**Comparative Analysis of Digital Banking and Financial Inclusion in the United States: Opportunities, Challenges and Policy Implications**

**Abstract**

This study explores the role of digital banking in promoting financial inclusion in the United States, assessing its opportunities, challenges, and policy implications. Using a comparative analysis of secondary data, policy reports, and literature reviews, the research evaluates how digital banking services have improved financial access, particularly for underserved populations. The findings indicate that digital banking has expanded financial inclusion by offering mobile banking, digital wallets, and contactless payment solutions, reducing dependency on physical bank branches. It was found that regulatory frameworks from institutions such as the Federal Reserve and FDIC have encouraged innovation whilst ensuring consumer protection and financial stability. However, significant challenges persist, including cybersecurity threats, digital literacy gaps, and disparities in broadband access, which hinder equitable financial inclusion. Additionally, the complexity of regulatory compliance slows fintech adoption, limiting the reach of digital financial services to underbanked communities. Notwithstanding these obstacles, the result revealed that digital banking continues to transform the financial landscape. Fintech firms and traditional banks are leveraging artificial intelligence, blockchain, and open banking to enhance service accessibility. The study highlights that bridging the financial inclusion gap requires collaborative efforts among policymakers, financial institutions, and technology providers.

**Keywords:** Digital banking, financial inclusion, fintech, regulatory framework, cybersecurity, digital literacy, mobile banking.

**1.0 Introduction**

The rapid advancement of digital technologies has significantly transformed the financial services industry, leading to the rise of digital banking and fintech solutions. These innovations have reshaped how financial services are delivered, making banking more accessible, cost-effective, and efficient. This study examines the role of digital banking in enhancing financial inclusion within the United States, with a particular focus on its opportunities, challenges, and policy implications. The objective is to provide a comprehensive analysis of the current landscape and highlight potential pathways for improving financial access for underserved populations.

Digital banking has introduced numerous benefits that can help bridge financial gaps. Agarwal and Zhang (2020) note that digital financial services lower transaction risks and costs associated with cash-based systems. “They also facilitate access to a variety of essential financial products, including credit, savings, insurance, and pension schemes.” Similarly, Alexander and Karametaxas (2021) argue that digitalization has enabled financial institutions to optimize service delivery, offering lower transaction costs and tailored products that cater to diverse consumer needs. Additionally, the digitalization of the financial sector has enhanced efficiency by enabling the integration of artificial intelligence and automation, which improves decision-making processes and customer service.

Moreover, emerging technologies such as blockchain and advanced data analytics have the potential to revolutionize financial systems. Jameaba (2023) underscored that these technologies can enhance security, transparency, and efficiency in financial transactions. Blockchain, for instance, provides a decentralized framework that reduces fraud and operational inefficiencies, while data analytics allows financial institutions to assess creditworthiness more accurately, thereby expanding access to credit for individuals and small businesses. Further, the implementation of these technologies presents regulatory and operational challenges. Policymakers must ensure that digital banking innovations comply with existing financial regulations and address concerns related to data privacy, cybersecurity, and equitable access.

Despite its advantages, the transition to digital banking is not without obstacles, particularly in ensuring inclusive access in the United States Banking sector. Buteau et al. (2021) stated that although financial access has improved over the past decade, a significant proportion of the population remains unbanked or underbanked. In the United States, marginalized communities, particularly low-income households and rural populations, often face barriers to adopting digital banking services. These barriers include limited access to digital infrastructure, lack of financial literacy, and concerns about data security. Addressing these challenges is crucial for ensuring that digital banking contributes to meaningful financial inclusion rather than exacerbating existing inequalities.

This study provides a detailed analysis of the current state of digital banking and financial inclusion in the United States. Drawing from academic research, industry reports, and policy frameworks, it explores the relationship between digital banking innovations and financial accessibility. The findings offer valuable insights for policymakers, financial institutions, and industry stakeholders seeking to enhance financial inclusion through digital transformation. Through identifying best practices and policy recommendations, this study contributes to ongoing discussions on fostering a more inclusive and resilient financial system.

**2.0 Literature Review**

**2.1 The Shift from Traditional to Internet-Based Banking**

The transition from traditional banking to digital banking is a game changer for the banking industry which includes technological innovations and modification of **consumers** expectations. This literature review explores the dynamic relationship between digital banking and financial inclusion in the U.S., highlighting significant trends, obstacles, and potential policy considerations that shape the landscape of contemporary financial services.

This has improved efficiency, accessibility, and financial security. According to Shah and Wadia (2022), the transition to digital payment systems, including e-wallets, mobile banking, and digital currencies, has simplified financial transactions and improved transparency. In the context of the **U.S.**, digital banking promotes increased financial inclusion, providing greater access to banking services, especially for underbanked and unbanked individuals. Unequal access to the internet and digital literacy act as significant barriers to entry that need to be overcome with targeted policy measures.

Innovations expanded the services that digital banking could provide and the ways it could deliver personalized, efficient financial solutions (Adukpo & Mensah, 2025; Fasnacht & Fasnacht, 2018). With this study, we qualitatively analyzed the role played by emerging technologies such as mobile applications, biometric authentication, artificial intelligence (AI), machine learning (ML), and blockchain, in increasing digital banking adoption in the United States (Agbadamasi et al. 2025; Umoren et al., 2025). Amoako et al. (2025) underscored that “Through adaptation of a vigilant, collaborative, and technology-driven approach, U.S. financial institutions can leverage ML and DL to enhance AML frameworks, safeguard consumer trust, and protect the integrity of the financial system.” However, issues such as cybersecurity vulnerabilities, regulatory compliance, and data privacy are significant challenges policymakers and financial institutions must consider for equitable access to digital banking services.

A global perspective further enriches the discussion on digital banking and financial inclusion. Islam and Mia (2024) examined Bangladesh’s rapid adoption of digital payments and blockchain technology, offering insights into how emerging economies tackle financial inclusion through digital means. The study demonstrates that exposure to a broader range of financial services closely correlates with safety perception. Consequently, expanding service offerings globally, like low-cost digital accounts, mobile-led financial literacy programs, or even AI-led financial planning applications, could go a long way in driving higher digital banking engagement rates among marginalized communities in the U.S.

The evolution of the banking paradigm in the United States emphasizes the importance of financial companies adopting service frameworks that optimize efficiency and accessibility while promoting profitability and usability (Bueno et al., 2024). One of the key enablers of this trend is open banking, allowing data sharing with the help of standard APIs and encouraging cooperation between traditional banks with fintech companies and other financial players to create solutions from the customers’ perspective. On the one hand, open banking can offer benefits in terms of financial inclusion, for example, personalized banking products and real-time credit assessments, but on the other hand, there are concerns about data privacy and regulatory oversight (Plaitakis & Staschen, 2020). Innovations around AI, ML, and blockchain have also transformed aspects of banking operations, making them more customer-centric and risk-aware (Amoako et al. 2025; Adukpo & Mensah, 2025; Adebayo et al., 2025). Nevertheless, there remain challenges like cybersecurity threats and the digital divide, which can prevent low-income and rural populations from accessing digital banking because of insufficient infrastructure and digital literacy. This research highlights a need for targeted education, infrastructure investments, and consumer protection measures amongst policymakers, allowing both innovation and regulation to coexist in a manner that increases digital banking accessibility and security for every socioeconomic group in society.

Figure 1: Digital Banking Transformation in the United States



*Shah & Wadia (2023)*

The chart shows how digital banking is transforming financial service provision in the United States. At the centre, a large blue circle represents digital banking transformation. The four smaller circles that connect to it show an important part of this change. The dark blue circle represents technology, including AI, machine learning, and blockchain. The green circle stands for financial inclusion, focusing on making banking services more accessible. The red circle highlights challenges like cybersecurity risks and the digital divide. The orange circle represents policy measures, including laws and regulations that guide digital banking in the U.S. Moreover, the lines that connect these circles show how these factors influence each other. This visual helps explain how technology, inclusion, challenges, and policies work together to shape modern banking in the U.S.

**2.2 The United States Digital Banking Landscape: Analysing Technological Progress, Financial Access, and Policy Framework.**

Digital banking in the United States commenced in the mid-to-late 1990s, a period of technological innovation where many traditional banks began offering online services (Al-Alawi et al. 2020). This literature review addresses the evolution, challenges, and policy implications of digital banking in the U.S. financial system, focusing on financial inclusion outcomes.

Consumer demand for convenient services, competition among fintech companies, and the need to modernize legacy systems have led to the digital transformation of the U.S. banking sector. Lottu et al. (2023) trace the path toward digital banking innovation in the U.S., noting the importance of mobile banking platforms, contactless payments, artificial intelligence, and blockchain technology. Their research illustrates how the pressures from the market, regulatory frameworks, and technological capabilities have influenced the American digital banking landscape.

Despite immense progress toward digital banking adoption in the U.S., various challenges still exist in providing equitable access to financial services. Ehimuan et al. (2024) explore the digital disparity in American banking, highlighting that income inequality, geographic location, and technological literacy still affect financial inclusion. Their findings highlight the need for efforts to overcome connectivity gaps and improve digital literacy in promoting inclusive financial services in all communities.

The U.S. banking system, including its cybersecurity architecture, is a key element of trust in digital finance. This research highlights the complex cyber threats confronting American financial institutions and the considerable resources involved in the safeguarding of digital assets and customer data. With a focus on both the impact of legislation on U.S. digital banking cybersecurity and the emergence of technologies that can help secure it, the study provides use cases to examine regulatory requirements like those from the Federal Reserve and FDIC and their role in shaping practice.

Williams (2023) examines the impact of financial inclusion and digital business innovations on economic growth, emphasizing how digital technologies expand access to financial services. In the United States, financial inclusion remains a challenge for underbanked communities due to factors such as income disparities, lack of digital literacy, and trust issues in banking institutions. Regulatory barriers and the digital divide further hinder the widespread adoption of digital banking. Addressing these challenges requires investment in financial infrastructure, adaptive regulatory frameworks, and targeted policies to enhance accessibility.

Additionally, Ogboye et al. (2022) highlight the importance of digital banking convenience in driving customer satisfaction, with speed and ease of use emerging as key factors influencing adoption. In the U.S., similar trends suggest that fintech innovations and seamless user experiences significantly impact consumer preferences. Through fostering regulatory innovation and investing in digital literacy, financial institutions can bridge existing gaps and drive broader economic participation.

Table 1: U.S. Digital Banking Landscape – Key Trends, Challenges, and Policy Impact

|  |  |  |  |
| --- | --- | --- | --- |
| Category | Key Trends | Challenges | Policy & Regulatory Impact |
| Technological Progress | Mobile banking, AI-driven financial services, blockchain adoption, and contactless payments (Lottu et al., 2023) | Cybersecurity threats, data privacy concerns, and the need for advanced fraud detection | Regulations from the Federal Reserve, FDIC, and OCC on cybersecurity and consumer data protection |
| Financial Access & Inclusion | Digital banking expanding services to underbanked populations via mobile banking (Williams, 2023) | Digital divide, limited internet access in rural areas, and low digital literacy (Ehimuan et al., 2024) | Policy focuses on digital literacy programs, financial education, and internet infrastructure investments. |
| Consumer Behavior | Increasing preference for convenience and seamless user experience in fintech apps (Ogboye et al., 2022) | Trust issues with online banking, concerns over financial fraud, and usability barriers for older populations | CFPB regulations promoting transparency, fair lending, and consumer protection |
| Cybersecurity & Data Protection | Advanced encryption, biometric authentication, AI-powered fraud detection | Rising cyber threats, phishing attacks, and unauthorized data access risks | Compliance with the Gramm-Leach-Bliley Act (GLBA), Federal Reserve guidelines, and FDIC security mandates |
| Regulatory Frameworks | Introduction of regulatory sandboxes to foster fintech innovation (Al-Alawi et al., 2020) | Balancing innovation with compliance, complex licensing requirements for digital banks | OCC and SEC oversight of fintech companies, regulatory adaptability for new financial products |

Table 1 highlights the U.S. digital banking environment, comprising technological advancement, the challenges of financial inclusion, consumer behavior, cybersecurity, and regulatory frameworks. It showcases the use of mobile banking, artificial intelligence, and blockchain for broadening financial access but also notes the ongoing hurdles that underbanked communities face, such as income disparities and gaps in digital literacy. The table also highlights consumer preferences around convenience, where speed and ease of use are significant adoption drivers. Additionally, it indicates however that, cybersecurity, fraud, and data breaches are still major concerns, so advanced security measures, such as biometric authentication and AI-driven fraud detection, must be implemented. Regulatory frameworks designed by institutions such as the Federal Reserve, FDIC, and CFPB are key to fostering fintech innovation, protecting consumers, and ensuring financial stability. The table highlights the need to form a suitable ecosystem in terms of regulatory and policy changes, proper digital literacy efforts, and investments to allow for a more robust financial inclusion space with the U.S. digital banking framework.

**2.3 Digital Banking and Financial Inclusion Strategies in the United States**

Incorporating digital banking with financial inclusion strategies has proved to be a key factor in the evolution of the U.S. financial industry. Digital banking represents a unique opportunity for the industry to expand access to those it has long overlooked. Through such transformations, services can be made more inclusive, accessible, and cost-effective, especially for people lacking advanced banking infrastructure.

According to Patel and Satapathy (2023), fintech and digital finance serve as enablers that improve access to financial services by unbanked people. This lowers the cost of transactions and investment in physical banking infrastructure. At the same time, the rapid proliferation of smartphones and access to the internet has made it possible for fintech startups to bring about a significant reduction in the access, affordability, and usability of financial services to such populations (Adukpo & Mensah, 2025).

Natsir et al. (2023) research reveals how financial knowledge affects financial literacy and inclusion through the study of the interrelation of financial knowledge and financial inclusion through the innovation of next-gen digital services. Their results highlight the need for financial education programs to facilitate digital service adoption. Similarly, Ibeh et al. (2024) describe the significant role of business analytics and decision science in strategic decision-making in contemporary times with references to the synergy between advanced analytics and financial literacy, strategic decisions in digital banking, and financial inclusion.

Though digital banking holds much promise for financial inclusion, challenges like digital literacy, cybersecurity risks, and regulatory concerns persist. To address these barriers,  policymakers prioritize initiatives that can facilitate access to financial literacy programs and robust cybersecurity measures. Moreover, regulations have to adapt to foster innovation while creating a safe environment for users and guaranteeing fair digital banking access.

The transformative potential of digital banking in driving economic development in the United States is significant, with implications for economic empowerment, particularly among underserved populations, small and medium-sized enterprises (SMEs), and rural communities. Mhlongo et al. (2024) highlight how digital banking serves as a key driver of financial inclusion by improving access to financial services, reducing transaction costs, and fostering economic growth. However, the study also points to challenges such as the digital disparity, regulatory complexities, and data privacy concerns. To unlock the full potential of digital banking, the authors advocated for comprehensive regulatory reforms, increased investments in digital infrastructure, and financial literacy programs aimed at empowering underserved groups, including women and rural residents.

In contrast, Cnaan et al. (2023) provide a cautionary perspective, drawing lessons from rural India, where the shift to digital banking and cashless systems has not always resulted in greater financial inclusion. Their findings underscore the importance of financial literacy and internet access as enablers for the success of digital banking, highlighting the risk of excluding marginalized populations if these factors are not addressed.

**2.4 Analysis of Digital Banking Strategies for Promoting Financial Inclusion in the United States: Mobile Banking, Online Platforms, and Digital Wallets**

The financial services industry in the United States has undergone a significant transformation driven by the rapid advancement of digital technologies (Zhou et al., 2017; Adebayo, et al., 2025). As brick-and-mortar banking institutions face increasing competition from digital financial service providers, the adoption of innovative digital banking strategies has become relevant for promoting financial inclusion and reaching underserved populations (Gigante et al., 2022; Mensah, et al., 2024; Umoren, et al., 2025).

One of the primary digital banking strategies for enhancing financial inclusion is the development and promotion of mobile banking services. Mobile banking has been touted as a means to extend financial services to rural and marginalized communities, as it can overcome geographical barriers and provide convenient access to banking services (Omarini, 2018). However, the success of mobile banking initiatives in promoting financial inclusion is not universal, as certain contextual factors can lead to various forms of resistance to the adoption of this technology (Klyton et al., 2020; Adukpo & Mensah, 2025). To address this challenge, financial institutions must carefully consider the unique needs and preferences of the target population and design tailored mobile banking solutions that address their specific pain points.

In addition to mobile banking, the expansion of online banking platforms and digital wallets has also played a significant role in improving financial inclusion in the United States. These digital banking solutions offer a range of financial services, such as account management, bill payments, and money transfers, which can be accessed remotely without the need for physical branch visits. The integration of digital wallets with mobile devices has further simplified financial management, enabling individuals to conveniently access their accounts and perform transactions directly from their smartphones (Gigante et al., 2022; Mensah & Adukpo, 2025). Though the implementation of these digital banking strategies has shown promising results in promoting financial inclusion, it is essential to recognize that the benefits of digitalization may not be equally accessible or beneficial to all segments of the population.

**2.5 Impact Assessment of Digital Banking Strategies on Financial Inclusion in the United States: Mobile Banking, Online Platforms, and Digital Wallets**

Digital banking technologies have rapidly revolutionized the financial services industry in the United States, offering new avenues to improve financial inclusion for marginalized communities (Klyton et al., 2020). The digitalization of financial services has the potential to bridge the gap in financial access and usage, particularly for unbanked and underbanked populations. Through the adoption of mobile banking, online platforms, and digital wallets, vulnerable groups can reduce the cost and risk of using cash while gaining access to a wider range of financial products and services (Buteau et al., 2021). However, the success of these digital initiatives is heavily dependent on contextual factors and the unique challenges faced by different communities.

Recent studies have cautioned that the “more technology inclusion” approach does not always yield the desired results, and financial inclusion policies need to consider factors such as digital literacy and access to cash alongside technological solutions (Dostov et al., 2019). In India, for instance, the digitalization of financial services has registered substantial improvements in banks financial statements, but this has not entirely reflected in advancement of financial inclusion (Kanungo & Gupta, 2021).

The United States is no exception to these challenges. While digital banking has made significant strides in enhancing financial inclusion, certain marginalized groups, such as the elderly, low-income individuals, and racial minorities, continue to face barriers to accessing and utilizing these digital financial services (Kanungo & Gupta, 2021, Klyton et al., 2020; Dostov et al., 2019).

To effectively leverage digital banking strategies for financial inclusion, policymakers and financial institutions in the United States must adopt a holistic approach that addresses the multifaceted nature of financial exclusion. This includes investing in digital literacy programs, ensuring equitable access to digital infrastructure, and designing inclusive financial products that cater for the unique needs of various communities.

Table 2: Key Findings on the Impact of Digital Banking Strategies on Financial Inclusion in the U.S.

|  |  |  |
| --- | --- | --- |
| Digital banking strategy | Key findings | Supporting data and citations |
| Mobile banking | Mobile banking has significantly improved accessibility to financial services, particularly in remote areas. | 55% of U.S. bank customers use mobile apps as their primary method for managing bank accounts (ABA, 2024). |
| Online platforms | Online banking platforms have democratized access to financial services, promoting financial literacy. | 22% of U.S. bank customers use online banking via laptop or PC as their primary method for managing bank accounts (ABA, 2024). |
| Digital wallets | Digital wallets enhance transactional efficiency and security and reduce transaction costs. | 49.7% of U.S. households use nonbank online payment services such as PayPal, Venmo, or Cash App (FDIC, 2023). |
| Challenges and opportunities | Despite progress, challenges like digital literacy, cybersecurity threats, and regulatory gaps persist. | Nonbank online payment services usage grew from 46.4% in 2021 to 49.7% in 2023, highlighting increased reliance on digital finance (FDIC, 2023). |

*American Bankers Association, (2024) and Federal Deposit Insurance Corporation. (2023)*

The table highlights the significant impact of digital banking strategies, specifically mobile banking, online platforms, and digital wallets, on financial inclusion in the United States. Mobile banking, with 55% of U.S. bank customers using apps as their primary banking method, has enhanced access to financial services, especially in underserved and remote areas. Online platforms have also contributed to financial inclusivity by providing an accessible avenue for banking services, with 22% of consumers using them for account management via laptops or PCs, further supporting financial literacy. Digital wallets, with nearly 50% of U.S. households utilizing nonbank online payment services like PayPal and Venmo, have improved transaction efficiency, security, and cost-effectiveness.

**2.6 Comparative Analysis of Digital Banking and Financial Inclusion in the United States: Opportunities, Challenges, and Policy Implications.**

 The transformative potential of digital banking in enhancing financial inclusion in the United States has attracted significant empirical research. This aspect of the literature review delves into studies that explored the diverse impacts of digital banking strategies, such as mobile banking, online platforms, and digital wallets, and the factors contributing to the success and challenges of these initiatives in promoting financial inclusivity in the U.S. Empirical evidence highlights a positive correlation between the adoption of digital banking and improved financial inclusion rates (Mhlongo et al., 2024). Studies have shown that mobile banking has expanded access to financial services, particularly for underserved populations such as low-income, rural, and minority communities. For instance, the rise of mobile banking apps has enabled individuals who previously lacked access to traditional banking infrastructure to manage their finances conveniently and affordably (Mhlongo et al., 2024; Atisu et al., 2024).

However, these studies also underscore challenges in the U.S. that hinder the efficacy of digital banking in achieving full financial inclusion. Issues such as digital literacy, cybersecurity concerns, and a lack of access to high-speed internet in rural areas remain significant barriers to widespread adoption. These challenges persist despite technological advancements, creating a digital disparity between different demographic groups (Reis et al., 2024; Appiah et al., 2025). Furthermore, the role of regulatory frameworks and government support is relevant in addressing these issues. Comparative analyses of digital banking initiatives across different states in the U.S. reveal that supportive policies, including enhanced financial literacy programs and investments in digital infrastructure, are crucial for leveraging digital banking solutions effectively (Mhlongo et al., 2024).

Empirical findings also highlight the varied impact of digital banking on different demographic groups. While mobile and online banking platforms have expanded financial access for younger, tech-savvy populations, older individuals, low-income communities, and rural residents face significant hurdles in adopting these technologies (Reis et al., 2024). Studies indicate that tailored strategies are necessary to ensure that these groups can fully benefit from digital banking. Moreover, the data suggests that financial inclusion policies should consider the diverse needs of these populations to mitigate exclusionary effects (Mhlongo et al., 2024; Mensah & Adukpo, 2025).

**2.7 Comparative Analysis: Successes and Challenges in the United States**

American digital banking innovation leaders are leveraging technology to improve financial inclusion. However, there are challenges the country faces that impact the efficacy of its digital banking strategies. This comparative analysis examines the successes and challenges faced in the country’s efforts to enhance financial inclusion through digital banking.

Mobile banking services can be considered one of the most significant success stories in the U.S. digital banking experience. As per Pew Research Center (Smith, 2019), nearly 90% of Americans possess a mobile phone, with the majority of them having a smartphone, the environment is perfect for mobile banking applications. These applications have increased financial accessibility, as they provide 24/7 access to accounts and allow for seamless transactions.

Loan products offered under regulatory programs, such as the Community Reinvestment Act (CRA), also promote financial inclusion. Originally enacted in 1977, the CRA encourages banks to lend to low- and moderate-income communities and make investments in digital banking infrastructure (Federal Reserve Board, 2020). The CRA has helped to address the financial access gap, particularly for disenfranchised communities, by providing incentives for financial institutions to offer digital services in underserved areas.

Despite these advancements, the U.S. faces several challenges in achieving full financial inclusion even with the emergence of digital banking. One of the primary barriers is the digital divide, which represents disparities in access to digital technologies across socioeconomic groups. The Federal Communications Commission (FCC) reports that approximately 21 million Americans lack high-speed internet access, predominantly in rural and low-income urban areas (Federal Communications Commission, 2021). This digital disparity limits the reach of online banking platforms, hindering efforts to provide equal financial access across all demographics.

Cybersecurity and privacy concerns also present significant challenges. With rising cyber threats and data breaches, many consumers remain hesitant to fully embrace digital banking due to fears of identity theft and financial fraud (Swan, 2020; Olise et al., 2025; Narteh-Kofi et al., 2025). Implementing strong cybersecurity measures and educating consumers on safe online banking practices are essential to building trust in digital financial services. Narayan et al. (2024) emphasize the importance of robust data protection measures in financial institutions, noting the significant role cybersecurity plays in safeguarding financial data against breaches and fraud. Their research highlights the necessity for stringent security protocols to enhance consumer confidence in digital banking.

Furthermore, financial literacy disparities hinder the effectiveness of digital banking in fostering financial inclusion. Research by Lusardi and Mitchell (2014) underscores the widespread lack of financial knowledge among many Americans, particularly those from marginalized communities. This deficiency can limit their ability to effectively utilize digital banking tools and make informed financial decisions. Expanding financial education programs tailored to underserved communities is essential to ensuring that digital banking contributes to economic empowerment.

**2.8 Comparative Analysis of Findings in the USA: Opportunities, Challenges, and Lessons Learned**

Digital banking has come a long way in the United States, greatly improving financial inclusion by reaching out to underserved groups. Digital banking has revolutionized the operations of financial institutions amidst rapid technological advancements which ensure convenience, efficiency, and cost savings. Despite these developments, challenges persist in having equitable access.

In the US, digital banking has opened tremendous possibilities for financial inclusion. AI and analytics allow banks and fintech to offer personalized banking services that improve customer services (Federal Reserve, 2021). The use of blockchain technology also provides additional security and minimizes the risk of fraud (Federal Reserve, 2021). It has also significantly bridged gaps for underbanked populations such as low-income households and individuals in remote areas through the use of mobile and internet banking, consequently reducing their reliance on costly traditional banking methods (Ibeh et al., 2024; Enebeli-Uzor & Mukhtar, 2023). Such innovations are the reason banking services have become more accessible, efficient, and inclusive.

Yet numerous obstacles continue to limit complete financial inclusion. One of the biggest barriers is the digital disparity, with some of the U.S. population still without reliable access to the internet or digital banking tools. This problem specifically affects rural communities, senior citizens, and low-income families, restricting their participation in digital financial services (Guerra-Leal et al., 2021). In addition, privacy concerns and cybersecurity risks continue to deter many users. Thus, the full adoption of digital banking services for certain demographic groups is limited due to increasing threat of fraud, data breaches, and identity theft (Jain et al., 2022). Another emerging issue is the need for regulatory compliance because financial institutions are required to operate within specific legal frameworks and ensure consumer protection without stifling innovation (US Department of the Treasury, 2018).

The U.S. experience with digital banking underscores several key lessons that can inform future policies and strategies. A robust regulatory framework is essential to encourage fintech growth while simultaneously implementing strong consumer protection measures (US Department of the Treasury, 2018). Expanding digital literacy programs is also essential in improving the adoption of digital banking, particularly among vulnerable populations who may lack the necessary skills to navigate digital financial platforms effectively (Guerra-Leal et al., 2021). Additionally, strengthening cybersecurity measures and fraud detection systems play a vital role in increasing consumer trust and ensuring the continued expansion of digital banking services (Jain et al., 2022).

**3.0 Regulatory and Policy Frameworks for Digital Banking in the United States**

**3.1 Regulatory Environment for Digital Banking**

Digital banking is becoming a game changer in the quest for financial inclusion globally. To ensure effective digital transformation, a well-defined regulatory and policy environment which provide integrity to the financial system and encourage innovation is important. The digital banking landscape in the United States is governed by federal and state laws, which together create a multi-faceted regulatory framework.

The Office of the Comptroller of the Currency (OCC) is also at the forefront of bringing existing regulatory frameworks up to speed with the rapid growth of fintech players and digital banking services. The OCC has launched one of its major initiatives; a special-purpose national bank charter for fintech companies to play a leading role in integrating them into the financial system to facilitate consumer protection. Through these charters, the OCC seeks to provide a legal mechanism through which fintech companies could operate nationally without requiring the same litany of licenses across each state,  thus limiting regulatory fragmentation and supporting innovation (US Department of the Treasury, 2018).

Federal agencies such as the Federal Reserve, the Consumer Financial Protection Bureau (CFPB), and the Federal Deposit Insurance Corporation (FDIC) collectively oversee digital banking. Therefore, fintech firms are saddled with a host of both state and federal laws covering lending, payments, and data privacy to comply with. These two-tiered regulatory systems lead to compliance burdens, especially for startups and fintech innovators attempting to scale their operations. Whilst the European Union has a single, cross-jurisdictional framework through various directives such as the Payment Services Directive 2 (PSD2), there is no single regulatory framework covering digital banking within the U.S. (Federal Reserve, 2021).

**4.0 Future Directions and Innovations in Digital Banking**

The future of digital banking in the United States is poised for significant transformation, driven by emerging technologies that aim to enhance financial inclusion. As digital banking continues to evolve, innovations such as artificial intelligence (AI), blockchain and big data analytics are expected to play a pivotal role in bridging financial gaps and expand access to underserved populations.

Mobile financial systems have emerged as a pivotal solution for accelerating financial inclusion and economic growth, particularly for unbanked and underbanked individuals (Lumsden, 2018). In the United States, though digital banking is widely adopted, financial exclusion persists among low-income households, rural communities, and minority populations. The increasing adoption of mobile banking applications has shown substantial potential in addressing these disparities, particularly through features such as real-time transaction tracking, peer-to-peer transfers, and automated financial planning tools (Maripally & Bridwell, 2017).

Emerging technologies such as AI, blockchain, big data analytics and cloud computing are at the forefront of transforming digital banking services in the U.S. (Indriasari et al., 2022). AI-powered financial tools, such as robo-advisors and chatbots, are enhancing financial decision-making for consumers, whilst blockchain technology is driving innovations in secure transactions and decentralized finance (DeFi). These advancements are particularly relevant for marginalized communities that may lack access to traditional banking institutions.

The role of fintech innovations in advancing financial inclusion has gained significant recognition, particularly in the post-pandemic era. The COVID-19 crisis underscored the necessity for accessible, digital financial services, leading to increased adoption of fintech solutions across the United States (Datta, 2023). However, regulatory challenges remain, as policymakers continue to assess how best to balance innovation with consumer protection and financial stability.

Additionally, financial literacy and internet accessibility play key roles in shaping digital banking adoption. Studies have highlighted that financial literacy is a key factor influencing the effective use of digital banking platforms, particularly in underserved areas (Cnaan, Scott, Heist, & Moodithaya, 2021). Without sufficient financial education, even the most innovative digital banking tools may fail to achieve their intended impact on financial inclusion. Likewise, the digital disparity where rural and low-income populations have limited access to reliable internet connectivity remains a significant barrier to digital banking adoption (Widarwati, Solihin, & Nurmalasari, 2022).

Consumer behavior trends, especially among the younger generation, are also shaping the future of digital banking. Generation Z’s digital-first approach to financial services necessitates revising banking business models that align with their expectations for convenience, speed, and seamless integration with other digital services (Irwin et al. 2023). The growing demand for embedded finance where banking services are integrated into non-banking platforms, such as social media and e-commerce demonstrates how digital banking must evolve to meet changing consumer preferences.

In the long term, the success of digital banking in enhancing financial inclusion in the United States will depend on a combination of technological advancements, regulatory frameworks, and targeted financial education initiatives. Through addressing disparities in digital access, strengthening consumer trust in fintech solutions, and ensuring that innovations remain inclusive and accessible, digital banking can play a transformative role in reducing financial exclusion and fostering economic empowerment across the diverse U.S. population.

**4.1 Conclusion**

This study has shown that digital banking plays a key role in improving financial inclusion in the United States. Regulations, new technologies, and good policies help more people, especially the unbanked and underbanked, access financial services. However digital banking offers many opportunities, but it also comes with challenges that need to be addressed.

One important finding is that strong regulations shape digital banking. Regulatory sandboxes help fintech companies test new ideas while ensuring safety and fairness. Agencies like the Consumer Financial Protection Bureau (CFPB) and the Office of the Comptroller of the Currency (OCC) work to balance innovation with protection for consumers. Mobile banking and digital payments have greatly improved financial access for low-income, rural, and minority communities (Lumsden, 2018; Maripally & Bridwell, 2017). However, some people still struggle due to low digital literacy, internet access issues, and security risks. National strategies, like digital literacy programs and better financial products, help close these gaps. Studies show that financial knowledge is important for using digital banking effectively (Cnaan et al., 2021). At the same time, strong consumer protection laws are needed to prevent fraud and financial harm (Indriasari et al., 2022).

The paper underscored that going forward, digital banking in the U.S. must continue evolving. Policymakers, banks, and technology companies must work together to improve access to safe and efficient financial services. New technologies like AI and blockchain can help, but it is also important to invest in internet access and digital education (Datta, 2023; Widarwati, Solihin, & Nurmalasari, 2022). Expanding financial access is not just an economic goal; it is also a social responsibility. Everyone, no matter their income or background, should have access to financial tools that help them succeed. The lessons from this study can guide future policies to create a fairer and more inclusive financial system in the U.S.

**Disclaimer (Artificial intelligence)**

Option 1:

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

Option 2:

Author(s) hereby declare that generative AI technologies such as Large Language Models, etc. have been used during the writing or editing of manuscripts. This explanation will include the name, version, model, and source of the generative AI technology and as well as all input prompts provided to the generative AI technology

Details of the AI usage are given below:

1.

2.

3.

**References**

Adebayo, O., Mensah, N., Adukpo, T. K. (2025). Beyond Cash Flow Management: How Machine Learning and Scenario Planning Drive Financial Resilience. EPRA International Journal of Economics, Business and Management Studies (EBMS), 12(3), 81-89. <https://doi.org/10.36713/epra20503>

Adebayo, O., Mensah, N., Adukpo, T. K. (2025). Navigating Liquidity Management Challenges in the Era of Digital Banking in the United States. World Journal of Advanced Research and Reviews, 25(2), 2711-2719. <https://doi.org/10.30574/wjarr.2025.25.2.0576>

Adukpo, T. K., & Mensah, N. (2025). Financial technology and its effects on small and medium-scale enterprises in Ghana: An Explanatory Research. Asian Journal of Economics, Business and Accounting, 25(3), 268-284. <https://doi.org/10.9734/ajeba/2025/v25i31709>

Agarwal, S., & Zhang, J. (2020). FinTech, Lending and Payment Innovation: A Review [Review of FinTech, Lending and Payment Innovation: A Review]. Asia-Pacific Journal of Financial Studies, 49(3), 353. Wiley. <https://doi.org/10.1111/ajfs.12294>

Agbadamasi, T. O., Opoku, L. K., Adukpo, T. K., Mensah, N. (2025). The Role of Business Intelligence in AI Ethics: Empowering U.S. Companies to Achieve Transparent and Responsible AI. EPRA International Journal of Economics, Business and Management Studies (EBMS), 12(3), 8-14. <https://doi.org/10.36713/epra20314>

Al-Alawi, A. I., & Al-Bassam, M. S. A. (2020). The significance of cybersecurity system in helping managing risk in banking and financial sector. Journal of Xidian University, 14(7), 1523-1536

Alexander, K., & Karametaxas, X. E. (2021). Digital transformation and financial inclusion. In Routledge eBooks (p. 273). Informa. <https://doi.org/10.4324/9780429325670-15>

Amoako, E.K.W., Boateng, V., Ajay, O., Adukpo, T.K., Mensah, N. (2025). Exploring the Role of Machine Learning and Deep Learning in Anti-Money Laundering (AML) Strategies within U.S. Financial Industry: A Systematic Review of Implementation, Effectiveness, and Challenges. Finance & Accounting Research Journal, 7(1). <https://doi.org/10.51594/farj.v7i1.1808>

Anyanwu, A., Olorunsogo, T., Abrahams, T. O., Akindote, O. J., & Reis, O. (2024). Data confidentiality and integrity: A review of accounting and cybersecurity controls in superannuation organizations. Computer Science & IT Research Journal, 5(1), 237-253.

Appiah, D., Appiah, A. D., Agbeve, V. (2025). The Influence of E-Banking on Service Delivery in a Covid-19 Era: The Case of Fidelity Bank Ghana Limited. Iosr Journal Of Economics And Finance (Iosr-Jef), 16(1), 55-61. <https://doi.org/10.9790/5933-1601055561>

Atisu, J. C., Mensah, N., Alipoe, S. A., & Rahman, S. A. (2024). The Effect Of Non-Performing Loans On The Financial Performance Of Commercial Banks In Ghana. IOSR Journal of Economics and Finance, 15(5), 42-48. <https://doi.org/10.9790/5933-1505054248>

Atisu, J. C., Mensah, N., Junior, K. N., Akuamoah, O. A. (2024). Board Gender Diversity and Financial Performance of Listed and Unlisted Firms in Ghana. International Journal of Research Publication and Reviews, 5(9), 2788-2796. <https://doi.org/10.55248/gengpi.5.0924.2658>

Bueno, L. A., Sigahi, T. F., Rampasso, I. S., Leal Filho, W., & Anholon, R. (2024). Impacts of digitization on operational efficiency in the banking sector: Thematic analysis and research agenda proposal. International Journal of Information Management Data Insights, 4(1), 100230.

Buteau, S., Rao, P., & Valenti, F. (2021). Emerging insights from digital solutions in financial inclusion. In CSI Transactions on ICT (Vol. 9, Issue 2, p. 105). Springer Science+Business Media. <https://doi.org/10.1007/s40012-021-00330-x>

Cnaan, R. A., Scott, M. L., Heist, H. D., & Moodithaya, M. S. (2023). Financial inclusion in the digital banking age: Lessons from rural India. Journal of Social Policy, 52(3), 520-541. <https://doi.org/10.1017/S0047279421000738>

Datta, D. (2023). The future of financial inclusion through fintech: A conceptual study in post pandemic India. Sachetas, 2(1), 11-17. <https://doi.org/10.55955/210002>

Dostov, V., Shust, P., & Khorkova, A. A. (2019). New trends in financial inclusion policies: role of digital technologies and digital inclusion. <https://doi.org/10.2991/ies-18.2019.54>

Ehimuan, B., Anyanwu, A., Olorunsogo, T., Akindote, O. J., & Abrahams, T. O. (2024). Digital inclusion initiatives: Bridging the connectivity gap in Africa and the USA–A review. International Journal of Science and Research Archive, 11(1), 488-501.

Ehimuan, B., Chimezie, O., Akagha, O. V., Reis, O., & Oguejiofor, B. B. (2024). Global data privacy laws: A critical review of technology's impact on user rights. World Journal of Advanced Research and Reviews, 21(2), 1058-1070.

Enebeli-Uzor, S., & Mukhtar, A. (2023). Efficacy of digital finance on financial inclusion: Evidence from the Nigerian banking industry. Innovation, 12, 13.

Fasnacht, D., & Fasnacht, D. (2018). Open innovation in the financial services (pp. 97-130). Springer International Publishing.

Federal Communications Commission (2021). Broadband Deployment Report. Retrieved from [www.fcc.gov](http://www.fcc.gov)

Gigante, N. I., Martin, P. A., & Marutani, H. (2022). Transitioning Towards a Fully Digital Banking Environment: Analyzing Financial Consumption Preferences of Metro Manila Banking Customers. In Journal of Business and Management Studies (Vol. 4, Issue 2, p. 213). <https://doi.org/10.32996/jbms.2022.4.2.17>

Guerra-Leal, E. M., Arredondo-Trapero, F. G., & Vázquez-Parra, J. C. (2021). Financial inclusion and digital banking on an emergent economy. Review of Behavioral Finance, 15(2), 257-272. <https://doi.org/10.1108/rbf-08-2021-0150>

Hughes, N., & Lonie, S. (2007). M-PESA: Mobile money for the "unbanked" turning cellphones into 24-hour tellers in Kenya. Innovations: Technology, Governance, Globalization, 2(1-2), 63-81. <https://doi.org/10.1162/itgg.2007.2.1-2.63>

Ibeh, C. V., Asuzu, O. F., Olorunsogo, T., Elufioye, O. A., Nduubuisi, N. L., & Daraojimba, A. I. (2024). Business analytics and decision science: A review of techniques in strategic business decision making. World Journal of Advanced Research and Reviews, 21(2), 1761-1769.

Ibeh, C. V., Elufioye, O. A., Olorunsogo, T., Asuzu, O. F., Nduubuisi, N. L., & Daraojimba, A. I. (2024). Data analytics in healthcare: A review of patient-centric approaches and healthcare delivery. World Journal of Advanced Research and Reviews, 21(2), 1750-1760.

Indriasari, E., Prabowo, H., Gaol, F. L., & Purwandari, B. (2022). Digital banking: Challenges, emerging technology trends, and future research agenda. International Journal of E-Business Research, 18(1), 1-20. <https://doi.org/10.4018/ijebr.309398>

Irwin, N., Kurniawan, K., Alesandro, A., & Limantara, N. (2023). Understanding the technology acceptance model of digital banking usage among generation z: A study on user adoption and satisfaction. In 2023 International Conference on Information Management and Technology (ICIMTech) (pp. 200-205). IEEE. <https://doi.org/10.1109/ICIMTech59029.2023.10277761>

Islam, M. J., & Mia, M. R. (2024). The evolution of payment systems in Bangladesh: Transition from traditional banking to blockchain based transactions. Malaysian Journal of Business, Economics and Management, 16-25. <https://doi.org/10.56532/mjbem.v3i1.30>

Jain, P., Sharma, B. K., Jain, R., Pandey, A. K., & Khare, S. (2022). Mobile banking adoption for digital financial inclusion. In 2022 7th International Conference on Business and Industrial Research (ICBIR) (pp. 254-258). IEEE. <https://doi.org/10.1109/ICBIR54589.2022.9786477>

Jain, R., Kaur, B., & Mehta, K. (2022). Exploring pathways of digital financial inclusion to improve women's economic participation. In 2022 8th International Conference on Advanced Computing and Communication Systems (ICACCS) (Vol. 1, pp. 1550-1553). IEEE. <https://doi.org/10.1109/ICACCS54159.2022.9785138>

Jameaba, M.-S. (2023). Digitalization, Emerging Technologies, and Financial Stability: Challenges and Opportunities for the Indonesian Banking Sector and Beyond. Muyanja Ssenyonga Jameaba. <https://doi.org/10.32388/csttyq.3>

Kanungo, R. P., & Gupta, S. (2021). Financial inclusion through digitalisation of services for well-being. In Technological Forecasting and Social Change (Vol. 167, p. 120721). Elsevier BV. <https://doi.org/10.1016/j.techfore.2021.120721>

Klyton, A. van, Mesías, J. F. T., & Castaño-Muñoz, W. (2020). Innovation resistance and mobile banking in rural Colombia. In Journal of Rural Studies (Vol. 81, p. 269). Elsevier BV. <https://doi.org/10.1016/j.jrurstud.2020.10.035>

Lottu, O. A., Abdul, A. A., Daraojimba, D. O., Alabi, A. M., John-Ladega, A. A., & Daraojimba, C. (2023). Digital transformation in banking: A review of Nigeria's journey to economic prosperity. International Journal of Advanced Economics, 5(8), 215-238. <https://doi.org/10.51594/ijae.v5i8.572>

Lumsden, E. (2018). The future is mobile: Financial inclusion and technological innovation in the emerging world. Stanford Journal of Law, Business & Finance, 23(1), 1-41.

Lusardi, A., & Mitchell, O. S. (2014). The economic importance of financial literacy: Theory and evidence. American Economic Journal: Journal of Economic Literature, 52(1), 5-44.

Lusardi, A., & Mitchell, O. S. (2014). The economic importance of financial literacy: Theory and evidence. Journal of Economic Literature, 52(1), 5-44. <https://doi.org/10.1257/jel.52.1.5>

Malladi, C. M., Soni, R. K., & Srinivasan, S. (2021). Digital financial inclusion: Next frontiers—Challenges and opportunities. CSI Transactions on ICT, 9(2), 127-134. <https://doi.org/10.1007/s40012-021-00328-5>

Maripally, A., & Bridwell, L. (2017). The future of financial inclusion and its impact on poverty reduction in India. Competition Forum, 15(2), 329-335.

Mensah, N., Adukpo, T. K. (2025). Impact of Government Expenditure on Economic Growth of Ghana. Asian Journal of Economics, Business and Accounting, 25(3), 232-247. <https://doi.org/10.9734/ajeba/2025/v25i31706>

Mensah, N., Atisu, J. C., Alipoe, S. A., Ofori, D. E. K. (2024). Impact of Corporate Governance Structure on Profitability of Quoted and Unquoted Firms in Ghana. International Journal of Research Publication and Reviews, 5(10), 1026-1033. <https://doi.org/10.55248/gengpi.5.1024.2731>

Mhlongo, N. Z., Daraojimba, D. O., Olubusola, O., Ajayi-Nifise, A. O., & Falaiye, T. (2024). Reviewing the impact of digital platforms on entrepreneurship in Africa. International Journal of Science and Research Archive, 11(1), 1364-1375.

Mhlongo, S., et al. (2024). Digital Banking and Financial Inclusion: A Global Perspective. Journal of Financial Inclusion Studies, 10(2), 112-127.

Narayan, M., Shukla, P., & Kanth, R. (2024). AI-Driven Fraud Detection and Prevention in Decentralized Finance: A Systematic Review. AI-Driven Decentralized Finance and the Future of Finance, 89-111.

Narteh-Kofi, E., Asamoah, E., Adukpo, T. K., Mensah, N. (2025). Mergers and Acquisitions in the U.S. Capital Market: Theoretical Foundations, Market Dynamics and Strategic Implications. EPRA International Journal of Economics, Business and Management Studies (EBMS), 12(3), 71-80. <https://doi.org/10.36713/epra20500>

Natsir, K., Arifin, A. Z., & Ronald, R. (2024). Financial inclusion in the use of digital banking services in Jakarta. International Journal of Advanced Economics and Business, 1(4), 2477-2493. <https://doi.org/10.24912/ijaeb.v1i4.2477-2493>

Ogboye, K. S., Akande, F. I., & Kwarbai, J. (2022). Determinants of digital banking convenience and customer satisfaction of selected deposit money banks in Nigeria. European Journal of Accounting, Auditing and Finance Research, 10(2), 1-30. <https://doi.org/10.37745/ejaafr.13/vol10no2pp.1-30>

Okoyeuzu, C. R., Kalu, E. U., & Ukpere, W. I. (2019). Evaluating the impact of electronic payment channels on sustainable financial inclusion in Nigeria. Journal of Reviews on Global Economics, 8, 1363-1370. <https://doi.org/10.6000/1929-7092.2019.08.119>

Olise, P., Opoku, L. K., Mensah, N. (2025). Innovative Strategies for Cost Reduction and Risk Mitigation in Event and Public Safety Management (Noting a Case Study of Large-Scale Event). EPRA International Journal of Economics, Business and Management Studies (EBMS), 12(1). <https://doi.org/10.36713/epra19964>

Olise, P., Opoku, L. K., Mensah, N. (2025). The impact of advanced safety leadership training programs on reducing workplace accidents and enhancing asset reliability in U.S. industrial sectors. International Journal of Science and Research Archive, 14(1), 25-33. <https://doi.org/10.30574/ijsra.2025.14.1.2594>

Omarini, A. (2018). Fintech and the Future of the Payment Landscape: The Mobile Wallet Ecosystem - A Challenge for Retail Banks? In International Journal of Financial Research (Vol. 9, Issue 4, p. 97). Sciedu Press. <https://doi.org/10.5430/ijfr.v9n4p97>

Orieno, O. H., Ndubuisi, N. L., Eyo-Udo, N. L., Ilojianya, V. I., & Biu, P. W. (2024). Sustainability in project management: A comprehensive review. World Journal of Advanced Research and Review, 21, 656-677.

Patel, A., & Satapathy, S. K. (2023). Empowering digital banking services and enhancing financial inclusion using smart and robust fintech software solutions. In 2023 World Conference on Communication & Computing (WCONF) (pp. 1-9). IEEE. <https://doi.org/10.1109/WCONF58270.2023.10235246>

Plaitakis, A., & Staschen, S. (2020). Open banking: How to design for financial inclusion. Consultative Group to Assist the Poor (CGAP) Working Paper.

Reis, O., Eneh, N. E., Ehimuan, B., Anyanwu, B., Olorunsogo, T., & Abrahams, T. O. (2024). Privacy law challenges in the digital age: A global review of legislation and enforcement. International Journal of Applied Research in Social Sciences, 6(1), 73-88.

Reis, O., Oliha, J. S., Osasona, F., & Obi, O. C. (2024). Cybersecurity dynamics in Nigerian banking: Trends and strategies review. Computer Science & IT Research Journal, 5(2), 336-364.

Reis, P. M. N., & Soares Pinto, A. P. (2022). How do banking characteristics influence companies’ debt features and performance during COVID-19? A study of Portuguese firms. International Journal of Financial Studies, 10(4), 98.

Saxena, D., & Goyal, N. (2022). Digital financial inclusion in India. Interscience Management Review, 188-200. <https://doi.org/10.47893/imr.2022.1131>

Shah, M. K. M., & Wadia, A. K. (2023). Neoteric finance and evolution in banking operation in India. Journal of Corporate Finance Management and Banking System, 3(1), 1-4. <https://doi.org/10.55529/jcfmbs.31.1.4>

Singh, K., Premalatha, K. P., Benakatti, S., & Srivatsa, V. (2023). Revolutionizing digital banking: Harnessing blockchain smart contracts for enhanced security and efficiency. In 2023 3rd International Conference on Smart Generation Computing, Communication and Networking (SMART GENCON) (pp. 1-5). IEEE. <https://doi.org/10.1109/SMARTGENCON60755.2023.10442642>

Smith, A. (2019). Mobile Banking Adoption in the United States. Pew Research Center. Retrieved from [www.pewresearch.org](http://www.pewresearch.org)

Swan, E. J. (2023). Cybercurrency Law: A Guide to Digital Asset Regulation Around the World.

Udeh, C. A., Orieno, O. H., Daraojimba, O. D., Ndubuisi, N. L., & Oriekhoe, O. I. (2024). Big data analytics: A review of its transformative role in modern business intelligence. Computer Science & IT Research, 5, 219-236.

Ukpoju, E. A., Adefemi, A., Adegbite, A. O., Balogun, O. D., Obaedo, B. O., & Abatan, A. (2024). A review of sustainable environmental practices and their impact on US economic sustainability. World Journal of Advanced Research and Reviews, 21(1), 384-392.

Umoren, J., Adukpo, T. K., & Mensah, N. (2025). Leveraging Artificial Intelligence in Healthcare Supply Chains: Strengthening Resilience and Minimizing Waste. EPRA International Journal of Economics, Business and Management Studies (EBMS), 12(2), 190-196. <https://doi.org/10.36713/epra20385>

Umoren, J., Adukpo, T. K., Mensah, N. (2025). Exploring factors, outcomes, and benefits in supply chain finance: Insights and future directions for the U.S. healthcare system. World Journal of Advanced Research and Reviews, 25(2), 60-71. <https://doi.org/10.30574/wjarr.2025.25.2.0345>

Wardani, D., Wulandari, N., & Baskara, C. A. (2021). Understanding customer acceptance to financial technology: Study in Indonesia. International Journal of Innovative Technologies in Economy, 2(34). <https://doi.org/10.31435/rsglobal_ijite/30062021/7550>

Wezel, T., & Ree, M. J. J. (2023). Nigeria--fostering financial inclusion through digital financial services. International Monetary Fund. <https://doi.org/10.11113/ijibs.v18.142>

Widarwati, E., Solihin, A., & Nurmalasari, N. (2022). Digital finance for improving financial inclusion Indonesians' banking. Signifikan: Jurnal Ilmu Ekonomi, 11(1), 17-30. <https://doi.org/10.15408/sjie.v11i1.17884>

Williams, M. (2023). A digital business innovation and financial inclusion: Panacea to Nigeria's economic growth. International Journal of Innovation and Business Strategy, 18(2), 49-62. <https://doi.org/10.11113/ijibs.v18.142>

Zhou, M., Geng, D., Abhishek, V., & Li, B. (2017). When the Bank Comes to You: Branch Network and Customer Omni-Channel Banking Behavior. In SSRN Electronic Journal. RELX Group (Netherlands). <https://doi.org/10.2139/ssrn.3033988>