



Analysis of Opportunities and Risks in Financial Technology Innovation for Islamic Banking in Adapting to the Changing Financial Ecosystem: A Case Study

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Abstract

This study analyzes the opportunities and risks associated with financial technology (fintech) innovations in Islamic banking, with a specific focus on Bank Syariah Indonesia (BSI) North Sumatra Regional Office. The research is driven by the rapid advancements in fintech, which are reshaping the global financial ecosystem, including the Islamic banking sector. The study aims to evaluate the impact of fintech innovations on BSI's operations and explore strategies to leverage these opportunities while addressing inherent risks. A qualitative case study approach with a descriptive-analytical method was utilized, incorporating primary data from interviews and secondary data from relevant literature. The findings highlight that BSI North Sumatra Regional Office has implemented various fintech solutions that improve operational efficiency and promote financial inclusion. However, challenges persist, particularly in regulatory compliance, cybersecurity, and technological adaptation. The study concludes that a holistic and adaptive strategy is crucial for BSI to effectively integrate fintech innovations and maintain its competitiveness in a dynamic financial ecosystem.

Introduction

The development of financial technology or fintech has brought significant changes in the banking industry around the world, including in Islamic banking. In recent years, this technology has become a key driver of transformation in financial services, facilitating wider access to banking products and services and accelerating the transaction process (Cortet et al., 2016). In Indonesia, Bank Syariah Indonesia (BSI) North Sumatra Regional Office, as part of the largest Islamic bank in the country, faces unique challenges and opportunities in implementing fintech innovations. On the one hand, fintech offers various opportunities for BSI to improve operational efficiency, expand service reach, and strengthen financial inclusion among the underserved Muslim community (Putra, 2023). However, on the other hand, it also presents risks, such as regulatory challenges, cybersecurity, and the need to continuously adapt to rapid technological developments (Bechara & Schuch, 2021).

The importance of financial technology adoption in Islamic banking lies not only in improving efficiency, but also in the ability to compete in an increasingly competitive and dynamic market. As a financial institution that operates based on sharia principles, BSI North Sumatra Regional Office must ensure that the innovations implemented are in line with Islamic law, while meeting strict technological and regulatory standards (Akbar et al., 2024). This demands a careful and comprehensive approach in integrating new technologies into the Islamic banking system.

Besides efficiency and competition, the adoption of financial technology in Islamic banking also plays an important role in promoting financial inclusion in Indonesia. As a country with

the largest Muslim population in the world, Indonesia still faces significant challenges in reaching people who are underserved by the formal banking system, especially in remote areas. Financial technology provides an innovative solution that can bridge this gap by providing financial services that are easily accessible through digital devices. Thus, Bank Syariah Indonesia (BSI) North Sumatra Regional Office has great potential to utilize fintech in expanding its service reach to people who have not been reached by conventional banks, so as to encourage wider financial inclusion (Oseni & Ali, 2019).

The adoption of fintech in Islamic banking also presents its own challenges, especially with regard to sharia compliance aspects. Technological innovations must be studied in depth to ensure that they are not only efficient and safe, but also in accordance with sharia principles that avoid *riba*, *gharar* and *maisir* (Dusuki, 2011). For example, the use of blockchain technology and smart contracts in Islamic financial products requires an in-depth analysis of how such technology can be implemented without violating Shariah rules. This calls for close collaboration between technologists, Islamic banking practitioners and scholars to develop solutions that suit the needs of the industry while complying with sharia principles (Laldin & Furqani, 2018).

As the institution responsible for regulation and supervision in the financial services sector, the Financial Services Authority (OJK) has an important role in ensuring the adoption of fintech runs according to national regulations and sharia principles. OJK is tasked with regulating, supervising, and providing guidance for the financial industry, including Islamic banking. According to Hibatullah et al. (2023) the first Chairman of the OJK Board of Commissioners, this institution not only aims to protect consumers but also to encourage inclusive and sustainable growth of the financial sector. In the context of fintech, OJK's role is to provide a framework that facilitates technological innovation while maintaining financial system stability. The role of OJK is very relevant for Bank Syariah Indonesia (BSI) North Sumatra Regional Office to adopt financial technology while still complying with applicable regulations.

The opportunities presented by financial technology innovation in Islamic banking include increased financial inclusion and operational efficiency. According to Ismail (2019), fintech can open wider access to financial services, especially in remote areas that were previously difficult to reach by conventional banking. Bank Syariah Indonesia (BSI) North Sumatra Regional Office has demonstrated success in utilizing this technology to reach underserved segments of society, while offering sharia-based products that are more relevant to customer needs.

However, the risks posed by these innovations cannot be ignored. As Nazara et al. (2024) explains, cybersecurity risks, such as the threat of hacking, as well as potential sharia deviations in the implementation of new technologies, are major concerns. BSI North Sumatra Regional Office has taken mitigation measures through strengthened security protocols and close collaboration with the Sharia Supervisory Board (DPS) to ensure that all innovations remain compliant with Islamic law.

Changes in the financial ecosystem that are increasingly digitalized also provide pressure and opportunities for Islamic banking. According to Khan & Bhatti (2008), the shift in consumer preferences to digital-based services requires banks to continuously adapt to new technologies without forgetting sharia values. In this context, BSI North Sumatra Regional Office has adopted a digitalization strategy that integrates modern financial technology with sharia compliance to improve its competitiveness in the market.

As a case study, Bank Syariah Indonesia North Sumatra Regional Office stands out as a model of fintech implementation in Islamic banking. Anagnostopoulos (2018) notes that this bank not only focuses on technological innovation but also develops transparent and collaborative governance with regulators and industry associations. This approach allows BSI to not only meet existing regulations but also contribute to the development of policies that support the Islamic banking industry as a whole.

Regulation and cybersecurity are other critical areas that need to be considered in the implementation of fintech in Islamic banking. Given the sensitive nature of financial data, Bank Syariah Indonesia North Sumatra Regional Office must ensure that the technology systems they use are equipped with sophisticated security protocols to protect customer data from potential cyber threats. In addition, regulations that support the development of fintech in Indonesia need to be harmonized with the needs of Islamic banking. The Ministry of Finance and the Financial Services Authority (OJK) have taken important steps in regulating the fintech industry, but these regulations must be continuously updated to accommodate new innovations that emerge in the market, while ensuring that these regulations do not hinder the growth of Islamic banking (Hasan et al., 2020).

The implementation of effective regulation in Islamic banking, particularly in relation to financial technology (fintech), is not only important to ensure compliance with Shariah law, but also to maintain the stability of the financial system as a whole. In this context, proactive and adaptive regulation is key in anticipating new risks arising from the adoption of new technologies. For example, threats to data privacy and information security are increasing along with the digitization of financial services. Therefore, Bank Syariah Indonesia North Sumatra Regional Office must ensure that they not only comply with existing regulations, but also actively participate in regulatory dialog to advocate for the unique needs of Islamic banking.

Cybersecurity in Islamic banking requires special attention due to the characteristics of sharia that demand transparency and fairness in financial transactions. The technological systems used must have the ability to detect and respond to cyber threats in real-time, so as to protect the integrity of Islamic transactions. In addition, the implementation of technologies such as blockchain and smart contracts, while promising efficiency and transparency, must also be closely monitored to ensure that their use does not raise new issues in terms of security or sharia compliance (Bechara & Schuch, 2021).

In addition to technical aspects, regulations must also consider socio-economic aspects, particularly in the context of financial inclusion. Fintech is expected to be a means to reach populations underserved by the conventional banking system, including those in remote areas. However, this also presents its own challenges, as regulations must be flexible enough to accommodate various innovative business models, while remaining strict to prevent misuse of technology that could harm customers. Therefore, cooperation between regulators, industry players, and academics is crucial to develop a regulatory framework that not only protects consumers but also encourages innovation in accordance with sharia principles.

As the fintech ecosystem continues to evolve, it is important for Bank Syariah Indonesia North Sumatra Regional Office and other Islamic financial institutions to not only rely on existing regulations, but also develop internal initiatives to improve cyber resilience and sharia compliance. This includes training for staff, upgrading technology infrastructure, and collaborating with fintech institutions that have sharia compliance as a priority. With this approach, Bank Syariah Indonesia North Sumatra Regional Office can be better prepared to face the challenges arising from technological innovation, while ensuring that sharia values remain the cornerstone of their operations.

In order to provide *novelty* value related to this research, the following authors present several previous studies that have similar themes with this research:

Negarawati & Rohana (2024) revealed that the adoption of fintech by Islamic banks in Indonesia, such as Bank Syariah Indonesia, has great potential to increase financial inclusion, especially for people who have not been reached by conventional banks, although the main challenges are regulatory aspects and sharia compliance. Putra (2023) stated that fintech innovation has become a key factor in improving the competitiveness of Islamic banks, where banks that are able to integrate fintech effectively tend to experience increased operational efficiency and customer service, but must face risks related to cybersecurity and regulatory complexity. Farihah et al. (2024) found that while fintech offers many benefits, there are concerns regarding its impact on sharia compliance, emphasizing the importance of cooperation between regulators, scholars, and industry players to ensure technological innovations remain in line with Islamic law. Syahwildan & Damayanti (2022) showed that fintech adoption significantly affects the financial performance of Islamic banks, especially in terms of increased profitability and cost efficiency, but also highlighted the need for vigilance against potential risks such as regulatory uncertainty and operational risks related to new technologies (Syahwildan & Damayanti, 2022). Finally, Shofawati (2023) discusses that Indonesian Islamic Banks have successfully implemented several fintech innovations that improve service quality and financial inclusion, but the main challenges faced are maintaining a balance between innovation and sharia compliance and managing risks related to the adoption of new technologies, especially in terms of data security and regulation.

This research has significant novelty because, although many studies have examined the adoption of financial technology (fintech) in Islamic banking, none has comprehensively analyzed how Bank Syariah Indonesia (BSI) North Sumatra Regional Office specifically manages the balance between technological innovation and sharia compliance amidst dynamic financial ecosystem changes. Previous studies tend to focus on aspects of fintech adoption in general or its impact on financial performance without linking in-depth to the regulatory, cybersecurity risk, and sharia compliance challenges faced by BSI as the largest Islamic banking entity in Indonesia. This research highlights the state-of-the-art by integrating the analysis of opportunities and risks in the context of strict regulation and sharia compliance, which has not been widely discussed in previous studies, thus making an important new contribution to the Islamic banking and fintech literature.

The focus of this article is on how Bank Syariah Indonesia (BSI) North Sumatra Regional Office implements financial technology (fintech) innovations in its operations, particularly in the face of opportunities and risks arising from changes in the increasingly digital financial ecosystem. This research highlights the challenges BSI faces in maintaining a balance between utilizing fintech to improve efficiency and financial inclusion, as well as ensuring that the innovations implemented remain compliant with sharia principles and applicable regulations. In addition, the article also focuses on how BSI manages risks related to cybersecurity and sharia compliance in an evolving technological environment.

The first objective of this study is to analyze how Bank Syariah Indonesia (BSI) North Sumatra Regional Office implements financial technology (fintech) innovations in its banking operations, with a focus on identifying opportunities generated by such innovations in improving the bank's efficiency, financial inclusion, and competitiveness in an increasingly digital marketplace. The second objective is to evaluate the risks arising from the adoption of fintech, specifically related to compliance with sharia principles, regulation, and cybersecurity, and how BSI manages these risks in the face of a changing and dynamic financial ecosystem.

Methods

The research method used in this article is a qualitative case study method, which aims to deeply analyze the implementation of financial technology (fintech) innovation in Islamic banking, focusing on Bank Syariah Indonesia (BSI) North Sumatra Regional Office as the object of research. This approach was chosen to explore in detail the specific context and dynamics that occurred in the fintech adoption process by BSI North Sumatra Regional Office, as well as how the bank faced opportunities and risks arising from changes in the financial ecosystem. The data used in this study consisted of primary and secondary data. Primary data was obtained through in-depth interviews with management and staff of BSI North Sumatra Regional Office who are directly involved in the development and implementation of fintech. Meanwhile, secondary data was collected from various sources, such as BSI's annual reports, regulations related to fintech and Islamic banking, and relevant academic literature (Creswell & Poth, 2018).

Data collection techniques included interviews, participatory observation and document analysis. Interviews were conducted in a semi-structured manner to provide flexibility in exploring issues that arose during the research process. Participatory observation was conducted by attending several activities related to fintech implementation at BSI North Sumatra Regional Office. Document analysis involved reviewing BSI's internal policies and procedures, as well as official publications related to fintech regulations in Indonesia. The data obtained was then analyzed using thematic analysis techniques, where key patterns and themes related to fintech implementation and risk management were systematically identified and categorized. This approach was taken to comprehensively understand how BSI North Sumatra Regional Office integrates fintech into their operations while maintaining compliance with sharia principles and facing regulatory challenges (Miles et al., 2014; Patton, 2014).

Results and Discussion

Implementation of Financial Technology Innovation in Islamic Banking at BSI North Sumatra Regional Office

The implementation of financial technology (fintech) innovation in the operations of Bank Syariah Indonesia (BSI) North Sumatra Regional Office is a strategic step taken to strengthen the bank's position in the midst of increasingly competitive banking competition. BSI North Sumatra Regional Office has various types of fintech, including digital payments, mobile banking, and peer-to-peer financing platforms that comply with sharia principles. One significant innovation is the development of a mobile banking application that provides basic banking services such as fund transfers and bill payments, as well as features that support sharia-based transactions, such as zakat calculators and digital waqf features. This innovation aims to improve the bank's operational efficiency by reducing reliance on conventional services at branch offices and expanding service coverage to areas that are difficult to reach by traditional banking infrastructure,

This is in line with the results of interviews with informants from this study, the following are the results of the interviews:

"BSI implements an adaptive strategy in keeping up with the times to provide services that are more efficient and easily accessible to customers. This step is taken so that more and more customers are interested in using BSI services." (Interview with Sahman, Retail Sales Executive of Bank Syariah Indonesia, 2024).

BSI North Sumatra Regional Office has also utilized blockchain technology to improve the transparency and security of sharia transactions. This technology offers innovative financial

products in line with market needs, such as smart contracts for Islamic financing. The use of blockchain increases customer trust in BSI and reduces operational costs through the automation of transaction verification and authorization processes. Thus, BSI can offer more competitive products and services, increasing its competitiveness in the Islamic banking market.

This is in line with the results of interviews with informants from this study, the following are the results of the interviews:

"In the face of a changing and increasingly digitized financial ecosystem, BSI sees a great opportunity to increase its presence in the market. This digital transformation expands BSI's competitiveness in the Islamic banking industry although it also poses new challenges." (Interview with Sahman, Retail Sales Executive of Bank Syariah Indonesia, 2024).

The implementation of fintech by BSI North Sumatra Regional Office has a significant impact on financial inclusion. Through service digitization, BSI has managed to reach more customers, including in areas that previously did not have easy access to banking services. The fintech-supported financial inclusion program helps BSI increase the number of new customers, especially from segments of society that have not been served by conventional banks. This innovation supports the Indonesian government's vision to increase national financial inclusion, especially among the Muslim community.

This is in line with the results of interviews with informants from this study, the following are the results of the interviews:

"To ensure that fintech innovations remain compliant with sharia principles, BSI presents sharia-compliant features and tries to minimize conflicting practices, such as the elimination of interest." (Interview with Sahman, Retail Sales Executive of Bank Syariah Indonesia, 2024).

The importance of fintech is not only in expanding access to banking services, but also in improving financial literacy. BSI North Sumatra Regional Office, through various fintech initiatives, is able to provide better financial education to its customers, especially through easily accessible digital platforms. This education includes a basic understanding of sharia financial products, the benefits of saving, and personal financial management. Thus, fintech not only serves as a tool to expand access, but also as a means of improving the quality of customer interaction with banking services, encouraging more responsible financial behavior.

This is in line with the results of interviews with informants from this study, the following are the results of the interviews:

"Fintech technology has contributed significantly to improving BSI's competitiveness. According to BSI, this contribution reaches around 90%, providing a strong impetus in expanding the market and improving efficiency." (Interview with Sahman, Retail Sales Executive of Bank Syariah Indonesia, 2024).

In addition, BSI's adoption of fintech to offer more inclusive financial products, such as microfinance products that can be accessed through digital platforms. These products are specifically designed to meet the needs of previously underserved market segments, such as micro, small, and medium enterprises (MSMEs). With the ease of access offered by digital technology, MSMEs can more easily obtain financing that complies with sharia principles, without having to face complex procedures such as in conventional banks. This not only helps improve financial inclusion, but also encourages more equitable economic growth in various walks of life.

The adoption of fintech offers inclusive products such as microfinance through digital platforms, which are designed to meet the needs of MSMEs. The ease of access offered by digital technology helps MSMEs obtain financing according to sharia principles without having to go through complex procedures. Fintech also uses data analytics to understand customer needs more deeply, improve customer satisfaction, and strengthen BSI's position in an increasingly competitive market.

This is in line with the results of interviews with informants from this study, the following are the results of the interviews:

"One of the biggest risks in fintech implementation is cybersecurity threats, such as hacker attacks. BSI is committed to protecting customer data by tightening security and maintaining information privacy." (Interview with Sahman, Retail Sales Executive of Bank Syariah Indonesia, 2024).

The utilization of data analytics by Bank Syariah Indonesia North Sumatra Regional Office in the context of fintech is not only limited to improving customer service, but also contributes to more informed strategic decision-making. By collecting and analyzing data from various digital sources, BSI is able to identify trends and patterns in customer behavior previously unseen by conventional methods. For example, it analyzes big data to design more effective and efficient marketing campaigns, targeting customer segments that are most likely to need specific sharia products. In addition, data analytics also assist BSI in designing more innovative financial products, such as financing packages tailored to the financial cycle of individuals or certain business segments, so as to meet customer needs more specifically and relevantly.

This is in line with the results of interviews with informants from this study, the following are the results of the interviews:

"BSI continues to develop internal regulations in accordance with sharia guidelines and adjusts the technology used to stay in line with the sharia values that are prioritized." (Interview with Sahman, Retail Sales Executive of Bank Syariah Indonesia, 2024).

The utilization of data analytics at BSI North Sumatra Regional Office helps make more informed strategic decisions. By collecting and analyzing data, BSI is able to identify trends and patterns of customer behavior that support more effective marketing campaigns and innovative product designs. The use of data analytics is also to improve risk management through predictive analysis, such as early detection of potential bad debts or high-risk customer behavior, so that preventive measures can be taken more quickly.

This is in line with the results of interviews with informants from this study, the following are the results of the interviews:

"Regulations play an important role in shaping innovation at BSI. BSI strives to implement innovations in accordance with MUI's fatwa to ensure compliance with sharia principles." (Interview with Sahman, Retail Sales Executive of Bank Syariah Indonesia, 2024).

In addition, BSI's ability to personalize services based on data analytics gives it a significant competitive advantage in the market. In an era where customers increasingly expect services tailored to their needs, personalization is a key element in increasing customer loyalty. For example, BSI can use data to send relevant product offers at the right time, such as education financing offers when data shows customers have children entering school age. Such personalization not only improves the customer experience, but also increases the chances of product sales conversion, which in turn contributes to increased bank profitability.

This is in line with the results of interviews with informants from this study, the following are the results of the interviews:

"In an increasingly complex digital era, BSI protects customer data by maintaining its confidentiality and strengthening cybersecurity to prevent threats that may arise." (Interview with Sahman, Retail Sales Executive of Bank Syariah Indonesia, 2024).

The ability of BSI North Sumatra Regional Office to personalize services based on data analytics provides a competitive advantage in the market. Personalization, such as offering education financing at the right time, not only improves the customer experience but also increases the chances of product sales conversion. The challenge ahead for BSI is how to utilize these data analytics while maintaining sharia principles, especially regarding the privacy and confidentiality of customer data (Syahwildan & Damayanti, 2020).

Risk Management and Sharia Compliance in the Adoption of Financial Technology at BSI North Sumatra Regional Office

Risk management and sharia compliance are crucial aspects in the adoption of financial technology (fintech) by Bank Syariah Indonesia (BSI) North Sumatra Regional Office. In implementing fintech, BSI North Sumatera Regional Office faces various risks that need to be managed carefully to ensure that the bank's operations remain in line with sharia principles and applicable regulations. One of the main risks is the potential violation of sharia principles, such as the occurrence of riba, gharar, and maisir in digital transactions. To address this risk, BSI has implemented strict control mechanisms, including involving the Sharia Supervisory Board (DPS) in every stage of fintech product development. The DPS plays an important role in assessing and ensuring that all technological innovations adopted, such as smart contracts and blockchain, comply with Islamic law (Ismail, 2019).

This is in line with the results of interviews with informants from this study, the following are the results of the interviews:

"BSI protects customer data by keeping it private and strengthening overall cybersecurity. Strengthening cybersecurity is already complex because by strengthening it, the network becomes more secure overall. In addition, BSI involves all stakeholders and IT teams to monitor threats, and sanctions those who try to damage or steal customer data." (Interview with Adli, Retail Sales Executive of Bank Syariah Indonesia, 2024).

In addition to sharia compliance, BSI North Sumatra Regional Office also faces cybersecurity risks that are increasing along with the adoption of digital technology. The use of fintech opens the door for potential cyber-attacks, such as hacking of customer data or misuse of personal information. To manage this risk, BSI has implemented a sophisticated cybersecurity system, including data encryption, multi-factor authentication, and real-time activity monitoring. In addition, BSI also regularly conducts security audits and cyber-attack simulations to ensure that their systems are always ready for threats. These measures not only protect the integrity of customer data, but also increase customer trust in the digital banking services provided by BSIs (Khan & Bhatti, 2008).

Regulatory challenges are also a major concern in BSI's adoption of fintech. While fintech regulations in Indonesia continue to evolve, Islamic banks such as BSI must ensure that any innovations implemented not only comply with national regulations, but also conform to sharia principles. Existing regulations sometimes do not specifically accommodate the needs of Islamic banking, so BSI must work closely with regulatory authorities, such as the Financial Services Authority (OJK), to develop clearer and more relevant guidelines. BSI is also actively

involved in regulatory discussions and consultations to ensure that the interests of Islamic banking are represented in the development of fintech policies in Indonesia.

This is in line with the results of interviews with informants from this study, the following are the results of the interviews:

"BSI has a very good collaboration with fintech companies to provide solutions that make it easier for customers. We always try to provide what our customers need to make the most of fintech technology. This collaboration includes developing a modern and accessible transaction system, thus maximizing technology in the digital era." (Interview with Adli, Retail Sales Executive of Bank Syariah Indonesia, 2024).

To ensure that the technological innovations implemented remain in accordance with Islamic law and applicable regulations, BSI North Sumatra Regional Office conducts a comprehensive risk management approach that includes risk identification from the planning stage, continuous risk evaluation, and appropriate risk mitigation. This approach also integrates sharia principles in every aspect of risk management, including in the development of policies and procedures.

This risk management approach is not only limited to internal risk management, but also includes external collaboration with industry associations, such as the Indonesian Sharia Fintech Association (AFSI), where BSI shares best practices and contributes to the establishment of better industry standards. Through this engagement, BSI not only complies with existing regulations, but also influences the development of sharia-compliant fintech policies.

This is in line with the results of interviews with informants from this study, the following are the results of the interviews:

"BSI's biggest challenge is to keep up with technological developments while maintaining sharia principles. In facing competition, we must be ready to innovate so that fintech users understand technology while still prioritizing sharia values. BSI ensures that every technological innovation still prioritizes sharia principles so that people are increasingly aware of and benefit from Islamic banking services." (Interview with Adli, Retail Sales Executive of Bank Syariah Indonesia, 2024).

BSI North Sumatra Regional Office also applies the latest technology in risk mitigation, such as artificial intelligence (AI) and machine learning to predict and detect potential risks early on. These technologies are used to identify suspicious patterns in financial transactions, so that early indications of potential fraud or sharia violations can be detected. With the ability to analyze data in real-time, BSI can respond to threats more quickly and effectively (Nazara et al., 2024).

BSI North Sumatra Regional Office strengthens internal governance and supervision by establishing a special committee consisting of sharia, information technology, and legal experts. This committee is tasked with evaluating risks from various perspectives to ensure that any technological innovations adopted meet sharia standards and applicable regulations (Anagnostopoulos, 2018).

In an effort to improve transparency, BSI North Sumatra Regional Office regularly reports the results of risk evaluation and sharia compliance to stakeholders, including the Sharia Supervisory Board and regulators. This report includes risk-related findings, mitigation measures that have been taken, as well as follow-up plans to improve risk management in the future (Syahwildan & Damayanti, 2022).

Transparency and accountability in risk management and sharia compliance by Bank Syariah Indonesia (BSI) is one of the main pillars that support customer and regulator confidence in the bank's operations. In order to strengthen transparency, BSI not only reports risk evaluation results regularly, but also ensures that the entire risk management process is carried out with the principle of openness involving various stakeholders. This includes involving customers in the evaluation process, through a feedback loop to submit complaints or suggestions regarding the products and services they use. In this way, BSI can obtain information directly from customers about potential risks that may not be detected by internal systems, so that risk management can be carried out more proactively and responsively (Bechara & Schuch, 2021).

BSI North Sumatra Regional Office also developed a digital platform that allows stakeholders to monitor sharia performance and compliance in real-time. The platform provides regular reports and in-depth analysis of sharia risk and compliance, as well as automatic notifications that alert relevant parties of potential sharia violations.

To ensure that the reports submitted reflect actual conditions, BSI North Sumatra Regional Office implements periodic independent audits that assess the effectiveness of the risk management system. In addition, BSI also continues to improve risk literacy among staff through training programs and workshops that ensure all staff understand the risks faced by the bank and how to manage them according to sharia principles.

BSI also continuously strives to improve risk literacy among its staff through various training programs and workshops. These programs are designed to ensure that all staff, from management to operational levels, have a deep understanding of the risks faced by the bank and how to manage them in accordance with sharia principles. Through this capacity building, BSI not only ensures that risk policies are applied consistently throughout the organization, but also encourages a strong culture of transparency and accountability among staff. Thus, BSI is able to create a work environment that supports effective risk management, while strengthening the trust of customers and other stakeholders in the bank's performance.

Conclusion

Financial technology (fintech) innovation in Islamic banking, as implemented by Bank Syariah Indonesia (BSI) North Sumatra Regional Office, shows great potential in improving operational efficiency, financial inclusion, and competitiveness amidst the changing financial ecosystem. BSI North Sumatra Regional Office has successfully utilized various types of fintech, ranging from digital banking to blockchain, to offer products and services that better suit customer needs while still adhering to sharia principles. This success has come despite significant challenges, particularly related to risk management, sharia compliance and cybersecurity. Through a comprehensive risk management approach and active regulatory engagement, BSI North Sumatra Regional Office is able to manage these risks effectively, ensuring that the innovations implemented provide maximum benefits to customers without violating sharia principles or applicable regulations. This confirms BSI North Sumatra Regional Office's position as a leader in Islamic banking in Indonesia that is able to adapt and grow in the digital era.

Although this research provides an in-depth insight into the implementation of fintech in Islamic banking at BSI North Sumatra Regional Office, there are some limitations that need to be noted. First, this research focuses on one case study, namely BSI North Sumatra Regional Office, so the findings and conclusions may not be fully applicable to other Islamic banks in Indonesia that have different operational contexts and challenges. Secondly, the analysis conducted is largely based on qualitative data, so the results may be limited in terms of quantitative generalizability. For future research, it is recommended to conduct comparative

studies with other Islamic banks or incorporate quantitative approaches to enrich the findings and strengthen the validity of the resulting conclusions.

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