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Digital Transformation in Banking and Inclusive Finance

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Abstract

Coronavirus disease 2019 (COVID-19) pandemic presented significant disruptions across sectors, with the financial industry being no exception. In response, banks accelerated digital transformation to maintain resilience and continuity. This chapter explores the role of digital transformation in promoting inclusive finance during the pandemic. Key innovations identified include mobile banking, AI-powered chatbots, fully digital banks, and biometric authentication. The chapter underscores that inclusive finance is anchored on core principles such as affordability, usability, and financial literacy. The chapter highlights how digital transformation has helped address inclusive finance barriers including gender disparities, inadequate infrastructure, and low digital literacy. However, despite its transformative potential, digital banking faces challenges ranging from regulatory constraints and cybersecurity risks to outdated systems necessitating innovation, FinTech collaboration, and comprehensive reform strategies.

9.1 Introduction

The Coronavirus Disease (COVID-19) is one of the major global crises of the 21st century, impacting nearly every sector of the economy, including the financial sector. Financial markets saw significant volatility, with stock indices plummeting in early 2020 before recovering unevenly across various regions (Statista Research Department, 2024). An empirical study by Ji et al. (2024) also testify how global stock markets struggled significantly during the COVID-19 pandemic. Both businesses and households struggled financially, raising concerns about potential credit losses and the long-term sustainability of debt (Goldstein et al., 2021). Specifically, households where members have lost their jobs or are on furlough experience reduced income, making it difficult to repay loans. This leads to not only lost revenue but also potential losses if repayment capacity is permanently affected, which in turn harms profits and bank capital (Economics Observatory, 2020). The pandemic also contributed to a global GDP decline, as businesses dealt with disruptions in supply chains and decreased consumer demand (World Economic Forum (WEF), 2020). The sector faced immense pressure, as many governments relied on it to combat the impacts of COVID-19 (WEF, 2020). For instance, financial institutions played a vital role in assisting governments with their social protection initiatives across African countries during COVID-19 (Iddrisu et al., 2024; Ofori et al., 2022). In response to the crisis, many financial institutions had to adjust their operating hours (Economics Observatory, 2020). For example, in Ghana, most financial institutions started at 8 a.m. and close at 2 or 3 p.m. instead of their usual 4 or 5 p.m. Additionally, several banks have discontinued Saturday banking, which was particularly important for the urban population due to COVID-19 (Zenith Bank (Ghana) Limited, n.d.).

Despite the above-mentioned impact, banks and other financial institutions were still expected to promote inclusive finance. Therefore, the idea of digital transformation banking emerges in other to promote inclusive finance. Digital transformation in banking involves digital technologies adoption and strategies to limit operations and boost customer experiences (Cromwell & Peprah, 2025; Iddrisu, Yakubu, & Asongu, 2025). It goes beyond simply providing online banking services, focusing on reshaping how banks function and engage with customers through innovations such as mobile apps, AI-driven chatbots, blockchain, and cloud computing (FinTech Magazine Africa, 2025; Iddrisu et al., 2022). Inclusive finance on the other hand, is where businesses and individuals access sustainable financial products, encompassing savings, micro-credit, payments, remittances, and insurance efficiently and effectively (Iddrisu, Ofoeda, Issah, & Iddrisu, 2025; World Bank, 2022b). Banks and other financial institutions have now integrate mobile money or other financial technologies into their business operation to promote inclusive finance (Cromwell & Peprah, 2025; World Bank, 2024b). For example, during lockdowns[1], banks leveraged mobile money and their own mobile apps to deliver financial services to customers unable to visit branches. Therefore, this chapter utilizes empirical studies and case studies to explore how digital transformation in banking has fostered inclusive finance during the COVID-19 era.

The rest of the chapter is structured as follows: Section 9.2 present the concepts and evolution of digital transformation in banking. The chapter discusses the overview of inclusive finance in Section 9.3. Section 9.4 captures the role of digital transformation in banking in inclusive finance. Section 9.5 discusses the changes and way forward in adopting digital transformation in banking.

[1]One of the strategies implemented to limit the spread of COVID-19

9.2 Digital Transformation in Banking: Concept and Evolution

Traditional banking primarily revolved around a brick-and-mortar model, where the core functions were limited to accepting deposits and issuing credit to customers (Cromwell & Peprah, 2025). This conventional approach relied heavily on physical infrastructure, face-to-face interactions, and manual processing of financial transactions (Cromwell & Peprah, 2025; Iddrisu, Ofoeda, Issah, & Iddrisu, 2025). However, the rapid advancement in Information and Communication Technology (ICT) has significantly transformed the landscape of the banking sector. The increasing demand from financial service users for convenience, speed, and personalized experiences has also contributed to this shift. As a result, banks have been compelled to move beyond traditional boundaries and adopt digital platforms that offer a broader range of services. This includes mobile banking, internet banking, digital wallets, and real-time payment systems. Moreover, emerging technologies such as blockchain, artificial intelligence, and big data analytics are being integrated into banking operations to enhance efficiency, improve customer experience, and ensure more secure and transparent financial transactions (Iddrisu, Yakubu, & Asongu, 2025).

Therefore, digital transformation in banking can be seen as the adoption of innovative digital technologies to fundamentally reshape banking operations and enhance customer service (Porter, 2025). It extends beyond traditional online banking to include mobile banking applications, digital payment platforms, and emerging technologies such as artificial intelligence (AI) and blockchain. Progress made in digital transformation in banking has been marked by a progressive shift from manual, paper-based processes to highly automated, technology-driven operations. In the early stages, particularly during the 1960s to 1980s, banks began adopting basic electronic systems such as Fedwire and Dinners Club to streamline internal record-keeping, accounting, and transaction processing (Dinners Club International, 2024; Dreier et al., 2015; Garbade & Silber, 1979). This marked the beginning of a gradual move away from labour-intensive processes. The introduction of Automated Teller Machines (ATMs) and magnetic stripe cards in the 1980s revolutionized customer interactions by enabling round-the-clock cash withdrawals and reducing reliance on physical bank branches (Iddrisu, Yakubu, & Asongu, 2025). These innovations significantly enhanced customer convenience and laid the groundwork for further advancements.

The 1990s witnessed a pivotal shift with the introduction of internet banking, allowing customers to perform basic transactions, view account balances, and pay bills online (Laine, 2021; Soni, 2022). As internet access became more widespread, banks began investing in digital platforms to improve accessibility and service delivery (Cromwell & Peprah, 2025). The 2000s further accelerated this transformation with the advent of mobile banking applications, which enabled users to access financial services on-the-go using smartphones and other handheld devices. These tools provided real-time interaction and expanded the reach of banking services, especially in underserved areas. The COVID-19 pandemic significantly accelerated the global shift toward digital transformation across various sectors, especially in the financial industry (Iddrisu, Boadi, Giamporcaro, & Doku, 2025; Iddrisu, Yakubu, & Abor, 2025). As lockdowns and social distancing measures disrupted traditional in-person banking, financial institutions were compelled to innovate and adapt quickly. This period marked a notable surge in the adoption and development of digital banking platforms. Almost every bank, regardless of size or location, launched or enhanced their mobile and online banking applications to ensure continued access to financial services (Amankwah-Amoah et al., 2021). The pandemic effectively highlighted the necessity of digital infrastructure, pushing banks to prioritize technology in their operations to meet evolving customer expectations and

needs. In the United States, more than 45% of individuals have altered their banking habits in response to the crisis. A survey conducted by McKinsey across Europe reveals a 20% rise in digital engagement, accompanied by a notable decline in cash usage. This shift toward online banking is expected to persist even post-COVID-19, further accelerating the growth of the digital market (Mag, 2020).

9.2.1 Technologies Driving Digital Transformation in Banking

There have been different technologies that spike the level of digital transformation in banking. Key among these technologies include the following:

1. **Artificial Intelligence**

Artificial Intelligence (AI) is revolutionizing the banking sector by driving efficiency, enhancing customer service, and improving decision-making processes (Porter, 2025). AI-powered chatbots, for example, can handle customer inquiries around the clock, offering instant support, resolving issues, and guiding users through transactions. These systems also enable banks to deliver personalized financial advice based on user behaviour and transaction history. Moreover, AI plays a critical role in unveiling fraudulent activities by assessing patterns as well as flagging suspicious transactions in real-time. In areas like risk management and algorithmic trading, AI helps banks assess creditworthiness, predict market trends, and execute trades swiftly, ultimately enhancing operational precision and profitability.

2. **Internet of Things**

Internet of Things (IoT) devices have the potential to significantly transform how banks engage with customers and manage their physical infrastructure (Li et al., 2023). These smart devices enable real-time data collection and connectivity, enhancing operational efficiency and customer experience. For instance, sensors embedded in ATMs can monitor machine performance, detect anomalies, and predict maintenance requirements before breakdowns occur, reducing downtime and improving service reliability. Additionally, wearable devices such as smartwatches and fitness bands can be integrated with banking apps to facilitate secure and convenient mobile payments through biometric authentication. By harnessing IoT, banks can offer smarter services, streamline operations, and gain deeper customer insights.

3. **Blockchain**

Blockchain technology holds immense potential to transform the financial services sector by enabling secure, transparent, and efficient transactions (Arner et al., 2017; Li et al., 2023). As a decentralized and tamper-resistant digital ledger, blockchain records transactions across a network of computers, ensuring data integrity and reducing the risk of fraud or unauthorized manipulation (Porter, 2025). Though still in the early stages of widespread adoption in banking, its applications are promising. Blockchain can revolutionize cross-border payments by significantly reducing processing time and costs, streamline trade finance by automating complex processes through smart contracts, and enhance identity management through secure, verifiable digital identities. This technology offers a foundation for greater trust and innovation in finance.

4. Cloud Computing

Cloud-based solutions provide a powerful foundation for modern banking by offering scalability, enhanced security, and operational flexibility (HA & Guled, 2016). These technologies allow banks to adapt quickly to changing market conditions and customer expectations (Arner et al., 2017). By leveraging cloud infrastructure, financial institutions can deploy new applications and digital services at a much faster pace, improving time-to-market and customer satisfaction. Additionally, cloud computing enables efficient data management, secure storage, and real-time analytics, all while supporting compliance with regulatory requirements. The ability to scale infrastructure on-demand ensures that banks can handle fluctuating workloads without incurring unnecessary costs, making cloud adoption a strategic move for digital transformation and innovation.

5. Big Data and Analytics

By analysing vast volumes of customer data, banks can unlock critical insights into customer behaviour, spending habits, preferences, and evolving financial needs (Aldboush & Ferdous, 2023). This deep understanding enables banks to offer personalized financial products and services tailored to individual lifestyles and goals, enhancing customer satisfaction and loyalty. Moreover, data analytics allows banks to identify emerging opportunities, anticipate market trends and proactively address potential risks. These insights support more informed, data-driven decisions across various operations, from product development and marketing to risk management and strategic planning. Ultimately, leveraging customer data empowers banks to improve efficiency, remain competitive, and drive innovation in an increasingly digital economy.

9.2.2 Example of Digital Transformation in Banking

There have been several key digital transformations in banking. The major digital innovations in banking that were adopted during this era are discussed below;

1. Mobile Banking Applications

Many banks have embraced digital innovation by offering mobile applications that empower customers to perform a plethora of banking activities directly from their smartphones. These mobile apps provide convenient access to essential banking services, such as transferring funds between accounts, checking account balances, and paying bills on time. Customers can also deposit checks remotely by simply capturing an image of the check, eliminating the need to visit a bank branch. With these features, mobile banking apps offer enhanced convenience, security, and efficiency, allowing customers to manage their finances anytime, anywhere, with just a few taps on their devices. During COVID-19, there was a rise of mobile banking applications. Some banks such as ICICI Bank introduced the iMobile Pay which offer access to more than 400 banking and lifestyle services (Box 9.1).

Box 9.1: ICICI Bank Introduced the iMobile Pay During COVID-19
ICICI Bank, one of India's leading private sector banks, has made significant strides in digital banking through the introduction of iMobile Pay, a comprehensive digital banking platform. Offering access to more than 400 banking and lifestyle services, iMobile Pay has revolutionized the way customers interact with their finances. The platform supports not only traditional banking functions such as fund transfers, bill payments, and loan services, but also includes value-added features like investments, insurance, and personal finance management. Its user-friendly interface and seamless integration across devices have contributed to its rapid adoption, particularly in major metropolitan areas and state capitals, where digital banking infrastructure and smartphone penetration are high. The app's growing popularity is evident from the migration of over one crore customers from other banks who have enrolled in iMobile Pay, a trend that underscores the platform's appeal beyond ICICI Bank's existing customer base. This significant shift has fueled a 26% increase in total transaction value during the current financial year up to February 2024, signaling strong customer confidence and growing reliance on digital channels. Moreover, the average transaction ticket size has risen by 16%, suggesting deeper user engagement and a broader range of financial activities being conducted through the platform. These figures not only highlight the robustness and scalability of iMobile Pay but also reflect ICICI Bank's strategic foresight in aligning with India's digital transformation agenda. The bank's ability to attract and retain a diverse user base through innovative services has positioned iMobile Pay as a key driver of financial inclusion and digital banking evolution in India. As customer preferences continue to shift toward convenience and real-time access, iMobile Pay stands as a testament to how digital innovation can enhance both the scope and efficiency of banking services.
Source: Kulthe (2024)

2. AI-Powered Chatbots

Banks are increasingly utilizing AI-powered chatbots to enhance customer service by providing round-the-clock support, answering queries, and assisting with various banking transactions. These intelligent systems can handle a wide range of tasks, such as checking account balances, processing transfers, providing information on loan products, and even troubleshooting issues, all in real-time. By offering instant, efficient, and personalized responses, AI chatbots improve overall customer satisfaction and reduce wait times. This automation not only enhances the customer experience but also allows banks to streamline operations and focus human resources on more complex tasks, optimizing both service quality and operational efficiency. Capital One's Eno AI-Chatbot was widely used in the USA during COVID-19 (Box 9.2).

Box 9.2: Capital One's Eno AI-Chatbot Enhance Financial Access During COVID-19
Capital One introduced Eno, its AI-powered virtual assistant, in 2017, becoming the first U.S. bank to launch a natural language SMS chatbot. Eno provides customers with round-the-clock access to essential banking services such as checking balances, reviewing transactions, and making credit card payments through text messages, the mobile app, or the website. Beyond basic functions, Eno monitors account activity, flags suspicious transactions, and delivers personalized spending insights by identifying recurring charges. During the COVID-19 pandemic, Eno's role became even more critical. It evolved to proactively detect unusual transactions such as excessively high tips or duplicate charges and notify customers with merchant details for resolution. These real-time alerts were especially useful as customers increasingly depended on digital banking during lockdowns. Eno's capabilities helped safeguard customers' finances and contributed significantly to Capital One's operational efficiency. By handling a wide range of inquiries, Eno reduced call center traffic by 50%, ensuring timely customer support despite the pandemic's disruptions. Its intelligent, automated support not only improved the customer experience but also demonstrated how AI can strengthen banking resilience in times of crisis. Eno remains a key component of Capital One's commitment to innovation and enhancing financial well-being through smart technology.
Source: (Bell et al., 2019)

3. Digital Banks

Some banks now operate entirely online, without the need for physical branches, offering a fully digital banking experience. These digital-only banks leverage advanced technology to provide a wide range of financial services via user-friendly digital platforms, including mobile apps and websites. By eliminating the overhead costs associated with maintaining physical branches, digital banks can pass on significant savings to customers in the form of lower fees and more competitive interest rates. This model also provides enhanced convenience, allowing customers to access and manage their accounts anytime, from anywhere, without the limitations of traditional banking hours or locations. The Philippines stands out as a key example of digital transformation in banking, leveraging digital banks to expand access and deliver essential financial services to customers (Box 9.3).

Box 9.3: Digital banks rose in Philippines During COVID-19: UNO Bank led inclusion efforts
UNO Bank Inc., a credit-led digital bank licensed under the Bangko Sentral ng Pilipinas (BSP) Digital Banking License framework, rebranded as UNO Digital Bank ahead of its official launch in the second quarter of 2022. This move positioned it among the six digital banks granted licenses in 2021, alongside OF Bank, Tonik Bank, UnionDigital, GoTyme, and Maya Bank. With the application window closed until 2023, UNO stands out as part of a select group shaping the future of digital banking in the Philippines. During the COVID-19 pandemic, UNO played a key role in promoting financial inclusion by offering accessible credit to underserved populations, especially those without access to formal banking services. It introduced UNOnow, a transparent, low-interest lending product that encouraged responsible borrowing and broadened credit access. Additionally, UNO partnered with organizations like Proxtera to deliver financial literacy training to Micro, Small, and Medium Enterprises (MSMEs), helping them integrate into the financial system. These efforts supported MSME growth and empowered unbanked and underbanked communities during a time of economic hardship. UNO's rebranding and initiatives reflect its commitment to building a tech-driven financial ecosystem and advancing inclusive digital finance across the Philippines.
Source: Raposas (2022)

4. Agent Banking

Agent banking is a system where banks and financial institutions deliver basic banking services through authorized third-party agents rather than traditional branches. These agents such as shopkeepers, mobile money operators, or small business owners are trained to perform transactions like cash deposits and withdrawals, bill payments, account opening, and fund transfers on behalf of the bank. The model is particularly effective in reaching rural and underserved communities, where establishing full-scale bank branches is expensive and impractical. Agent banking reduces operational costs, increases convenience, and fosters trust by using familiar community members as service providers.

Box 9.4: Fidelity Bank Ghana Employ Agent Banking During COVID-19
The significance of agency banking was notably heightened during the COVID-19 pandemic. Amid the lockdown period, when approximately 38 Fidelity Bank branches were temporarily closed, agency banking emerged as a critical alternative service delivery channel. Fidelity Bank strategically deployed informational posters to redirect customers from closed branches to nearby agent locations. As COVID-19 cases began to rise, agents adopted health and safety protocols to ensure a secure operating environment. Even at the peak of the lockdown, an impressive 74% of the average daily active agents remained operational, playing a vital role in cash-in services and deposit mobilization. Furthermore, the Government's COVID-19 Alleviation Program accelerated the adoption of digital financial services nationwide, aimed at mitigating the economic toll on SMEs and minimizing health risks linked to cash handling. Consequently, security personnel permitted agents to continue operating, officially recognizing them as providers of essential services.
Source: (Mburu, 2025)

Some banks such as the Fidelity Bank Ghana Ltd. provide financial services to customers through digital transformation banking such as agent banking during COVID-19 (Box 9.4).

5. Tailored Financial Service

Leveraging data analytics, banks are able to deliver personalized financial advice and customize products to align with the distinct needs of individual customers. The demand and provision of such tailored services saw significant growth during the COVID-19 period, as customers increasingly sought digital and responsive financial solutions. Through the analysis of customer transaction histories, spending patterns, and financial goals, banks gain valuable insights that empower them to recommend customized solutions, including personalized savings plans, tailored investment opportunities, and appropriate credit products. This personalization enhances the customer experience by providing relevant, timely, and actionable advice that aligns with each customer's specific circumstances. By using data-driven insights, banks can foster stronger relationships, build customer loyalty, and improve financial outcomes, creating a more customer-centric approach to banking and financial services. For instance, UNO Bank It introduced UNOnow, a transparent, low-interest lending product that encouraged responsible borrowing and broadened credit access during COVID-19 (Box 9.3).

Box 9.5: Equity Bank through Partnership has Used Biometric to Protect Customers

CompuLynx, a trusted IT partner of Equity Bank, designed and implemented a solution using Innovatrics Automated Biometric Identification System (ABIS) with advanced fingerprint authentication to address critical identity verification challenges. The system aimed to provide an immediate solution for Equity Bank's recent acquisition and offered scalability for future expansions, enabling deployment across additional acquisitions as part of the bank's retail growth strategy. It operates with a centralized biometric database (CBD) of customer fingerprints, housed at the bank's Data Centre in Nairobi, Kenya. Innovatrics ABIS ensures the creation of a single biometric profile for each customer, regardless of the number of accounts held across various banking services, including savings, loans, hire purchases, home loans, and education loans. For any transaction, such as registration for a new service, money withdrawal, or other banking activities, Innovatrics ABIS performs a 1:N matching operation to safeguard against identity fraud.

Source: https://www.innovatrics.com/references/secure-account-verification-sustains-retail-banks-expansion/ Accessed April 12, 2025

6. Preventive AI and Biometric Authentication

To combat fraud, banks are increasingly utilizing preventive AI for both fraud detection and prevention. The effective implementation and scalability of this technology proved indispensable during the COVID-19 pandemic, contributing to a more than 40% rise in fraud prevention activities compared to pre-pandemic levels (WFO, 2020). In addition to AI, banks are progressively adopting advanced biometric authentication methods such as voice recognition, fingerprint scanning and facial recognition. These biometric technologies offer superior protection over traditional passwords or PINs, as biometric data is unique to each individual and exceptionally difficult to replicate.

By integrating biometric authentication, banks significantly reduce the risk of unauthorized access to customer accounts or fraudulent transactions. This enhanced security not only safeguards sensitive financial information but also elevates the user experience, enabling customers to access their accounts swiftly and securely without the burden of remembering complex passwords. For example, Equity Bank strengthens customer security by implementing an Automated Biometric Identification System (ABIS) featuring advanced fingerprint authentication, effectively addressing key identity verification challenges (Box 9.5).

9.3 Overview of Inclusive Finance

Inclusive finance or financial inclusion is the process of making formal financial services accessible, available and affordable to business and individuals (Iddrisu et al., 2022; World Bank, 2025). Financial inclusion serves as a powerful enabler for achieving seven of the 17 Sustainable Development Goals (SDGs). It supports inclusive economic growth, enhances job creation, and empowers marginalised populations, especially women. It plays a critical role in reducing income inequalities, fostering entrepreneurship, and increasing financial resilience among low-income households (Iddrisu et al., 2022; Iddrisu, Yakubu, & Asongu, 2025). Additionally, financial inclusion contributes directly to poverty alleviation by providing the tools individuals and businesses need to improve their livelihoods, invest in education and health, and build a more sustainable and equitable future.

Finance becomes inclusive when it empowers beneficiaries whether individuals, families, small entrepreneurs, or larger enterprises to access a comprehensive suite of services and products tailored to their specific needs. These offerings may include financial services such as credit, digital payment systems, insurance, or transaction management, but they can also extend to non-financial support like training, legal and accounting assistance, or business development advisory. Inclusive finance goes beyond simple access; it ensures that these services are affordable, appropriate, and sustainable. It is regarded as responsible when it considers the broader ecosystem, including donors, microfinance institutions, and the environmental, energy, and socio-economic impacts of financial interventions (Iddrisu et al., 2022; Iddrisu, Yakubu, & Asongu, 2025). By engaging all actors along the value chain, inclusive finance helps create resilient economic systems that not only support individual livelihoods but also contribute to broader developmental goals. This holistic approach promotes equity, sustainability, and long-term financial empowerment for communities around the world.

9.3.1 Principles and Pillars of Inclusive Finance

The following are the principle and pillars of inclusive finance

1. Accessibility

Accessibility is the foundation of inclusive finance, focusing on ensuring that all individuals, especially those in underserved and marginalized communities, can access essential financial services (Shah & Dubhashi, 2015). This includes people in remote rural areas, women, youth, people with disabilities, and low-income households who are often excluded from the formal financial system. Enhancing accessibility involves expanding physical access points, such as banking agents or mobile money platforms, and leveraging technology to overcome geographic barriers. Policymakers and financial institutions must collaborate to eliminate legal, infrastructural, and systemic obstacles, thereby promoting equitable access to banking, savings, insurance, and credit services across socio-economic segments.

2. Affordability

Affordability ensures that the cost of financial services such as interest rates, transaction fees, and account maintenance charges remains within reach of low-income and vulnerable populations (Shirono et al., 2024). High costs can discourage use and lead to financial exclusion, especially among those already facing economic hardships. Inclusive finance promotes transparent and

competitive pricing that reflects the real value of services without exploiting users. Innovations like digital finance and mobile banking can reduce operating costs and improve affordability. Additionally, governments and financial institutions can support affordability through subsidies, regulatory reforms, and targeted financial products that cater specifically to the needs of disadvantaged groups.

3. Appropriateness

Appropriateness is the tailoring of financial products and services to suit the distinct needs, preferences, and circumstances of various user groups (Claessens & Perotti, 2007). A one-size-fits-all approach often fails in diverse populations, especially among those with irregular incomes, low literacy levels, or specific cultural norms. Inclusive finance emphasizes customer-centric product design whether it's flexible micro-loans for small-scale entrepreneurs, savings plans for seasonal workers, or Sharia-compliant services for Muslim communities. Engaging end-users in the design process and using behavioural insights can enhance product relevance and uptake. Appropriate financial solutions also build trust and ensure long-term engagement with the formal financial sector.

4. Usage

Beyond access, true financial inclusion demands meaningful usage of financial services (World Bank, 2025). Many people may have access to a bank account but rarely use it due to factors like inconvenient service delivery, lack of trust, or low perceived value (Iddrisu, Ofoeda, Issah, & Iddrisu, 2025). Ensuring usage involves creating user-friendly, reliable, and responsive financial services that integrate into the daily lives and economic activities of customers. This includes promoting regular savings, insurance uptake, and responsible borrowing. Sustained usage reflects a well-functioning financial ecosystem where services meet actual needs. Monitoring transaction frequency and patterns can help providers adjust their offerings, ensuring that inclusion efforts lead to positive development outcomes.

5. Financial Literacy and Consumer Protection

Financial literacy equips individuals with the skills and knowledge relevant to make informed decisions about budgeting, saving, borrowing, and investing (World Bank, 2025). In the context of inclusive finance, financial literacy is essential for empowering users particularly first-time entrants into the formal financial system to understand products, manage risks, and avoid over-indebtedness. Simultaneously, robust consumer protection frameworks are vital to guard against fraud, predatory lending, and data misuse. These include transparent disclosure practices, grievance redress mechanisms, and regulatory oversight. When people trust financial institutions and feel capable of using their services wisely, they are more likely to engage actively, ensuring both financial inclusion and long-term financial well-being.

9.3.2 Barriers to Inclusive Finance

1. Socio-Cultural and Gender Norms

Socio-cultural and gender norms play a critical role in limiting financial inclusion, especially for women and marginalized groups (Iddrisu, Ofoeda, Issah, & Iddrisu, 2025; World Bank, 2022a). In many societies, prevailing norms restrict women's mobility, decision-making power, and ownership of assets, which are

often prerequisites for accessing credit or opening bank accounts. Traditional beliefs and distrust of formal financial institutions can also reduce the willingness of communities to engage with banks. Gender bias within financial institutions may lead to discriminatory lending practices, while the lack of female representation in financial leadership further perpetuates inequality (Iddrisu, Ofoeda, Issah, & Iddrisu, 2025).

2. Structural and Institutional Barriers

Structural and institutional barriers to financial inclusion is the systemic constraints within the legal, regulatory, and financial systems that prevent equal access to financial services (Ambarkhane et al., 2022). These include rigid banking regulations, limited branch networks in rural areas, and weak governance mechanisms that discourage innovation and outreach. In many emerging economies, financial institutions focus on urban and profitable markets, neglecting underserved communities. Moreover, complex procedures, such as documentation requirements, licensing restrictions, and lack of interoperability between financial platforms, hinder access for small businesses and low-income individuals. Weak consumer protection frameworks and limited competition among service providers further reinforce exclusion from mainstream financial systems (Demirgüç-Kunt et al., 2022; World Bank, 2022a).

3. Inadequate Infrastructure

Poor infrastructure severely limits the reach and effectiveness of financial services, especially in remote or underserved regions (Amankwah-Amoah et al., 2021). Inadequate digital infrastructure means unreliable internet access, weak mobile connectivity, and insufficient data security, all of which hinder mobile banking and fintech innovations. Poor transportation networks make it difficult to reach bank branches or service agents, increasing travel costs and discouraging engagement (Iddrisu, Ofoeda, Issah, & Iddrisu, 2025). Additionally, erratic electricity supply affects the functionality of ATMs, point-of-sale devices, and mobile charging, further obstructing access to financial services. Investments in digital, transport, and energy infrastructure are vital to ensure that financial inclusion efforts are sustainable and accessible for all.

4. High Transaction Costs and Lack of Identification

High transaction costs discourage low-income populations from using formal financial services (Iddrisu, Ofoeda, Issah, & Iddrisu, 2025; World Bank, 2022a). These include account maintenance fees, ATM charges, and minimum balance requirements, which are often unaffordable for the poor. Additionally, Know Your Customer (KYC) regulations, while important for preventing fraud, create barriers when individuals lack formal identification, proof of address, or birth certificates common in informal settlements and rural areas. Without proper identification, potential customers are excluded from opening bank accounts or accessing credit. Financial institutions may also perceive such clients as high-risk, further limiting their access. Simplified KYC processes and subsidized fees are essential to foster greater financial inclusion.

5. Low Financial and Digital Literacy

A lack of financial and digital literacy significantly undermines efforts to enhance financial inclusion (Iddrisu, Ofoeda, Issah, & Iddrisu, 2025; World Bank, 2022a). Individuals unfamiliar with basic financial concepts such as saving, interest, loans, and insurance are less likely to engage with financial services or use them effectively. Similarly, limited digital literacy prevents users from leveraging mobile banking, digital wallets, or online platforms that are increasingly replacing traditional financial channels. This knowledge gap is particularly pronounced in rural and low-income areas, where access to education is limited. Without targeted literacy campaigns and capacity-building initiatives, even the most innovative financial solutions may remain inaccessible or be underutilized by intended beneficiaries (Iddrisu, Ofoeda, Issah, & Iddrisu, 2025; World Bank, 2022a).

9.4 The Role of Digital Transformation in Banking on Inclusive Finance

The adoption of digital transformation in the banking sector has progressively reduced barriers to inclusive finance. This section explores the role of digital transformation in promoting financial inclusion. It begins by examining the theoretical underpinnings of this relationship and concludes with practical and empirical insights into how digital innovations in banking contribute to enhanced financial inclusion.

9.4.1 Theoretical Perspectives

There are various underpinning theories that support the role of digital transformation in banking on inclusive finance. This chapter however discusses four of these theories.

1. **Diffusion of Innovation Theory**

The diffusion of innovation theory propounded by Rogers (1962) argued that innovations are adopted gradually within a social system over time through a communication process. According to the theory, individuals do not adopt innovations simultaneously; instead, their willingness and ability to adopt vary. As such, Rogers (1962) categorises adopters into five distinct groups: (i) innovators, (ii) early adopters, (iii) early majority, (iv) late majority, and (v) laggards, based on their readiness and openness to embrace new ideas or technologies. Innovators are risk-takers who are eager to try new concepts, while early adopters are opinion leaders who influence the broader community. The early majority adopts new technologies just before the average person, while the late majority is sceptical and adopts only after the majority has tried it. Laggards, on the other hand, are the most resistant to change. The speed and effectiveness of innovation diffusion are shaped by five essential factors: relative advantage (the perceived superiority of the innovation compared to current solutions), compatibility (the degree to which the innovation aligns with existing values and practices), complexity (the level of difficulty in comprehending or using the innovation), trialability (the measure of how much it can be evaluated prior to complete adoption), and observability (the visibility and clarity of the innovation's outcomes to others).

In the context of digital transformation in banking, this theory helps explain the adoption of innovations like mobile money, digital wallets, internet banking, and branchless banking services. For example, M-PESA in Kenya illustrates how mobile money services diffused across various socioeconomic groups (Iddrisu, Yakubu, & Asongu, 2025). Initially adopted by tech-savvy and urban-based early adopters, the service eventually reached rural populations, informal sector workers, and small-scale traders, thereby enhancing financial inclusion. Digital wallets such as Flutterwave's Barter or Opay in Nigeria follow a similar trajectory. Urban youths and SMEs first adopted them for convenience and lower transaction costs. Gradually, these tools spread to market traders, artisans, and farmers, often influenced by peer recommendations and visible benefits. In this social diffusion, change agents such as mobile agents, NGOs, or digital literacy advocates play a vital role in influencing others' decisions. Moreover, the theory underscores the importance of understanding socioeconomic and cultural dynamics. For example, in conservative or low-literacy communities, adoption may lag due to scepticism or lack of digital skills, highlighting the need for targeted education and trust-building measures.

2. **Digital Divide Theory**

The digital divide theory with some proponents including Hargittai (2002) and Warschauer (2003) focuses on the unequal distribution and usage of digital technologies across different segments of society. It highlights how limited access to ICTs including internet services, smartphones,

computers, and other digital tools can worsen existing social, economic, and regional inequalities. This divide is evident not only between developed and developing nations, referred to as the global digital divide, but also within individual countries. Marginalized populations such as rural communities, older adults, low-income groups, persons with disabilities, and women often face greater barriers due to inadequate infrastructure, limited digital literacy, and affordability issues. These disparities hinder access to healthcare, education, financial services, and job opportunities, ultimately restricting inclusive development and participation in the digital economy.

In the context of digital transformation in banking and finance, the digital divide presents a significant challenge to achieving inclusive finance. While digital technologies such as digital wallets, mobile banking, and online credit platforms have the potential to extend financial services to the unbanked and underbanked, their benefits are not equally distributed. People without access to affordable internet, smartphones, or basic digital skills are often excluded from these innovations, thereby widening financial and economic disparities. For instance, in many parts of SSA and South Asia, rural populations still struggle with unreliable electricity, poor network infrastructure, and low smartphone penetration (Jinapor et al., 2023). Even when infrastructure exists, digital illiteracy particularly among older adults and women in conservative communities can prevent individuals from effectively using digital financial services. Moreover, socio-cultural factors such as gender norms or mistrust in technology and formal financial institutions can further hinder adoption.

These barriers contribute to digital financial exclusion, where certain groups are unable to benefit from cost-effective, efficient, and scalable digital financial solutions. Therefore, addressing the digital divide is critical to achieving the broader objectives of financial inclusion and equitable development. Policy interventions such as digital literacy training, investment in rural ICT infrastructure, and inclusive design of digital banking products are essential steps toward bridging the divide and ensuring that digital transformation leads to inclusive and sustainable financial ecosystems.

3. Capability Approach

The capability approach, developed by Sen (1999), redefines development not simply as economic growth, but as the expansion of individuals' capabilities and the real freedoms people have to lead lives they value. Development should enhance the substantive opportunities available to individuals, empowering them to make choices and take actions that improve their well-being and social participation (Sen, 1999). Rather than focusing solely on income or consumption, the capability approach emphasises access to education, health, financial inclusion, and participation in community life as central components of development.

The Capability Approach offers a valuable lens for understanding the transformative potential of digital financial services in promoting inclusive finance, particularly in developing regions. Digital technologies such as mobile banking, mobile money platforms, digital wallets, and online microcredit services can enhance people's capabilities by giving them greater control over their financial lives. Moreover, digital financial inclusion enhances the ability of people to act on behalf of what they value and have reason to value. A woman in a remote village, for example, can receive remittances directly to her mobile wallet, saving her time and reducing dependency. Access to digital credit may allow her to start a small business, improving her income and status within her community. By expanding such capabilities, digital financial services align with Sen's vision of development as freedom where individuals are not merely passive recipients of aid but active participants in shaping their futures. Thus, integrating the Capability Approach into digital finance policies ensures that technological advancements are used not only to grow economies but also to promote equity, empowerment, and human development.

4. Technology Acceptance Model

The Technology Acceptance Model (TAM), developed by Davis et al. (1989) is a widely recognized framework for understanding how individuals come to accept and use technology. The core premise of TAM is that perceived ease of use and perceived usefulness are the primary factors that influence whether a user will adopt a new technology. According to the model, if a technology is perceived as easy to use and useful in achieving specific goals, individuals are more likely to embrace and integrate it into their daily lives. TAM provides critical insights into the adoption of digital banking tools and services, particularly among underserved populations, such as rural residents, women, the elderly, and low-income groups. In the context of digital finance, these individuals often face barriers related to digital literacy, lack of access to infrastructure, and socio-cultural factors. However, the principles of TAM can help banks and fintech companies design tools that cater to the specific needs of these groups, thereby encouraging greater adoption.

These two factors ease of use and usefulness are considered to be key determinants of technology acceptance, and they affect users' attitudes toward using the technology, ultimately influencing their behavior. *Perceived usefulness* is to the extent to which a user believes that using a particular technology will enhance their financial activities. In the case of mobile banking or digital wallets, if a user perceives that these services will make money transfers faster, more secure, and more affordable, they are more likely to adopt the technology. For instance, mobile money services like M-Pesa in Kenya and G-Cash in the Philippines have been widely adopted by underserved populations because these platforms address the practical need for secure, low-cost, and convenient money transfers. *Perceived ease of use* relates to the extent to which a person believes that using a technology will be free from effort. Digital banking services that are intuitive and easy to use increase the likelihood of adoption, especially among those who are not digitally savvy. For example, simple user interfaces and customer support services that guide users through the process of setting up accounts and conducting transactions can significantly reduce the barriers to adoption, especially in rural areas where literacy and digital skills may be limited.

9.4.2 Empirical Perspective

This subsection consolidates the findings of empirical studies and case studies into core themes, emphasizing how digital transformation in banking promotes inclusive finance. The chapter highlights the following key ways in which digital transformation in banking advances inclusive finance:

1. Expanding Access

Digital transformation in banking such as mobile banking applications, and digital banks have revolutionized access to financial services, especially for underserved populations. This has made These platforms enable individuals in remote or rural areas, where physical bank branches may be scarce or non-existent, to engage in essential financial activities such as saving, transferring money, paying bills, and applying for loans. The convenience and accessibility of mobile banking and online payment systems eliminate geographical and infrastructural barriers, allowing people to manage their finances securely from their mobile devices or computers. This digital shift has greatly improved financial inclusion, empowering people who were previously excluded from traditional banking systems, and has fostered greater economic participation and financial independence. Some empirical studies reveal that digital transformation in banking enhance

financial inclusion through expanding access (Doku et al., 2023; Iddrisu et al., 2022). Banks such as Fidelity Bank that lack branches in remote areas can now extend their reach to new customers through innovations like agent banking (Box 9.4).

2. Low Transaction Cost

Automation and the adoption of digital processes significantly reduce operational costs for banks by streamlining routine tasks, minimizing the need for extensive physical infrastructure, and decreasing reliance on manual labour. These cost savings allow financial institutions to offer a wider range of services at lower fees, which in turn makes banking more accessible and affordable for low-income individuals. For example, automated systems can handle account management, customer service inquiries, loan processing, and transaction monitoring more efficiently and at a fraction of the cost of traditional methods (Duarte, 2021; Laghmari, 2020). By passing on these savings to customers, banks can offer reduced or even zero-fee accounts, lower minimum balance requirements, and more competitively priced financial products. This shift not only enhances cost-effectiveness but also fosters greater financial inclusion by removing financial barriers that have traditionally excluded underserved populations from formal financial systems. In this way, digital transformation plays a crucial role in democratizing access to banking services.

3. Enhance Financial Literacy

Digital financial tools frequently incorporate educational resources that empower users to better understand and manage their personal finances (Cromwell & Peprah, 2025; Iddrisu, Yakubu, & Asongu, 2025). These resources may include interactive tutorials, budgeting tools, financial literacy videos, chatbots offering guidance, and real-time alerts or tips that help users make informed decisions. By integrating financial education into mobile banking apps, online platforms, and other digital channels, users especially those with limited prior exposure to formal banking can gradually build their knowledge and confidence in handling money. This is particularly important for long-term financial inclusion, as access alone is not sufficient; individuals must also develop the skills to use financial services effectively and responsibly. Financial education delivered through digital tools enables users to grasp key concepts such as savings, interest rates, credit management, and investment options. Ultimately, this contributes to more sustainable financial behaviour, reduces vulnerability to financial risks, and supports the broader goal of inclusive economic development. For example, Capital One's AI chatbot, Eno, has improved financial literacy by monitoring account activity, flagging suspicious transactions, and providing personalized spending insights through the identification of recurring charges (Box 9.2).

4. Empowering Small Businesses

Digital lending platforms and fintech innovations have significantly improved access to credit for small and medium enterprises (SMEs), which are often underserved by traditional banking institutions (Greitens, 2023; Iddrisu, Boadi, Giamporcaro, & Doku, 2025; Plc, 2024). These digital solutions leverage advanced technologies such as machine learning, artificial intelligence, and big data analytics to assess creditworthiness more efficiently, even in the absence of formal credit histories or collateral. By streamlining the application process and reducing bureaucratic hurdles, fintech platforms enable quicker loan approvals and disbursements, making financing more accessible to SMEs. This ease of access to credit empowers entrepreneurs to start, expand, or sustain their businesses, ultimately fostering innovation, job creation, and economic growth. Additionally, the flexibility and convenience of digital lending models allow SMEs to obtain tailored financial products that align with their specific needs and cash flow cycles. In turn, this promotes a more inclusive financial ecosystem where small businesses can thrive and contribute meaningfully to national and regional economic development. Stanbic Bank Ghana has supported SMEs by providing financial education and personalized services through its partnership with FinTech companies (Box 9.6).

Box 9.6: Stanbic Bank Ghana Empower SMEs During COVID-19
Stanbic Bank Ghana is driving growth for small and medium-sized enterprises (SMEs) through digital technology, emphasizing its commitment to enhancing business operations and financial management. At a recent Stanbic X-Space event on "Digital Transformation: Unlocking Growth Opportunities for SMEs in Ghana," the bank highlighted its partnerships with Fintech to provide innovative solutions. The bank is integrating digital technology to offer efficient, flexible, and data-driven services, including digital banking platforms, payment solutions, data analytics, and capacity-building initiatives. These tools are designed to streamline financial management and support business growth. Stanbic's digital platform, Enterprise Online, helps SMEs monitor transactions, make payments, transfer funds, and manage multiple accounts via a single payment channel. The integration of mobile money wallets allows small business owners to easily transfer funds between mobile wallets and bank accounts, enhancing financial management. POS devices also support both card and mobile money payments. The bank's e-commerce solutions enable SMEs to integrate payment gateways into their websites, facilitating secure online payments and expanding digital presence. Additionally, Stanbic plans to launch its Digitalized Lending platform, enabling SMEs to request loans through digital channels, reducing processing time. This initiative supports women-led enterprises, youth startups, and small businesses, fostering growth.
Source: Amartey (2024)

5. Overcoming Documentation and Collateral Barriers

Technologies such as blockchain and biometric authentication are transforming the financial services landscape by addressing two major barriers to financial inclusion: lack of documentation and security concerns. In many developing regions, individuals may not possess formal identification or reliable documentation required by traditional financial institutions. Biometric authentication using unique physical traits like fingerprints, facial recognition, or iris scans provides a secure and accessible alternative for verifying identities, thereby enabling more people to access financial services without conventional paperwork. At the same time, blockchain technology enhances transparency, accountability, and data integrity by creating tamper-proof digital records of transactions. This fosters greater trust among users, as it reduces the risk of fraud and ensures secure, real-time processing of financial activities. Together, these technologies strengthen the overall reliability of financial systems, making them safer and more inclusive. By overcoming identification and security challenges, they enable more individuals, especially in underserved communities, to participate confidently in the formal financial sector. To reduce barriers such as documentation requirements, collateral demands, and limited branch accessibility, BancoSol launched an innovative mobile banking platform during the COVID-19 pandemic (Box 9.7).

Box 9.7: BancoSol Launched Ganasol to Overcome Access Barrier During COVID-19
BancoSol, a leading Bolivian financial institution, has launched *GanaSol*, a gamified digital banking tool designed to enhance financial inclusion and promote the use of digital banking services. Integrated into BancoSol's upgraded mobile platform, *AppSol 3.0*, the tool rewards customers for increasing or maintaining their savings account balances. Users accumulate points that can be redeemed for cash prizes via a virtual roulette, as well as through weekly and monthly draws. Serving over 1.2 million clients, BancoSol developed *GanaSol* in collaboration with Mastercard and global nonprofit Accion, as part of a broader effort to expand access to quality financial services for Bolivia's micro-merchants. The initiative stems from *CibSol*, BancoSol's new innovation hub, established under the partnership to support the development of inclusive digital financial products. By incorporating gamification, BancoSol aims to dismantle psychological barriers to financial services, particularly among populations traditionally excluded from the formal financial sector. The approach combines entertainment with digital engagement, encouraging users—regardless of age or prior experience—to adopt modern banking practices. *GanaSol* is accessible to any individual with an active savings account who downloads *AppSol 3.0* and activates the tool. It represents a key step in BancoSol's digital transformation strategy and supports several Sustainable Development Goals, including SDG 1 (No Poverty), SDG 8 (Decent Work and Economic Growth), and SDG 10 (Reduced Inequalities). The project has been guided by Accion's Global Advisory Solutions team and supported by the Mastercard Center for Inclusive Growth, aiming to empower micro and small businesses through digital innovation. The initiative underscores the importance of cross-sector collaboration in creating data-driven, inclusive financial ecosystems that support underserved communities in navigating and benefiting from the digital economy.
Source: Accion (2021)

9.5 Adopting Digital Transformation in Banking: Challenges and Way Forward

This section discusses the challenges financial institutions face when adopting digital formation in banking and how to overcome such challenges.

9.5.1 Challenges

Adopting digital transformation in banking comes with several challenges that financial institutions must navigate carefully. Some of these challenges include the following;

1. Regulatory Compliance

The banking industry operates within a highly regulated environment, and any digital transformation efforts must comply with stringent legal and regulatory frameworks (Buckley, 2016). These include data privacy laws, such as the General Data Protection Regulation (GDPR), and anti-money laundering (AML) requirements that aim to prevent financial crimes and protect consumers. While these regulations are essential for maintaining trust, security, and the integrity of the financial system, they often pose significant challenges to innovation. Banks and FinTech companies must invest substantial time and resources to ensure compliance, including developing secure systems, conducting regular audits, and maintaining transparent reporting practices. This could lead to an additional cost. This rigorous regulatory landscape can also slow the pace of digital innovation, as institutions must navigate complex rules before launching new technologies or services. For instance, the introduction of the E-levy on transfers led to a decline in the use of digital platforms for fund transfers (Penteriani, 2023), potentially resulting in the loss of customers who were initially drawn to the convenience of mobile-based transactions.

2. Legacy Systems

Many banks continue to rely on legacy core banking platforms that were designed decades ago and lack the flexibility needed to support modern digital technologies[2]. These outdated systems often struggle to integrate with emerging innovations such as cloud computing, artificial intelligence, and real-time data analytics, limiting banks' ability to offer seamless and competitive digital services. Banks that depend on Bankmaster[3] may face challenges in adopting emerging technologies such as artificial intelligence, cloud computing, and real-time data analytics. This can hinder their ability to deliver seamless, innovative, and competitive digital services. Maintaining these legacy systems is not only costly, requiring specialized expertise and frequent patching, but also risky, as they are more vulnerable to cyber threats and system failures. Their outdated architecture can lead to inefficiencies, slower transaction processing, and poor customer experiences. As the demand for digital banking grows, these technological limitations create significant barriers to transformation, preventing banks from fully capitalizing on digital opportunities and meeting the evolving expectations of customers in a fast-paced, technology-driven financial landscape.

3. Cybersecurity Risks

As banks increasingly digitize their operations and shift services to online platforms, they also become more exposed to sophisticated cyber threats, including data breaches, phishing attacks,

[2] Read more here: https://www.mckinsey.com/industries/financial-services/our-insights/should-us-banks-be-moving-to-next-generation-core-banking-platforms Accessed April 11, 2025

[3] Bankmaster is a legacy core banking system known for its rigidity and limited integration capabilities

ransomware, and identity theft (Li et al., 2023; Zetzsche et al., 2017). The growing volume of digital transactions and the storage of sensitive customer information such as personal identification details, account numbers, and financial records make banks attractive targets for cybercriminals. As a result, ensuring robust cybersecurity measures has become a top priority. This involves implementing multi-layered security protocols such as firewalls, encryption, biometric authentication, real-time threat monitoring, and regular system audits. In addition, banks must invest in employee training and customer awareness programs to reduce human error, which remains a common vulnerability. Regulatory compliance, such as adherence to data protection laws, also plays a vital role.

4. Customer Expectation

Modern banking customers increasingly expect seamless, personalized, and omnichannel experiences that allow them to interact with their financial institutions anytime, anywhere, and through various platforms be it mobile apps, websites, call centres, or in-branch services. They want intuitive user interfaces, instant support, tailored financial products, and consistent service quality across all touchpoints. Meeting these high expectations is challenging for banks, especially while undergoing digital transformation. Legacy systems, limited data integration, and internal resistance to change can hinder the ability to deliver a smooth, unified customer experience. Additionally, ensuring personalization requires advanced data analytics and artificial intelligence capabilities, which not all banks are equipped to deploy effectively.

5. Cost and Resource Allocation

Digital transformation demands substantial investment in various areas, including advanced technologies, infrastructure upgrades, and employee training (Cromwell & Peprah, 2025). For banks to stay competitive, they need to adopt tools like artificial intelligence, cloud computing, and data analytics, which can be costly to implement and maintain. Additionally, upgrading legacy systems and ensuring cybersecurity measures are up to modern standards requires significant financial and technical resources. Smaller banks, in particular, may struggle to allocate resources effectively, as they often face budget constraints and lack the scale to absorb such high costs. Furthermore, staff must be trained to adapt to new technologies and processes, which can add another layer of financial burden. Without sufficient resources, smaller institutions may find it difficult to keep pace with larger competitors, potentially limiting their ability to offer innovative services, attract customers, or meet regulatory demands in the evolving digital banking landscape.

9.5.2 Overcoming the Challenges

Overcoming the challenges of adopting digital transformation in banking requires strategic planning, innovation, and collaboration. Some of the ways to overcome these challenges include the following:

1. Fostering a Culture of Innovation

Leadership buy-in is crucial for driving successful digital transformation within banks. When senior leaders fully commit to the change, it sets a clear vision and provides the necessary resources and strategic direction for the entire organization (World Bank, 2022c). However, beyond leadership support, empowering employees through comprehensive training is key to overcoming resistance.

Providing employees with the knowledge and skills needed to navigate new technologies fosters confidence and helps alleviate fears of job displacement or inadequacy. Encouraging a culture of experimentation also plays a vital role, as it motivates employees to explore innovative solutions without the fear of failure. By fostering an environment that embraces learning and creativity, banks can ease the transition and build internal champions of digital transformation. This collective approach ensures that employees at all levels are engaged and aligned with the bank's modernization goals, increasing the likelihood of long-term success.

2. Modernising Legacy System

Banks can adopt a phased approach to upgrading outdated systems, which allows for a more manageable and less disruptive transition. Instead of overhauling the entire infrastructure at once, banks can gradually migrate core functionalities, starting with less critical operations. This enables them to test new systems and processes in stages, reducing the risks associated with a large-scale implementation. Migrating core banking functions to cloud-based platforms is a key strategy, as it provides the flexibility, scalability, and agility needed to meet the growing demands of digital transformation. Cloud platforms offer the ability to scale operations quickly, manage data more effectively, and enable real-time access to financial services. Additionally, they reduce the burden of maintaining on-premise infrastructure and allow for cost savings in terms of hardware, software, and personnel. Overall, this gradual transition helps banks modernize their systems while maintaining operational stability and ensuring long-term growth.

3. Breaking Down Data to Silos

Implementing data governance frameworks and integration tools is essential for creating a unified and consistent view of customer needs across a bank's various systems (World Bank, 2022c). A robust data governance framework ensures that data is accurate, secure, and compliant with regulatory standards, while also fostering accountability and transparency in how data is managed. By integrating data from various sources such as mobile apps, transaction records, customer service interactions, and external databases banks can build a comprehensive profile of each customer, allowing for a deeper understanding of their preferences, behaviours, and financial needs. This integrated approach enables data-driven decision-making, where banks can offer personalized products, targeted marketing campaigns, and improved customer service. Additionally, a unified view of customer data allows for more efficient operations, better risk management, and enhanced strategic planning, ultimately leading to improved customer loyalty, satisfaction, and business performance.

4. Collaborating with FinTech

By partnering with fintech companies, banks can tap into innovative solutions that enhance their digital capabilities (Iddrisu, Yakubu, & Asongu, 2025). Fintech firms often specialize in cutting-edge technologies such as blockchain, artificial intelligence, and machine learning, which can help banks streamline operations, improve customer experiences, and reduce costs. These collaborations enable banks to quickly adopt new tools and services without the need to develop them in-house, allowing for faster innovation and more competitive offerings. Furthermore, partnering with FinTech allows banks to expand their digital reach and offer services that cater to a broader customer base, including those who may be underserved by traditional banking models. This strategic alignment fosters growth, improves operational efficiency, and positions banks to better meet the evolving demands of the digital financial landscape.

5. Navigating Regulatory Compliance

Banks can collaborate closely with regulators to ensure that their digital initiatives align with current compliance requirements, helping to avoid legal and regulatory issues (Li et al., 2023; World Bank, 2024a). By maintaining an open dialogue with regulatory bodies, banks can stay informed about changes in laws, such as data privacy regulations and AML requirements, and adjust their digital strategies accordingly. Additionally, leveraging advanced technology to automate compliance processes can significantly reduce the complexity of adhering to these regulations. Automation tools can streamline tasks such as transaction monitoring, reporting, and auditing, ensuring that they are performed accurately and efficiently. This not only reduces the risk of human error but also saves time and resources, allowing banks to focus on innovation and customer service while maintaining compliance. Ultimately, a strong compliance framework integrated into digital operations fosters trust and enhances the bank's reputation in the marketplace.

9.6 Conclusion

COVID-19 underscored the pivotal role of ICT, as the financial sector relied heavily on digital innovations to adapt and remain resilient amid economic disruptions. In this context, the chapter explores how digital transformation in banking has advanced inclusive finance during the COVID-19 era. The discussion begins with the concept and evolution of digital transformation in banking, identifying key technologies that drive this shift, including AI, IoT, blockchain, cloud computing, and big data analytics. Specific innovations arising from this transformation include mobile banking applications, AI-powered chatbots, fully digital banks, agent banking networks, personalized financial services, predictive AI, and biometric authentication systems.

The chapter then delves into the concept of inclusive finance, emphasizing essential components such as accessibility, affordability, appropriateness, usage, financial literacy, and consumer protection. It also highlights several barriers to financial inclusion, including socio-cultural and gender norms, structural and institutional limitations, inadequate infrastructure, high transaction costs, lack of formal identification, and low levels of financial and digital literacy. The role of digital transformation in promoting inclusive finance is examined through the lens of relevant theoretical frameworks, such as the Diffusion of Innovation Theory, the Digital Divide, the Capability Approach, and the TAM. Empirical studies and case analyses demonstrate that digital transformation enhances inclusive finance by broadening access, lowering transaction costs, promoting financial literacy, supporting small businesses, and mitigating documentation and collateral-related obstacles.

Despite its benefits, the adoption of digital transformation in banking presents challenges, including regulatory compliance, outdated legal frameworks, cybersecurity threats, rising customer expectations, and significant costs and resource demands. Addressing these challenges requires a multifaceted strategy involving the cultivation of an innovation-driven culture, modernization of legacy systems, integration of siloed data, collaboration with FinTech firms, and effective navigation of regulatory landscapes.

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