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Banking Digitalization and Cybercrime Challenges Post-COVID-19

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Abstract

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The phenomenon of digitalization in the financial and banking sector has accelerated the transformation of services toward faster, more efficient, and easily accessible digital platforms. Technologies such as mobile banking, internet banking, and artificial intelligence integration enable banks and financial institutions to enhance service quality while reaching a broader customer base. The COVID-19 pandemic acted as a significant catalyst, accelerating changes in societal behavior toward cashless transactions, online shopping, and the use of super apps. However, this rapid digitalization is not without major challenges, particularly the drastic increase in cybercrime during the pandemic. Threats such as phishing, identity theft, ransomware, and data misuse demand stronger regulations, robust security systems, and improved digital literacy among the public. This article aims to analyze the relationship between the effectiveness and efficiency of digital banking services and the associated security risks, while also examining the implications for consumer behavior in the digital economy context. Using a literature review method, the study provides a comprehensive overview of both the opportunities and challenges of post-pandemic banking digitalization.

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1. Introduction

The digitalization of the financial and banking sector is one of the key phenomena that has revolutionized how people interact with financial services. Along with technological developments, banks and financial institutions no longer just function as traditional service providers but have transformed into more dynamic, responsive, and integrated digital platforms. Innovations such as mobile banking, internet banking, and financial technology (fintech) have accelerated the provision of more effective and efficient banking services. The COVID-19 pandemic further accelerated this transformation due to the urgent need to reduce physical contact, prompting the public to switch to digital payment methods and online transactions (Baicu et al., 2020). A major change resulting from the digitalization phenomenon is the shift in consumer behavior in transactions. People are increasingly accustomed to using online shopping services, non-cash payments, and integrated financial applications. In fact, several studies have found that consumer preferences are shifting from basic needs to fast, secure, and personalized financial services (Aniqoh et al., 2022).

This trend is not only limited to developed countries but also extends to developing countries that are building digital infrastructure to support the transformation of financial services. However, behind the great potential of digitalization, there are significant challenges in the form of an increase in the risk of cybercrime. During the pandemic, cases of digital crime in the banking sector surged sharply, including identity theft, phishing scams, ransomware, and misuse of personal data (Macierzyński & Boczoń, 2022). Digitalization indeed increases service effectiveness, but at the same time, it opens up security gaps that can be exploited by irresponsible parties. A study by Abdajabar and Yunus (2023) shows that the increase in online transactions during the pandemic enlarged exposure to cyber risks, demanding banks and regulators to enhance layers of protection. In addition, the success of banking digitalization is not only measured by the aspect of effectiveness in achieving service goals but also by the efficiency in the use of resources.

Effectiveness reflects the ability of digital services to meet consumer needs accurately and with high quality, while efficiency emphasizes saving time, energy, and costs in the transaction process (Marcu, 2021). Thus, digital transformation in the financial sector can be considered successful if it is able to combine both aspects in a balanced way, while also minimizing risks. Regulation and compliance also become crucial factors. In some countries, weak regulations related to cybersecurity actually increase the opportunity for financial crime. For example, a study in Malaysia shows that although financial digitalization is developing rapidly, the level of regulatory compliance with cybersecurity is not yet adequate, thus increasing potential vulnerability (Jamil et al., 2022). This indicates that the success of banking digitalization does not only depend on technological innovation but also on the readiness of the legal and regulatory infrastructure.Besides regulatory challenges, recent literature also emphasizes psychological factors in consumers.

The pandemic caused fear of physical contact, which actually accelerated the adoption of digital services. However, at the same time, anxiety about the security of digital transactions also affects consumer decisions (Abdul-Rahim et al., 2022). Thus, the perception of risk and benefit becomes a key factor in shaping the pattern of financial technology adoption.A number of studies highlight that the speed of digitalization creates a dilemma between innovation and security. On one hand, banks and fintech companies are competing to present complete features, 24-hour access, low costs, and a wide reach. On the other hand, efforts to strengthen security actually increase operational costs and system complexity (Despotović et al., 2023). Therefore, a sustainable banking digitalization strategy must consider the balance between innovation, security, and compliance. Based on this description, this study will discuss the phenomenon of banking digitalization by highlighting changes in consumer behavior, the effectiveness and efficiency of digital services, and the risk of cybercrime that accompanies it. By using a library research method, this article seeks to present a comprehensive analysis of the opportunities and challenges of financial sector digitalization, especially in the context of the post-COVID-19 era.

2. Literature Review

2.1. Digitalization of Banking and Changes in Consumer Behavior

The phenomenon of banking digitalization has had a very significant impact on consumer behavior in carrying out various types of financial transactions. This digital transformation process shows that people are now increasingly relying on technology in managing their daily finances. The COVID-19 pandemic was the main trigger for the acceleration of this change, where strict social restrictions and concerns about direct physical contact encouraged the public to switch to digital services as a safer and more practical alternative (Baicu et al., 2020). In this context, various digital banking services such as mobile banking, internet banking, and modern fintech platforms are increasingly used, not only for routine payment needs but also for investment activities, fund transfers, product purchases, and access to credit and other financial services. Today's consumers show a strong preference for financial services that are fast, secure, and integrated into a single digital ecosystem. The presence of super apps that combine various transaction features at once is becoming increasingly popular, as they offer convenience and time efficiency for their users (Aniqoh et al., 2022).

In addition, modern consumers are also increasingly sensitive to the security aspect of transactions, so the decision to use digital services is often heavily influenced by the level of trust in the financial institution providing the service. The study by Abdul-Rahim et al. (2022) confirms that the perception of risk, especially related to the threat of cybercrime, directly influences the speed and intensity of financial technology adoption by the public. Therefore, changes in consumer behavior in the context of banking digitalization are not only adaptive to technological advances but also reflective of external factors, including the pandemic, rapid technological innovation, and the ever-evolving cybersecurity challenges.

2.2. The Risk of Cybercrime and Digital Security Challenges

Behind the various advantages offered by banking digitalization, a major challenge emerges that cannot be ignored: a significant increase in cases of cybercrime. The COVID-19 pandemic saw a dramatic surge in cybercrime incidents targeting the financial sector, including phishing scams, identity theft, and increasingly complex and sophisticated ransomware attacks (Macierzyński &

Boczoń, 2022). This situation is exacerbated by the fact that most banking transactions are now conducted online, thus providing a wider opportunity for cybercriminals to exploit system weaknesses and existing technological vulnerabilities.A study by Abdajabar and Yunus (2023) shows that the risk of cybercrime increases along with the surge in the number of internet banking users during the pandemic, which indicates a direct link between the adoption of digital services and exposure to cyber threats. In fact, Despotović et al. (2023) highlight that the rapid development of fintech and digital financial service innovations actually expands the attack surface, making digital banking systems more vulnerable to exploitation by irresponsible parties.

In addition, weak regulation and non-compliance with security standards also pose a serious challenge. A study in Malaysia found that inadequate cybersecurity regulations significantly increase the potential for financial crime and reduce the level of consumer trust (Jamil et al., 2022). This confirms that banking digitalization cannot be separated from the need for a strong security system, supported by strict regulatory policies, and adequate consumer education. The literature shows that the success of post-pandemic banking digitalization is highly dependent on the ability of the industry and regulators to balance innovation with security, so that consumers will only continue to use digital services if they feel safe, comfortable, efficient, and gain added value from every service provided.

3. Methods

This study uses a library research method with a descriptive qualitative approach. This method was chosen because it is relevant in understanding the phenomenon of financial and banking sector digitalization through the analysis of existing literature. Library research allows researchers to delve into in-depth information from various scientific sources including journal articles, research reports, and official publications from financial institutions and regulators. In this way, the research not only relies on empirical field data but also emphasizes theoretical and conceptual analysis that has been developed by previous researchers. The data collection process was carried out by searching for academic journals published after the COVID-19 pandemic and post-pandemic developments. The search was conducted through international academic databases from Google Scholar. The criteria for selecting sources included the suitability of the topic with the research focus, the recency of publication, and the credibility of the author and journal.

The articles reviewed covered issues of digital banking, fintech, consumer behavior in digital transactions, the effectiveness and efficiency of technology-based financial services, and the increased risk of cybercrime during and after the pandemic. The analysis was conducted qualitatively by reading, examining, and comparing the findings of previous studies. Each piece of literature was analyzed based on its contribution to understanding the three main aspects that are the focus of this research: changes in consumer behavior, the effectiveness and efficiency of digital services, and the security challenges posed by increasing cybercrime. The data obtained were not analyzed statistically but through descriptive interpretation that sought to find patterns, similarities, and differences in the existing literature.In the analysis process, the researcher also referred to a source triangulation approach, which is by comparing research results from various authors and different country contexts to obtain a more comprehensive understanding. For example, literature discussing changes in consumer behavior in Europe was compared with studies highlighting conditions in Southeast Asia to see if there were global patterns or differences influenced by local factors.

This approach is important because the phenomenon of banking digitalization is universal, but its impact can vary depending on the readiness of digital infrastructure, regulations, and the level of financial literacy of the public in each country. In addition, the library method also allows researchers to highlight the historical aspects and chronological development of financial sector digitalization. By comparing literature before, during, and after the pandemic, this study can provide an overview of the dynamics of digital transformation that is not only temporary but tends to be permanent in shaping new public behavior. Thus, the library research method in this study provides a strong foundation for conceptually analyzing the phenomenon of banking digitalization. Through the synthesis of various relevant literature, this research seeks to present a comprehensive picture of the opportunities and challenges of financial sector digitalization, especially in the context of effectiveness, efficiency, and the increasingly complex risk of cybercrime in the post-pandemic era.

4. Results

The digitalization of the financial and banking sector has become an unavoidable phenomenon in the last decade, especially since the COVID-19 pandemic which encouraged people to reduce physical contact and rely on technology-based services. This transformation not only occurred in the technical aspects of service provision but also had a widespread impact on consumer behavior, operational effectiveness and efficiency, and the emergence of serious challenges in the form of cybercrime. From the results of the literature review, it can be seen that banking digitalization brings significant benefits in increasing the accessibility, convenience, and speed of services, but at the same time presents complex risks that must be anticipated by the industry and regulators.

First, from the perspective of changes in consumer behavior, the COVID-19 pandemic was a catalyst that accelerated the shift from conventional to digital transactions (Chowdhury et al., 2022). Social restrictions and concerns about physical contact made consumers more likely to use mobile banking, internet banking, and fintech services to meet their daily financial needs. A study by Baicu et al. (2020) shows that consumers in Romania switched to digital banking services as a direct result of the pandemic, with an increasing preference for non-cash services and online transactions. A similar phenomenon also occurred in Southeast Asia, where consumers are increasingly familiar with the use of super apps that offer various financial features on one platform (Aniqoh et al., 2022). This indicates a structural change in consumer behavior that is likely to persist even after the pandemic ends.

This change in behavior is not only related to practical aspects but is also influenced by psychological factors. The fear of virus transmission made people prefer digital services that are considered safer. However, on the other hand, concerns about the security of digital transactions also arose. A study by Abdul-Rahim et al. (2022) found that the perception of risk plays an important role in the adoption of fintech, where consumers consider the balance between benefits and risks before deciding to use digital services. Thus, banking digitalization not only forms new consumption patterns but also changes how people assess the security and trust of financial institutions.

Second, digitalization is proven to increase the effectiveness and efficiency of banking services (Balkan, 2021). From the perspective of effectiveness, digital services allow banks to more quickly meet consumer needs, both in terms of financial transactions, loan applications, and investment services. In this regard, in terms of efficiency, the digitalization of the payment system allows for the acceleration of the budget expenditure process, a reduction in the use of physical documents, and the integration of data across agencies. Electronic-based systems can minimize human error, speed up data verification, and reduce the potential for fraud in the financial administration process. The quality of results also increases because consumers can enjoy services that are more personal and tailored to their needs. Meanwhile, from the perspective of efficiency, digitalization helps reduce the operational costs of banks by reducing dependence on physical offices and manual labor. According to Marcu (2021), the digitalization of the economy during the pandemic increased productivity and accelerated transaction processes, making banking services more efficient than before. This effectiveness and efficiency are important indicators of the success of digitalization, as they show how technology can be used optimally to achieve financial service goals.

However, behind these benefits, serious challenges emerge in the form of an increased risk of cybercrime. The COVID-19 pandemic not only accelerated digitalization but also showed the vulnerability of digital banking systems to cyberattacks. Cases such as phishing scams, identity theft, ransomware, and misuse of personal data increased significantly during this period. A study by Macierzyński and Boczoń (2022) shows that in Poland, the number of cyberattacks on electronic banking systems surged sharply during the pandemic, posing a serious threat to consumer security and the stability of the financial system. This finding is in line with Abdajabar and Yunus (2023) who emphasize that the increase in internet banking usage enlarges the opportunity for cybercrime. In addition to the increasing volume of cybercrime, the complexity of attacks is also developing.

Cybercriminals took advantage of the pandemic situation to launch more sophisticated attacks, including through fake websites, malicious applications, and scams targeting consumers with low digital literacy. Despotović et al. (2023) emphasize that the development of fintech expands the attack surface because there are more and more digital applications and platforms used by the public. This creates a dilemma for the banking industry, as efforts to expand digital services must be balanced with large investments in cybersecurity.Regulation and compliance are also crucial issues in this context. Some countries show that weaknesses in regulation increase the risk of financial crime. A study by Jamil et al. (2022) in Malaysia revealed that regulations related to cybersecurity are not yet adequate, so the compliance of financial institutions with security standards is still low. This condition reflects that digitalization requires not only sophisticated technology but also a strong legal and policy framework to protect consumers.

Furthermore, the research results also show that the risk of cybercrime not only causes financial losses but also impacts the reputation of financial institutions. Cases of data breaches or cyberattacks that are not handled properly can reduce public trust in banking institutions. According to Wronka (2022), the COVID-19 pandemic revealed a new pattern in financial crime, where consumer trust is a determining factor in the sustainability of digital services. Without trust, consumers will be reluctant to use digital services, even if technically the services are more effective and efficient.In addition, the results of the study also highlight the differences in the readiness of digital infrastructure in various countries. In developed countries with strong technological infrastructure, banking digitalization runs faster and is relatively safer (Wewege et al., 2020). However, in developing countries, limited internet access, low digital literacy, and weak regulations make the risk of cybercrime higher. This shows that although digitalization is a global trend, its impact is contextual and is highly influenced by local factors.

The results of this library research confirm that banking digitalization is a transformation that brings a dual impact. On one hand, digitalization increases the effectiveness, efficiency, and convenience of financial services. Consumers enjoy the convenience of transactions, 24-hour access, lower costs, and more personal services. However, on the other hand, digitalization opens up opportunities for the emergence of increasingly complex cybercrime risks. The success of post-pandemic banking digitalization is highly dependent on the ability of the financial industry and regulators to balance innovation with security. Without adequate protection, the benefits of digitalization can turn into significant losses for consumers and financial institutions.Thus, the findings of this study show that digital transformation in the banking sector is an inevitability that must be carried out with a careful strategy. Efforts to strengthen cybersecurity, increase public digital literacy, and strengthen regulations are absolute requirements so that digitalization can provide optimal benefits while minimizing risks. Digitalization is not just about technology, but also about building a safe, inclusive, and sustainable financial ecosystem in the post-pandemic era.

5. Discussion

The results of this study show that banking digitalization is a structural transformation that brings significant impacts in terms of both benefits and risks. The main benefit that emerges is an increase in the effectiveness and efficiency of services, where banks and financial institutions are able to provide 24-hour access, lower transaction costs, and a more personal service experience for consumers. This is in line with the findings of Marcu (2021), who confirms that digital transformation during the pandemic increased productivity and accelerated economic transactions. However, this benefit does not stand alone because it must always be balanced with new challenges that arise.

One of the biggest challenges is the increased risk of cybercrime. Digitalization indeed expands access and makes it easier for consumers, but it also enlarges the opportunity for more complex attacks. For example, phishing and ransomware not only cause financial losses but also damage the bank's reputation. Macierzyński and Boczoń (2022) prove that the number of cyberattacks increased significantly during the pandemic, while Abdajabar and Yunus (2023) emphasize that the more internet banking users there are, the greater the potential for vulnerability. This shows a dilemma between the expansion of digital services and the increase in security risks that accompany it.

In addition to technical aspects, the factor of consumer trust is an important issue. The study by Abdul-Rahim et al. (2022) confirms that the perception of risk plays an important role in the decision to adopt fintech. Consumers may be interested in the convenience of digital services, but if they feel that transactions are not secure, the adoption rate can decrease drastically. This means that security is not just a technical aspect but also a psychological element that determines the long-term success of banking digitalization. The discussion also highlights the importance of regulation and compliance. Without an adequate legal framework, digitalization risks becoming a boomerang. Jamil et al. (2022) show that weak regulations in Malaysia increase the potential for financial crime. This indicates that digitalization strategies must be accompanied by strengthening policies and security standards so that the digital financial ecosystem remains protected.

From a global perspective, the readiness of digital infrastructure also determines the level of digitalization success. Countries with strong infrastructure are generally more prepared to face the risk of cybercrime, while developing countries face a dual challenge of limited technology and low digital literacy. This local context is important because although digitalization is a global phenomenon, its implementation and impact can differ between countries. For example, consumers in Europe are faster to adopt digital banking due to more mature regulatory and technological support, while in Southeast Asia, adoption is slower and the risk of cybercrime is relatively higher (Aniqoh et al., 2022).

This discussion confirms that banking digitalization is an inevitability that brings great opportunities, but its success depends on the ability of the industry, regulators, and the public to balance innovation, security, and trust. Without adequate security, consumers will not feel comfortable using digital services. Conversely, without innovation, digital services will not be able to meet the increasingly complex needs of consumers. Therefore, the future direction must integrate the strengthening of security systems, public digital literacy, and strict regulations as part of a sustainable financial transformation strategy.

6. Conclusion

The digitalization of the financial and banking sector has become an inevitable transformation, especially after the COVID-19 pandemic which accelerated the adoption of digital services. This change brings great benefits in the form of increased effectiveness and efficiency, where consumers can enjoy 24-hour service access, lower transaction costs, and more integrated services. However, behind these advantages, there are significant challenges in the form of increasingly complex cybercrime risks, ranging from phishing, identity theft, to ransomware. These risks not only cause financial losses but also threaten the reputation of financial institutions and consumer trust. The literature shows that the success of banking digitalization is highly dependent on the balance between innovation, security, and regulation. Consumers will continue to use digital services if they feel safe and trust the existing system.

Therefore, future digitalization strategies must strengthen cyber protection, increase public digital literacy, and ensure compliance with adequate regulations. In addition, local factors such as the readiness of technological infrastructure and state policies also influence the success of digitalization implementation. Thus, banking digitalization is not just a technological innovation but a process of building an inclusive, safe, and sustainable financial ecosystem. In the future, the biggest challenge is to ensure that the speed of digital transformation is always balanced with efforts to protect consumers and strengthen regulations, so that the benefits of digitalization can be felt optimally by the wider community.

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