

The conceptual framework of digital banking and requirements for digital transformation

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Abstract---This presentation highlights the importance of the conceptual framework of digital banking as a key tool for understanding the significant changes taking place in the banking sector during the digital revolution. This encompasses the application of digital technology to all facets of banking services, including product and service delivery, internal operations management, data analysis, and customer interaction. Digital transformation in banking requires several key elements to ensure the successful implementation of digital banking. These include developing technological infrastructure, qualifying human resources in digital skills, providing data management and analysis systems, and establishing regulatory and legal frameworks that support cybersecurity and data protection. Furthermore, digital transformation requires a clear institutional strategy that is aligned with the bank's objectives.

Keywords---Digital Banking, Digital Transformation, Banking Sector, Digital Technology.

Introduction

Digital transformation is now essential for all financial institutions that want to evolve and improve the quality of their services. It facilitates access for customers and beneficiaries through digital tools and means that have achieved rapid global proliferation. These digital technologies play a pivotal role in improving the quality of banking services and simplifying the process of accessing them, thereby overcoming the temporal, spatial and cost constraints associated with traditional transactions. Furthermore, they facilitate the delivery of innovative services that challenge traditional banking expectations and transform the customer experience, prompting a shift from conventional services to highly efficient digital offerings¹.

Therefore, traditional banks must transition to digital banking to maintain their market share and keep pace with increasing competition. They can learn from the experiences of leading digital banks that have attracted broad segments of society by providing advanced, flexible services.

In light of these transformations and the global emergence of digital banks, Algerian banks must embrace this digital movement. They must adopt clear strategies for transitioning to digital banking, based on solid pillars such as developing technological infrastructure, qualifying human resources and adopting advanced data management and analysis systems. They also need to enhance digital communication channels with customers to ensure they can provide high-quality, effective services.

The challenges facing Algerian banks include meeting increasing customer expectations, providing innovative digital services and ensuring the security and

¹- G. Sadouki, S. Ghridissi and S. Slimi, 'The reality and importance of digital transformation and automation', *Arraâ Journal for Economic and Administrative Studies*, Vol. 3, No. 2, 2021, pp. 90-109.

protection of banking data. The main issue of this study is therefore how the conceptual framework of digital banking can contribute to understanding profound banking transformations and the extent to which banks are prepared to meet the requirements of digital transformation to improve service quality.

To address this, the presentation is divided into two sections. The first discusses digital banking in the context of digital transformation. The second examines how prepared banks are to meet the requirements of digital transformation to enhance service quality.

Section One: The Concept of Digital Banking in the Context of Digital Transformation

Studying digital banking in the context of digital transformation is important because technology plays a pivotal role in developing the banking sector and achieving greater efficiency in providing financial services. Digital banking is no longer merely an option or an auxiliary tool; it has become a strategic necessity, enabling banks to improve service quality, accelerate operations, enhance customer satisfaction and keep pace with global financial services sector developments. Digital transformation in banking involves the use of modern digital technologies in all areas of banking, from product and service provision to internal operations management and data analysis, and intelligent and effective customer interaction².

First: Definition of digital banking

Although modern definitions of digital banking vary, they all emphasise the integration of digital technology into all aspects of banking services to improve efficiency and customer access. Digital banking is a system that enables customers to carry out financial transactions such as payments, transfers and account management via personal computers or mobile devices without having to visit traditional bank branches. This reduces time and costs while enhancing the comfort and flexibility of banking transactions³.

Digital banking is also defined as using modern communication and information technologies to improve banking performance and the customer experience. It provides 24/7 access to banking information and services and supports transactions with greater accuracy and speed. These technologies include electronic channels, digital gateways, mobile applications, and electronic payment systems. They contribute to the simplification of banking procedures and the reduction of operational costs. They also enable financial institutions to innovate by offering new

²- Hanan Slawati, 'Electronic Banking as an Entry Point for Building the Digital Economy in Algeria', *Al-Ibdaa Journal*, Vol. 4, No. 4, 2014, pp. 20-31.

³- Hanan Dreej and Al-Tawous Gharib, 'Digital Banking as a Modern Trend for Algerian Banks: A Statistical Study', *Scientific Journal of Future Economics*, Vol. 10, No. 1, 2022, pp. 598-615.

services that align with the requirements of the digital age and changes in the global business environment⁴.

Additionally, digital banking has emerged as the primary means of providing banking services using modern information and communication technologies, such as the internet, banking applications, private networks and ATMs. These services enable customers to easily and quickly access banking operations, significantly reducing the associated time and costs and thereby improving service quality and customer experience⁵.

Digital banking has its roots in the emergence of electronic money in the early 1980s, when the concept of 'Monétique' was introduced, involving the use of cards instead of traditional cash. Card-based transactions began with the use of plastic cards in public payphones in France, while the United States saw the first metal customer identification cards issued by mail in the 1950s, such as the American Express cards issued in 1958. These later expanded to cover a broader range of banks and became part of the global VISA system. By the late 1970s, many industrialised countries had equipped cards with magnetic strips, enabling their effective and secure inclusion in electronic payments. Consequently, electronic cards became a form of smart payment technology, forming the cornerstone of digital banking services.

Since 1986, France Telecom has been equipping public telephone booths with early smart card technology implementations. As devices advanced in 1992, all banking cards in France became 'Carte à Puce', cards that identify their holders and ensure a high level of security for transactions conducted with them. This development significantly supported and secured banking operations, as smart cards became a fundamental means of completing financial transactions more securely and quickly, thereby enhancing customer confidence in digital banking services⁶.

Similar cards emerged in the United States in the mid-1990s to enable access to advanced financial services, with the first Afters banking cards issued. These cards allowed consumers to conduct financial transactions faster and at a lower cost than traditional methods. These developments helped to solidify the concept of digital banking globally, with a focus on developing the digital banking industry to include a range of core services. The most important of these are facilitating cash and financial payment flows, advancing information and communication technologies to

⁴- Katia Boxkits and Nasima Khedraoui, 'Digital Banking Services as a Mechanism to Enhance Financial Inclusion in Algeria: A Case Study of the Local Development Bank (Ghalma Branch)', Master's Thesis in Corporate Finance, 8 May 1945 University, Ghalma, 2024/25, p. 33.

⁵- Bouake, A. and Brahmi, Z., 'The Role of Electronic Banking in Modernising Banking Services in Algerian Banks', *Al-Risala Journal for Humanities Studies and Research*, Vol. 10, No. 2, 2025, pp. 586-604.

⁶- Jamil Ahmed and Racham Kahina, 'Credit Cards as a Means of Payment in Algeria', *New Economy Journal*, December 2009, pp. 107-127.

enable immediate responsiveness to customer requirements and expanding the scope of digital banking services to keep pace with the times and meet the needs of individuals and institutions alike.

Second: the goals of digital banking in the context of digital transformation.

Digital banking aims to improve the performance and operational efficiency of financial institutions by adopting innovative, technology-based solutions. This improves the flow of banking operations and reduces human errors associated with traditional procedures. It enables banks to offer advanced, rapid financial services that meet customer needs more precisely and effectively, while improving the user experience by providing easy access to banking products and the ability to conduct transactions anytime, anywhere. This enhances customer satisfaction and loyalty to the institution⁷. Digital banking also enables banks to make the most of available big data by applying advanced analytical tools and artificial intelligence techniques to extract financial patterns and market trends. This allows for informed and strategic decision-making. Furthermore, digital banking fosters financial innovation by developing new products and services, as well as creative banking solutions that align with rapid digital transformations. This gives financial institutions a strong competitive edge in an ever-changing market environment characterised by rapid technological advancements.

Third: digital banking services.

Automated teller machines (ATMs) are among the most common automated banking services. Emerging with electronic banking, they have spread widely as an alternative to bank tellers, aiming to reduce congestion in branches and enable customers to carry out various financial transactions without going directly to the bank. These machines rely on a dedicated customer database linked to their bank accounts, enabling them to execute transactions easily and securely⁸.

ATMs allow customers to perform various financial services using plastic and smart cards, including withdrawing cash, depositing money, paying bills and checking account balances. They are characterised by their speed in processing transactions, lower costs compared to other transfer methods and their 24/7 availability, which provides significant flexibility for customers.

Smart cards are a form of non-cash payment that allows customers to pay for purchases and withdraw cash up to a predefined limit, with the payment being

⁷- Wafa Hamdouch, Lamia Omari and Soumia Ben Ali, 'The Role of Financial Technology in Enhancing the Performance of the Algerian Banking Sector: Drivers and Challenges', *New Economy Journal*, Vol. 12, No. 4, 2021, pp. 540-557.

⁸- A. Boutheljah, *Electronic Banking, Lectures for Second-Year Master's Students Specialising in Finance and Banking*, University of Chlef, Hasiba Ben Bouali, 2020/21.

deducted directly from the card balance. This enhances financial security and reduces the need to carry cash. These devices and smart cards have both significantly transformed the provision of modern banking services, greatly improving the customer experience.

Thanks to the widespread internet and advancements in technology, electronic banks are among the most effective and convenient means of distributing digital banking services. They allow customers to access all traditional banking services, such as checking balances and paying bills, without having to visit a branch. Electronic banks provide a range of basic features that make it easy and secure for customers to access their accounts and conduct various banking transactions.

These include three main types of website: informational sites, which provide information about the bank's services, products and special features; interactive sites, which facilitate communication between the bank and its customers via email; and transactional sites, which enable customers to carry out all banking operations remotely. Banks also offer telephone banking services, enabling customers to monitor their accounts and access other services such as enquiry services, transferring money between accounts and requesting statements. This allows them to manage their financial transactions flexibly and conveniently.

Moreover, electronic funds transfers are one of the most prominent payment tools offered by online banks to their customers. These transfers allow customers to issue orders to transfer a specified amount of money in either local or foreign currency according to the established transfer procedures. Customers can issue transfer orders in a variety of ways, such as via email or in person at the bank, and can ensure the accuracy of the order before it is executed⁹.

Transfers are executed electronically via the SWIFT network, the global financial hub for interbank transactions. This system is characterised by its speed, accuracy and security, as well as lower associated costs compared to traditional methods. Electronic funds transfers enable customers to easily complete financial transactions and are an essential part of the digital banking ecosystem, which aims to provide advanced, secure and rapid financial services that meet customer needs at all times and in all places.

⁹- Nouredine Zahoufi and Omar Zamala, 'Electronic Financial Transfers: Mechanisms of Operation and Risks in the Era of Modern Payment Methods', *International Economy and Globalisation Journal*, Vol. 1, No. 1, 2018, pp. 249-261.

Section Two: The Core Foundations of Digital Banking

This section aims to review the core foundations of digital banking. First, it examines the key requirements for successfully conducting digital banking operations. Then, it studies the potential risks and ways to mitigate them.

First: Requirements of Digital Banking

The essential requirements of digital banking form the building blocks that ensure the integrity of the banking infrastructure and the efficiency of operations within the electronic banking environment. The most prominent of these requirements are:

1. Technical infrastructure:

Technical infrastructure is the cornerstone of digital banking; no digital bank can operate effectively without a comprehensive IT environment. This includes secure communication networks, advanced computing systems and robust databases, as well as policies related to information security and internet usage. This environment ensures the efficient execution of electronic banking operations, provides comprehensive data protection and market security, and minimises risks arising from weak connections or multiple users. The effectiveness and security of this infrastructure also help to ensure regulatory and legal compliance within the telecommunications and digital banking sectors¹⁰.

2. Modern technology for banking operations

Modern technology plays a pivotal role in enabling banks to deliver their digital services in an innovative and effective manner. Combining technical knowledge with financial capabilities, it maximises the benefits of information technology, ensuring the development of banking service delivery methods that align with industrial and commercial innovation. Digital banking relies on advanced systems that automate processes such as electronic fund transfers, account management, risk monitoring and remote customer service, thereby enhancing operational efficiency and reducing human error¹¹.

3. Security and safety requirements

Digital banking requires high levels of security to protect customers' financial and personal data. This includes transaction encryption, multi-level authentication systems and monitoring for suspicious activity. Ensuring the integrity of financial operations also involves continuous auditing and review mechanisms to guarantee transactions are executed accurately and securely, thereby reducing the risk of cybercrime or financial breaches.

¹⁰- Hmara, S. and Ben Ghida, S., 'The Infrastructure of Electronic Transactions in Algerian Banks: Reality and Challenges', *Journal of Economic and Financial Research*, Vol. 7, No. 1, 2020, pp. 66-85.

¹¹- Sara Krazdi and Fawaz Ljlato, 'The Role of Information Technology in the Development of Electronic Banking', *Algerian Journal of Human Security*, Vol. 7, No. 1, 2022, pp. 689-712.

The success of digital banking hinges on a robust technical infrastructure, adoption of the latest technologies, implementation of stringent security standards and the ability to adapt to continuous changes in the global financial market. This makes the digital banking system the foundation on which to develop digital banking services and achieve a sustainable competitive advantage for banks.

4. Human Resources

Human resources are one of the fundamental pillars of successful digital banking operations and performance enhancement. The human element is a vital link between advanced technological infrastructure and effective banking performance; no digital system can succeed without qualified personnel who can manage and apply technology effectively¹².

The required competencies vary according to the diverse activities and digital banking services. These include the ability to work with advanced technical infrastructures, ensure smooth operations and efficiently and quickly understand and meet customer digital needs. They must also be able to monitor performance, identify potential risks and address them professionally to ensure uninterrupted, error-free service delivery. Furthermore, continuous training for human resources is vital to maximise the benefits of ongoing technological advancements. Building a trained and qualified human workforce enables employees to fulfil their responsibilities cohesively, achieving continuous improvement in banking operations in line with innovation and modernisation in digital banking.

Second: motivations for digital banking

There are multiple motivations that have encouraged banks to adopt digital banking. These motivations encompass a range of internal and external factors, all of which contribute to enhancing the effectiveness of banking operations and improving the quality of services provided to customers.

1. Internal Factors

These represent the motivations related to the bank's own objectives and its commitment to developing its operations and keeping pace with digital transformations. The most important of these factors are:

A. Diversification of banking services:

Through digital banking, banks can enhance existing services and innovate new offerings to meet the varying needs of their customers. For example, a bank could offer a variety of financing and credit solutions, or develop new electronic payment

¹²- The human element is the link between modern technology and technical infrastructure. It is also the critical factor in transforming a bank's digital capabilities into reliable and successful banking performance, which enhances customer trust and improves the quality of digital financial services.

tools that enable customers to perform various financial transactions easily and quickly, eliminating the need to visit traditional branches. This diversification strengthens the bank's ability to meet increasing and diverse customer demands while boosting operational flexibility¹³.

B. Attracting new customers:

Digital banking is an effective means of attracting new customers, particularly given the intense competition among financial institutions. Digital banks offer innovative, accessible services at low cost and at flexible times, making them an attractive choice for customers seeking a quick and easy banking experience. This expands the customer base, increases the volume of banking transactions and consequently enhances the bank's revenue and market presence¹⁴.

C. Improving customer experience and enhancing loyalty:

Providing integrated and user-friendly digital services enables customers to complete transactions efficiently and securely, thereby enhancing their satisfaction and strengthening their loyalty to the bank. One of the core internal motivations for adopting digital banking is improving customer experience, as customer satisfaction leads to increased engagement with banking services and repeated use.

Second: external factors.

These represent motivations imposed by the bank's surrounding environment, whether technological, economic or social, and play a crucial role in pushing banks towards digital adoption. Among these factors are:

1. Technological advancements and the emergence of modern communication tools:

In recent decades, there have been tremendous developments in information and communication technology, such as the advent of broadband internet, wireless networks and smart mobile phones. These modern technologies have compelled banks to utilise digital tools to provide banking services more effectively and rapidly. The ability to reach customers through these digital channels has become essential to ensure the continuity of banking operations and keep pace with technological changes.

2. Emergence of modern software and information systems:

Advanced software and management information systems provide banks with effective tools to automate internal processes and facilitate financial transactions for customers. Using these systems reduces human error, increases transaction

¹³- Bouake, A. and Brahmī, Z., 'Previous Reference', pp. 586-604.

¹⁴- Karima and Radia Zahyiwa, 'The Reality of Implementing Electronic Banking in Commercial Banks in Light of Current Technological Developments', *Shuaa Journal for Economic Studies*, Vol. 8, No. 1, 2024, pp. 252-567.

accuracy and speed, and enables banks to provide innovative services that meet customers' constantly evolving needs.

3. Significant Changes in the Economic and Social Environment:

The economic and social environment is undergoing rapid transformation, including financial globalisation, changes in customer behaviour towards digital services and increased demand for secure, fast banking services. These changes motivate banks to adopt digital solutions to meet the needs of customers and investors, and adapt to economic and social changes in order to ensure the sustainability of their operations.

4. Globalisation and intense competition in the banking services sector:

In the context of globalisation, offering online banking services has become a competitive necessity as many global banks compete to provide innovative, flexible digital services to attract and retain customers. Failing to adopt these technologies means the bank risks falling behind the competition, since geographical borders no longer pose an obstacle to providing digital banking services. This makes digital innovation an essential factor for survival in the market.

Conclusion

Digital transformation in banking has become essential for keeping pace with rapid technological developments and modern customer demands. Traditional banking is no longer sufficient to meet the changing needs of the market. Adopting digital banking means more than just offering electronic services such as fund transfers or bill payments; it involves creating a comprehensive banking environment that relies on advanced technical infrastructure, modern information systems and qualified staff who can use this technology efficiently and securely.

This shift enhances operational efficiency, ensuring fast execution and reducing operational costs. It also increases customer trust and empowers banks to compete in both local and international markets.

Moreover, the success of digital banking requires a balanced response to internal and external factors. Internal factors such as developing banking services, diversifying products, attracting new customers and providing qualified staff are fundamental to the effective implementation of strategies. Meanwhile, external factors such as advancements in communication technologies, modern software, economic and social changes, and heightened global competition serve as strong motivators for digital transformation. Therefore, integrating these factors and possessing a clear vision for financial technology ensures the continuity of banks and enables them to excel in providing innovative, secure banking services that align with future customer aspirations.

Recommendations

1. Continuous investment in technical infrastructure: ensure the sustainability and security of digital services by developing technical infrastructure on an ongoing basis.
2. Enhance employee capabilities: Strengthen employee skills through specialised training programmes focused on using modern banking technology.
3. Expand the range of digital services to include all essential banking operations, thereby facilitating customer access.
4. Implement strict cybersecurity policies to protect customer data and financial transactions.
5. Monitor technological and social changes to ensure that banking services align with market needs.
6. Encourage innovation in service delivery and develop new digital products to attract and retain customers.

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