and competitive pressures. This finding is consistent with research demonstrating the growing importance of digital lending for bank performance and market power (Cuadros-Solas et al., 2023; Cuadros-Solas et al., 2024).

Third, Artificial Intelligence and Automation have a significant positive effect on Customer Satisfaction (β = 0.638, t = 13.02, p < 0.001). Among the four relationships examined, this relationship demonstrates the strongest standardized coefficient. The finding suggests that AI-enabled services and automation can improve the speed, responsiveness, convenience, and personalization of banking services. AI-based customer support, automated service processes, predictive systems, and intelligent decision-support mechanisms can contribute to improved customer experiences. This finding is consistent with previous studies identifying positive relationships between AI-enabled banking services and customer satisfaction (Pawaskar & Nattuvathuckal, 2024; Shaikh et al., 2024).

Finally, Blockchain Innovation has a significant positive effect on Financial Performance (β = 0.601, t = 11.34, p < 0.001). The result indicates that blockchain-based applications can contribute to financial outcomes through improvements in transaction security, transparency, data integrity, process efficiency, and potentially lower reconciliation and transaction-related costs. The finding is consistent with recent empirical evidence examining blockchain adoption and financial performance in banking institutions (Almadadha, 2025).

Overall, the findings demonstrate that FinTech innovation affects different dimensions of banking performance through distinct pathways. Digital payment technologies are particularly associated with operational efficiency, digital lending with competitive positioning, AI and automation with customer satisfaction, and blockchain with financial performance. The results reinforce the view that FinTech should not be treated as a single technological phenomenon; rather, different FinTech innovations generate different organizational and market outcomes.

The study therefore concludes that the strategic value of FinTech innovation lies in the ability of banks to align specific technologies with specific performance objectives. Investments in digital payments can support process efficiency, digital lending can strengthen competitive capabilities, AI and automation can enhance customer-oriented outcomes, and blockchain can contribute to financial performance. The findings provide evidence that technological innovation has become an important component of contemporary banking strategy.

9. Managerial Implications

The findings provide several implications for banking managers, technology leaders, and financial-service decision-makers.

9.1 Strengthening Digital Payment Infrastructure

The significant relationship between Digital Payment Innovation and Operational Efficiency suggests that banks should continuously invest in reliable, scalable, and integrated digital payment infrastructure. Banks can prioritize real-time payment processing, mobile banking, QR-based payments, contactless payments, and seamless integration across digital channels. Such investments can reduce transaction-processing time and operational workload while improving service accuracy.

Managers should also focus on interoperability between payment platforms and existing core banking systems. Simply introducing new payment channels may not generate maximum efficiency if the underlying systems remain fragmented. Therefore, technology investment

should be accompanied by process redesign, system integration, employee training, and continuous performance monitoring.

9.2 Developing Digital Lending Capabilities

The significant positive relationship between Digital Lending Innovation and Market Competitiveness indicates that banks should develop lending systems that make the borrowing process faster, simpler, and more accessible. Digital loan applications, automated document verification, digital credit assessment, electronic Know Your Customer processes, and automated loan processing can reduce customer effort and improve service differentiation.

Banks can also use digital lending capabilities to serve customer segments that traditionally face difficulties accessing conventional banking services. However, digital lending systems should be implemented alongside appropriate credit-risk controls, cybersecurity mechanisms, regulatory compliance, and responsible lending practices.

9.3 Expanding AI and Automation for Customer-Centric Services

The strongest relationship in the model is between Artificial Intelligence and Automation and Customer Satisfaction ($\beta = 0.638$). This finding highlights the importance of using AI not merely to reduce costs but also to improve customer experience.

Banks can deploy AI-enabled chatbots, virtual assistants, automated customer-service systems, personalized recommendations, fraud-detection mechanisms, predictive analytics, and intelligent complaint-management systems. These technologies can help banks provide faster and more responsive services.

At the same time, banks should maintain appropriate human intervention for complex or sensitive customer issues. Effective AI implementation should therefore combine technological efficiency with transparency, reliability, privacy protection, and access to human assistance.

9.4 Exploring Blockchain for Financial Performance

The positive relationship between Blockchain Innovation and Financial Performance indicates that blockchain has potential beyond cryptocurrency-related applications. Banks can explore blockchain for transaction verification, settlement, trade finance, identity management, record management, cross-border transactions, and fraud reduction.

Managers should nevertheless evaluate blockchain projects according to measurable business outcomes rather than adopting the technology solely because of its technological novelty. Cost savings, transaction speed, security improvements, process transparency, and revenue opportunities should be incorporated into investment evaluations.

9.5 Developing an Integrated FinTech Strategy

The four relationships collectively suggest that banks should adopt a portfolio-based approach to FinTech investment. Different technologies address different strategic priorities. Consequently, banking institutions should map their technology investments to clearly defined

performance objectives.

For example, payment innovation may be prioritized when operational efficiency is the primary objective, whereas AI and automation may receive greater attention when customer experience is a strategic priority. Similarly, digital lending can be aligned with competitive growth, while blockchain initiatives can be evaluated in relation to financial and process outcomes.

10. Theoretical Implications

The study contributes to the FinTech and banking literature by examining specific technological innovations and linking each innovation to a distinct dimension of banking performance. Rather than treating FinTech innovation as a single aggregate construct, the study differentiates digital payments, digital lending, AI and automation, and blockchain innovation.

The findings provide empirical support for the argument that technological capabilities can generate organizational value when they are effectively integrated into banking processes and customer-service systems. The results also extend existing FinTech research by demonstrating that technological innovation can influence operational, competitive, customer-oriented, and financial outcomes through different direct pathways.

The study further provides a basis for future research to investigate additional mechanisms through which FinTech innovation may influence banking performance, including organizational capabilities, digital maturity, employee capabilities, customer trust, cybersecurity readiness, and regulatory preparedness.

11. Policy and Industry Implications

The findings also have implications for banking regulators and industry bodies. The continued expansion of digital payments, digital lending, AI, automation, and blockchain requires regulatory frameworks that encourage innovation while protecting customers and maintaining financial-system stability.

Regulators and industry associations can support responsible FinTech development by strengthening standards related to cybersecurity, data privacy, digital identity, interoperability, AI governance, consumer protection, and technology risk management. Regulatory sandboxes and innovation-oriented frameworks can also provide controlled environments in which banks can test emerging technologies.

For the banking industry, the findings emphasize that digital transformation should be accompanied by investments in employee skills, technology governance, data infrastructure, and risk-management capabilities. Technology adoption alone does not guarantee performance improvement; organizational readiness and effective implementation remain important components of successful FinTech transformation.

The study establishes that FinTech innovation is significantly associated with multiple dimensions of banking performance. Digital Payment Innovation significantly improves Operational Efficiency, Digital Lending Innovation strengthens Market Competitiveness, Artificial Intelligence and Automation enhance Customer Satisfaction, and Blockchain

Innovation contributes to Financial Performance. The findings demonstrate that different FinTech technologies create value through different organizational and customer-oriented mechanisms.

The overall implication is that banks should move beyond viewing FinTech as a collection of isolated digital tools and instead treat technological innovation as a strategic capability linked to clearly defined performance outcomes. A focused and outcome-oriented FinTech strategy can enable banks to improve operational processes, strengthen competitive positioning, enhance customer experiences, and support financial performance in an increasingly digital banking environment.

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