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Theoretical Review on the Application of Technological Innovation to Banking Performance in Nigeria

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Abstract: *This study provides a concise theoretical review of technological innovation and its implications for bank performance in Nigeria. It synthesizes four dominant frameworks Innovation Diffusion Theory (IDT), Technology Acceptance Model (TAM), Disruptive Innovation Theory, and the Unified Theory of Acceptance and Use of Technology (UTAUT) to explain how digital transformation influences banking outcomes in an emerging economy. The Nigerian banking sector has experienced rapid technological advancement through mobile banking, internet banking, automated teller machines (ATMs), artificial intelligence applications, agent banking, and fintech-driven platforms, which have collectively reshaped service delivery, operational efficiency, financial inclusion, and competitive dynamics. The review shows that IDT explains how banking technologies spread across different user categories based on perceived advantages, compatibility, simplicity, trialability, and observability. TAM emphasizes perceived usefulness and perceived ease of use as central determinants of technology acceptance, which directly affect customer satisfaction, employee efficiency, and institutional performance. Disruptive Innovation Theory highlights how fintech entrants and digital platforms disrupt traditional banking structures, compelling incumbents to adapt or risk losing market relevance. UTAUT integrates key behavioral drivers' performance expectancy, effort expectancy, social influence, and facilitating conditions to explain both intention and actual usage of banking technologies. Findings indicate that technological innovation enhances bank performance through faster service delivery, cost reduction, improved customer experience, higher profitability, and expanded financial inclusion. However, these outcomes are moderated by infrastructural deficiencies, cybersecurity risks, regulatory constraints, digital literacy gaps, and varying levels of customer trust. The study concludes that technological innovation is central to sustainable competitiveness in Nigeria's banking sector, but its impact depends on the interaction between technology, users, and institutional environment. By integrating multiple theories, the study offers a robust conceptual foundation for understanding innovation-driven banking performance and provides guidance for researchers, practitioners, and policymakers.*

Keywords*:* artificial intelligence, banking technologies, digital, financial literacy, innovation

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INTRODUCTION

The global banking industry has undergone profound transformation over the past two decades, driven largely by rapid technological innovation, evolving customer expectations, intensified competition, and the increasing digitization of financial services. Traditional banking models, once dominated by physical branches and face-to-face transactions, are being replaced by technology-enabled platforms that emphasize speed, convenience, accessibility, and personalized service delivery. Innovations such as automated teller machines (ATMs), internet banking, mobile banking, biometric authentication, artificial intelligence (AI), blockchain systems, cloud computing, and data analytics have fundamentally redefined how financial institutions create value, manage risks, and interact with customers. In both developed and emerging economies, technological innovation has become a strategic imperative for banks seeking to improve operational efficiency, customer satisfaction, profitability, and long-term competitiveness (Deloitte, 2023; Organisation for Economic Co-operation and Development (OECD), 2021).

In Nigeria, the banking sector has experienced one of the most visible waves of digital transformation in Africa. The introduction of electronic payment systems, cashless policy initiatives, mobile transfer platforms, agent banking, digital wallets, fintech partnerships, and core banking applications has significantly reshaped financial intermediation. Regulatory institutions, particularly the Central Bank of Nigeria (CBN), have also played a vital role in promoting innovation through policies aimed at enhancing financial inclusion, payment system modernization, cybersecurity, and digital banking infrastructure. These reforms have encouraged banks to adopt new technologies not only as tools for internal process improvement but also as mechanisms for expanding market reach and responding to increasingly sophisticated customer demands (CBN, 2023; Ibitomi et al., 2025; KPMG, 2022).

Banking performance, traditionally measured through profitability indicators such as return on assets (ROA), return on equity (ROE), cost efficiency, and liquidity, is now increasingly linked to non-financial dimensions such as service quality, customer retention, innovation capability, transaction speed, digital adoption rates, and organizational resilience. Technology enables banks to automate routine processes, reduce operational costs, improve decision-making through real-time data, strengthen fraud detection systems, and deliver seamless customer experiences across multiple channels. Consequently, banks that successfully integrate technological innovation into their business models are more likely to achieve superior performance outcomes than those that remain dependent on conventional operating systems (Adewoye, 2013; Ozili, 2018)

Despite these opportunities, the relationship between technological innovation and banking performance is not always straightforward, especially in developing economies such as Nigeria. Challenges including poor digital infrastructure, cybersecurity threats, inadequate technological

skills, resistance to change, unreliable power supply, low levels of financial literacy, regulatory uncertainty, and customer trust concerns can weaken the expected benefits of innovation. Furthermore, the heterogeneous nature of customers across urban and rural areas means that the adoption and impact of banking technologies may vary significantly across demographic and socioeconomic groups. This suggests that technological innovation alone may not guarantee improved banking performance unless supported by conducive institutional, behavioral, and infrastructural conditions (World Bank, 2022; Akinola, 2020)

Given these complexities, theoretical frameworks are essential for understanding how technological innovation influences banking performance. Theories provide structured explanations of why individuals adopt technologies, how organizations respond to disruptive changes, and under what conditions innovation generates measurable outcomes. Several theoretical models have been widely applied in technology and banking research, including Innovation Diffusion Theory (IDT), Technology Acceptance Model (TAM), Disruptive Innovation Theory, and the Unified Theory of Acceptance and Use of Technology (UTAUT). Each of these theories offers unique insights into the adoption, diffusion, acceptance, and strategic impact of technological innovations within the banking environment (Davis, 1989; Rogers, 2003; Venkatesh et al., 2012).

Innovation Diffusion Theory explains how new technologies spread through social systems over time and categorizes adopters into innovators, early adopters, early majority, late majority, and laggards. This perspective is particularly relevant in explaining customer acceptance of mobile banking, internet banking, and digital payment systems in Nigeria. The Technology Acceptance Model emphasizes perceived usefulness and perceived ease of use as major determinants of technology adoption, making it valuable for assessing customer and employee responses to banking innovations. Disruptive Innovation Theory highlights how emerging technologies and fintech entrants can challenge established banks by offering more accessible and efficient alternatives. Meanwhile, the Unified Theory of Acceptance and Use of Technology provides a broader framework by integrating performance expectancy, effort expectancy, social influence, and facilitating conditions to explain user intentions and actual technology usage (Christensen, 1997; Rogers, 2003; Okpiabhele et al., 2022; Venkatesh et al., 2012).

Although empirical studies have examined the effects of digital banking services on bank performance in Nigeria, many studies focus narrowly on specific technologies or isolated performance indicators without providing a robust theoretical synthesis of the mechanisms through which innovation creates value. A theoretical review is therefore necessary to consolidate existing knowledge, identify conceptual relationships, reveal gaps in current scholarship, and propose a stronger foundation for future empirical inquiry. Such a review is particularly important in Nigeria, where rapid technological change coexists with structural constraints and evolving customer behavior (Eze & Chinedu, 2021; Ibitomi, et al., 2024; Ozili, 2020).

Against this backdrop, this study presents a theoretical review on the application of technological innovation to banking performance in Nigeria. The paper critically examines major theoretical perspectives that explain technology adoption and performance outcomes in the banking sector, evaluates their relevance to the Nigerian context, and develops conceptual insights for researchers, practitioners, and policymakers. By doing so, the study contributes to the growing discourse on digital transformation, financial sector competitiveness, and sustainable banking development in emerging economies.

REVIEW OF THEORIES

Innovation Diffusion Theory (IDT)

Innovation Diffusion Theory (IDT) was developed by Rogers (1962) and later refined in subsequent editions of his work, particularly Rogers (1995; 2003). The theory explains how new ideas, products, or technologies spread within a social system over time. It focuses on the process through which individuals or organizations become aware of an innovation, develop an interest in it, evaluate its usefulness, decide whether to adopt or reject it, implement it, and finally confirm their decision through continued use. In essence, diffusion refers to the communication of innovation through specific channels among members of a social system.

According to Rogers (2003), the adoption process occurs in five stages: knowledge, persuasion, decision, implementation, and confirmation. At the knowledge stage, potential users become aware of the innovation. In the persuasion stage, they form either a positive or negative attitude toward it. This leads to the decision stage, where adoption or rejection occurs. If accepted, the innovation is implemented and later confirmed through repeated use and satisfaction.

A major contribution of IDT is its classification of adopters into five categories based on their readiness to embrace innovation: innovators (2.5%), early adopters (13.5%), early majority (34%), late majority (34%), and laggards (16%). Innovators are risk-takers who are willing to experiment with new technologies, while early adopters influence others through their positive experiences. The early majority adopt innovations after observing evidence of benefits, whereas the late majority are skeptical and adopt only when innovations become widely accepted. Laggards are the last to adopt, often due to tradition, limited resources, or resistance to change.

The theory further identifies five attributes that determine the rate of innovation adoption: relative advantage, compatibility, complexity, trialability, and observability. Relative advantage refers to the degree to which an innovation is perceived as better than previous alternatives. Compatibility measures how consistent the innovation is with users' values and needs. Complexity concerns the difficulty of understanding or using the innovation. Trialability refers to the ability to test the innovation before full adoption, while observability is the visibility of the innovation's benefits to others.

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Innovation Diffusion Theory is highly relevant to the topic *Technological Innovation on Bank Performance in Nigeria* because it provides a strong theoretical explanation for how banking technologies are introduced, accepted, and utilized by customers and institutions. In the Nigerian banking sector, innovations such as mobile banking, internet banking, ATMs, POS terminals, agent banking, biometric verification systems, and digital wallets do not generate value automatically. Their contribution to bank performance depends largely on the extent to which they are adopted and used by customers and bank employees.

First, the theory helps explain customer adoption behavior toward banking technologies. For example, younger and educated customers are often early adopters of mobile banking apps and digital payment channels, while older or rural customers may belong to the late majority or laggard categories. This distinction is important because higher adoption rates increase transaction volumes, customer retention, and market penetration, all of which improve bank performance.
Second, the concept of relative advantage is directly linked to banking performance. Customers are more likely to adopt technologies that save time, reduce transaction costs, offer convenience, and improve security compared with traditional branch banking. When banks provide such benefits, they attract more users and improve profitability.

Third, the theory explains the role of complexity in technology usage. If digital banking platforms are difficult to understand or unreliable, adoption rates decline. Conversely, user-friendly banking applications encourage wider acceptance, leading to better service delivery and operational efficiency (Abdulgaffar et al., 2024).

Fourth, trialability is highly useful in the Nigerian context. Banks often allow customers to test new services such as mobile apps, USSD banking, or internet platforms before fully relying on them. This reduces uncertainty and increases confidence in digital channels.

Fifth, observability is critical in spreading innovation in Nigeria, where word-of-mouth and peer influence are strong. When customers see others successfully using mobile transfers, ATM cards, or online banking services, they are more likely to adopt these technologies themselves.

Finally, IDT is useful for explaining how technological innovation enhances bank performance indicators such as profitability, customer satisfaction, service quality, operational efficiency, financial inclusion, and competitive advantage. Banks that successfully diffuse innovations across different customer segments are more likely to outperform competitors that rely on traditional service models.

Despite its usefulness, IDT has some limitations. The theory pays more attention to adoption patterns than to post-adoption challenges such as cybersecurity risks, system failures, or regulatory barriers. It also assumes a relatively linear adoption process, whereas technology acceptance may

be influenced by changing economic conditions, trust issues, and infrastructure constraints. Furthermore, it does not fully account for institutional and environmental factors common in developing countries like Nigeria, such as poor electricity supply, internet instability, and low digital literacy.

In conclusion, Innovation Diffusion Theory provides a robust framework for understanding the spread and acceptance of technological innovations in the Nigerian banking industry. Its concepts of adopter categories and innovation attributes are particularly useful in explaining how digital banking services influence customer behavior and, ultimately, bank performance. Therefore, the theory is highly suitable for this study because it links technology adoption with measurable improvements in banking outcomes.

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) was developed by Davis (1989) to explain the factors that influence users' acceptance and use of new technologies. The model was derived from the Theory of Reasoned Action (TRA) proposed by Fishbein and Ajzen (1975), which posits that an individual's behavior is determined by behavioral intentions, and such intentions are shaped by attitudes and beliefs. Davis adapted this logic to the field of information systems by proposing that users' decisions to accept or reject technology are primarily influenced by their perceptions of the technology's usefulness and ease of use.

TAM has become one of the most widely used theoretical frameworks in technology adoption studies because of its simplicity, predictive power, and applicability across industries. The model explains that before individuals adopt a technological system, they first evaluate whether the system will improve their performance and whether it can be used without difficulty. These perceptions then shape their attitudes, intentions, and eventual actual usage behavior.

The two central constructs of TAM are Perceived Usefulness (PU) and Perceived Ease of Use (PEOU)**.** Perceived usefulness refers to the degree to which a person believes that using a particular technology will enhance job performance, productivity, or task efficiency (Davis, 1989). In contrast, perceived ease of use refers to the extent to which a person believes that using the technology will require little effort. According to TAM, a technology that is both useful and easy to use is more likely to be accepted by users.

Perceived usefulness is often regarded as the stronger determinant of adoption because users are generally motivated to use technologies that offer clear value. However, ease of use is equally important because technologies that are difficult to understand or operate may discourage potential users, regardless of their benefits. Furthermore, perceived ease of use can positively influence perceived usefulness, since users are more likely to value technologies that are convenient and user-friendly.

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The Technology Acceptance Model is highly relevant to the topic *Technological Innovation on Bank Performance in Nigeria* because the success of banking technologies depends largely on customer and employee acceptance. Technologies such as mobile banking, internet banking, ATMs, USSD banking, point-of-sale (POS) terminals, artificial intelligence chatbots, and biometric verification systems can only improve bank performance when they are willingly adopted and consistently used.

First, the concept of perceived usefulness is directly applicable to the Nigerian banking environment. Customers are more likely to adopt digital banking platforms when they believe such innovations save time, reduce transaction costs, improve convenience, enhance transaction speed, and provide round-the-clock access to banking services. When customers perceive these benefits, adoption rates increase, leading to higher transaction volumes, customer loyalty, and improved profitability for banks.

Second, perceived ease of use is equally significant in Nigeria, where varying levels of digital literacy exist among customers. User-friendly mobile applications, simple USSD codes, accessible ATM interfaces, and straightforward internet banking platforms can encourage wider usage across different age groups and educational backgrounds. When banking technologies are easy to use, customers are less likely to abandon them, thereby improving service efficiency and customer satisfaction.

Third, TAM is useful for explaining employee acceptance of internal banking technologies. Bank staff regularly interact with enterprise systems, customer relationship management software, fraud detection tools, automated reporting systems, and digital compliance platforms. If employees perceive these systems as useful and easy to use, they are more likely to adopt them effectively, resulting in improved productivity, reduced errors, and faster service delivery.

Fourth, the theory explains how positive user attitudes toward digital banking can translate into measurable performance outcomes. Increased adoption of digital channels reduces pressure on physical branches, lowers operating costs, enhances resource utilization, and enables banks to serve more customers with fewer constraints. This directly contributes to operational efficiency and competitive advantage.

Fifth, TAM is relevant in evaluating customer satisfaction as a mediating factor between technological innovation and bank performance. When customers find digital services beneficial and convenient, they develop positive experiences with the bank, which strengthens trust, retention, and long-term profitability.
In the Nigerian context, TAM can be used to assess the acceptance of several innovations, including:

i. Mobile Banking Applications**:** Adoption depends on whether customers consider the apps secure, useful, and easy to navigate.
ii. USSD Banking Services: Simplicity and convenience are major determinants of acceptance, especially in areas with limited internet access.
iii. ATMs and Self-Service Technologies: Ease of operation and reliability influence repeated usage.
iv. Internet Banking Platforms: Customers evaluate speed, security, and convenience before adoption.
v. Artificial Intelligence Systems: Chatbots and automated support systems are accepted when they solve problems efficiently and accurately.

Despite its strengths, TAM has certain limitations. First, the model focuses mainly on perceived usefulness and ease of use, while overlooking other important variables such as trust, perceived risk, social influence, cultural values, regulatory environment, and infrastructure quality. These factors are particularly relevant in developing countries such as Nigeria.

Second, TAM assumes that users make rational decisions based on utility, but emotional and psychological factors may also affect technology acceptance. For example, fear of fraud or cybercrime may discourage customers from using digital banking platforms even when they are useful and easy to use.

Third, the model places emphasis on behavioral intention rather than actual usage behavior. In practice, customers may express willingness to use technology but fail to adopt it due to network failures, poor electricity supply, or lack of smartphones.

Fourth, TAM may not fully capture organizational factors that influence employee acceptance, such as management support, training, incentives, and workplace culture.

Technology Acceptance Model provides a valuable framework for understanding how users perceive and adopt technological innovations in the banking sector. Its key constructs perceived usefulness and perceived ease of use are highly relevant in explaining customer and employee responses to digital banking innovations in Nigeria. Since technology adoption is a prerequisite for realizing the benefits of innovation, TAM offers important insights into how technological innovation can enhance bank performance through improved service delivery, customer

satisfaction, operational efficiency, and profitability. Therefore, the theory is highly suitable for this study.

Disruptive Innovation Theory

Disruptive Innovation Theory was introduced by Christensen (1997) to explain how smaller firms with limited resources can successfully challenge established organizations by offering simpler, cheaper, or more accessible alternatives to existing products and services. Rather than competing directly with dominant firms in their most profitable market segments, disruptive entrants typically begin by serving overlooked, low-end, or previously unserved customers. Over time, these innovations improve in quality and functionality, eventually attracting mainstream customers and reshaping the competitive structure of the industry.

The theory distinguishes between sustaining innovation and disruptive innovation. Sustaining innovations involve incremental or radical improvements to existing products, services, or processes that help incumbent firms maintain their market position. These innovations generally enhance performance for existing customers and strengthen current business models. Examples in banking include upgrading branch operations, improving ATM speed, or enhancing existing mobile applications.

By contrast, disruptive innovations introduce a new value proposition that differs from traditional market expectations. They often prioritize affordability, convenience, accessibility, simplicity, or speed rather than high-end performance at the early stage. Initially, established firms may ignore these innovations because they appear less profitable or less attractive to their premium customers. However, as disruptive technologies improve, they begin to meet the needs of mainstream users and may eventually displace traditional service models (Christensen et al., 2015).

According to the theory, disruption is a process rather than a single event. It develops gradually along two trajectories: product performance and customer demand. Incumbent firms usually continue improving products for their most profitable customers, sometimes beyond what average users actually need. This creates an opportunity for new entrants to provide simpler and more cost-effective solutions to underserved customers. As the new solutions improve, they gain broader market acceptance and transform industry competition.

Disruptive Innovation Theory is highly relevant to the topic *Technological Innovation on Bank Performance in Nigeria* because the Nigerian banking sector has experienced significant structural change through digital technologies, fintech expansion, and alternative service delivery models. The theory explains how innovation can redefine competition, customer behavior, and performance outcomes in the financial services industry.

First, the theory helps explain the rise of fintech companies and digital financial platforms in Nigeria. Many fintech firms entered the market by solving problems that traditional banks had not fully addressed, such as slow transfers, limited financial inclusion, expensive transactions, and inconvenient branch-based services. By offering mobile payments, instant transfers, digital wallets, agency banking, and user-friendly apps, these entrants created alternatives that pressured traditional banks to innovate faster.

Second, the theory is useful for understanding how mobile banking and internet banking transformed traditional banking operations. Customers no longer depend solely on physical branches for deposits, transfers, bill payments, and account management. This shift has reduced branch traffic, lowered transaction costs, and improved service convenience. As a result, banks that successfully adopted these disruptive channels have improved efficiency, customer satisfaction, and market competitiveness.

Third, the theory explains how technological innovation can enhance financial inclusion in Nigeria. Many rural and previously underserved populations lacked access to conventional banking due to distance, documentation barriers, or high service costs. Innovations such as agent banking, USSD banking, and mobile money services brought financial services to these excluded groups. Expanding access increases customer base, deposit mobilization, and long-term revenue opportunities for banks.

Fourth, the theory highlights the importance of strategic adaptation by incumbent banks. Traditional banks that respond proactively to disruption through partnerships, internal innovation, digital transformation, and customer-centric strategies are more likely to sustain performance. Conversely, banks that resist change risk losing relevance, customers, and market share.

Fifth, the theory is useful for linking innovation to core indicators of bank performance such as profitability, cost reduction, service quality, speed of transactions, operational efficiency, customer acquisition, and competitive advantage. In a dynamic financial environment, the ability to adapt to disruptive change is now a critical determinant of organizational success.

In the Nigerian context, the theory can be applied to several developments, including:

i. Fintech Platforms: Digital payment firms offering faster and more convenient services than traditional channels.
ii. Mobile Banking: Banking through smartphones without visiting physical branches.
iii. USSD Banking: Low-cost banking solutions for customers without internet-enabled devices.
iv. Agent Banking: Community-based banking outlets extending services to rural and underserved areas.

v. Artificial Intelligence and Automation: Smart systems improving customer support, fraud detection, and operational speed.
vi. Digital Lending Platforms: Faster credit access compared to traditional loan procedures.

Despite its relevance, Disruptive Innovation Theory has some limitations. First, not every successful innovation is truly disruptive; some are simply sustaining improvements. Therefore, the concept may be overused when describing technological change.

Second, the theory focuses strongly on market competition and may pay less attention to regulatory, institutional, and infrastructural factors. In Nigeria, issues such as internet instability, cybersecurity risks, power supply challenges, and financial regulation significantly influence innovation outcomes.

Third, disruption may not always eliminate incumbent banks. In many cases, traditional banks adapt successfully through partnerships, acquisitions, or internal innovation. This suggests that disruption can lead to coexistence rather than complete displacement.

Fourth, the theory does not fully explain user trust, technology acceptance, or behavioral intentions, which are important in banking where security and confidence strongly influence adoption decisions.

Disruptive Innovation Theory provides a strong framework for understanding how new technologies and business models reshape competition and performance in the Nigerian banking sector. It explains the emergence of fintech firms, the shift from branch-based banking to digital channels, and the growing importance of strategic adaptation among traditional banks. Since technological change can redefine customer expectations and operational models, the theory is highly suitable for this study. It demonstrates that banks that embrace disruptive innovation are more likely to achieve superior performance in terms of efficiency, profitability, inclusion, and long-term competitiveness.

Unified Theory of Acceptance and Use of Technology (UTAUT)

The Unified Theory of Acceptance and Use of Technology (UTAUT) was developed by Venkatesh, Morris, Davis, and Davis (2003) and later extended by Venkatesh, Thong, and Xu (2012). It is one of the most comprehensive frameworks for explaining users' intentions to adopt technology and their actual usage behavior. The theory integrates core elements from eight earlier models of technology acceptance, including the Technology Acceptance Model (TAM), Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), Motivation Model, Model of PC Utilization, Social Cognitive Theory, and Innovation Diffusion Theory (IDT). By combining these perspectives, UTAUT provides a stronger explanatory model for understanding how and why people accept or reject technological innovations.

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The central argument of UTAUT is that an individual's intention to use technology, and subsequent actual use, is influenced by four major constructs: performance expectancy**,** effort expectancy**,** social influence**,** and facilitating conditions. These constructs are further moderated by variables such as age, gender, experience, and voluntariness of use.

Performance expectancy refers to the degree to which an individual believes that using a particular technology will help improve task performance, efficiency, or productivity (Venkatesh et al., 2003). It is conceptually similar to perceived usefulness in TAM. In the banking context, customers are more likely to adopt technologies such as mobile banking, internet banking, biometric verification, or AI-powered systems when they believe these tools will make transactions faster, easier, safer, and more convenient.

Effort expectancy refers to the degree of ease associated with the use of a technology. It captures users' perceptions regarding how simple, understandable, and user-friendly a system is. Technologies that require minimal effort are generally more likely to be adopted. In banking, intuitive mobile applications, simple ATM interfaces, easy registration processes, and clear transaction procedures can significantly improve customer acceptance of digital channels.

Social influence is the degree to which an individual perceives that important others such as family members, friends, colleagues, or opinion leaders believe they should use a new technology. In many societies, including Nigeria, recommendations from peers and trusted social networks strongly affect behavioral decisions. Customers may adopt digital banking services when they observe others benefiting from them or when respected individuals endorse their usage.

Facilitating conditions refer to the extent to which users believe that the necessary organizational, technical, and infrastructural support exists to enable technology use. This includes internet availability, smartphone access, customer support services, technical assistance, training, and secure digital systems. Where such support systems are available, customers are more likely to adopt and continue using banking technologies.

The Unified Theory of Acceptance and Use of Technology is highly relevant to the topic *Technological Innovation on Bank Performance in Nigeria* because it offers a broad and practical explanation of the factors influencing customer and employee acceptance of banking technologies. Since innovation only improves performance when users actively adopt and utilize it, UTAUT provides an appropriate framework for examining the relationship between technological innovation and bank outcomes.

The theory helps explain why customers accept or reject innovations such as mobile banking apps, internet banking platforms, USSD services, ATMs, POS terminals, and AI-enabled customer

service systems. Customers are more likely to adopt these technologies when they perceive them as useful, easy to use, socially accepted, and adequately supported (Micah et al., 2023).
When customers migrate from physical branches to digital channels, banks reduce congestion in branches, lower administrative costs, improve transaction speed, and optimize human resources. These efficiency gains contribute directly to stronger bank performance.

UTAUT is useful in explaining how customer satisfaction emerges from positive technology experiences. If banking technologies are reliable, convenient, and well-supported, customers are more satisfied with the bank's services. Customer satisfaction can lead to loyalty, repeat usage, and positive word-of-mouth.

In Nigeria, many individuals in rural and underserved areas depend on simplified technologies such as USSD banking, agent banking, and mobile wallets. UTAUT helps explain how facilitating conditions, effort expectancy, and social influence can encourage adoption among previously excluded populations, thereby expanding banks' customer base.

The theory is not limited to customers. It is also useful for understanding how bank employees adopt internal systems such as fraud detection software, customer relationship management tools, automated reporting systems, and digital compliance platforms. Higher employee adoption improves productivity, decision-making, and service delivery.

The theory can be applied to several technological innovations in the Nigerian banking industry, including:

i. Mobile Banking: Customers adopt mobile apps when they are secure, useful, and easy to navigate.
ii. USSD Banking: Simplicity and accessibility make adoption easier, especially for users without smartphones.
iii. ATM Services: Ease of use and availability determine customer satisfaction and repeated use.
iv. Internet Banking: Performance expectancy and trust influence adoption decisions.
v. Agent Banking: Facilitating conditions such as agent availability and network access encourage use.
vi. Artificial Intelligence Systems: Customers use AI chatbots and smart platforms when they provide quick and accurate support.

Despite its strengths, UTAUT has certain limitations.

First, the model can be considered complex because it includes multiple constructs and moderating variables, making empirical application more demanding than simpler models such as TAM.

Second, although UTAUT captures important behavioral factors, it may not fully explain context-specific issues such as cybersecurity concerns, regulatory uncertainty, fraud risks, and unstable electricity supply, which are particularly relevant in Nigeria.

Third, the theory assumes rational decision-making, whereas emotional factors such as fear, mistrust, or previous negative experiences may also affect technology adoption.

Fourth, the relative importance of the constructs may differ across cultures, industries, and demographic groups, meaning the model may require adaptation to fit specific contexts.
Unified Theory of Acceptance and Use of Technology provides a robust and comprehensive framework for understanding how users adopt technological innovations in the banking sector. Its four major constructs performance expectancy, effort expectancy, social influence, and facilitating conditions are highly relevant to explaining customer and employee responses to digital banking systems in Nigeria. Since technology adoption is a critical pathway through which innovation influences profitability, customer satisfaction, service quality, and operational efficiency, UTAUT is highly suitable for this study. It offers a strong theoretical basis for analyzing how technological innovation can improve bank performance in Nigeria.

CONCLUSION

This study critically reviewed the major theoretical foundations explaining the relationship between technological innovation and bank performance in Nigeria, with emphasis on Innovation Diffusion Theory (IDT), Technology Acceptance Model (TAM), Disruptive Innovation Theory, and the Unified Theory of Acceptance and Use of Technology (UTAUT). The review confirms that technological innovation has become a fundamental driver of transformation in the banking industry and an essential determinant of institutional survival, competitiveness, and long-term growth. In the contemporary financial environment, innovation is no longer limited to operational support; it now shapes customer experience, market structure, service delivery models, and strategic performance outcomes.

The analysis shows that each theory offers a distinct but complementary explanation of how innovation improves banking performance. Innovation Diffusion Theory explains how new banking technologies spread across customer groups and highlights the importance of relative advantage, compatibility, trialability, observability, and reduced complexity in accelerating adoption. This is particularly relevant in Nigeria, where differences in age, education, income, location, and digital literacy significantly influence the pace and pattern of technology usage. The implication is that the benefits of innovation can only be realized when banks successfully diffuse technological solutions across diverse market segments.

The Technology Acceptance Model demonstrates that perceived usefulness and perceived ease of use remain central to the successful adoption of banking technologies. Customers and employees are more likely to embrace innovations such as mobile banking, internet banking, ATMs, USSD platforms, biometric systems, and artificial intelligence applications when such systems are convenient, reliable, and capable of improving task efficiency. Thus, usability and functional value are critical pathways through which innovation translates into customer satisfaction, productivity, and profitability.

Disruptive Innovation Theory extends the discussion by showing that technological change is also a competitive force capable of redefining the banking landscape. The emergence of fintech firms, digital wallets, agency banking, and alternative payment platforms has intensified competition and compelled traditional banks to rethink conventional business models. Banks that respond proactively through digital transformation, strategic partnerships, and continuous innovation are more likely to sustain relevance and improve performance in a rapidly changing market environment.

Similarly, UTAUT provides a broader behavioral perspective by integrating performance expectancy, effort expectancy, social influence, and facilitating conditions. The theory reinforces the argument that innovation outcomes depend not only on the technology itself but also on the surrounding ecosystem of infrastructure, trust, peer influence, institutional support, and user readiness. In developing economies such as Nigeria, these contextual factors are particularly important in determining whether technological investments yield measurable returns.

Overall, the study concludes that technological innovation exerts a positive and significant influence on bank performance through improved operational efficiency, faster service delivery, reduced transaction costs, enhanced customer satisfaction, broader financial inclusion, stronger competitiveness, and increased profitability. However, these gains are not automatic. Their realization depends on the interaction between technology, users, institutions, and the wider regulatory environment. Challenges such as cybersecurity threats, inadequate infrastructure, low digital literacy, and resistance to change can constrain the expected benefits of innovation if not properly addressed.

The study therefore establishes that the future of banking performance in Nigeria will depend largely on the ability of financial institutions to strategically integrate innovation into their business models while responding to local market realities. By synthesizing multiple theoretical perspectives, this review contributes to existing scholarship and provides a stronger conceptual basis for future empirical research, managerial decision-making, and policy formulation in the area of digital banking and financial sector development.

Recommendations

Banks in Nigeria should adopt a customer-centered innovation strategy by designing secure, simple, and inclusive digital platforms that address the practical needs of different user groups. Technologies that are easy to use, accessible, and responsive to customer expectations are more likely to achieve widespread adoption and generate sustainable improvements in satisfaction, loyalty, and financial performance.

There is also a need for continuous investment in digital infrastructure, cybersecurity systems, and employee capability development. Reliable technological infrastructure, strong data protection mechanisms, and regular staff training will enhance operational efficiency, reduce service disruptions, build consumer trust, and improve the effective implementation of innovation initiatives across banking operations.

Regulators and industry stakeholders should strengthen the enabling environment for innovation through supportive policies, effective supervision, and collaborative partnerships between banks and fintech firms. A balanced regulatory framework that promotes competition, consumer protection, interoperability, and financial stability will accelerate responsible innovation and deepen financial inclusion in Nigeria.

Finally, future researchers should move beyond single-theory explanations by adopting integrated theoretical models and broader performance indicators that capture both financial and non-financial outcomes. Longitudinal and comparative studies are particularly recommended to provide deeper evidence on how technological innovation shapes banking performance over time within Nigeria and across other emerging economies.

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