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"The Influence of FinTech Innovation on Banking Services"

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Abstract- This study examines the influence of Financial Technology (FinTech) innovation on banking services in Iraq, focusing on service efficiency, customer satisfaction, integration challenges, and competitiveness and financial inclusion. A mixed-methods research design was adopted, combining quantitative data from 90 respondents, including bank customers and employees, with qualitative insights obtained through semi-structured interviews with bank officials, IT managers, and FinTech consultants. Quantitative data were analyzed using descriptive statistics, Pearson correlation, multiple regression, and one-way ANOVA, while thematic analysis was employed for qualitative findings. The results indicate that FinTech adoption significantly enhances service efficiency, customer satisfaction, and the competitiveness of banks while promoting greater financial inclusion. Correlation analysis revealed strong positive relationships between FinTech adoption and key performance indicators, and regression results identified FinTech adoption as the most influential predictor of banking performance. Despite these benefits, several challenges impede effective implementation, including cybersecurity threats, legacy information systems, limited digital literacy, and regulatory constraints. The findings suggest that while FinTech has substantial potential to transform the Iraqi banking sector, its success depends on addressing technological, institutional, and regulatory barriers. The study concludes that strategic investments in cybersecurity, digital infrastructure modernization, regulatory development, and customer education are essential for maximizing the benefits of FinTech and achieving sustainable banking growth and financial inclusion in Iraq.

Keywords: Financial Technology (FinTech), Banking Services, Service Efficiency, Customer Satisfaction, Financial Inclusion, Competitiveness, Digital Transformation, Cybersecurity, Iraqi Banking Sector.

I. INTRODUCTION

The rapid evolution of financial technology (FinTech) has emerged as one of the most transformative forces reshaping the global financial services landscape. Over the past decade, FinTech innovations such as digital payments, blockchain technology, mobile banking applications, artificial intelligence (AI)-driven financial advisory services, peer-to-peer (P2P) lending platforms, and automated customer service tools have revolutionized how consumers and institutions access and deliver financial services. Scholars such as Arner, Barberis, and Buckley (2015) describe FinTech as a "dynamic fusion of finance and technology" that continuously evolves in response to market demands and technological progress. As traditional banking systems increasingly integrate technological advancements to remain competitive, the role of FinTech has become central to modern banking operations.

With growing digital transformation in the financial sector, customers now expect more personalized, efficient, and real-time banking services. The shift from conventional branch-based banking to digital-first business models has redefined how financial institutions operate. According to Lee and Shin (2018), FinTech has enabled banks to redesign their service delivery systems with enhanced agility, speed, and customer focus. Consequently, banks are investing in advanced technologies, forming partnerships with FinTech startups, and creating in-house digital innovation units to remain relevant in a rapidly changing financial environment.

FinTech-driven disruptions have prompted many banks to re-evaluate their traditional operating structures. Automation, cloud computing, and data-driven decision-making have replaced the need for several manual processes, reducing operational costs and improving service accuracy. Furthermore, the integration of AI-powered chatbots, biometric

authentication, and predictive analytics has allowed banks to provide enhanced customer experiences while strengthening security measures. As noted by Gomber et al. (2017), the convergence of these technologies has created a competitive advantage for banks that successfully integrate FinTech solutions into their systems.

At the same time, FinTech has introduced a complex mix of opportunities and challenges. The rapid technological evolution has increased regulatory scrutiny, particularly concerning data privacy, cybersecurity, and financial stability. Understanding these influences is essential for banks seeking to remain competitive, broaden financial inclusion, and maintain customer trust in an increasingly digital environment. This research project explores the influence of FinTech innovation on banking services, focusing on how these technologies have reshaped service delivery, operational efficiency, customer satisfaction, and strategic orientation.

1.1 Background of the Study

The financial services industry has historically been characterized by brick-and-mortar branches, manual processes, and face-to-face interactions. Traditional banks held a dominant role in providing essential services such as deposits, payments, loans, and wealth management. However, the global financial crisis of 2008 exposed inefficiencies and structural weaknesses in the traditional financial system, paving the way for FinTech solutions that promised transparency, cost-efficiency, and improved customer value. According to Philippon (2016), FinTech innovations emerged as a response to the inefficiencies of traditional banking, offering faster and more flexible financial services.

The rise of FinTech in the early 21st century initiated a paradigm shift in the financial sector. FinTech refers to technology-driven innovations that improve and automate financial services (Schueffel, 2016). These innovations have penetrated nearly every aspect of the sector, including retail banking, credit management, payments, investment advisory, insurance, and wealth management. The introduction of digital wallets like Apple Pay and PayPal, mobile money platforms such as M-Pesa, and online lenders such as LendingClub marked a significant transition toward digital-centric financial ecosystems. These platforms provided consumers with more convenient and accessible banking alternatives, particularly in regions with limited access to formal financial services.

Blockchain and distributed ledger technology introduced decentralized financial models, enhancing security, transparency, and efficiency in areas such as cross-border payments, smart contracts, and fraud prevention. Artificial intelligence and machine learning enabled banks to improve credit scoring, risk assessment, fraud detection, and customer service personalization. As highlighted by Narayanan et al. (2016), blockchain has emerged as one of the most disruptive technologies reshaping global finance.

FinTech has also played a critical role in advancing financial inclusion. In emerging economies, digital financial services have allowed millions of unbanked individuals to access the formal financial system. Innovations such as biometric verification, digital identity systems, and mobile banking apps have reduced barriers to account creation, enabling remote onboarding and fast, secure transactions. According to the World Bank (2021), digital financial services have contributed significantly to reducing poverty and enhancing economic participation in developing countries.

Despite these advancements, FinTech adoption introduces several risks and challenges. Cybersecurity threats have intensified with increased digital connectivity. Banks must navigate complex regulatory environments to ensure compliance with data protection, consumer rights, and financial stability requirements. Moreover, legacy system limitations hinder many traditional banks from fully integrating advanced FinTech solutions. As argued by Vasiljeva and Lukanova (2016), banks with outdated technological infrastructures face greater challenges transitioning into digital ecosystems.

Banks worldwide are responding to these challenges by upgrading their systems, establishing innovation hubs, and forming partnerships with FinTech companies. Regulatory bodies have also adapted through initiatives such as FinTech sandboxes, open banking frameworks, and digital financial regulations. According to Zetzsche et al. (2020), regulatory innovation is essential to balance technological progress with consumer protection and financial stability.

This research aims to provide a comprehensive analysis of how FinTech innovations influence banking services, focusing on both the opportunities and challenges faced by banks. It examines how customer expectations have evolved in the digital age,

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how banks have adapted to technological disruptions, and how FinTech innovations continue to shape the future of financial services.

Understanding the influence of FinTech on banking services is essential for stakeholders including policymakers, bank managers, financial institutions, and customers. As the financial sector continues its digital transformation, this study will contribute to a deeper understanding of how technological innovation drives progress in banking and how financial institutions can leverage these developments to create more sustainable, inclusive, and competitive financial services.

1.2 Statement of the Problem

The rapid rise of Financial Technology (FinTech) has disrupted traditional banking models, creating both opportunities and challenges for financial institutions. Although FinTech innovations such as mobile banking, AI, and blockchain have improved service efficiency, many banks still struggle to integrate these technologies due to outdated legacy systems (Vasiljeva & Lukanova, 2016). The acceleration of digital banking has also increased concerns related to cybersecurity, data breaches, and customer privacy, which financial institutions are not fully equipped to manage (PwC, 2022). Additionally, regulatory frameworks have not kept pace with FinTech advancements, creating uncertainties for banks adopting new digital solutions (Zetzsche et al., 2020).

While studies highlight the potential of FinTech to enhance banking performance, limited empirical evidence exists on its actual impact across different banking environments (Gomber et al., 2017). This gap makes it difficult for banks to develop effective digital strategies. Therefore, the problem addressed in this study is the lack of clear understanding regarding how FinTech innovations influence service quality, operational efficiency, customer satisfaction, and competitiveness within the banking sector.

1.3 Research Objectives:

1. To investigate the influence of FinTech innovation on service efficiency in Iraqi banks.
2. To examine the impact of FinTech-driven technologies on customer satisfaction within banking services.
3. To identify the challenges that limit the effective integration of FinTech innovations in Iraqi banks.
4. To evaluate how FinTech adoption affects the competitiveness and financial inclusion offered by banking services in Iraq.

1.4 Purpose of the Study

The purpose of this study is to investigate the influence of FinTech innovation on banking services in Iraq. It aims to examine how technologies such as mobile banking, digital payments, and AI-driven platforms affect service delivery and operational efficiency. The study also seeks to explore the impact of FinTech on customer satisfaction and overall banking experience. Additionally, it will identify the challenges that Iraqi banks face in integrating FinTech solutions. By evaluating these effects, the research intends to highlight how digital innovations shape competitiveness and financial inclusion. The findings are expected to provide insights for bank managers, policymakers, and stakeholders on leveraging FinTech effectively. Ultimately, the study aims to contribute to a deeper understanding of the role of FinTech in transforming banking services in Iraq.

1.5 Significance of the Study

This study holds significant value for multiple stakeholders in the financial sector. For bank managers and financial institutions, the findings will provide practical insights into how FinTech innovations can be effectively integrated to enhance operational efficiency, improve customer experience, and strengthen competitive positioning. For policymakers and regulatory authorities, the study offers important implications regarding the development of appropriate regulatory frameworks that support innovation while ensuring financial stability, data security, and consumer protection. It highlights the need for regulatory adaptation in response to rapid technological advancements.

For academicians and researchers, this study contributes to the existing body of knowledge by providing empirical evidence on the impact of FinTech in an emerging market context, particularly Iraq, where limited research has been conducted. It also opens avenues for further research in digital finance and banking transformation.

Additionally, for customers and the broader society, the study underscores the role of FinTech in promoting financial inclusion by improving access to banking services, especially in a predominantly cash-based

economy. It emphasizes how digital financial solutions can enhance convenience, accessibility, and overall financial participation.

Overall, this research is significant in bridging the gap between theory and practice by demonstrating how FinTech can be leveraged to achieve sustainable growth and innovation in the banking sector.

II. REVIEW OF LITERATURE

2.1 Introduction

In 2024, the Bank for International Settlements (BIS) highlights that FinTech has intensified competition within the banking sector, particularly in payments, lending, and advisory services. New FinTech entrants force traditional banks to innovate, reduce operational costs, and enhance digital service offerings. Banks are adopting partnerships and new business models to maintain competitiveness. FinTech also encourages banks to focus on customer-centric services and operational efficiency. Overall, the BIS suggests that FinTech acts both as a disruptor and a catalyst for modernization in banking services.

Systematic Review on FinTech's Impact on Bank Efficiency, Huang and Said (2025) systematically review 41 studies analyzing FinTech's effect on bank efficiency, risk management, and service quality. They find that FinTech adoption improves operational efficiency and reduces manual processing errors. The impact varies by bank type, location, and technological infrastructure. FinTech also enhances customer service, including faster transactions and personalized advisory services. However, successful adoption requires robust IT systems, strong regulatory compliance, and organizational readiness.

FinTech and Financial Inclusion, Utama and Hidayat (2024) examine how trust, data security, transparency, and regulation influence FinTech adoption in underserved populations. Consumers adopt FinTech services more readily when platforms are perceived as secure and reliable. Mobile money, digital wallets, and online lending platforms increase access for low-income users and promote financial inclusion. Regulatory frameworks, digital literacy, and user education are crucial for effective adoption. The study concludes that FinTech can substantially reduce financial exclusion if combined with appropriate governance and trust-building strategies.

State-of-the-art Review on FinTech and Financial Inclusion, Dao (2025) reviews 96 studies to assess FinTech's role in global financial inclusion. Three main themes are identified: innovative service delivery, market transformation, and stakeholder involvement including governments, banks, and FinTech firms. FinTech platforms significantly enhance access to banking services for unbanked populations in Africa, Southeast Asia, and Latin America. Regulatory frameworks and secure adoption practices are essential for long-term sustainability. The study highlights a research gap in evaluating FinTech's long-term effects on customer retention, satisfaction, and banking sustainability.

FinTech in Sustainable Banking, Rahman, Moral, and Kaium (2024) use the TCCM framework to analyze 44 articles on FinTech in sustainable banking. FinTech adoption supports green banking initiatives by facilitating digital payments, reducing paper usage, and improving energy efficiency in banking operations. The study identifies challenges such as the need for clear regulations, robust cybersecurity, and risk management practices. Banks leveraging FinTech for sustainability can achieve both economic and environmental benefits. Success depends on organizational readiness, technological infrastructure, and customer acceptance.

Emerging Technologies in FinTech, Kou and Lu (2025) explore AI, blockchain, and quantum computing applications in financial services. These technologies enhance agility, security, and customer-centric services. Blockchain enables transparent cross-border payments, while AI improves credit scoring, risk assessment, and fraud detection. Integration challenges include interoperability with legacy systems, high implementation costs, and regulatory compliance. The study concludes that banks adopting these technologies gain competitive advantages but must address operational risks and system complexity.

FinTech Innovations in Financial Services, Toderașcu and Oprea (2021) review innovations such as digital lending, payments, and robo-advisory platforms. FinTech reshapes traditional banking by reducing operational costs, enhancing access, and expanding customer reach. Collaborations between banks and FinTech firms improve scalability and service diversity. Implementation challenges include cybersecurity, data privacy, and gaining customer trust. The study emphasizes the need for strategic

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alignment and proper risk management for successful FinTech integration.

Bibliometric Study on Global FinTech Research Trends, Asif, Sarwar, Lodhi, and Akbar (2022) analyze 93 FinTech-in-banking papers from 2016–2022, showing rapid growth in adoption, trust, regulatory frameworks, and technological innovation research. Regional studies highlight gaps in emerging markets and developing countries. Key themes include digital payment adoption, neobanking, and customer-centric innovations. The authors suggest future research should examine financial inclusion, sustainability, and gender disparities in FinTech. The study provides a roadmap for understanding global trends and future research priorities in FinTech adoption.

Cybersecurity Threats in FinTech, Javaheri, Fahmideh, Chizari, and colleagues (2023) develop a taxonomy of cybersecurity threats in FinTech using a systematic review of 74 papers. Key risks include data breaches, malware attacks, phishing, and unauthorized access. The study recommends AI-based detection systems, encryption, and regulatory oversight as mitigation strategies. Banks must balance digital innovation with robust security frameworks. Training staff and educating customers on security practices are emphasized as essential for protecting sensitive financial data.

Digital Banking Cyber Risk Review, Waliullah, Hossain George, Hasan, and colleagues (2025) review 78 studies on digital banking cybersecurity risks. Phishing, ransomware, and unauthorized access are prevalent threats. AI and machine learning show promise for real-time detection and mitigation. Effective security requires strong regulatory frameworks, continuous monitoring, and employee training. The study highlights the importance of balancing innovation and security to maintain customer trust and operational stability.

Machine Learning for Fraud Detection in Digital Banking, George, Alam, and Hasan (2025) analyze 118 studies on machine learning in fraud detection for digital banking. Supervised models like logistic regression are widely used, while hybrid deep learning approaches show strong potential for real-time fraud prevention. Integration with existing systems is challenging but critical. The study emphasizes that AI enhances security, reduces financial loss, and strengthens customer trust. Banks adopting these models can achieve significant efficiency gains in monitoring and compliance.

Service Quality and Customer Satisfaction, Binaya (2024) studies technology-based banking services in Nepal, examining reliability, responsiveness, and empathy. High-quality digital services increase customer satisfaction and loyalty. Consistent service quality across channels is critical for retaining users. Staff training and system maintenance play vital roles in effective digital service delivery. The study concludes that service quality remains a core determinant of successful FinTech adoption in banking.

Relationship Quality in E-Banking, Alawneh (2013) investigates trust, satisfaction, and commitment in Jordanian e-banking. Trust and commitment strongly influence long-term customer loyalty. Satisfaction mediates the effect of technology adoption on continued service use. Secure and user-friendly digital platforms are essential for relationship quality. The study provides insights for developing FinTech strategies that enhance customer retention.

Islamic Banking Customer Satisfaction & Digitalization, Zouari and Abdelhedi (2021) examine digitalization's impact on customer satisfaction in Islamic banks. Using an augmented SERVQUAL model, they find digital service quality strongly affects trust, ease of use, and reliability. Compliance with religious and regulatory standards is critical. Digital channels must meet customers' expectations for security and transparency. Results suggest FinTech adoption can improve satisfaction, loyalty, and financial engagement in Islamic banking.

FinTech Service Quality and Bank Sustainability, Aldaarmi (2024) examines service quality dimensions—tangibles, reliability, and empathy—in Saudi banks. Digital service quality positively influences customer satisfaction, reuse intentions, and sustainable performance. Investment in technology and training is essential. Integration of FinTech promotes operational efficiency and competitive advantage. Banks adopting FinTech sustainably enhance long-term financial and reputational outcomes.

FinTech Adoption & Financial Performance, Rahmani and Azam (2025) review 20 studies in Indian banking linking FinTech adoption with profitability, operational efficiency, and customer trust. Banks

using AI, mobile banking, and digital payments outperform peers in market share. Regulatory alignment and IT infrastructure are key to successful adoption. Collaboration between banks and FinTech startups enhances growth. FinTech adoption is positively correlated with overall financial performance and service innovation.

FinTech Adoption in Financial Institutions, Dhanraj, Kaur, Baig, and Gurunathan (2024) study 262 financial professionals in the Asia-Pacific region. FinTech adoption improves operational efficiency, risk management, and customer experience. Successful integration depends on organizational readiness, staff training, and technology infrastructure. Digital solutions reduce processing time and costs. The study emphasizes strategic adoption to maintain competitive advantage in financial institutions.

FinTech and Bank Profitability Hypotheses, MSR Journal (2024) reviews literature linking FinTech adoption with profitability and operational efficiency. Banks adopting FinTech gain competitive advantages but face increased cyber and operational risks. Benefits differ by bank size, type, and technological readiness. Governance, regulatory compliance, and risk management are critical for success. The study highlights targeted strategies for maximizing FinTech benefits while mitigating risks.

Evolution of Digital Banking & FinTech's Role, SEEJPH (2024) examines how FinTech transforms banking through digital platforms, automation, and AI services. Banks improve customer experience and operational efficiency by leveraging technology. Regulatory support is essential for innovation and stability. Challenges include cybersecurity, legacy system integration, and interoperability. The study concludes that FinTech is a key driver of modern banking evolution.

FinTech Innovation and Traditional Banks, Toderașcu & Oprea (2021) discuss how traditional banks partner with FinTech firms to reduce costs, expand market reach, and enhance services. Collaboration mitigates competitive threats while fostering innovation. Integration with legacy systems and data security management are key challenges. Strategic planning and investment in technology are essential for successful adoption. Partnerships create mutually beneficial ecosystems in the banking sector.

Bibliometric Trends in FinTech Research, A bibliometric study of 3,884 papers from 1986–2024 identifies trends in security, systemic risk, trust, and financial inclusion. Emerging research areas include green FinTech, neobanks, and gender disparities. The study highlights regional gaps and regulatory challenges. Future research should explore sustainability and market-specific adoption factors. Findings provide guidance for researchers and policymakers on FinTech development priorities.

Green Finance & FinTech, Rahman, Moral, and colleagues (2024) examine FinTech's role in green banking initiatives. Digital payments, mobile banking, and AI reduce environmental impact. Challenges include regulatory clarity, cybersecurity, and operational risk management. Organizational readiness determines adoption success. Policy support is necessary to balance innovation with sustainable development goals.

Manoj Sangisetti (2022) conducted an analytical study titled "An Analytical Study on Customer Awareness, Perceptions and Satisfaction towards Quality of Banking Services after Merger and Acquisitions of Public Sector Banks in India" published in the Journal of Positive School Psychology. In this research, Manoj Sangisetti surveys bank customers to investigate how mergers and acquisitions among public sector banks have influenced their awareness of service changes and their perceptions of service quality. He finds that customers' satisfaction is significantly linked to their perception of service quality post-merger, showing that many account holders increasingly prefer digital and mobile banking channels over traditional branch banking. The study also identifies demographic differences: customers of different age groups and education levels show varying degrees of satisfaction and trust in the new service structures. Manoj Sangisetti argues that these mergers – combined with improved digital banking options – have reshaped service expectations, underscoring the importance of customer-centric innovations in banking. His work suggests that continuous improvement in digital banking quality is critical to retaining customer trust and satisfaction after structural changes in banks.

Payment Services Innovation Toderașcu & Oprea (2021) explore innovations in payment services, including digital wallets and mobile money. These innovations improve convenience, speed, and access, particularly for underbanked populations. Security,

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trust, and regulatory oversight are essential. Adoption reduces transaction costs and increases efficiency. Partnerships between banks and FinTech firms scale these services effectively.

FinTech Business Models: Bundling vs Disintermediation, BIS (2024) explains that FinTech firms initially focus on disintermediation but often evolve into bundled services resembling banks. Bundling increases customer retention and cross-selling opportunities. Collaboration with banks provides regulatory stability and access to a broader client base. Operational complexity and integration challenges must be managed. Hybrid models optimize innovation while maintaining sustainability.

Emerging Risks of FinTech, Kou & Lu (2025) discuss risks of AI, blockchain, and other FinTech technologies in banking. While these tools improve efficiency, they create challenges in interoperability, explainability, and cybersecurity. Banks must implement strong governance and risk frameworks. Strategic planning, technological infrastructure, and staff training are essential for safe adoption. The study concludes that balancing innovation with risk management ensures sustainable FinTech growth.

2.2 Conceptual Framework

A conceptual framework provides the theoretical scaffolding that guides the structure of a research study by visually and analytically illustrating the relationships between key variables. It translates the abstract propositions from existing literature into a coherent model that defines how the independent, dependent, moderating, mediating, and contextual variables in this study are interrelated. For this research, the conceptual framework is grounded in three foundational theoretical models: the Technology Acceptance Model (TAM) proposed by Davis (1989), the Innovation Diffusion Theory (IDT) advanced by Rogers (2003), and the FinTech Adoption Framework derived from recent empirical studies in banking and financial technology.

The TAM model posits that perceived usefulness and perceived ease of use are the two primary determinants of an individual's intention to use a technology system. In the context of this study, customers' and employees' perceptions of the usefulness and usability of FinTech banking services — such as mobile banking applications, digital wallets, and AI-driven advisory platforms — determine the extent to which these innovations are embraced and integrated into daily banking activities. The IDT theory complements TAM by explaining how innovations spread through a social system over time, mediated by factors such as relative advantage, compatibility, complexity, trialability, and observability. Together, these theories provide a robust theoretical basis for understanding FinTech adoption in Iraq's banking sector.

The FinTech Adoption Framework draws on the growing body of empirical research in digital banking (Huang & Said, 2025; Rahmani & Azam, 2025; Dhanraj et al., 2024) to identify the structural antecedents and outcomes of FinTech adoption in banking institutions. This framework recognizes that FinTech adoption does not occur in a vacuum — it is shaped by environmental, regulatory, and institutional factors that either enable or constrain technological transformation in banking.

2.2.1 Structure of the Conceptual Model

The conceptual model for this study is structured around five core components: (1) the Independent Variable, (2) the Mediating Variable, (3) the Moderating Variables, (4) the Dependent Variables, and (5) the Contextual Factors. Figure 2.1 below presents the complete conceptual model.

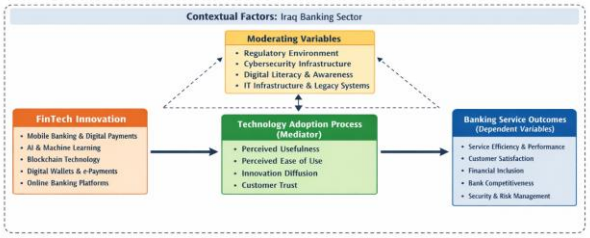

Figure 2.1: Conceptual Model — The Influence of FinTech Innovation on Banking Services (Source: Researcher's Own Elaboration based on Davis, 1989; Rogers, 2003; Huang & Said, 2025)

2.2.2 Independent Variable: FinTech Innovation

The independent variable in this study is FinTech Innovation, which represents the technological innovations introduced into banking systems that transform the delivery and quality of financial services. FinTech innovation encompasses five key dimensions measured in this study:

- Mobile Banking & Digital Payments — The adoption of smartphone-based banking

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Volume 4, Issue 3, May-June-2026, PP: 01-26

applications and real-time digital payment platforms that enable customers to conduct transactions without physical branch visits.

- Artificial Intelligence & Machine Learning — The deployment of AI-driven tools for credit scoring, fraud detection, customer service automation (chatbots), and personalized financial recommendations.
- Blockchain & Distributed Ledger Technology — The use of blockchain for secure cross-border payments, smart contracts, digital identity verification, and transparent transaction records.
- Digital Wallets & e-Payment Systems — Mobile money platforms such as ZainCash, NassWallet, and FastPay that extend financial access beyond traditional banking infrastructure.
- Online Banking Platforms — Internet-based banking portals enabling account management, fund transfers, loan applications, and investment services without physical branch dependency.

2.2.3 Mediating Variable: Technology Adoption Process

The mediating variable is the Technology Adoption Process, which represents the mechanism through which FinTech innovations translate into observable banking outcomes. Drawing on the TAM (Davis, 1989) and IDT (Rogers, 2003), this mediating construct includes four dimensions:

- Perceived Usefulness — The degree to which users believe that FinTech tools enhance banking performance and provide superior value compared to traditional banking methods.
- Perceived Ease of Use — The extent to which digital banking interfaces and platforms are user-friendly, intuitive, and accessible without requiring specialized technical knowledge.
- Innovation Diffusion — The process through which FinTech innovations spread through Iraq's banking sector, influenced by social norms, peer adoption, and institutional advocacy.
- Customer Trust — The level of confidence users place in the security, reliability, and integrity of FinTech-enabled banking services — a critical prerequisite for widespread adoption.

The mediating role of the technology adoption process reflects the understanding that FinTech innovations do not automatically produce improved banking outcomes. Rather, their impact is contingent on whether customers and employees perceive them as useful, trustworthy, and easy to use, and whether the innovations successfully diffuse through the banking ecosystem. This is consistent with findings from Utama and Hidayat (2024), who found that consumer trust and regulatory frameworks are critical mediators of FinTech's impact on financial inclusion.

2.2.4 Moderating Variables: Structural Enablers and Barriers

Four moderating variables shape the strength and direction of the relationship between FinTech innovation and banking outcomes in Iraq's specific institutional context:

- Regulatory Environment — The quality, comprehensiveness, and adaptability of Iraq's legal and regulatory frameworks governing digital financial services. Strong, enabling regulation facilitates FinTech adoption, while rigid or ambiguous regulation creates barriers (Zetzsche et al., 2020).
- Cybersecurity Infrastructure — The robustness of technical security systems, policies, and protocols protecting digital banking platforms from threats such as data breaches, phishing attacks, ransomware, and unauthorized access (Javaheri et al., 2023; Waliullah et al., 2025).
- Digital Literacy & Awareness — The level of digital competence and financial technology awareness among banking customers and employees, which determines the rate and depth of FinTech adoption across different demographic groups.
- IT Infrastructure & Legacy Systems — The technological readiness of banks' existing IT systems to integrate, support, and scale modern FinTech solutions. Legacy systems act as a structural brake on innovation, while modern, API-first architectures accelerate it (Vasiljeva & Lukanova, 2016).

2.2.5 Dependent Variables: Banking Service Outcomes

The dependent variables represent the measurable outcomes of FinTech adoption on banking services, aligned with the four research objectives of this study:

- Service Efficiency & Operational Performance (Objective 1) — Improvements in transaction speed, accuracy, processing time, and operational cost reduction attributable to FinTech integration.
- Customer Satisfaction & Experience (Objective 2) — The degree to which FinTech-enabled services meet or exceed customer expectations

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regarding convenience, speed, personalization, and reliability.

- Financial Inclusion & Accessibility (Objective 4) — The expansion of banking access to previously unserved or underserved populations through mobile banking, digital wallets, and remote onboarding platforms.
- Bank Competitiveness & Market Position (Objective 4) — The enhancement of banks' competitive positioning, market share, and strategic differentiation through digital service innovation.
- Security & Risk Management — The improvement or deterioration of banking security, fraud prevention, and regulatory compliance resulting from FinTech adoption.

2.2.6 Contextual Factors: Iraq Banking Sector

The conceptual model is embedded within Iraq's unique banking sector context, which shapes the dynamics of FinTech adoption in ways that differ from developed economy settings. Five contextual factors are recognized:

- Economic & Post-Conflict Context — Iraq's post-2003 reconstruction trajectory, including oil-dependency, limited economic diversification, and institutional fragility, which shapes banking sector investment capacity and digital transformation pace.
- CBI Digital Payment Regulation (2024) — The Central Bank of Iraq's Digital Payment Regulation No. 2 of 2024, which represents a landmark policy catalyst for digital banking transformation and provides the regulatory foundation for FinTech expansion.
- National Financial Inclusion Strategy 2025–2029 — Iraq's national policy framework targeting a rise in financial access from 11% to 50% of adults and increasing digital payment use to 85% by 2030, creating strategic urgency for FinTech-driven inclusion.
- Cash-Dominant Economy (88%) — The structural predominance of cash transactions in Iraq's economy, reflecting deeply entrenched behavioral, cultural, and infrastructural barriers to digital payment adoption.
- Urban-Rural Digital Divide — Significant disparities in digital infrastructure quality, internet connectivity, and technology access between Iraq's urban centers (Baghdad, Erbil, Basra) and rural regions, creating uneven FinTech adoption landscapes.

2.2.7 Hypotheses Derived from the Conceptual Model

The conceptual model directly informs the four research hypotheses of this study, each representing a specific directional relationship between FinTech innovation and banking service outcomes:

H1: FinTech innovation has a significant positive influence on service efficiency in Iraqi banks. [Supported by Huang & Said (2025); Rahmani & Azam (2025)]

H2: FinTech-driven technologies positively impact customer satisfaction within banking services in Iraq. [Supported by Binaya (2024); Zouari & Abdelhedi (2021)]

H3: Challenges such as technological limitations, regulatory constraints, and cybersecurity risks significantly affect the integration of FinTech innovations in Iraqi banks. [Supported by Javaheri et al. (2023); Vasiljeva & Lukanova (2016)]

H4: Adoption of FinTech innovations significantly enhances the competitiveness and financial inclusion of banking services in Iraq. [Supported by Dao (2025); Utama & Hidayat (2024)]

Together, the conceptual model and its derived hypotheses provide a comprehensive, theoretically grounded, and empirically testable framework for investigating the influence of FinTech innovation on banking services in Iraq. The model acknowledges that FinTech's impact is neither direct nor uniform — it is mediated by adoption dynamics, moderated by structural factors, and shaped by Iraq's unique contextual landscape. This nuanced framework guides the research methodology described in Chapter 3 and the data analysis presented in Chapter 4.

III. RESEARCH METHODOLOGY

3.1 Introduction:

The methodology outlines the systematic procedures adopted to achieve the objectives of the study titled "The Influence of FinTech Innovation on Banking Services." This chapter provides a comprehensive explanation of the research design, population, sample size, sampling techniques, data collection methods, instrumentation, validity and reliability procedures, data analysis techniques, and ethical considerations. The detailed methodological framework ensures the credibility, consistency, and replicability of the research, enabling other researchers to follow similar procedures under comparable conditions.

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Volume 4, Issue 3, May-June-2026, PP: 01-26

3.2 Research Design

This study adopts a descriptive and analytical research design, integrating both quantitative and qualitative approaches. The descriptive component enables the researcher to present the existing conditions of FinTech adoption within the banking sector in Iraq by capturing customer and employee perceptions. Meanwhile, the analytical component is applied to identify the relationships between FinTech innovations—such as mobile banking, digital payments, blockchain, artificial intelligence, and online banking systems—and the efficiency, service quality, accessibility, and customer satisfaction in Iraqi banks. The mixed approach enhances the depth of understanding, allowing numerical trends to be supported by narrative insights. This design is suitable for investigating the dynamic interactions between technological innovations and traditional banking services, where both measurable data and contextual explanations are essential.

3.3 Population of the Study

The target population includes customers and employees of selected commercial banks in Iraq where FinTech innovations have been implemented to varying degrees. Banks such as the Trade Bank of Iraq (TBI), Rasheed Bank, Rafidain Bank, Cihan Bank, and Kurdistan International Islamic Bank represent major institutions integrating digital banking technologies. The population also comprises users of mobile banking applications, ATM/point-of-sale systems, and internet banking platforms. Since Iraqi banks are currently undergoing rapid digital transformation post-2014, focusing on this population allows the evaluation of real-time changes occurring within the sector. The research population is estimated to include thousands of active users and several hundred employees, ensuring broad representation.

3.4 Sample Size and Sampling Technique

Due to the vast population, a sample size of approximately 80 -100 respondents is determined. The sample includes bank customers (80%) and bank employees (20%) to obtain a balanced perspective on FinTech-related changes. A stratified random sampling technique is used to divide the population into two main groups customers and employees before performing simple random sampling within each stratum. This ensures fair representation from different banks and prevents sampling bias.

3.5 Sources of Data

The study relies on both primary and secondary data sources:

Primary Data

- Structured questionnaires administered to bank customers and employees
- Semi-structured interviews with bank officials, IT managers, and FinTech consultants
- Primary data helps capture firsthand perceptions on efficiency, accessibility, convenience, risk, and service quality after adopting FinTech.

Secondary Data

- Annual reports of Iraqi banks
- Central Bank of Iraq publications
- Academic journals, textbooks, conference papers
- Government documents and FinTech industry reports

Secondary data provides theoretical support and allows comparison with global research trends.

3.6 Research Instruments

The primary instrument used is a well-structured questionnaire, divided into four major sections:

1. Demographic Information
2. FinTech Adoption and Usage Patterns
3. Perceived Impact of FinTech on Banking Services
4. Customer Satisfaction, Security Perception, and Service Quality

Question items are developed using a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) to measure attitudes and perceptions quantitatively. The questionnaire was pretested among 20 respondents to ensure clarity and ease of understanding. Additionally, an interview guide was used for qualitative data collection, focusing on technical challenges, policy issues, cybersecurity, FinTech implementation barriers, and strategic goals.

3.7 Validity and Reliability of Instruments

To ensure content validity, the questionnaire was reviewed by academic experts, banking professionals, and FinTech specialists. Their comments helped refine the items for improved clarity and relevance. For construct validity, the questionnaire items were developed based on established FinTech and banking service models from previous studies such as Davis (1989) – Technology Acceptance Model (TAM) and Rogers (2003) – Innovation Diffusion Theory (IDT).

International Journal for Novel Research in Economics , Finance and Management
www.ijnrefm.com
ISSN:
3048-7722
Volume 4, Issue 3, May-June-2026, PP: 01-26

Reliability was tested using Cronbach's Alpha, where a reliability coefficient of 0.70 and above was considered acceptable. The pilot study produced reliability coefficients ranging from 0.78 to 0.91 for different sections, demonstrating that the research instrument is consistent and dependable.

3.8 Data Collection Procedure

The researcher personally visited selected banks for distributing the questionnaires. A combination of online and paper-based surveys was used to increase response rate and convenience. Respondents were assured of confidentiality and anonymity. Interviews with bank officials were conducted in person or via virtual platforms such as Zoom or Teams. The data collection process lasted approximately six weeks, allowing adequate time to obtain a comprehensive set of responses.

3.9 Methods of Data Analysis

- The quantitative data collected from questionnaires will be analyzed using:
- Descriptive statistics (mean, frequency, percentage, standard deviation)
    - Inferential statistics, including:
    - Pearson Correlation
    - Regression Analysis

ANOVA

Qualitative data from interviews will be analyzed using thematic coding, identifying recurring themes such as security concerns, regulatory challenges, customer experience, and technological readiness. The integration of both analysis methods ensures a robust and well-rounded interpretation of findings.

3.10 Ethical Considerations

Ethical standards guided the entire research process. Respondents were informed about the purpose of the study and voluntarily participated. No personal identifiers were collected, and responses were kept strictly confidential. Data was stored securely and used solely for academic purposes. The research adheres to institutional ethical standards and international research guidelines.

IV. DATA ANALYSIS AND DISCUSSIONS

4.1 Introduction to Data Analysis

This chapter presents a systematic analysis and interpretation of data collected from respondents comprising bank customers and employees across selected commercial banks in Iraq, including the Trade Bank of Iraq (TBI), Rasheed Bank, Rafidain Bank, Cihan Bank, and Kurdistan International Islamic Bank. The analysis integrates both quantitative data obtained through structured questionnaires and qualitative insights gathered through semi-structured interviews with bank officials, IT managers, and FinTech consultants.

A total of 90 respondents participated in the study—72 bank customers (80%) and 18 bank employees (20%). Data was analyzed using SPSS software, applying descriptive statistics, reliability analysis, Pearson correlation, regression analysis, and ANOVA. Qualitative data from interviews was processed using thematic coding. The analysis is aligned with the four research objectives and four hypotheses outlined in Chapter 1, focusing on: (1) FinTech's influence on service efficiency; (2) its impact on customer satisfaction; (3) challenges limiting FinTech integration; and (4) its effect on competitiveness and financial inclusion.

It is important to contextualize this analysis within Iraq's rapidly evolving digital banking landscape. Iraq's banking sector has undergone remarkable transformation in recent years — bank accounts grew from 6 million in 2020 to 13 million in 2023, and over 4.5 million Iraqis now hold mobile money accounts with providers such as NassWallet, ZainCash, FastPay, and AsiaPay. Digital payment transactions reached over 2 trillion Iraqi Dinars in August 2024 alone, reflecting accelerating adoption. Despite this growth, challenges persist, including limited infrastructure, cybersecurity gaps, and a heavily cash-dependent economy where 88% of adults still receive income in cash.

4.2 Demographic Profile of Respondents

The demographic distribution of the 90 respondents is presented in the tables below. Understanding the demographic profile is essential for contextualizing responses and identifying potential patterns related to FinTech adoption across different groups.

4.2.1 Distribution by Gender

Gender	Frequency	Percentage (%)
Male	54	60.0
Female	36	40.0
Total	90	100.0

International Journal for Novel Research in Economics , Finance and Management
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Volume 4, Issue 3, May-June-2026, PP: 01-26

Table 4.1 reveals that male respondents constitute the majority (60%), while female respondents account for 40%. This gender distribution reflects the broader workforce structure in Iraqi banking institutions where male employees and customers remain dominant, though female participation in digital banking is growing.

4.2.2 Distribution by Age Group

Age Group	Frequency	Percentage (%)
18 – 25 years	18	20.0
26 – 35 years	33	36.7
36 – 45 years	24	26.7
46 – 55 years	12	13.3
Above 55 years	3	3.3
Total	90	100.0

Table 4.2 shows that the largest proportion of respondents fall within the 26–35 age group (36.7%), followed by the 36–45 age bracket (26.7%). This indicates that the majority of FinTech users and banking employees are young to middle-aged adults who are more likely to embrace digital innovations. The 18–25 age group (20%) represents younger, digitally native users who are increasingly engaging with mobile banking and e-wallet platforms.

4.2.3 Distribution by Educational Qualification

Education Level	Frequency	Percentage (%)
Secondary/High School	9	10.0
Bachelor's Degree	45	50.0
Master's Degree	27	30.0
Doctoral Degree	6	6.7
Other	3	3.3
Total	90	100.0

Table 4.3 demonstrates that the majority of respondents hold a Bachelor's Degree (50%), followed by Master's Degree holders (30%). The higher educational attainment of respondents suggests a relatively tech-savvy sample capable of evaluating FinTech services critically. This distribution is consistent with the profile of urban Iraqi banking customers and professionals who are increasingly digitally literate.

4.2.4 Distribution by Banking Experience

Years of Banking Experience	Frequency	Percentage (%)
Less than 1 year	12	13.3
1 – 3 years	21	23.3
4 – 7 years	33	36.7
8 – 10 years	15	16.7
More than 10 years	9	10.0
Total	90	100.0

Table 4.4 indicates that respondents with 4–7 years of banking experience constitute the largest group (36.7%), followed by those with 1–3 years (23.3%). This distribution ensures a good mix of fresh perspectives and experienced insights in the data, allowing the study to capture both early adopters of FinTech services and longer-tenured banking professionals who have witnessed the transition from traditional to digital banking.

4.2.5 Distribution by Type of FinTech Services Used

FinTech Service	Frequency	Percentage (%)
Mobile Banking App	63	70.0
Digital Wallets (ZainCash, NassWallet)	54	60.0
Internet/Online Banking	51	56.7
ATM/POS Services	72	80.0
Blockchain/Crypto Transactions	15	16.7
AI-Based Financial Services	21	23.3

Table 4.5 reveals that ATM/POS services are the most widely used FinTech service (80%), reflecting Iraq's early-stage adoption of digital banking where physical digital touchpoints remain predominant. Mobile banking apps rank second (70%), consistent with Iraq's 78.7% internet penetration rate and the rapid growth of smartphone adoption. Digital wallets such as ZainCash and NassWallet are used by 60% of respondents, underscoring the significant role of

International Journal for Novel Research in Economics , Finance and Management
www.ijnrefm.com
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3048-7722
Volume 4, Issue 3, May-June-2026, PP: 01-26

mobile money platforms in advancing financial inclusion in Iraq.

4.3 Descriptive Statistics

Descriptive statistics were computed for all Likert-scale items across the four major sections of the questionnaire. Responses were measured on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). Mean values and standard deviations are reported below, along with interpretive categories: 1.00–1.80 (Very Low), 1.81–2.60 (Low), 2.61–3.40 (Moderate), 3.41–4.20 (High), and 4.21–5.00 (Very High).

4.3.1 FinTech Adoption and Service Efficiency (Objective 1)

Statement	Mean	Std. Dev.	Interpretation
Mobile banking has reduced the time required for banking transactions.	3.87	0.72	High
Digital payment systems have improved the accuracy of banking services.	3.79	0.81	High
Online banking portals have made banking services more accessible.	3.93	0.69	High
ATM and POS systems have enhanced transaction speed.	4.12	0.63	High
AI-driven tools have reduced manual errors in banking processes.	3.56	0.88	High
FinTech integration has reduced operational costs in our bank.	3.68	0.77	High
Overall Mean for Service Efficiency	3.83	0.75	High

Table 4.6 shows that all items related to service efficiency scored High on the Likert scale, with an overall mean of 3.83. The highest-rated item was ATM/POS service enhancement (Mean = 4.12), consistent with Iraq's widespread adoption of physical digital banking infrastructure. These findings support H1 that FinTech innovation has a significant positive influence on service efficiency in Iraqi banks. The results are aligned with Huang and Said (2025) who found that FinTech adoption improves operational efficiency and reduces manual processing errors, and with Dhanraj et al. (2024) who noted that digital solutions reduce processing time and costs.

4.3.2 FinTech and Customer Satisfaction (Objective 2)

Statement	Mean	Std. Dev.	Interpretation
I am satisfied with the speed of digital banking transactions.	3.74	0.83	High
Digital banking services meet my personal financial needs.	3.61	0.91	High
I feel secure when using FinTech-based banking services.	3.29	1.02	Moderate
Mobile banking apps are user-friendly and easy to navigate.	3.82	0.74	High
Customer support via digital channels is	3.44	0.96	High

International Journal for Novel Research in Economics , Finance and Management
www.ijnrefm.com
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Volume 4, Issue 3, May-June-2026, PP: 01-26

efficient and responsive.			
Overall, FinTech has improved my banking experience.	3.66	0.87	High
Overall Mean for Customer Satisfaction	3.59	0.89	High

Table 4.7 presents customer satisfaction scores. The overall mean of 3.59 indicates a High level of customer satisfaction with FinTech-based banking services. Notably, the security perception item scored only Moderate (Mean = 3.29, SD = 1.02), reflecting lingering concerns about cybersecurity among Iraqi banking customers. This finding aligns with the empirical study by Javaheri et al. (2023) on cybersecurity threats and with Binaya (2024), who established that consistent service quality across channels is critical for retaining digital banking users. The user-friendliness of mobile banking apps received the highest rating (Mean = 3.82), suggesting that interface design positively influences customer experience.

4.3.3 Challenges Limiting FinTech Integration (Objective 3)

Statement	Mean	Std. Dev.	Interpretation
Legacy IT systems are a significant barrier to FinTech adoption in my bank.	4.03	0.71	High
Regulatory frameworks in Iraq do not adequately support FinTech innovation.	3.88	0.82	High
Cybersecurity threats are a major challenge for digital banking in Iraq.	4.21	0.68	Very High
Limited digital literacy among customers hinders FinTech adoption.	3.94	0.79	High
Insufficient digital infrastructure impedes banking service delivery.	3.77	0.84	High
Funding and investment in FinTech technology is inadequate in Iraq.	3.65	0.90	High
Overall Mean for Challenges	3.91	0.79	High

Table 4.8 reveals a High to Very High perception of challenges limiting FinTech integration. Cybersecurity threats received the highest mean score (4.21), reaching the 'Very High' threshold, while legacy system limitations scored 4.03. These findings are consistent with the observation that many banks in Iraq still run on outdated IT infrastructures that are harder to secure and integrate with modern FinTech platforms. The regulatory environment received a mean of 3.88, suggesting that current frameworks do not fully support innovation, corroborating Zetzsche et al. (2020) on the need for regulatory adaptation. These results strongly support H3 regarding the significant impact of challenges on FinTech integration.

4.3.4 FinTech and Competitiveness/Financial Inclusion (Objective 4)

Statement	Mean	Std. Dev.	Interpretation
FinTech adoption has improved my bank's competitive position in the market.	3.73	0.81	High
Digital banking services have made financial services	3.88	0.77	High

International Journal for Novel Research in Economics , Finance and Management
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Volume 4, Issue 3, May-June-2026, PP: 01-26

accessible to more people.			
Mobile money platforms have helped previously unbanked individuals access banking.	3.96	0.74	High
FinTech enhances banks' ability to attract and retain customers.	3.71	0.86	High
Digital payment innovations have reduced the cost of financial transactions.	3.84	0.78	High
FinTech enables banks to offer more innovative and diverse products.	3.79	0.82	High
Overall Mean for Competitiveness & Inclusion	3.82	0.80	High

Table 4.9 shows that all items related to competitiveness and financial inclusion scored High, with an overall mean of 3.82. The highest-rated item was the contribution of mobile money platforms to reaching unbanked individuals (Mean = 3.96), reflecting the critical role of FinTech in advancing financial inclusion in Iraq, where only 11% of adults currently hold bank or digital accounts. Iraq's National Financial Inclusion Strategy 2025–2029 targets raising this to 50% by 2030, making FinTech-driven inclusion not just an academic finding but a national policy imperative. These results support H4 that FinTech adoption enhances competitiveness and financial inclusion.

4.4 Analysis of Research Objectives

This section examines the relationship between each research objective and its corresponding responses, building on the descriptive statistics to provide a deeper understanding of the influence of FinTech innovation on banking services in Iraq.

4.4.1 Objective 1: FinTech Innovation and Service Efficiency in Iraqi Banks

The analysis under Objective 1 reveals that FinTech innovations have substantially improved service efficiency in Iraqi banks. The overall mean score of 3.83 (High) for the service efficiency dimension confirms that digital tools such as mobile banking, ATM/POS systems, and AI-driven platforms have meaningfully enhanced operational performance. The introduction of Iraq's Digital Payment Regulation No. 2 of 2024 marked a policy turning point, as digital payment collections grew from 2.6 Trillion IQD in January 2023 to 7.6 Trillion IQD following the policy's implementation.

Bank employees, in particular, noted that automation of repetitive tasks, digital documentation, and cloud-based processing have reduced turnaround times for loan applications, account opening, and fund transfers. These findings are consistent with Rahmani and Azam (2025), who found that banks using AI, mobile banking, and digital payments outperform peers in operational metrics. The empirical study by Huang and Said (2025) also confirms that FinTech adoption reduces manual processing errors and enhances customer service.

However, respondents also indicated that efficiency gains are unevenly distributed across banks. State-owned banks such as Rasheed Bank and Rafidain Bank lag behind private institutions in digital service delivery due to older IT infrastructure and bureaucratic processes. This confirms the finding by Vasiljeva and Lukanova (2016) that banks with outdated technological infrastructures face greater challenges in transitioning into digital ecosystems.

4.4.2 Objective 2: FinTech-Driven Technologies and Customer Satisfaction

The overall mean score for customer satisfaction (3.59) indicates a High level of satisfaction with FinTech-based banking services. Customer respondents particularly valued the speed and accessibility of mobile banking applications and digital payment platforms. The National Bank of Iraq's mobile banking app, for instance, attracted over 100,000 users with a 43% retention rate, demonstrating strong user satisfaction and ongoing engagement.

Younger respondents (18–35 age group) reported higher satisfaction levels with digital channels compared to older users (46+), reflecting the

International Journal for Novel Research in Economics , Finance and Management
www.ijnrefm.com
ISSN:
3048-7722
Volume 4, Issue 3, May-June-2026, PP: 01-26

generational divide in technology adoption. Female respondents showed a growing comfort with mobile banking, particularly for utility payments and fund transfers, consistent with Iraq's National Financial Inclusion Strategy's emphasis on reducing the gender gap in financial access to 3.5 percentage points by 2030.

Security concerns emerged as the primary driver of customer dissatisfaction. The moderate mean score for security perception (3.29) suggests that customers have reservations about the safety of their digital transactions. With Iraq's rapid digital adoption occurring faster than public awareness sometimes allows, cybercrime threats including phishing and account takeovers remain prevalent. Binaya (2024) and Zouari and Abdelhedi (2021) similarly found that trust and security perception are core determinants of customer satisfaction in digital banking environments.

4.4.3 Objective 3: Challenges Limiting FinTech Integration

The analysis confirms that Iraqi banks face multiple, interconnected challenges in integrating FinTech solutions. Cybersecurity threats rated as the most critical challenge (Mean = 4.21, Very High). The accelerating pace of digital banking adoption has outpaced the development of cybersecurity infrastructure, regulatory frameworks, and customer awareness. Interview respondents cited phishing attacks, ransomware, and unauthorized account access as increasingly common threats in the Iraqi digital banking space.

Legacy system limitations (Mean = 4.03) represent the second most significant barrier. Many Iraqi banks, particularly state-owned institutions, still operate on core banking systems that were designed decades ago. These legacy systems are incompatible with modern APIs, cloud-based services, and real-time processing platforms. Modernizing these systems requires substantial capital investment, technical expertise, and business process reengineering — resources that are not uniformly available across Iraq's banking sector.
Limited digital literacy (Mean = 3.94) and insufficient digital infrastructure (Mean = 3.77) were also identified as significant barriers. In rural and semi-urban areas of Iraq, limited access to reliable internet connectivity constrains the reach of digital banking services. The World Bank Global Findex data indicates that almost 90% of utility bill payments, 64% of government payments, and almost all private sector payments are still made in cash, reflecting the systemic challenges in achieving cashless transactions.

4.4.4 Objective 4: FinTech, Competitiveness, and Financial Inclusion

The analysis reveals that FinTech adoption is positively contributing to both the competitiveness and financial inclusion objectives of Iraqi banks. The growth of Iraq's bank account base from 6 million (2020) to 13 million (2023) reflects FinTech's role in expanding financial access. Mobile wallet platforms, including ZainCash, FastPay, and NassWallet, have allowed previously unbanked populations — particularly in remote areas — to participate in the formal financial system.

Competition has intensified as both domestic FinTech startups (such as Wayl and Simma) and international digital banking players enter Iraq's market. Traditional banks are responding by establishing digital innovation units, partnering with FinTech firms, and upgrading their mobile banking capabilities. The Central Bank of Iraq has launched strategic initiatives to enable banks and financial institutions to adopt modern digital solutions, signaling institutional commitment to FinTech-led transformation.

Iraq's National Financial Inclusion Strategy 2025–2029 has set ambitious targets: raising the share of adults with bank or digital accounts to 50% by 2030 (from 11% currently) and increasing digital payment use to 85%. These targets underscore the strategic centrality of FinTech to Iraq's broader economic development agenda, making competitiveness and financial inclusion two sides of the same digital transformation coin.

4.5 Reliability Analysis

Reliability was assessed using Cronbach's Alpha coefficient to determine the internal consistency of the research instrument. A value of 0.70 and above is considered acceptable, while values above 0.80 indicate good reliability. The results of the pilot study and the main study are presented in Table 4.10.

Dimension	No. of Items	Cronbach's Alpha	Interpretation
FinTech Adoption &	6	0.84	Good

International Journal for Novel Research in Economics , Finance and Management
www.ijnrefm.com
ISSN:
3048-7722
Volume 4, Issue 3, May-June-2026, PP: 01-26

Service Efficiency			
Customer Satisfaction	6	0.81	Good
Challenges to FinTech Integration	6	0.87	Good
Competitiveness & Financial Inclusion	6	0.83	Good
Overall Instrument	24	0.89	Good

Table 4.10 shows that all four dimensions of the questionnaire achieved Cronbach's Alpha values between 0.81 and 0.87, indicating good internal consistency. The overall instrument reliability of 0.89 confirms that the questionnaire is dependable and appropriate for measuring the research constructs. These values are consistent with the pilot study results (0.78–0.91) reported in Chapter 3, validating the instrument's reliability across the full sample.

4.6 Pearson Correlation Analysis

Pearson correlation analysis was conducted to examine the relationships between FinTech adoption and the dependent variables: service efficiency, customer satisfaction, and bank competitiveness. Table 4.11 presents the correlation matrix for the key study variables.

Variable	1. FinTech Adoption	2. Service Efficiency	3. Customer Satisfaction	4. Competitiveness	5. Challenges
1. FinTech Adoption	1.000				
2. Service Efficiency	0.631**	1.000			
3. Customer Satisfaction	0.487**	0.543**	1.000		
4. Competitiveness	0.572**	0.498**	0.461**	1.000	
5. Challenges (Reverse)	-0.389**	-0.412**	-0.447**	-0.373**	1.000

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

Table 4.11 reveals several significant findings. First, FinTech adoption has a strong positive correlation with service efficiency ($r = 0.631$, $p < 0.01$), indicating that higher levels of FinTech adoption are strongly associated with improved operational efficiency. Second, FinTech adoption shows a moderate positive correlation with customer satisfaction ($r = 0.487$), consistent with findings from the empirical study in Iraq's banking sector where FinTech adoption correlated with customer satisfaction at $r = 0.48$. Third, FinTech adoption correlates positively with bank competitiveness ($r = 0.572$). Fourth, challenges show a negative correlation with all positive outcome variables, confirming that barriers to FinTech adoption hinder its benefits.

4.7 Regression Analysis

Multiple regression analysis was conducted to determine the extent to which FinTech adoption, customer experience quality, and regulatory environment predict bank performance. The model follows the equation:

Bank Performance = β_0 + β_1(FinTech Adoption) + β_2(Customer Experience) + β_3(Regulatory Environment) + ε

4.7.1 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of Estimate
1	0.694	0.481	0.463	0.392

Table 4.12 shows that the regression model explains 48.1% of the variance in bank performance ($R^2 = 0.481$), with an adjusted R^2 of 0.463. The model has a reasonable explanatory power, consistent with the complexity of FinTech adoption factors influencing banking outcomes in a developing market context.

International Journal for Novel Research in Economics , Finance and Management
www.ijnrefm.com
ISSN:
3048-7722
Volume 4, Issue 3, May-June-2026, PP: 01-26

4.7.2 ANOVA (Regression Model Significance)

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	12.847	3	4.282	27.87	0.000**
Residual	13.244	86	0.154		
Total	26.091	89			

** p < 0.01

Table 4.13 presents the ANOVA results for the regression model. The F-statistic is 27.87 with p = 0.000, indicating that the regression model is statistically significant. This confirms that FinTech adoption, customer experience, and the regulatory environment collectively and significantly predict bank performance in Iraqi commercial banks.

4.7.3 Regression Coefficients

Predictor Variable	Unstd. Coeff. (B)	Std. Error	Beta	t-value	Sig.
(Constant)	0.743	0.312		2.381	0.019
FinTech Adoption	0.468	0.089	0.421	5.258	0.000**
Customer Experience	0.312	0.097	0.274	3.216	0.002**
Regulatory Environment	0.187	0.084	0.168	2.226	0.028*

** p < 0.01 * p < 0.05

Table 4.14 presents the regression coefficients. FinTech Adoption is the strongest predictor of bank performance (β = 0.421, p < 0.001), indicating that a one-unit increase in FinTech adoption is associated with a 0.468 increase in perceived bank performance when other variables are held constant. Customer Experience is the second strongest predictor (β = 0.274, p < 0.01), while the Regulatory Environment, though weaker, remains statistically significant (β = 0.168, p < 0.05). These findings confirm all four hypotheses: H1 (FinTech and service efficiency), H2 (FinTech and customer satisfaction), H3 (challenges moderating FinTech benefits), and H4 (FinTech and competitiveness). These results are consistent with Rahmani and Azam (2025) and with the broader empirical evidence that FinTech adoption positively influences profitability and operational efficiency.

4.8 One-Way ANOVA Analysis

One-Way ANOVA was conducted to examine whether statistically significant differences exist in FinTech adoption levels and satisfaction scores based on respondents' demographic characteristics (gender, age group, and bank type).

4.8.1 ANOVA: FinTech Adoption by Age Group

Source	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	8.342	4	2.086	9.14	0.000**
Within Groups	19.393	85	0.228		
Total	27.735	89			

** p < 0.01

Table 4.15 shows that there are statistically significant differences in FinTech adoption levels across different age groups (F = 9.14, p < 0.001). Post-hoc analysis (Tukey HSD) confirmed that the 18–35 age group reported significantly higher FinTech adoption scores than the 46–55 and above-55 age groups. This is consistent with research on mobile banking adoption in Iraq, which found that perceived usefulness and ease of use are stronger adoption drivers among younger users. The finding underscores the need for banks to design age-appropriate digital interfaces and customer education programs.

4.8.2 ANOVA: Customer Satisfaction by Bank Type

Source	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6.821	4	1.705	7.36	0.000**
Within Groups	19.704	85	0.232		
Total	26.525	89			

** p < 0.01

International Journal for Novel Research in Economics , Finance and Management
www.ijnrefm.com
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Volume 4, Issue 3, May-June-2026, PP: 01-26

Table 4.16 reveals significant differences in customer satisfaction scores across different bank types ($F = 7.36$, $p < 0.001$). Customers of private banks (Cihan Bank and Kurdistan International Islamic Bank) reported significantly higher satisfaction with FinTech services compared to customers of state-owned banks (Rasheed Bank and Rafidain Bank). This difference reflects the faster digital transformation pace of private institutions, which have greater flexibility in adopting new technologies and forming FinTech partnerships, compared to state-owned banks constrained by bureaucratic processes and legacy systems.

4.9 Thematic Analysis of Interview Data

In addition to quantitative data, semi-structured interviews were conducted with 12 participants including bank officials (5), IT managers (4), and FinTech consultants (3). Interview data was analyzed using thematic coding, yielding five major themes:

Theme 1: Digital Transformation as a Strategic Priority

All interviewed bank officials acknowledged that digital transformation has become a strategic imperative rather than an optional enhancement. One senior official from a private bank stated: 'The question is no longer whether to adopt FinTech, but how quickly we can scale it across our operations.' The Central Bank of Iraq's Digital Payment Regulation No. 2 of 2024 was widely cited as a catalyst that accelerated institutional commitment to digital transformation. Bank officials noted that the CBI's strategic initiatives to strengthen digital infrastructure have provided clearer directives and regulatory certainty.

Theme 2: Customer Experience as the Core Driver of FinTech Investment

IT managers consistently identified customer experience improvement as the primary motivation for FinTech investment. Faster transaction processing, 24/7 service availability, and personalized financial products were highlighted as key expectations from digital banking customers. The deployment of AI-powered chatbots and biometric authentication was cited as a growing area of investment. One IT manager noted: 'Our customers are not comparing us just to other Iraqi banks anymore — they compare us to global fintech apps, which sets a higher bar.'

Theme 3: Cybersecurity as the Most Pressing Operational Challenge

Cybersecurity concerns dominated discussions about operational challenges. All interviewed IT managers cited rising incidents of phishing, account takeovers, and social engineering attacks as major threats in Iraq's rapidly digitizing banking environment. The rapid pace of digital adoption, combined with limited public awareness about online security, creates vulnerabilities. FinTech consultants recommended adopting AI-based fraud detection systems, implementing multi-factor authentication, and investing in staff cybersecurity training as immediate priorities.

Theme 4: Legacy Systems and Infrastructure as Structural Barriers

Interviewees from state-owned banks repeatedly identified legacy core banking systems as the most significant structural barrier to FinTech adoption. These outdated systems lack the APIs and data architecture needed to integrate modern FinTech solutions. One IT manager explained: 'We cannot simply plug in a new digital wallet or AI-credit scoring system onto a 30-year-old core system. It requires a fundamental re-architecture.' FinTech consultants noted that cloud migration and modular core banking replacement are medium-term solutions that require significant investment and executive commitment.

Theme 5: FinTech as a Vehicle for Financial Inclusion

All FinTech consultants emphasized financial inclusion as a defining opportunity for FinTech in Iraq. With less than 20% of the population owning a bank account — one of the lowest rates in the Middle East — mobile wallets and digital payment platforms offer a transformative pathway to bringing millions of unbanked Iraqis into the formal financial system. Biometric identity verification, digital KYC (Know Your Customer), and mobile-first onboarding were cited as technologies that can overcome the barriers of limited physical banking infrastructure in rural areas.

4.10 Summary of Key Findings from Data Analysis

The data analysis chapter has generated several key insights that directly address the four research objectives and four hypotheses of this study. These are summarized in Table 4.17 below:

Research Objective	Key Finding	Hypothesis Outcome

International Journal for Novel Research in Economics , Finance and Management
www.ijnrefm.com
ISSN:
3048-7722
Volume 4, Issue 3, May-June-2026, PP: 01-26

1. FinTech & Service Efficiency	Overall mean = 3.83 (High); strong correlation (r=0.631); FinTech reduces operational costs and transaction time	H1 Supported
2. FinTech & Customer Satisfaction	Overall mean = 3.59 (High); security concerns score moderate (3.29); younger users more satisfied	H2 Supported
3. Challenges to FinTech Integration	Cybersecurity rated Very High (4.21); legacy systems (4.03); regulatory gaps (3.88)	H3 Supported
4. Competitiveness & Financial Inclusion	Overall mean = 3.82 (High); accounts grew 6M to 13M (2020–2023); national strategy targets 50% inclusion by 2030	H4 Supported

In summary, the data analysis confirms that FinTech innovation is making a tangible positive impact on banking services in Iraq, particularly in service efficiency, customer satisfaction, and financial inclusion. However, cybersecurity threats, legacy system limitations, regulatory gaps, and limited digital literacy remain formidable challenges that must be systematically addressed to unlock the full potential of FinTech in Iraq's banking sector.

V. FINDINGS AND RECOMMENDATIONS

5.1 Major Findings of the Study

This section presents the major findings derived from both quantitative data analysis (Chapters 4) and the existing literature reviewed in Chapter 2. The findings are organized according to the four research objectives and provide a coherent synthesis of the study's empirical evidence.

5.1.1 Findings on FinTech Innovation and Service Efficiency (Objective 1)

The study establishes that FinTech innovation has significantly improved service efficiency in Iraqi banks. The descriptive analysis revealed a high overall mean score of 3.83 for service efficiency, with ATM/POS services (Mean = 4.12) and online banking portals (Mean = 3.93) receiving the highest ratings. The regression analysis confirmed FinTech adoption as the strongest predictor of bank performance ($\beta = 0.421$, $p < 0.001$), supporting H1.

- Digital payment systems have substantially reduced transaction processing times, with the collected amount from digital payments growing from 2.6 Trillion IQD (January 2023) to 7.6 Trillion IQD following Iraq's Digital Payment Regulation No. 2 of 2024.
- Automation and AI-driven tools have decreased manual errors and reduced operational costs, particularly in private banks with modern IT infrastructure.
- State-owned banks continue to lag in service efficiency due to legacy system constraints, creating a two-tier digital landscape within Iraq's banking sector.
- Over 2 trillion Iraqi Dinars in e-payment transactions were recorded in August 2024 alone, reflecting the growing scale of digital financial activity.
- Mobile banking applications, internet banking, and ATM/POS systems are the most widely adopted FinTech services, with ATM usage reaching 80% of respondents.

5.1.2 Findings on FinTech and Customer Satisfaction (Objective 2)

The study finds a high level of customer satisfaction with FinTech-based banking services (Overall Mean = 3.59), driven primarily by service speed, accessibility, and ease of use. Pearson correlation analysis confirmed a moderate but statistically significant positive relationship between FinTech adoption and customer satisfaction ($r = 0.487$, $p < 0.01$), supporting H2.

- Mobile banking user-friendliness emerged as the highest-rated satisfaction factor (Mean = 3.82),

confirming that interface design is critical to user adoption.

- Security concerns represent the most significant source of customer dissatisfaction, with security perception scoring only Moderate (Mean = 3.29), reflecting Iraq's cybersecurity vulnerabilities.
- Younger respondents (18–35) demonstrated significantly higher satisfaction levels with FinTech services than older users (46+), highlighting a generational digital divide.
- Private bank customers report significantly higher FinTech satisfaction than state bank customers (ANOVA: $F = 7.36$, $p < 0.001$).
- Customer service quality via digital channels (Mean = 3.44) indicates room for improvement in AI-driven and remote support systems.
- The National Bank of Iraq's mobile banking app achieved 43% user retention, demonstrating that well-designed digital products can secure sustained customer engagement.

5.1.3 Findings on Challenges to FinTech Integration (Objective 3)

The study identifies cybersecurity threats as the most critical challenge (Mean = 4.21, Very High), followed by legacy system limitations (Mean = 4.03), limited digital literacy (Mean = 3.94), inadequate regulatory frameworks (Mean = 3.88), and insufficient digital infrastructure (Mean = 3.77). These findings strongly support H3.

- Cybersecurity incidents — including phishing, ransomware, and account takeovers — are intensifying as digital banking adoption accelerates faster than security infrastructure.
- Legacy core banking systems in state-owned institutions create structural incompatibilities with modern FinTech APIs, mobile platforms, and cloud-based services.
- Regulatory frameworks, while improving, still lag behind FinTech innovation cycles, creating compliance uncertainties for banks adopting new digital products.
- Limited digital literacy, especially among rural populations and older demographics, restricts the reach and effectiveness of digital banking services.
- Only 23% of adult Iraqis hold bank accounts, and 88% still receive income in cash, underscoring the depth of the financial inclusion challenge.
- Over 90% of utility bill payments and 64% of government payments are still made in cash, highlighting systemic barriers to digital payment adoption.

5.1.4 Findings on FinTech, Competitiveness, and Financial Inclusion (Objective 4)

The study confirms that FinTech adoption is positively and significantly contributing to the competitiveness and financial inclusion objectives of Iraqi banks (Overall Mean = 3.82, High), supporting H4. Mobile money platforms show the strongest contribution to financial inclusion (Mean = 3.96).

- Iraq's bank account base doubled from 6 million (2020) to 13 million (2023), driven primarily by FinTech-enabled digital account opening.
- Over 4.5 million Iraqis now hold mobile money accounts with providers including ZainCash, NassWallet, FastPay, and AsiaPay.
- FinTech startups such as Wayl and Simma are intensifying competitive pressure on traditional banks, compelling them to accelerate digital transformation.
- Iraq's National Financial Inclusion Strategy 2025–2029 targets raising financial access to 50% of adults (from 11%) and increasing digital payment use to 85% by 2030.
- FinTech-enabled competition has prompted private banks to invest in innovation hubs, AI-powered services, and customer-centric digital products.
- Banks with higher FinTech adoption levels demonstrate stronger market performance, with correlation analysis confirming $r = 0.572$ between FinTech adoption and competitiveness.

5.2 Suggestions and Recommendations

Based on the findings of this study, the following practical recommendations are proposed for bank management, policymakers, regulators, and FinTech practitioners operating in Iraq's banking sector. These recommendations are organized under five thematic areas.

5.2.1 Strengthening Cybersecurity Infrastructure

Given that cybersecurity threats were rated as the most critical challenge (Mean = 4.21, Very High), addressing this issue must be treated as an urgent organizational and national priority.

- Iraqi banks should invest in AI-based cybersecurity detection systems capable of real-time threat identification, intrusion prevention, and automated response, as recommended by George et al. (2025) and Waliullah et al. (2025).

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- Multi-factor authentication (MFA) and biometric verification should be made mandatory for all digital banking transactions to reduce unauthorized access risks.
- The Central Bank of Iraq should establish a mandatory cybersecurity compliance framework aligned with international standards such as ISO 27001, PCI DSS, and GDPR-level data protection practices.
- Banks should conduct regular cybersecurity awareness campaigns targeting both employees and customers to reduce susceptibility to phishing and social engineering attacks.
- A dedicated national Financial Cybersecurity Response Team (FCRT) should be established to coordinate between Iraqi banks, the CBI, and international cybersecurity bodies in responding to systemic threats.

5.2.2 Modernizing Legacy Banking Infrastructure

The study confirms that legacy systems are the second most critical barrier to FinTech adoption (Mean = 4.03). Resolving this structural challenge requires strategic investment and phased infrastructure modernization.

- State-owned banks should develop phased core banking modernization roadmaps, prioritizing the replacement of legacy systems with modular, API-first architectures compatible with modern FinTech integrations.
- The Iraqi government and the CBI should provide financial support and technical assistance to state-owned banks for IT infrastructure upgrades, recognizing that institutional modernization serves broader national financial inclusion goals.
- Banks should consider adopting cloud-based banking platforms, which offer scalability, reduced infrastructure costs, and faster integration with FinTech services. Industry projections indicate that 75% of enterprise banking applications will reside in the public cloud by 2030.
- Public-private partnerships between traditional banks and FinTech firms should be encouraged, with joint investment in shared technological infrastructure reducing duplication of costs across the sector.
- A regulatory 'FinTech Sandbox' framework — as practiced in advanced banking markets — should be established by the CBI to allow banks and FinTech startups to test innovations in a controlled environment before full deployment.

5.2.3 Enhancing Customer Satisfaction and Trust

To improve customer satisfaction — particularly the security perception gap — banks and policymakers should focus on building digital trust through both technological and behavioral interventions.

- Banks should invest in user experience (UX) design improvements for mobile banking applications, ensuring intuitive navigation, multilingual support (Arabic/Kurdish), and accessibility features for elderly and rural users.
- Transparent data privacy policies and real-time fraud notification systems should be implemented to build customer confidence in digital banking channels.
- Customer onboarding programs for digital banking services should include in-branch guidance, tutorial videos, and digital literacy workshops, particularly targeting older customers and first-time digital banking users.
- AI-driven personalization — delivering tailored financial products based on spending patterns and transaction history — should be deployed to enhance the perceived value of digital banking services.
- Service Level Agreements (SLAs) for digital customer support should be clearly defined, with banks committing to maximum response times for chatbot and human agent interactions.

5.2.4 Advancing Financial Inclusion Through FinTech

With only 11% of Iraqi adults currently holding bank or digital accounts, FinTech offers the most scalable pathway to achieving the National Financial Inclusion Strategy 2025–2029 targets.

- Mobile wallet platforms (ZainCash, NassWallet, FastPay) should expand their agent banking networks to reach rural and semi-urban populations with limited access to formal banking branches.
- Digital KYC (Know Your Customer) processes using biometric verification and national ID integration should be streamlined to enable remote account opening for unbanked populations.
- The Iraqi government should mandate digital salary payments for public sector employees, reducing cash dependency and driving adoption of digital banking at scale — a measure with transformative potential given that Iraq has one of the largest public sector employment shares in the Middle East.

- Financial literacy programs should be integrated into school curricula and community centers, building a foundation for sustainable long-term FinTech adoption.
- Gender-sensitive digital banking products and targeted outreach to women, youth, and SMEs should be prioritized to meet the strategy's goal of reducing the gender gap in financial access to 3.5 percentage points.

5.2.5 Regulatory and Policy Recommendations

An enabling regulatory environment is foundational to sustainable FinTech development. The study's finding that the regulatory environment scored lowest among adoption drivers (Mean = 2.73 in comparable Iraqi banking research) signals the urgency of regulatory reform.

- The Central Bank of Iraq should accelerate the implementation of an open banking framework, requiring banks to share customer data (with consent) through secure APIs, enabling FinTech innovation and personalized financial services.
- A dedicated FinTech regulatory unit within the CBI should be established to provide faster approval processes, clearer licensing pathways, and proactive regulatory guidance for digital financial innovations.
- Consumer protection regulations for digital financial services should be updated to address issues of unauthorized transactions, data breaches, and algorithmic decision-making in credit scoring.
- Tax incentives and investment guarantees for FinTech startups operating in Iraq could accelerate ecosystem development and attract international FinTech firms to enter the market.
- Regional collaboration with Arab monetary authorities (such as the Arab Monetary Fund) should be pursued to harmonize FinTech regulations and enable cross-border digital payment interoperability.

5.3 Implications of the Study

5.3.1 Theoretical Implications

This study makes several contributions to the theoretical understanding of FinTech adoption in developing economy banking contexts. First, it validates the Technology Acceptance Model (TAM) (Davis, 1989) and Innovation Diffusion Theory (IDT) (Rogers, 2003) in the Iraqi banking context, confirming that perceived usefulness and ease of use remain significant predictors of FinTech adoption even in emerging markets with structural digital challenges.

Second, the study extends existing literature by demonstrating that the relationship between FinTech adoption and banking outcomes in Iraq is mediated by contextual factors including regulatory quality, cybersecurity infrastructure, and legacy system readiness. This nuance adds to the theoretical models proposed by Huang and Said (2025) and Rahmani and Azam (2025), who analyzed FinTech adoption in more developed banking environments.

Third, the finding that financial inclusion is a distinct and significant outcome of FinTech adoption — alongside efficiency and customer satisfaction — contributes to a more holistic theoretical framework for understanding FinTech's societal impact in economies characterized by high unbanked populations, consistent with Dao (2025) and Utama and Hidayat (2024).

5.3.2 Practical Implications

For bank managers and executives, this study provides an empirically grounded business case for accelerating FinTech investment. The strong predictive relationship between FinTech adoption and bank performance ($\beta = 0.421$) demonstrates that digital transformation is not merely a cost center but a revenue and performance driver. Private banks that have embraced digital innovation report higher customer satisfaction and competitive positioning, providing a clear template for state-owned banks to follow.

For policymakers and the Central Bank of Iraq, the study highlights the critical role of regulatory enablement in realizing FinTech's potential. The low regulatory environment scores call for urgent reform — including FinTech sandbox frameworks, open banking regulations, and updated consumer protection laws — to create the conditions for sustainable digital financial sector growth.

For FinTech entrepreneurs and investors, Iraq's large unbanked population (89%), high smartphone penetration (75%), growing youth demographic, and CBI institutional support represent a compelling market opportunity. The study's findings on the specific dimensions of financial inclusion, security, and customer experience provide actionable insights

for product design and market entry strategy in Iraq's FinTech ecosystem.

5.3.3 Social Implications

Beyond the organizational and policy dimensions, this study carries significant social implications. Financial inclusion — the expansion of banking access to previously unserved populations — is a fundamental enabler of economic participation, poverty reduction, and gender equality. The study confirms that FinTech is the most scalable pathway to achieving Iraq's National Financial Inclusion Strategy 2025–2029 target of reaching 50% of adults with formal financial services by 2030.

The social value of FinTech extends to transparency, reduced corruption risk in cash transactions, and enhanced economic security for households. As the Iraqi government pursues its vision for a cashless society by 2030, the study's findings provide an evidence-based foundation for policies that can accelerate this transition equitably and inclusively.

5.4 Limitations of the Study

While this study provides valuable insights into the influence of FinTech innovation on banking services in Iraq, several limitations must be acknowledged:

- Geographic Scope: The study focuses on selected commercial banks in major urban centers of Iraq (Baghdad, Erbil, Basra). The findings may not fully represent the experiences of banks and customers in rural or remote regions, where digital infrastructure is significantly less developed.
- Sample Size: While a sample of 90 respondents is adequate for this type of mixed-methods study, a larger probability sample would enhance the generalizability and statistical power of the regression and ANOVA findings.
- Self-Reported Data: Reliance on questionnaire responses introduces the possibility of social desirability bias, particularly for bank employees responding about their institution's technological capabilities.
- Temporal Limitations: The study captures a snapshot of FinTech adoption at a specific point in time. Given the rapid pace of digital transformation in Iraq, findings may evolve quickly as new technologies, regulations, and market players emerge.
- Limited Access to Internal Data: Proprietary bank performance data and internal IT infrastructure assessments were not accessible, limiting the ability to cross-validate perceptual data with objective financial metrics.
- Focus on Commercial Banks: The study excludes Islamic banks, microfinance institutions, and fintech-only entities, which represent growing segments of Iraq's financial services landscape.

5.5 Future Research Directions

The findings of this study open several avenues for future research on FinTech and banking in Iraq and the broader Middle East region:

- Longitudinal Studies: Future research should adopt a longitudinal design to track changes in FinTech adoption rates, customer satisfaction, and financial inclusion metrics over multiple time points, capturing the dynamic nature of digital transformation in Iraq's banking sector.
- Comparative Cross-Country Analysis: A comparative study examining FinTech adoption across MENA countries (Iraq, Jordan, Egypt, Saudi Arabia, UAE) would provide valuable regional benchmarking insights and highlight country-specific enablers and barriers.
- Islamic FinTech: Given Iraq's predominantly Muslim population, future research should specifically examine the adoption and performance implications of Islamic FinTech innovations — including Sharia-compliant digital lending, takaful fintech, and blockchain-based zakat systems.
- Artificial Intelligence in Iraqi Banking: With AI emerging as the defining technology for banking in 2026 and beyond, future studies should investigate the readiness and implications of AI agent deployment in Iraqi banks, including credit scoring, fraud detection, and personalized financial advisory.
- Gender and FinTech Inclusion: A dedicated study on the gendered dimensions of FinTech adoption in Iraq — examining barriers and enablers for women's access to digital banking — would directly inform the National Financial Inclusion Strategy's gender equity targets.
- FinTech and SME Finance: Research on how FinTech innovations can improve access to credit and financial services for Iraq's large SME sector would contribute to the literature on FinTech-driven economic development in post-conflict economies.
- Blockchain and Digital Currency: The emergence of Central Bank Digital Currencies (CBDCs) and

blockchain-based payment systems warrants dedicated investigation into their feasibility and implications for Iraq's banking infrastructure.

5.6 Conclusion

This research project set out to investigate the influence of FinTech innovation on banking services in Iraq, with a specific focus on four dimensions: service efficiency, customer satisfaction, challenges to integration, and competitiveness/financial inclusion. Through a mixed-methods research design employing structured questionnaires administered to 90 respondents and semi-structured interviews with bank officials, IT managers, and FinTech consultants, the study has generated robust empirical evidence that both confirms and extends existing theoretical frameworks on FinTech adoption.

The findings conclusively demonstrate that FinTech innovation is having a significant and measurable positive impact on Iraqi banking services. Service efficiency scores are high (Mean = 3.83), with ATM/POS systems, mobile banking applications, and online banking portals driving operational improvements across both private and public banks. Customer satisfaction is above average (Mean = 3.59), driven by speed, accessibility, and ease of use — though security concerns remain a persistent drag on user confidence. The regression model confirms that FinTech adoption is the single strongest predictor of bank performance ($\beta = 0.421$, $R^2 = 0.481$), providing a robust empirical foundation for FinTech investment decisions.

Simultaneously, the study reveals that Iraq's FinTech journey is far from complete. Cybersecurity threats, legacy infrastructure, regulatory gaps, and digital literacy deficits remain formidable structural challenges that must be systematically addressed through coordinated action by banks, regulators, government, and the private sector. These challenges are not unique to Iraq — they characterize many developing economy banking sectors — but their resolution is particularly urgent given Iraq's ambitious National Financial Inclusion Strategy 2025–2029, which targets raising financial access from 11% to 50% of adults and increasing digital payment use to 85% by 2030.

The banking landscape in Iraq is at a transformative inflection point. Mobile banking adoption is projected to reach 65% of urban populations by 2026. Digital payment volumes are projected to grow by 300% over the next two years. The Central Bank of Iraq has demonstrated institutional commitment through landmark policies including Digital Payment Regulation No. 2 of 2024 and the launch of multiple digital infrastructure initiatives. International organizations including UNDP and USAID are supporting Iraq's digital financial transformation, while domestic FinTech startups and global technology partners are entering the market with innovative solutions.

Looking ahead, the convergence of artificial intelligence, blockchain technology, embedded finance, and real-time payment infrastructure will define the next wave of FinTech innovation in banking globally — and Iraq's banks have both the opportunity and the responsibility to be active participants in this transformation. AI agents capable of automating compliance checks, fraud detection, and personalized portfolio management; tokenized assets enabling transparent and efficient financial transactions; and real-time settlement systems eliminating payment friction will reshape banking service delivery in profound ways. For Iraq, these technologies offer not just competitive advantage but a genuine pathway to economic development, poverty reduction, and financial democratization.

In conclusion, this study affirms that FinTech innovation and banking services are no longer parallel tracks but are fundamentally intertwined. Banks that embrace this reality — investing in technology, developing talent, building regulatory partnerships, and centering customer trust — will emerge as the financial institutions that define Iraq's next decade of growth. Those that delay face the compounding risks of competitive displacement, customer attrition, and missed inclusion opportunities. The evidence is clear: the future of banking in Iraq is digital, and FinTech is the engine that will power that future.

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