

**FROM TRANSACTIONS TO TRANSFORMATIONS: E-BANKING, MOBILE PAYMENTS AND THE EVOLUTION OF BANKING SERVICES IN E-GOVERNANCE USING ARTIFICIAL INTELLIGENCE****Kalpana. R, Navin. N, Monesh. B, Edmond Rowan M, Vimala. D**

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**Abstract**

The landscape of banking services is undergoing a profound transformation in the digital age, shifting from traditional transactions to innovative, transformative experiences. From Transactions to Transformations: E-Banking, Mobile Payments, and the Evolution of Banking Services, explores the dynamic interplay between technology, finance, and consumer behaviour. The study begins with an informative historical viewpoint that traces the development of electronic banking and mobile payments. It thoroughly studies their evolution, highlighting key technology advancements and their impact on global financial networks. The complicated web of digital technologies, which includes mobile applications, block chain, artificial intelligence, and data analytics, is central to our investigation. These technologies have revolutionised financial services, providing convenience, security, and efficiency for users.

**Keywords:** Artificial Intelligence, E-Banking, E-Governance, Mobile Payments**Introduction**

This paper focuses on how consumers behave and what they wish for in e-banking and mobile payments. Utilizing surveys, case studies, and behavioral analytics, this paper outlines detailed interactions between consumers, businesses and digital financial services. Furthermore, this paper examines the socioeconomic outcomes of this particular form of digital transformation, including the financial inclusion, economic empowerment, and the democratization of access to financial services in the economically vulnerable regions. With the increased use of digital financial services, the importance of security and regulatory compliance become more crucial. This paper identifies the extent to which issues such as cyber security, data privacy, and the regulation of digital services intersect, and proposes frameworks for industry players and policymakers. It also examines the use of unorthodox instruments to foster the banking industry the use of technology and the imposition of security.

This document anticipates the direction of technological innovations and the next generation of financial services. This paper identifies and examines emerging trends which include decentralized finance (DeFi), quantum computing, and human-centric design to create a roadmap for financial institutions and fintech to meet the ever-changing needs of consumers and market.

'From Transactions to Transformations' is valuable for bankers, policymakers, researchers, and fintech start-ups. This report describes the present state of digital banking and, through a unique blend of thorough research, real-world case studies, and expert commentary, outlines the path ahead. It demonstrates the enormous potential of technology and finance integration to reshape the future of financial services as a domain of boundless creativity and innovation.

The changes in technology and rapid advancements in interconnectedness have led to a transformed state of banking and financial services.

[1] While banking has traditionally been based on face-to-face interactions and physical transactions, it has evolved with digital innovations.

[2] The development of e-banking and mobile payments fundamentally changed how financial services interact with their customers, moving away from transactional relationships and toward more meaningful interactions with customers. [3]

This evolution started when the internet first came about, and the first concepts of online banking emerged with the promise of great efficiency and convenience. [4] The progress we have witnessed in technology since then has been astounding. Billions of people have access to mobile devices that serve as gateways to banking services. Innovative technology also created a multitude of new payment options. [5]

This marks a shift in the way the financial services industry thinks about, designs, and treats consumers of their services. That evolution has created an industry that now thinks in fundamentally transformed ways about financial services. [6] The comprehensive redesign of the banking experience involves moving from simple transactions to banking straight through to empowering individuals and businesses, enhancing financial inclusion, and facilitating economic progress. [7] It incorporates innovative technologies like AI, blockchain, and analytics to create flexible, tailored, and intelligent solutions to address customer needs and expectations. It is about dismantling constructs to ensure equitable and universal access to financial services, irrespective of geographic or economic status. [8]

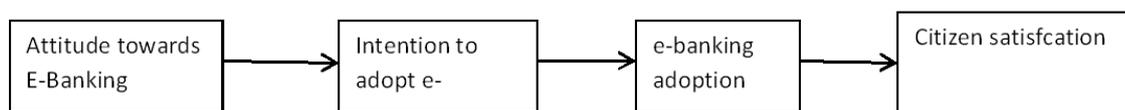
The primary aim of the study, "From Transactions to Transformations: E-Banking, Mobile Payments, and the Evolution of Banking Services," is to analyze the elements of the ongoing digital revolution. The study seeks to provide an in-depth analysis of digital banking and mobile payments through the application of primary and secondary data, comprehensive research and analysis, and a plethora of case studies. It seeks to explore the drivers of the evolution, the challenges and the possibilities for change, and the evolution of digital banking and mobile payments in relation to technology. [9]

**1. Objectives**

1. To analyze the impact of digital banking on financial inclusion and the closure of the financial inclusion gap between the banked and the unbanked.
2. To assess the impact of digital financial services on small businesses and entrepreneurship, especially in developing economies.
3. Examine the impact of digital banking services on economic growth, cashless economies, and innovation in financial markets.

**2. From Transactions to Transformations: A Conceptual Framework**

The conceptual framework of the study, "From Transactions to Transformations: E-Banking, Mobile Payments, and the Evolution of Banking Services," employs a multidimensional model considering technology, consumer, and market, as well as the socio-legal aspects. It is designed to offer a coherent and structured approach to the understanding of digital financial services. The framework is composed of several components that are interlinked:



Many clients praised the e-banking system for its convenience. Customers can check account balances, make payments, and even apply for a loan online, which makes banking more convenient than the traditional system. Those looking to e-bank had potential security risks that e-banking involved. Many customers steered clear of banking services online due to fear of identity theft, phishing, and fraud. Banks and other financial institutions have made great efforts to improve security to ease their customers' worries.

Younger, more tech-savvy people were the first to e-bank. They were comfortable with the complete use of their smartphones and computers, including the use of online banking. The surrounding tech and digital environment were also factors that drove e-banking adoption. People in urban, wealthy countries had a higher level of internet and mobile phone availability, making it easier for them to e-bank. In contrast, people in poor, rural countries had little internet access and e-banking exposure.

#### **a. E-banking Services Adoption Intention**

People will more likely make use of electronic banking services if they think they can receive some advantages. People think services are convenient if they provide access to banking functionalities all day, every day. They also appreciate services that save time, are less expensive to use, and give them the ability to oversee their accounts anytime. It is also true that people are likely to refrain from using banking services electronically if they are apprehensive about the safety and privacy of the services. People use electronic banking services at their own risk when they think that their confidential banking information may be compromised. [12]

A customer's degree of confidence and reliability in online banking and its applicable electronic services is essential, particularly in the technology used for banking electronically. People are more likely to engage in electronic banking services if they are comfortable with technology. [13] Those lacking in access to technology and those without basic technology skills may be less inclined to use banking services that are available on the internet. One of the more essential factors to consider for customers are the ease of use and simplicity of the banking services offered electronically. People are more inclined to use banking services that are offered electronically if they experience less difficulty in using the services and more ease in using the services to conduct their banking. [14]

#### **3.3. Progress of Technology**

**Mobile Tech:** Growth in the ubiquity of mobile phones, their market penetration, and the increase in functionalities of mobile phones.

**Digital Platforms:** Examination of the creation, features, security, and user interface of diverse electronic banking platforms. The future of banking services: Blockchain, artificial intelligence, biometrics, and data analytics.

**Consumer Preferences and Behaviour: Adoption Patterns:** Analysis of demographic indicators and other variables determining the use of electronic banking and mobile payment solutions. Assessment of digital banking interface design, ease of use and accessibility, and the resultant effect on user engagement. [15]

**Trust and Security:** The effect of security measures on consumer confidence and trust in digital payment transactions.

**Regulatory Framework:** The intersection of data protection, consumer rights, and the evolving (developing) regulatory and legal frameworks related to digital financial services; the responsible use of technology in banking and the ethics of data privacy, security, and the concerns of the use of developing technology. [16]

**4. Socioeconomic Impact: Financial Inclusion:** Assessing the role of digital banking in facilitating financial inclusion and reducing the disparity between the populations who do and do not have access to banking services.

**Entrepreneurship:** Assess the influence of digital financial services on small businesses and entrepreneurial ventures, especially in developing economies.

**Economic growth:** evaluating digital banking services and how they assist in economic growth, cashless economies, and foster innovation and investment. [17]

**5. Future Trajectories and Innovation:** Estimating the effects of emerging technologies on banking, including decentralized finance (DeFi), quantum computing, and IoT.

**Human-Centered Design:** Exploring design thinking concepts to enhance user experience design while ensuring the inclusion and accessibility of diverse user populations.

**Figure 2: Advancements made in developing virtual assistants in banking using AI**

2016	<b>Banking's first bots</b> Bank of America launched its AI based chatbot Erica to help clients track consumer habits The Royal Bank of Scotland's virtual assistant, Luvo, answered client questions via chat messages Mastercard proposed Facebook's chatbot as a new means to interact with its clients in an automated and AI enhanced manner
2017	<b>Company chatbots</b> Banks start to launch services through which clients can learn about offers and promotions by chatting with a bot After six months of pilot testing, Capital One launches a chatbot that answers questions about account status and available credit via text SMS
2018	<b>Chatbot fever</b> The use of chatbots is widespread among the main financial institutions. They are taking advantage of this technology in order to improve customer service and save on costs Banks begin to incorporate Alexa into their virtual assistant offerings for product and service enquiries
2019	<b>Value added Services</b> New advances make it possible to create value-added services for clients, such as splitting purchases or moving funds through the use of a bot The integration and functionality of commercial virtual assistants is expanding. For example, voice interactions are being adapted to display devices in order to complement the information
2020	<b>Voice biometrics</b> Voices are unique and non-transferable, and biometrics makes it possible to identify a person through their voice patterns.

Sustainable Banking: Promotion of Environmental Sustainability and Ethical Digital Banking.

### **a. Challenges and How to Overcome Them**

**Security Problems:** The identification of potential cybersecurity problems and weaknesses and the provision of methods to bolster the security of digital banking.

**Regulatory Challenges:** The examination of the problems faced by financial institutions in the areas of compliance with the new regulations and the enforcement of regulatory frameworks to ensure the industry operates in an ethically responsible manner.

**User Awareness:** The promotion of adequate levels of digital and financial literacy in order to empower users to engage in safe digital transactions.

This concept integrates numerous perspectives and disciplines, thus providing an overview of the delicate balance that exists between the various aspects of technology, consumer behaviour, the regulatory frameworks, and the various dimensions of the society. The purpose of the study is to assess how the provision of financial services has evolved from being simply transactional to being transformational, using this framework to provide value to the industry players, policymakers, and scholars in the area of digital finance. For the purposes of this analysis, the authors start by outlining the history of digital banking and the evolution of digital banking from the first online banking systems to the present-day consumer-centric banking interfaces. Most of the milestones in the history of digital banking, including the legislation that has impacted the digital banking landscape, Brown and Adams (2018) and Smithson (2019).

**4.2. Progress and New Areas:** The greatest share of literature review is allocated for what is considered to be the most important of the variables, the development of technology. Some of the most important works on the development of digital banking services and the role of mobile technology, artificial intelligence (AI), blockchain technology, and biometrics include Johnson (2020), and Gupta et al. (2017). These authors highlight the most revolutionary aspects of the aforementioned technologies in the enhancement of the safety, user experience, and new financial products and services.

**4.3. Changes in Consumer Behavior and Acceptance:** Consumer behavior is especially important in the development of digital banking. The adoption of e-banking and mobile payments in their studies of Lee and Kim (2018) and Wang et al. (2019), the authors highlight the user preferences, the mechanisms for building trust and the role of the social systems, which have been very useful for the consolidation of the interfaces to the users and for user trust.

**4.4. Legal and Ethical Considerations:** The works of the authors of digital banking in the legal and ethical aspects in the studies of the regulatory analysts Peters and Wagner (2016) and Fernandez and Bernal (2018) are combined. These authors analyze the regulations on the protection of data, the privacy issues, and the ethics of digital banking transactions, which helps understand the constraints and the opportunities of the regulatory frameworks.

**4.5. Social and economic impact, as well as financial inclusion:** The evaluation also encompasses the social and economic ramifications of research in the field of digital banking. The aforementioned authors analyze the digital banking phenomenon and its role in financial inclusion, economic development, and poverty reduction, emphasizing its immense value in transforming the economic landscape in developing countries.

For "From Transactions to Transformations" the literature review acts as a springboard, integrating and synthesizing a multitude of research works, thus offering a fully grounded perspective on the evolution of technological innovations, changes in consumer patterns, regulatory shifts, and the socio-economic effects of ebanking, mobile payments, and the overall metamorphosis in banking services. In short, this integrated perspective affords a great deal of space to examine the innovations in digital banking and the changes to the future of banking.

### **5. Results and Discussions**

**Technological Advances and User Experience:** As suggested in the report, the introduction of technology such as mobile applications, artificial intelligence, and biometrics has positively impacted user experiences in digital banking. Mobile banking applications with friendly user interfaces and artificial intelligence chatbots have increased customer interaction.

**Financial Inclusion and Socioeconomic Impact:** The role of digital banking services in promoting financial inclusion is confirmed. The ability to make mobile payments is a means of providing financial services in remote areas where conventional banking is not an option. A correlation was established within the scope of the research between the accessibility of digital banking services and the decrease in the poverty levels within a country. In addition to that, access to digital financial services and their ability to facilitate safe and seamless financial services was positively correlated with the growth of small businesses.

### **6. Discussion**

**1. The Future of Banking Experiences:** The study demonstrates the transformational potential of digital banking products. There is a need for financial institutions to focus on the development of new services as their customers demand seamless, easy to use, and less complicated products. The Future of Banking will be characterized by a high level of service personalization with the use of Artificial Intelligence, predictive banking, and voice banking. Given the intense competition in the market, the discussion has highlighted the need to focus on the development of new services as a means of improving their position in the market, along with the partnerships between banks and fintech companies.

**2. Managing Ethical Concerns:** The main challenges of digital banking including data privacy and responsible use of Artificial Intelligence (AI) as well as bias in algorithms were explored. Balancing innovation and ethics is imperative for financial institutions. Proactive approaches including transparent policies on data usage, ethical guidelines for AI, and predictive analytics were characterized as valuable. The collaboration of industry stakeholders, policymakers, and ethicists was considered vital for the reduction of ethical concerns and the enhancement of trust within the community.

**3. The Role of Financial Literacy and Inclusiveness:** The discussions highlighted the importance of financial education in fostering the use of inclusive digital banking. Digital literacy efforts, especially in disadvantaged communities, were shown to be important. Moreover, in inclusive digital banking, the user-centered design approaches that respond to different users, languages, and varying levels of complexity were appreciated. To close the digital divide and enhance financial literacy, collaboration is essential among governments, financial institutions, and schools.

The comments and findings of this study trace the evolution of banking services, from face-to-face transactions to fully automated digital transactions. Numerous variables shape the finance future: the fusion of technology and ethics, the emergence of new regulations, and the inclusiveness of frameworks. Financial services and regulators must focus on user experience, ethics, and digital literacy in order to create a fully accessible and innovative digital banking ecosystem. The principles outlined above will empower the banking sector to adapt to new challenges, transform digitally, and create a positive social impact through financial inclusion.

### **7. Conclusion**

It is the banking sector's ability to cope with the rapid changes in consumer behaviour and the technology being deployed to assist with payment processing – through payment apps and other delivery channels – that must be noted as the transformative change we have observed. This is evidenced in the research study, 'From Transactions to Transformations', which demonstrates the evolution of banking and the impact

regulatory pressure, technology, customer values, and social factors have on banking services. The development of services offered by banks through the use of technology such as mobile banking, apps, chatbots, artificial intelligence, and fingerprint/face recognition technology has shifted the banking sector to an era of smart and seamless banking. The study suggested financial institutions, in order to stay astute and competitive, must embrace the use of technologies as they are constantly developing. Financial institutions must seek and incorporate technology in a proactive manner.

Consumer trust in the digital banking environment is built on the laws, restrictions, and guidelines of ethical banking that are established to protect the rights of the consumer. Trust is developed through the financial institution's compliance with the provisions of the General Data Protection Regulation (GDPR) and the implementation of strict guidelines for the protection of consumer data. The ethical use of data, the policies on data usage, and the frameworks for responsible artificial intelligence (AI) all contribute to the trust of the customer.

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