



The Impact of Digital Banking Adoption on Service Efficiency and Financial Performance in the Banking Sector

Wullyatri Dewi Risma Sutanto¹

¹ Universitas Muhammadiyah Surakarta, Surakarta, Indonesia

Abstract

Article history:

Received: January 11, 2024

Revised: February 22, 2024

Accepted: April 5, 2024

Published: June 30, 2024

Keywords:

Banking,
Digital Adoption,
Efficiency,
Financial Performance,
Transformation.

Identifier:

Zera Open

Page: 1-17

<https://zeraopen.com/journal/amos>

Digital transformation has been a key driver of change in the modern banking industry, encouraging financial institutions to adapt to the demands of efficiency and service innovation. This study aims to analyze the relationship between digital banking adoption, service efficiency, and banking financial performance through a literature review approach that examines various academic literature in the last five years. The results of the study show that digital banking contributes significantly to improving operational efficiency through process automation, data integration, and reduced transaction costs. In addition, digitalization strengthens competitiveness and expands access to services for customers. However, its impact on financial performance is not always immediate as it relies heavily on organizational readiness, data security, technology infrastructure, and the quality of customer experience. Service efficiency is proving to be an important mediating variable that bridges technology adoption with increased profitability. Thus, the success of banking's digital transformation requires adaptive regulatory support, strong risk governance, and continuous innovation to create competitive advantage and sustainable growth.



1. Introduction

Digital transformation has fundamentally changed the face of the global banking industry in the last five years. Technological innovations such as mobile banking, internet banking, and digital payment systems accelerate operational efficiency and increase the competitiveness of financial institutions amid the dynamics of the digital economy. According to Saroy et al. (2023), the adoption of digital payment systems plays an important role in improving service efficiency and financial system stability in various developing countries. This paradigm shift has prompted banks to shift from conventional models to digital platforms that are oriented towards speed, convenience, and transparency.

In the midst of this progress, the issue of efficiency and financial performance is the main focus. Cross-country studies show that digital-based financial services can strengthen banks' cost efficiency and performance when integrated with adaptive risk management and governance strategies (Syed et al., 2022). However, several other studies reveal that the adoption rate of digital banking is not always directly proportional to improved financial performance, especially in developing countries where infrastructure readiness and digital literacy are still challenges (Otieno & Ndede, 2020).

According to Nguyen et al. (2022), factors such as the quality of customer experience and data security also determine the effectiveness of digital transformation in influencing bank profitability. Banks that are able to integrate digital technology with customer-based strategies have proven to be better able to maintain loyalty and improve service efficiency during crisis periods, such as the

COVID-19 pandemic. These findings are in line with the report by Hakizimana et al. (2023), which emphasized that most previous studies have highlighted the technology side rather than the direct impact of digital banking on the efficiency and profitability of financial institutions.

In the regional context, digital transformation also presents challenges related to regulation and consumer protection. Akbar (2023) emphasized that the sustainability of digital banks can only be achieved if there is legal clarity regarding the protection of personal data and the supervision of electronic transaction systems. This is important considering that customer trust is the main foundation in the digital banking ecosystem. Banks need to ensure data security and transparency of services so that digital transformation can take place in a sustainable manner.

In addition, Chauhan et al. (2022) mentioned that the customer experience dimension is often an intermediate variable that bridges the influence of technology adoption on bank performance. On the other hand, Mugambi (2022) emphasized the need for data integration and internal management systems to maximize the potential for digitalization in improving operational efficiency. This shows that the success of digital transformation is not only determined by the speed of technology adoption, but also by managerial readiness and internal governance.

Thus, there are still research gaps that need to be bridged, especially regarding the direct relationship between the level of digital banking adoption on financial performance and service efficiency. This study seeks to make an empirical contribution in explaining how the adoption of digital technology affects the service efficiency and financial performance of banking institutions as a whole. This study

is expected to strengthen the literature related to sustainable digital banking strategies, by paying attention to the regulatory dimensions, consumer confidence, and competitive advantages generated through operational efficiency.

2. Literature Review

2.1. Digital Banking Adoption and Service Efficiency Transformation

Digital transformation in the banking industry is marked by the widespread adoption of digital services such as mobile banking, internet banking, and AI-based customer service that accelerate transaction efficiency and lower operational costs. According to Saroy et al. (2023), digital payments and automation systems improve the efficiency of banking services through cutting manual processes and increasing service speed. However, this efficiency is only optimal if it is supported by system integration and adequate human resource training. Mugambi's research (2022) confirms that digitalization will only be effective if banks are able to adjust their organizational structures to support the application of new technologies.

Banks that integrate data analytics and real-time monitoring systems can reduce operational costs by 15–20%, while improving service quality. However, there is still a research gap related to how digital adoption directly affects service efficiency in the context of global banking. Meanwhile, Nguyen et al. (2022) found that digital customer experience is an important mediator in the effectiveness of technology-based bank services. Thus, the current literature shows that the digital transformation of banking does not only depend on technology, but also on process

innovation and user experience management to achieve sustainable service efficiency.

2.2. The Relationship between Digital Banking Adoption and Financial Performance

The financial performance of banks is a key indicator of the success of digital transformation strategies. Syed et al. (2022) show that increased adoption of digital services has a positive correlation with profitability and stability of the financial system, especially in countries with mature digital ecosystems. However, Otieno & Ndede (2020) found that in developing countries, technology adoption does not always result in increased profitability due to limited infrastructure and low digital literacy of the community.

Furthermore, Hakizimana et al. (2023) identified research gaps related to the direct relationship between digital transformation and bank financial outcomes. The researcher emphasized the need for an approach that measures the impact of digital efficiency on profitability indicators such as Return on Assets (ROA) and Net Interest Margin (NIM). From a theoretical perspective, this can be explained through the Resource-Based View (RBV) which states that technology is a strategic resource that creates a sustainable competitive advantage. Thus, the relationship between digital adoption and financial performance still requires in-depth study, especially to explain the conditions when technology is actually an investment cost that has not produced optimal financial efficiency for banks.

3. Methods

This study uses a library research approach that focuses on an in-depth analysis of the scientific literature published between the last five years. This approach was chosen because it is relevant to understand the phenomenon of digital transformation in the banking industry without direct involvement in field data collection. The literature study allows researchers to systematically examine various previous research results, industry reports, and academic publications related to the adoption of digital banking, service efficiency, and financial performance of banking institutions.

The initial step of the research was carried out by identifying relevant literature from reputable databases such as Google Scholar, Elsevier, and ResearchGate. The literature selection considered the criteria of the year of publication, the relevance of the topic, and the direct relevance to the main variables of the study. The main focus is directed at articles that discuss the relationship between the level of digital banking adoption and the operational efficiency and financial performance of banks. Each source is then analyzed based on the research objectives, methodology, findings, and remaining gaps to be used as the basis for the preparation of conceptual arguments.

The next stage is to conduct a comparative analysis to find patterns of relationships and differences between research results. Through this technique, researchers can assess the consistency of findings as well as identify global trends in digital banking adoption. This approach also helps to group research based on influence variables, such as profitability, service efficiency, and financial stability. This process is strengthened by the narrative synthesis technique, which is

integrating the results of various studies into a complete and coherent conceptual framework.

The results of this literature study are expected to contribute to clarifying the relationship between digital banking adoption and financial performance, as well as highlighting how service efficiency can be an important intermediary variable. By examining empirical and theoretical data from various sources, this study not only illustrates the trend of digital transformation of banking, but also provides the basis for further quantitative research in the future. This literature review approach ultimately aims to strengthen a conceptual understanding of how digitalization affects the strategies and sustainability of banking institutions in the digital economy era.

4. Results

Based on the results of a literature review of various recent studies on digital banking, it was found that digital transformation has had a significant impact on service efficiency and financial performance of banking institutions. However, most of the studies analyzed showed variations in results and diverse approaches, both in terms of regional context, measurement indicators, and analysis models used. To better understand the gaps that still exist in previous research, a systematic mapping of various major literature published between the last five years was carried out.

This analysis aims to identify patterns of findings, methodological differences, and research areas that have not been explored much. This approach also helps in formulating the direction of further research development, especially as it relates to

the relationship between digital banking adoption, service efficiency, and bank financial performance. A summary of the results of the study and the research gaps can be seen in Table 1 below.

Table.1 Gap Analysis of Digital Banking Adoption, Financial Performance, and Service Efficiency Research

Yes	Name (Year)	Title	Key Findings	Gap Research
1	Hakizimana et al. (2023)	Digital Banking Transformation and Performance Where Do We Stand	Finding a positive relationship between digital transformation and efficiency, but empirical results are still limited to regional contexts.	There is no comprehensive model that measures the impact of digital banking on efficiency and profitability simultaneously.
2	Nguyen et al. (2022)	Effect of Digital Banking-Related Customer Experience on Financial Performance During COVID-19	The digital experience of customers increased the bank's profitability during the pandemic.	It does not assess how the level of technology adoption affects operational efficiency directly.
3	Saroy et al. (2023)	Impact of Digital Payment Adoption on Indian Banking Sector Efficiency	The adoption of digital payments is increasing the efficiency of India's financial system.	It did not test the direct relationship between digital adoption and the financial performance of banking institutions.
4	Otieno & Ndede (2020)	Adoption of Digital Banking Technology and	The adoption of digital banking has a positive effect on	The limitations of longitudinal methodology and not

		Financial Performance of Commercial Banks in Kenya	profitability, but the long-term impact is not significant.	measuring service efficiency variables as intermediate factors.
5	Mugambi (2022)	Effects of Digital Banking on Banking Sector Performance in Kenya	Digital banking lowers operational costs and improves transaction efficiency.	It does not explore the cause-and-effect relationship between efficiency and financial performance.
6	Chauhan et al. (2022)	Customer Experience in Digital Banking: A Review and Future Research Directions	Customer experience is an important mediator in the digital transformation of banking.	There is no strong empirical evidence linking digital experiences to long-term profitability.
7	Syed et al. (2022)	Do digital financial services influence banking stability and efficiency: an ARDL analysis of a developed and a developing economy.	Digital financial services improve the efficiency and stability of cross-border banking.	Not focusing on the micro dimensions of banking, such as operational performance and cost efficiency.
8	Akbar (2023)	Perkembangan yang Pesat dan Tantangan Perbankan Digital di Indonesia	Highlighting the importance of regulation and data security in building public trust.	It has not linked regulatory and trust aspects to financial efficiency and performance.
9	Aslam & Jawaid (2023)	Green Banking Adoption Practices: Improving Environmental, Financial, and Operational Performance	The adoption of sustainable practices has a positive impact on the bank's operational performance and efficiency.	It has not examined how a similar model can be applied to the context of digital banking as a whole.

10	Mavlutova et al. (2022)	Digital transformation as a driver of the financial sector sustainable development: An impact on financial inclusion and operational efficiency.	Digitalization strengthens operational efficiency and service quality.	It does not explicitly link operational efficiency to the profitability of digital banks.
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Based on table 1 of the results of the analysis from ten main sources, it can be concluded that the development of digital banking between the last five years has had a significant impact on improving the operational efficiency and financial performance of banking institutions in various regions. However, from a conceptual and empirical perspective, there are a number of research gaps that still need to be bridged to produce a more comprehensive understanding of the relationship between the main variables, namely digital banking adoption, financial performance, and service efficiency.

First, most studies such as Hakizimana et al. (2023) and Syed et al. (2022) emphasize that digital transformation has driven increased efficiency of the financial system, but there is no empirical model that has yet to simultaneously test the linkage between efficiency, profitability, and technology adoption rates. This condition demonstrates the need for an integrated approach that combines financial and operational dimensions within a single analytical framework.

Second, Nguyen et al. (2022) and Chauhan et al. (2022) revealed that customer digital experiences have an important mediating role in banks' financial performance,

especially during the COVID-19 pandemic. However, their research still focuses on customer experience without evaluating the aspect of internal service efficiency that is actually a strategic element in digital transformation. This raises the need to expand the research dimension towards cost efficiency and digital productivity.

Third, research in developing countries such as by Otieno & Ndede (2020) and Mugambi (2022) shows mixed results regarding the relationship between technology adoption and financial performance. Limited infrastructure and the readiness of human resources are factors that hinder the realization of optimal efficiency from digital transformation. Therefore, strengthening internal supporting factors such as human resource training and information system integration is an important research agenda for the context of developing countries.

Fourth, Saroy et al. (2023) provide strong empirical evidence regarding improved efficiency through digital payment systems in India. However, the study has not shed light on the relationship between system efficiency and increased profitability of financial institutions. This opens up space for studies that evaluate how service efficiency can act as a mediator variable in the relationship between digital adoption and financial performance.

Fifth, the dimensions of regulation and public trust are also important factors that are often overlooked in previous literature. Akbar (2023) emphasized that data protection and transaction security are prerequisites for the success of digital banking, because consumer trust is the main driver of business loyalty and sustainability. However, there have not been many studies that explicitly link legal and data protection aspects with efficiency and profitability indicators. In addition,

Mavlutova et al. (2022) and Aslam & Jawaid (2023) show that the principles of sustainability and digitalization have a synergistic impact on the operational efficiency of banks. However, the cause-and-effect relationship between operational efficiency and financial performance in the context of digitalization is still not explained in detail.

From the overall literature, the general pattern that emerges suggests that while digitalization drives efficiency and service innovation, its impact on bank profitability is not always linear. Many financial institutions are experiencing increased initial investment costs, especially in IT infrastructure development, cybersecurity, and employee training, which in the short term actually lowers profit margins. However, in the long run, digitalization has proven to create a competitive advantage through increased service speed, transaction automation, and expanding customer base.

Therefore, this study places digital banking adoption as independent variables, service efficiency as mediation variables, and financial performance as dependent variables to explain how digital transformation can strengthen the competitiveness of financial institutions in a sustainable manner. These findings are expected to make a conceptual contribution to the development of technology adoption theory and operational efficiency, as well as become an empirical reference for the formulation of effective and sustainable digital banking strategies in the future.

5. Discussion

The findings of the study show that the adoption of digital banking has a substantial impact on improving the service efficiency and financial performance of banking institutions. In general, digitalization has been proven to speed up the transaction process, lower operational costs, and expand service access to a wider customer segment. However, the results of the literature analysis also indicate that the relationship between digital adoption and bank profitability is not always direct. In many cases, service efficiency is an intermediate variable that bridges the influence of technology on financial performance. This is in line with the views of Hakizimana et al. (2023) who affirm the importance of a comprehensive evaluation between efficiency and financial results in the context of digital transformation.

Research by Nguyen et al. (2022) highlights that the effectiveness of technology adoption is also determined by the digital experience of customers and the ability of banks to tailor services to user needs. The quality of digital interaction has been proven to increase loyalty and strengthen the image of financial institutions in the eyes of the public. However, without a robust data security system and transaction transparency, consumer confidence can decline, ultimately negatively impacting the bank's financial stability. Therefore, the success of digital banking does not only depend on technology alone, but also on effective data protection and transaction supervision policies.

In addition, Saroy et al. (2023) show that the adoption of digital payment systems is able to drive macroeconomic efficiency, although its contribution to short-term profitability is still limited. This phenomenon shows that digitalization

provides long-term strategic benefits that are only felt when infrastructure, financial literacy, and risk management have matured. Banks that place digital investment as a long-term strategy will be better prepared to deal with industry disruption and changes in consumer behavior.

In terms of policy, Akbar (2023) emphasized that the success of digital banking transformation requires regulations that are adaptive to technological changes. Clear regulations regarding personal data protection and transaction security systems will increase public trust in digital banking services. It is also an important factor in strengthening the relationship between service efficiency and the profitability of banking institutions. Progressive regulation promotes financial system stability and creates a healthy competition climate between digital banks and conventional banks that are transforming.

Finally, the findings of Syed et al. (2022) reinforce the view that digital financial services have a strategic role in improving banking stability through cost efficiency and service innovation. However, further research is still needed to measure the extent to which digital efficiency can translate into increased profitability and company value. Therefore, this discussion confirms that digital transformation is not just about technology, but also about how banks manage organizational change, build public trust, and create efficiencies that have a direct impact on financial outcomes.

6. Conclusion

Digital transformation in the banking industry has become a major factor determining the growth and sustainability direction of modern financial institutions. Based on the results of the literature analysis, it can be concluded that the adoption of digital banking has a positive influence on service efficiency and financial performance, although the relationship between the two is not always direct. Service efficiency acts as a strategic bridge that connects the application of digital technology with increasing bank profitability. Banks that successfully leverage technology to automate processes, speed up transactions, and improve customer experience will gain a long-term competitive advantage.

However, the success of digital transformation is not only determined by technological capabilities, but also by organizational readiness and adequate policy support. Aspects of regulation, data security, and digital literacy are fundamental elements that must be strengthened so that the digital banking ecosystem runs sustainably and is trusted by the public. In other words, digitalization does not only bring technical innovation, but also demands changes in organizational culture, risk governance, and strategic orientation based on efficiency and transparency. Therefore, future research and policy need to focus on integrative measurements between digital banking adoption, service efficiency, and financial performance. The approach will help banking institutions build systems that are more resilient, inclusive, and adaptive to global technological changes.

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