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THE FUTURE OF BANKING IN THE TECHNOLOGY ERA: DIGITAL TRANSFORMATION AND IMPLICATIONS

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Abstract

This research analyzes the impact of flexible regulations and technology adoption on the competitiveness of Islamic banks in the digital era. With a qualitative approach, this research assesses the importance of adaptive regulations and the adoption of technologies such as fintech and blockchain in enhancing operational efficiency and Sharia compliance. The results show that flexible regulations and the application of digital technology can drive innovation, strengthen competitiveness, and enhance customer satisfaction in Islamic banking. These findings contribute novelty by linking regulation, technology, and competitiveness in the context of the digital transformation of Islamic banking.

Keywords: *flexible regulation, digital technology, Islamic banking, digital transformation*

INTRODUCTION

The technological revolution in the digital era has brought significant global and local challenges to the banking industry, including Islamic banking. Financial technology (fintech) has become an important element in improving bank performance, especially after the Covid-19 pandemic. Islamic banking, such as in Pakistan, utilizes technologies like blockchain and mobile banking to achieve institutional goals and enhance customer service (Ahmad et al., 2021).

Digital transformation has significantly changed the way banks operate from manual services to automated technology. The global and local challenges faced by Islamic banking include the need to adapt to rapid digitalization. Technologies such as Robotic Process Automation (RPA) have enabled banks to automate operational processes, reduce staff workload, and improve service efficiency (Ahmet Unal & Bolukbas, 2021). Digitalization also enables banks to offer more innovative services and meet consumer needs more efficiently (Shifa Fathima, 2020).

Islamic banking faces significant global and local challenges, including intense competition and the need to adapt to digital technology. The banking sector plays an important role in the economy by facilitating economic transactions and the efficient mobilization of resources. Digital transformation has had a direct impact on customers and bank operations, enhancing customer satisfaction through the digitalization of services and strengthening the stability of Islamic banking during crises such as the COVID-19 pandemic (Shah et al., 2023; Zouari & Abdelhedi, 2021).

What are the main challenges faced by traditional banks in adopting digital transformation? How can traditional banks remain relevant in the face of increasingly rapid technological disruption? How can this research bridge the literature gap in exploring the impact of digital transformation on operational aspects, customer satisfaction, and bank sustainability?

This topic has significant relevance both in a global and national context, given the increasing adoption of cutting-edge technologies such as artificial intelligence (AI), blockchain, and open banking, which fundamentally change the banking ecosystem. This technology not only offers efficiency and service personalization for customers but also presents new challenges in terms of regulation, data protection, and cybersecurity risks. At the global level, banks face pressure to remain competitive in a landscape dominated by fintech and large technology companies, while at the national level, this digital transformation becomes key to supporting financial inclusion and economic growth. The direct impact of these changes is seen in customers who demand faster and more accessible services, regulators who need to create adaptive policies to maintain the stability of the financial system, and banks that must navigate new risks while leveraging technological opportunities. Therefore, understanding the future of banking in the technological era is crucial to support strategic decision-making that is not only relevant for the sustainability of the industry but also impacts the economy as a whole.

This topic as the focus of research is based on its urgency and relevance to the banking industry's need to adapt to rapidly changing technology. In the digital era, banks are required to adopt innovations such as artificial intelligence, blockchain, and open banking to enhance operational efficiency and meet the ever-evolving expectations of customers. The inability to adapt can lead to a decline in competitiveness, especially amidst the intense competition from fintech and large technology companies. Moreover, this topic has wide-ranging implications for various stakeholders. For academics, this research contributes to enriching the literature on digital transformation in banking. For practitioners, the research results can provide strategic guidance to face challenges and effectively leverage technological opportunities. Meanwhile, for regulators, this study helps in designing policies that are not only adaptive to technological changes but also maintain the stability and security of the financial system. Thus, this research is expected to serve as a foundation for the development of sustainable digital transformation strategies in the banking sector.

The objective of this research is to analyze the main challenges faced by traditional banks in adopting digital transformation, as well as to identify the factors that influence their ability to remain relevant in the face of rapidly evolving technological disruptions. This research aims to explore how banks can overcome these challenges, both from the

technological, regulatory, and customer behavior perspectives, as well as how effective strategies can be implemented to maintain competitiveness. In addition, this research also aims to bridge the gaps in the existing literature by providing deeper insights into the impact of digital transformation on the operational aspects of banks, customer satisfaction, and the long-term sustainability of the banks themselves. Through this analysis, it is hoped that recommendations can be found to help banks formulate more targeted and sustainable digital transformation strategies.

Islamic banking faces significant global and local challenges, especially in integrating new technologies with traditional banking business models. Although financial technology (FinTech) has brought significant changes to the banking sector, research highlighting the synergy between technological innovation and traditional banking business models is still lacking. This is important to enhance the efficiency and competitiveness of Islamic banking in the digital era (Panjwani & Shili, 2020a).

Islamic banking faces significant global and local challenges, including the need to adapt to technology while ensuring customer satisfaction and operational sustainability. However, there is a gap in previous research linking technology adaptation with customer satisfaction and bank sustainability. Existing studies have focused more on the aspect of customer satisfaction in the context of digitalization without directly linking it to bank sustainability (Zouari & Abdelhedi, 2021).

This research emphasizes novelty by adopting a multidisciplinary approach that combines technological, business, and social perspectives in understanding digital banking. By leveraging various disciplines, this research aims to provide a comprehensive overview of how new technologies such as artificial intelligence, blockchain, and open banking affect not only the operational aspects of banks but also their business models and social interactions between banks and customers. This approach is important because digital transformation not only involves changes in technological infrastructure but also affects how banks operate within a broader social and economic context, including building long-term relationships with customers. The justification for the importance of this research lies in its role as a guide for banks to survive and thrive amidst rapid technological changes. By understanding how to effectively integrate technology into their business models, banks can enhance efficiency, strengthen their competitive position, and maintain customer satisfaction, which are key to sustainability in the digital era. Additionally, this research also makes a significant contribution to the development of banking literature by highlighting existing gaps in the study of digital transformation, as well as offering practical insights for the banking industry in formulating more sustainable and responsive digital strategies to the ever-changing market demands.

RESEARCH METHOD

Basically, this section explains how the research was conducted. The important points of this section are: (1) research design; (2) population and sample (research target); (3) data collection and instrument development techniques; (4) and data analysis techniques. For research that uses tools and materials, it is important to write down the specifications of the tools and materials. The tool specification describes the sophistication of the tool used while the material specification describes the type of material used. For qualitative research such as

classroom action research, ethnography, phenomenology, case studies, etc., it is necessary to add the presence of researchers, research subjects, informants who help collect research data, the location and duration of the research and a description of the validity check of the research results.

This research uses a literature review, which is a method of data collection through the examination of related literature. Nazir states that this method involves the collection of data from various literature sources, such as books, journals, magazines, and lecture materials related to the research subject (Mardalis, 2006). Furthermore, Muhadjir stated that library research prioritizes philosophical and theoretical approaches over empirical field tests. This is because the aim of this research is to gain a better understanding of the concepts and theories underlying the problem being studied, as well as to create a strong theoretical framework for this research. The data collected in this research were gathered by reading and analyzing relevant literature. To ensure the relevance and quality of the obtained data, this process involves the identification, collection, and evaluation of information from carefully selected written sources. Next, the literature data is analyzed descriptively to identify the main themes and patterns. The aim of this research is to gain a comprehensive understanding of the research topic and to develop arguments supported by evidence from the literature. The literature study method used in this research allows the researcher to collect and analyze data from various relevant written sources, with a focus on philosophical and theoretical approaches. This method also provides a strong foundation for understanding and explaining the issues discussed.

RESULT AND DISCUSSION

This section is the main section of a research article and is usually the longest section of an article. Data analysis processes such as statistical calculations and hypothesis testing processes do not need to be presented. Only the results of the analysis and the results of the hypothesis test must be reported. Tables and graphs can be used to clarify the presentation of research results verbally. Tables and graphs should be commented on or discussed.

Digital Transformation in Islamic Banking: What Was Found

This research found that Islamic banks are beginning to implement technologies such as blockchain, mobile banking, and Robotic Process Automation (RPA) to improve operational efficiency, accelerate services, and expand access for customers. The implementation of this technology has become an important part of enhancing the competitiveness of Islamic banks in the digital era. Blockchain, for example, offers better transparency and security in financial transactions, which is crucial in maintaining customer trust. In addition, mobile banking makes it easier for customers to access banking services anytime and anywhere, thereby increasing customer convenience and satisfaction (Ahmad et al., 2021).

Robotic Process Automation (RPA) also plays an important role in automating routine and repetitive processes, allowing banks to allocate human resources to more strategic and value-added tasks. This not only increases operational efficiency but also reduces overall operational costs. In this context, research shows that technological innovation has contributed to the increase in productivity of Islamic banks, although it has not yet been fully followed by an increase in efficiency (Nugrohowati et al., 2020).

Overall, the adoption of technology in Islamic banking not only improves the performance of banks but also strengthens their position in facing challenges in the global financial industry. By continuously innovating and adapting to technological developments, Islamic banks can continue to grow and meet the increasingly complex needs of their customers.

This research shows that traditional banks face significant challenges such as a lack of resources for investing in digital infrastructure, resistance to change from employees, and difficulties in aligning technology with existing systems. These challenges are further exacerbated by fierce competition from more agile and innovative financial technology companies. Traditional banks are often hindered by rigid organizational structures and strict regulations, making it difficult for them to quickly adapt to technological changes (Diener & Špaček, 2021; Krasonikolakis et al., 2020).

Moreover, resistance to change from employees also becomes a significant obstacle. Many employees feel comfortable with the existing systems and work processes, making them reluctant to switch to new technologies that may require additional training and changes in their work methods (Kitsios et al., 2021). This is exacerbated by the lack of a comprehensive digital strategy and strong leadership to guide the digital transformation (Jayalath & Premaratne, 2021).

The difficulty in aligning new technology with existing systems also becomes a major challenge. Traditional banking systems are often built on outdated and inflexible technology infrastructure, making integration with new technology complicated and expensive (Sund et al., 2021). Therefore, banks need to develop clear and well-planned strategies to address these challenges, including increasing employee engagement and adopting appropriate technology (Niemand et al., 2021).

Overall, digital transformation in the banking sector requires a holistic and coordinated approach, with a focus on the development of human resources and appropriate technology to ensure long-term success.

This research found that the adoption of technology has brought significant changes to customer service, where many banks have started offering mobile banking services, the use of chatbots, and more efficient and accessible mobile payment platforms for customers. Technologies like chatbots have become a smart method for retaining loyal customers by responding to their inquiries quickly. Chatbots powered by artificial intelligence (AI) are one of the innovative approaches in the banking industry that can enhance customer satisfaction and reduce bank operational costs by approximately $7.3 billion over the next two years (Gupta et al., 2022).

In addition, the adoption of mobile payments has also significantly changed banking payment practices. Studies show that the adoption of mobile payments not only increases customers' credit card activity at banks but also enhances customer loyalty by reducing churn rates (Xu et al., 2024). In India, the adoption of mobile banking has been driven by factors such as ease of use, trust, and subjective norms, all of which have a significantly positive effect on the intention to adopt mobile banking (Kumar et al., 2020).

Overall, the adoption of technology in banking not only enhances service efficiency but also strengthens the relationship between banks and their customers. Thus, banks can leverage this

technology to create added value for customers and enhance their competitiveness in an increasingly digital market (Carranza et al., 2021; Souiden et al., 2020).

This research found that digital technology plays a crucial role in enhancing the sustainability of banks, where the implementation of new technologies such as blockchain and AI can reduce operational costs, accelerate services, and improve managerial effectiveness. In this context, digitalization and corporate sustainability reinforce each other to enhance market performance and bank efficiency (Forcadell et al., 2020). Competent information technology and responses to digital disruption have a positive and significant effect on sustainable banking performance (Wicaksono, et al., 2020). The digital transformation of banks has also proven to enhance efficiency and environmental, social, and governance (ESG) performance (Zhu & Jin, 2023).

Additionally, investment in digital technologies such as CyberTech has become a strategic necessity to enhance operational efficiency and service quality, despite the increasing cybersecurity risks (Uddin et al., 2020). In Taiwan, fintech-related initiatives have helped banks improve efficiency, although this improvement is not significant (Liao, 2023). Fintech also plays a role in promoting green finance, which makes financial businesses more sustainable (Chueca Vergara & Ferruz Agudo, 2021).

In Kenya, digital banking technology innovations have improved the financial performance of commercial banks by accelerating transaction settlement times and increasing loan values (Ouma & Ndede, 2020). The reputation generated by corporate sustainability strategies can overcome the challenges of digitalization, narrow organizational boundaries, and expand the scope of banks (Forcadell et al., 2020). Investment in digitalization has contributed to the increase in production efficiency of commercial banks, although there is heterogeneity among banks. The transformation of big data technology also enhances the green operational capabilities of the banking sector (Yun & Jin, 2024).

Overall, the implementation of digital technology in banking not only enhances operational efficiency but also supports sustainability and social responsibility, making it a key element in modern banking strategies.

Regulation plays an important role in the adoption of digital technology in the banking sector. Rigid policies can hinder innovation, while more adaptive policies can accelerate change. In this context, research shows that digitalization and economic globalization drive international regulatory cooperation and legislative harmonization, which in turn affects the adoption of digital technology in the banking sector (Tsindeliani et al., 2022).

Pandemic COVID-19 also acted as a catalyst in the digital transformation of the banking sector, forcing banks to adopt digital solutions faster than previously planned (Mursalov, 2020). In India, for example, banking digitalization has helped with financial inclusion and increased customer satisfaction, although challenges remain in meeting customer demands and expectations (Gupta et al., 2022).

Additionally, the adoption of technologies such as RegTech (Regulatory Technology) can help banks manage regulatory processes more efficiently, although its implementation can be costly if not well integrated (Von Solms, 2021). In Europe, banks have adopted APIs (Application Programming Interfaces) to support new service models, demonstrating the importance of regulation in driving innovation (Stefanelli & Manta, 2023).

Overall, adaptive and innovative regulations can be a key driver in the digital transformation of the banking sector, enabling banks to remain competitive and meet customer needs in the digital era.

This research confirms previous findings that traditional banks have difficulty adopting new technologies compared to fintech, which adapts more quickly to technological changes. Traditional banks are often hindered by rigid organizational structures and complex regulations, making them slower to respond to technological innovations compared to more agile and adaptive fintech companies (Ghosh, 2021; Hornuf et al., 2021). Fintech, with its technological advantages and innovations, is able to offer more efficient and faster financial services, changing the way consumers interact with financial services (Boustani, 2020; Dzhuruk, 2020).

Collaboration between banks and fintechs has become one of the strategies adopted to address this challenge. Banks with a clear digital strategy and employing a chief digital officer are more likely to form alliances with fintechs to modernize their services (Hornuf et al., 2021). In India, for example, collaboration between banks and fintech companies has created financial disruptions that are transforming traditional payment systems (Bhasin & Rajesh, 2021).

In addition, fintech also leverages technologies such as artificial intelligence and digital platforms to accelerate financial service processes, which traditional banks often cannot do due to infrastructure and regulatory limitations (Boot et al., 2020; Suryanto, 2020). Therefore, although traditional banks have a large customer base and an extensive branch network, they need to adapt quickly to remain competitive in this digital era (Ghosh, 2021; Iluba & Phiri, 2021).

Overall, although traditional banks face challenges in adopting new technologies, collaboration with fintech and the adoption of appropriate digital strategies can help them remain relevant and competitive in the ever-evolving market.

This new technology is used to address the challenges of improving the performance of Islamic banks and meeting the expectations of customers who increasingly desire ease and accessibility in conducting transactions. In addition, technology also enables banks to reduce operational costs and increase transparency in transactions. In this context, financial technology (fintech) plays an important role in the transformation of the Islamic banking sector. Fintech enables Islamic banks to offer more efficient and affordable services, as well as enhance customer experience through innovations such as mobile banking and blockchain (Ahmad et al., 2021; Panjwani & Shili, 2020b; Rickinghall, 2022).

The use of technology such as blockchain not only enhances transaction security but also supports profit-sharing financing models that are characteristic of Islamic banking. This technology can reduce risk and increase productivity by providing a more transparent and reliable platform (Kamdzhalov, 2020). In addition, fintech also contributes to the increase in revenue for Islamic banks by expanding access to financial services for previously underserved individuals (Panjwani & Shili, 2020b).

In Malaysia, for example, Islamic fintech innovation has proven to have a positive impact on bank performance, especially for smaller banks that are more flexible in adopting new technologies (Rickinghall, 2022). Thus, the adoption of new technology in Islamic banking not

only enhances operational efficiency but also strengthens the competitiveness of banks in an increasingly competitive market (farhadi & fooladi, 2021; Nugrohowati et al., 2020).

Many traditional banks face significant challenges in adapting to rapid technological changes. Older infrastructure and long-established systems are the main obstacles for these banks to quickly adopt new technology. Established systems are often incompatible with modern technology, requiring significant investment for upgrades and integration. Additionally, there are concerns that new technologies, such as artificial intelligence and digital platforms, could replace human jobs, which adds to the level of resistance to adopting new technologies (Boot et al., 2020).

Changes in financial intermediation, as discussed in research on fintech, indicate that innovations in data collection and processing as well as communication have transformed the way banks operate. This trend leads to the use of more structured information and a decrease in face-to-face interactions. Innovations such as artificial intelligence and digital platforms can lead to vertical and horizontal disintegration of traditional bank business models. Specialized financial service providers can take over activities that do not rely on balance sheet access, while platforms can position themselves between banks and customers (Boot et al., 2020).

Thus, traditional banks need to balance between maintaining human jobs and adopting new technologies to remain competitive. The right policies are needed to address these challenges and ensure that the transition to new technologies can be carried out smoothly without sacrificing the human workforce.

Changes in banking services are urgently needed because customers today desire convenience and accessibility in their banking transactions. Efficient services that can be accessed anytime and anywhere have become a primary necessity in the digital era. Digitalization in banking has changed the way customers interact with banks, allowing them to conduct transactions anytime without having to visit physical branches (Malathi, 2020). This is in line with findings that show that the convenience of access and transactions is the main factor driving the adoption of mobile banking (Jebarajakirthy & Shankar, 2021; Shankar & Rishi, 2020).

In addition, the digitization of banking has also reduced human errors and increased customer loyalty by providing faster and more secure services (Malathi, 2020). In India, for example, digital banking has rapidly developed thanks to internet and mobile penetration, allowing people to transact more easily and securely (C.B & V.*, 2020). This digital transformation not only benefits customers but also banks, by reducing operational costs and increasing revenue through various channels (Malathi, 2020).

Thus, banks must continue to innovate and enhance their digital platforms to meet the needs of customers who increasingly desire fast and easily accessible services. Research shows that the convenience of using digital services is key to increasing the adoption and use of digital banking services (Rose & Sureya, 2020). Therefore, banks need to focus on improving comfort and accessibility to remain competitive in this increasingly digital market.

The sustainability of a bank heavily depends on its ability to adapt to technological changes and the continuously evolving market demands. Technology plays a crucial role in accelerating the bank's internal processes and meeting customers' increasingly high expectations for service quality and speed. In a competitive and constantly changing

environment, banks must continuously engage in technological innovation to remain competitive and achieve competitive advantage (Krishna, 2020).

Innovation in banking technology not only helps banks improve operational efficiency but also attract and retain customers. E-banking, for example, has become a strategic tool used by the global banking sector to enhance customer satisfaction by offering faster and more accurate services (Jindal, 2020). In addition, digitalization allows banks to expand their customer base and reduce costs, while offering customers more convenient access to their products and services (Rysin & Boryk, 2020).

However, this innovation process is also accompanied by certain challenges, such as the risks associated with the development of new technologies. Therefore, it is important for banks to consider the economic feasibility of the innovation and its benefits for customers (Rysin & Boryk, 2020). Thus, innovation in banking technology is not only a vital necessity for the efficient functioning of banks but also for maintaining their competitiveness in the market (Rysin & Boryk, 2020).

Overall, the sustainability of banks in this digital era heavily depends on their ability to integrate technological innovations with corporate sustainability strategies, which can enhance their reputation and reduce customer concerns about opportunistic behavior (Forcadell et al., 2020).

Proper regulations can provide a framework that supports digital transformation, protects customer interests, and maintains the stability of the financial system. In the context of digital transformation, regulation plays an important role in ensuring that technological innovations can be implemented safely and efficiently. For example, the implementation of new financial technologies such as fintech can stimulate competition and product variation that benefit society and the economy. However, to achieve this, an adequate regulatory framework is needed that allows for innovation while maintaining financial inclusion, financial stability, market integrity, and consumer protection (Zetzsche et al., 2020).

However, if regulations are too strict or slow to adapt, this can delay the implementation of new technologies. For example, in the European Union, the existing regulatory framework often struggles to keep pace with the speed of innovation and faces challenges in facilitating the entry of new markets while managing the associated regulatory risks. Therefore, the proposal for a regulatory "sandbox" is put forward, which is an experimental space that allows market participants to test fintech services in the real market under strict supervision from regulators. This approach can reduce the "time to market" cycle of financial innovations while still protecting consumers (Ringe & Ruof, 2020).

Moreover, the rapid digital transformation in the financial industry demands regulators to adopt a new, more adaptive approach. Regulators must be interested in technological developments and lead in their implementation, as well as consider potential development trends and new regulations with financial institutions (Mykhailiuk et al., 2021). Thus, effective and adaptive regulation is crucial to support sustainable and secure digital transformation.

The difference in adoption speed between traditional banks and fintech can be explained through their organizational structure and operational flexibility. Traditional banks are often hindered by larger and more complex organizational structures, which can slow down decision-making processes and innovation. This hierarchical and bureaucratic structure makes

traditional banks less responsive to rapid market changes and dynamic consumer needs. On the other hand, fintech has a leaner and more flexible structure, allowing them to quickly adapt to technological changes and consumer preferences. This flexibility allows fintech to offer more efficient and innovative services, which in turn enhances their competitiveness in the financial market (Iluba & Phiri, 2021).

A study on the evolution of fintech in Zambia shows that fintech is superior in terms of convenience, efficiency, and speed compared to traditional banks bound by bureaucratic requirements (Iluba & Phiri, 2021). This study reveals that there is a strong positive correlation between relative advantage and the adoption of fintech services, as well as between compatibility and adoption. This confirms that fintech is better able to meet the needs of modern consumers who desire fast and easily accessible financial services.

Thus, this difference in adoption speed highlights the challenges faced by traditional banks in maintaining their relevance and competitiveness in the digital era. Banks need to adopt more innovative and flexible strategies to compete with rapidly growing fintech companies.

Many Islamic banks that are just beginning to adopt technology face significant challenges, particularly related to concerns about the compatibility of technology with Sharia principles and security. In this context, research shows that although technology can offer great opportunities for innovation and efficiency, there are deep concerns regarding compliance with Sharia and potential security risks that may arise. For example, collaboration between Islamic banks and financial technology (FinTech) companies can pave the way for more innovative financial products, but it must still pay attention to aspects of morality and Sharia compliance (Haridan et al., 2020).

Furthermore, other research shows that the adoption of internet banking in Islamic banks is influenced by social factors such as social reviews, expert support, and social perception. These factors can enhance the adoption of internet banking, but they also raise concerns about the privacy of personal and financial information, especially in Islamic banks (Naeem, 2020). In Nigeria, for example, trust, social influence, and government support were found to have a significantly positive relationship with the adoption of Islamic banking, indicating that these factors are important in overcoming technology adoption barriers (Ezeh & Nkamnebe, 2021).

Overall, although the adoption of technology in Islamic banks offers many benefits, it is important to ensure that the technology complies with Sharia principles and is safe for users. This requires active involvement from the Sharia board and bank management in developing new, compliant financial technology products (Haridan et al., 2020).

Banks that are more flexible and quick to adapt to new technologies have greater opportunities for growth. Research shows that the development of financial technology (FinTech) can enhance profitability, financial innovation, and risk control in commercial banks. By leveraging financial technology, banks can enhance their traditional business models by reducing operational costs, improving service efficiency, and strengthening risk control capabilities, thereby increasing overall competitiveness (Wang et al., 2021).

Moreover, banking innovation plays a crucial role in ensuring the competitiveness of banks. This innovation includes the development of new products and services, innovative customer service channels, and human capital management. Banks that successfully adopt this

innovation can strengthen their competitive position in the banking services market (Banking University, Kyiv, Ukraine & Zaionts, 2020).
Digitalization is also a key driver of the bank's competitiveness. By adopting an online platform-based business model, banks can expand the reach of their banking products and attract more customers, which ultimately shapes competitive policies and gains a competitive advantage (Kolodiziev et al., 2021).
However, the growth of FinTech companies can also exert competitive pressure on the performance of banks. In Indonesia, the growth of FinTech has been proven to negatively affect the performance of banks, indicating that banks must quickly adapt to these changes to remain competitive (Phan et al., 2020).
Overall, banks that can quickly adapt to technological changes and integrate innovations into their business strategies tend to be more successful in maintaining and enhancing their competitiveness in an increasingly competitive market.

Previous studies have shown that although the adoption of digital banking technology brings many benefits, there are still concerns related to data protection and customer privacy, which pose a significant challenge in developing digital banking services. Investment in information technology (IT) by banks has proven to have a significantly positive impact on the adoption of financial digitalization by customers. This encourages customers to conduct financial transactions more frequently through digital channels rather than physical branches, which transforms the way traditional banking interactions occur (Carbó-Valverde et al., 2020). However, on the other hand, digitalization also poses new challenges related to data vulnerability and customer privacy. The digital environment and the availability of massive data from customers can create information asymmetry that is detrimental to customers, which can hinder the positive impact of digitalization on bank performance (Forcadell et al., 2020).
To address this challenge, the market-oriented corporate digital responsibility (MODR) approach is proposed as a strategy to minimize consumer data vulnerability. This strategy places vulnerable customers as the primary stakeholders and integrates corporate digital responsibility as a key element of the organizational strategy (Liyanaarachchi et al., 2021). Thus, although the adoption of digital banking technology offers many advantages, it is important for banks to develop effective strategies to protect customer data and privacy in order to ensure sustainability and trust in digital banking services.

The application of technology in the banking industry has shown great potential in increasing efficiency and reducing operational costs. However, some banks face significant challenges in implementing large-scale technological changes. One of the main concerns is the organizational unpreparedness and the operational risks that may arise. Research shows that although fintech innovation can improve cost efficiency and the technology used by banks, as seen in studies of the Chinese banking industry, state-owned banks often have the lowest cost efficiency and operate with less optimal technology (Lee et al., 2021).
In addition, the adoption of technology such as e-banking also faces challenges in terms of consumer acceptance. The Technology Acceptance Model (TAM) shows that factors such as ease of use and organizational support greatly influence technology adoption by consumers (Carranza et al., 2021). On the other hand, the adoption of online channels in banking can

increase profit efficiency, but it can also increase solvency risk due to a decline in loan quality (He et al., 2020).

In the context of India, the adoption of banking technologies such as blockchain faces challenges in terms of legal issues and standardization, especially in cross-border transactions and interoperability between different blockchain systems (Patki & Sople, 2020). Nevertheless, this technology offers advantages such as transparency, speed, and cost reduction by eliminating intermediaries (Patki & Sople, 2020).

Overall, although technology offers many benefits, banks must consider organizational readiness and the operational risks associated with massive technological changes. Further research is needed to understand how banks can overcome these challenges and effectively leverage technology to achieve greater efficiency and innovation.

These studies show that flexible regulations, such as those implemented in the UK and Singapore, can enhance innovation in the financial sector by balancing competition, market integrity, and financial stability. This is consistent with findings that show financial flexibility can drive innovation investment, especially in non-state companies (Han et al., 2021). Additionally, other research highlights the importance of strategic flexibility and complexity management to enhance innovation performance. For example, a case study at a large financial institution in Denmark shows that high flexibility and low complexity in the company's response to regulatory changes can enhance innovation performance (Bentzen et al., 2021).

Strategic flexibility is also identified as an important factor influencing innovation and market outcomes, which in turn can mediate the positive relationship between strategic flexibility and financial performance (Herhausen et al., 2021). In the context of environmental regulation, flexible regulatory tools and a combination of rigid and flexible regulatory tools are more conducive to encouraging corporate innovation activities (Sund et al., 2021).

Thus, flexible regulations and proper strategic management can create an environment that supports innovation, allowing companies to adapt to changes and seize new opportunities. This shows that a balanced and adaptive regulatory approach can be key to driving sustainable innovation in the financial sector and other industries.

Although many studies show that traditional banks lag behind in technology adoption, this research provides a new perspective by highlighting the steps taken by Islamic banks in integrating new technology while adhering to Sharia principles. Islamic banks have collaborated with Financial Technology (FinTech) companies to expand their market share. This collaboration allows Islamic banks to offer more innovative financial technology products while still paying attention to aspects of morality and Sharia compliance (Haridan et al., 2020). Furthermore, digitalization in Islamic banking has increased customer satisfaction by improving service quality. Studies show that customers not only pay attention to compliance with Sharia law but also to the way services are delivered, which now must include digital banking features to remain relevant in the digital era (Zouari & Abdelhedi, 2021).

Blockchain technology has also been identified as a potential tool to enhance transparency and Sharia compliance in Islamic banking transactions. Blockchain can ensure maximum security in transactions and support partnership-based financing such as mudarabah and musharakah (Chowdhury et al., 2022).

The development of financial technology in Islamic banking not only enhances operational efficiency but also strengthens the position of Islamic banks in facing global economic challenges. By adopting new technologies, Islamic banks can reduce risks and increase productivity while maintaining Sharia principles (Kamdzhalov, 2020)(K.
Overall, the integration of technology in Islamic banking shows that Islamic banks are not only able to compete with traditional banks but can also offer more ethical and sustainable financial solutions.

Theoretical and Practical Implications

Theoritical: This research contributes to the banking literature by demonstrating the relationship between technology, policy, and bank sustainability, particularly in the context of Islamic banking and its challenges in digital transformation.

Practical: Banking practitioners and regulators need to collaborate to design policies that support the responsible adoption of technology in line with market needs and sustainable financial principles.

CONCLUSION

The conclusion of this research emphasizes that flexible and adaptive regulations are crucial in supporting digital transformation in the banking sector, especially in Islamic banking. This research shows that the adoption of new technologies, such as fintech and blockchain, can enhance efficiency, transparency, and Sharia compliance, which are key factors in the competitiveness of Islamic banks. On the other hand, regulators must create policies that support innovation while maintaining market stability and security. The novelty of this research lies in a deeper understanding of the relationship between flexible regulations, the acceptance of technology by Islamic banks, and the challenges in ensuring Sharia compliance.

However, this research also has limitations, particularly in terms of geographical scope and the application of specific technologies. For further research, it is recommended to expand the study's scope to various countries with a more holistic approach, as well as to explore the challenges faced by Islamic banks in the implementation of new technologies in more detail. In addition, further research is needed to evaluate the long-term impact of technology adoption on customer satisfaction and the financial performance of Islamic banks.

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