

APPLICATION OF FINTECH FOR A MODERN ISLAMIC FINANCIAL INDUSTRY: CHALLENGES AND PRACTICAL SOLUTIONS

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Abstract: Fintech can be defined as a digital financial service by using sophisticated technologies through software systems. This paper aims to define Fintech in an understandable definition. This study also attempts to find out the challenges of Fintech application in the modern Islamic financial industry. Then, practical solutions are recommended in this paper to address the arising current challenges to ensure the maximization of Fintech usage in a modern Islamic financial industry. This paper relies on past literature, past studies, published reports, online news, and official website portals related to the topic. The qualitative method is used for this study by reviewing the collected past literature reviews to achieve the objective of the research. Hence, the findings revealed that there are 12 challenges of Fintech application encountered by the Islamic financial industry; ; (1) Regulation framework; (2) Human resources; (3) Sharia-compliant issue; (4) Security risk; (5) High competition from Fintech Firms; (6) Clients' and Investors' trust; (7) Adaptation of new Fintech tools; (8) Government support; (9) Lack of IT skills by the client; (10) Lack of technology and capital venture; (11) Islamic Financial Business Model and its management; and lastly (12) Penetration of international market. Next, practical solutions are suggested for every Fintech challenge to achieve the second research objective of this paper. The practical solutions are targeted to the national and global policymakers. This paper helps to improve Fintech usage in the Islamic financial industry with the latest sophisticated technologies to be able to sustain in the market while maintaining its reputation.

Keywords: Fintech, Islamic finance industry, Challenges, Practical Solutions

A. INTRODUCTION

In the Islamic financial industry, all the financial transactions and financial products provided by Islamic financial institutions are sharia compliant. This means that Islamic finance prohibits uncertainty such as unclear financial transactions, prohibition of interest rates such as interest rates on debts, and the prohibition of investment in forbidden sectors such as gambling, alcohol, tobacco, drugs, and other prohibited activities in Islam. Conversely, Islamic finance encourages asset-backup in the financing, profit markup, risk sharing, transparency of business activities, and fairness. Nowadays, Islamic finance is growing rapidly due to the rapid growth of the Muslim population as Islam is the second largest religion in the world, and this has resulted in high demand for Islamic finance all over the world.

The global Islamic finance industry is expected to grow up to 12% within 2021-2022 due to the increase in the issuance of Islamic bonds (Sukuk) (Barbuscia, 2021). Despite of Covid19 pandemic where many sectors had been affected badly, especially manufacturing and tourism sectors, the Islamic finance industry kept growing at a commendable rate because of the Fintech adoption in the industry to ease the customers and investors to access the transactions through digital platforms provided by the Islamic financial institutions. By adopting the Fintech concept, it is recorded that US\$3.374 trillion of Islamic finance assets in the industry in 2020 compared to US\$2.88 trillion in 2019(Dar Al Sharia, 2021), and it is expected to rise to US\$4.95 trillion in 2025(Refinitiv LSEG (London Stock Exchange Group), 2021). Fintech is vital in daily life to prevent the customers from queuing for hours at banks and ease them to check their financial transactions within some clicks through gadgets. In addition to this, the bar graph below shows the growth of global Islamic finance assets from 2016 and the expected growth in 2025 by adopting Fintech in the system.

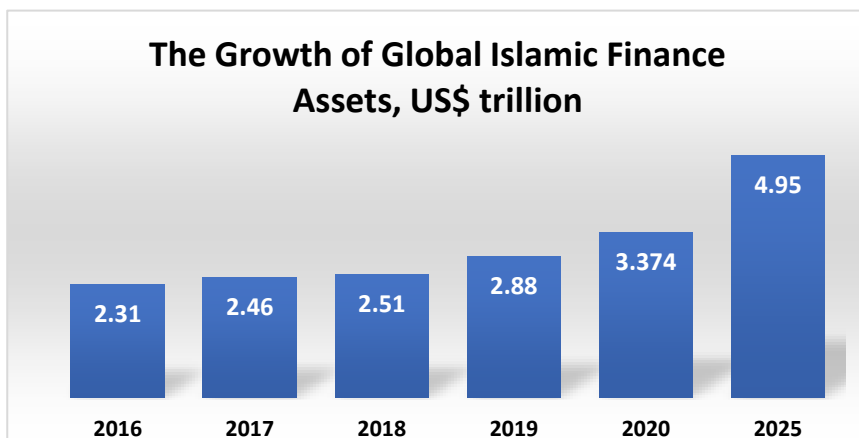


Figure 1.1: The Growth of Global Islamic Finance Assets, US\$
Source: Refinitiv Islamic Development Report, December 2021,
(Refinitiv LSEG (London Stock Exchange Group), 2021)

Based on the figure above shows that the usage of Fintech gives benefits to the Islamic financial industry, and it potentially could attract investors and customers to easily access the created system which is used the digital platforms in providing products and services. The rapid growth of this industry with a sophisticated Fintech system has widened the opportunity for Islamic finance practice around the globe and the non-Muslim majority countries such as Hong Kong, the United Kingdom, South Africa, and Luxembourg had opened the Islamic finance window by issuing Islamic bonds (Sukuk) due to high demands (Asian Development Bank, 2022). Despite of the opportunities, the application of Fintech in this industry is uneasy as it required a huge cost, expertise, professionalism, long-term consideration, and changes in the whole system.

Therefore, this paper attempts to reveal the fundamental challenges faced by this Islamic financial industry in applying Fintech into the system. This paper aimed to provide practical solutions for each challenge, so that the policymakers can innovate the existing to improve the industry towards a better user-friendly system for all internal and external users. The research problem of the Fintech application as mentioned above has created the research objectives in this paper. The research gap of this paper is to provide new and updated practical solutions for a future sophisticated system that encourages the industry to use the paperless method as a green banking system for sustainability banking.

Generally, Finance Technology (Fintech) is a remodeling process of financial service by using sophisticated technologies through software systems such as online banking, mobile payment apps, blockchain, and other digital payment methods. Meanwhile, Fintech can also be defined as the application of modern and innovative technology in financial services with high security (Rabbani, Khan & Thalassinis, 2020). However, Islamic Fintech is sophisticated finance technology deployed by Islamic financial institutions in providing financial services designed to comply with sharia. Islamic Fintech has grown rapidly in the Organization of Islamic Countries (OIC) amounting to US\$49 billion in financial transactions in 2020.

The application of Islamic Fintech is not only to ensure the sharia-compliant products but also to monitor the institution in addressing some issues related to the Muslim population that required the compliance of sharia principles with easy payment process such as remittance payment from one country to another country (Rahmatulloev, 2021). Through a creative Fintech system, it eases all the financial transactions in the industry with cheaper costs, and easy processes rather than using the traditional processes. Hence, this paper also aimed to define Fintech and Islamic Fintech in an understandable definition.

B. LITERATURE REVIEW

Definition of Fintech and Islamic Fintech

Fintech was traceable in the 19th century as a first stage (Fintech 1.0), where a device known as Pantelegraphy was developed and transatlantic cables were designed as a network. Next, Fintech 2.0 started when Barclay introduced the ATM machine in 1967, the NASDAQ stock market was set up in 1971, SWIFT transaction was created in 1973, and cashless payment PAYPAL in 1998. Fintech kept growing rapidly to the next stage, Fintech 3.0 by introducing cryptocurrency and bitcoin after the 2008 financial crisis. Then, Fintech 3.5 emerged in the year of 2014 to 2018 such as Alipay, financial software and, the electronic market payments rate soared upwards. Last stage, Fintech 4.0 which is started in 2018 until now which has launched all the financial services electronically and created blockchain as Fintech commercial model (FINTICA, 2021). So, there are five stages of Fintech evolution until now and it grows from decade to decade due to the changes in our global economic environment and financial crisis. Other reasons for Fintech development are easy to access, providing better services, easy monitoring, cheap price, and saving time.

The Financial Services Board has defined Fintech as technology that is able to be innovated into financial services to create a new process, new models, new applications, and new products which affected the provided services (Yateem, 2019, p.10). Mufti Faraz Adam defined Fintech as a system with systematic complex techniques and high knowledge through a creative, innovative, and disruptive process to operate an efficient financial transaction, whereas Islamic Fintech acts the same but complies with the Sharia regulation (Adam, 2021). Thus, Fintech can be defined as services provided by financial institutions which required the application of software

and technology to deliver its services to the customers as well as act as a financial solution.

However, Islamic Fintech is an application of software system into financial services by complying with the regulation and principles of sharia such as online international transfer payments via mobile banking (Desai, 2019). In other words, it is referring to the latest modern technologies such as artificial intelligence, robotics, 5G, blockchain, and other software that can improve Islamic financial services (Lajis, 2022). Somehow, Hassan, Rabbani & Mohd.Ali,(2020) defined Islamic Fintech as the delivery of digital products and services by using the current technology and any permitted Fintech must not violate the sharia rules. Moreover, the innovation of Fintech is encouraged in Islam if there are no such prohibited elements and unclear processes. Hence, in simple words, Islamic Fintech is a delivery of digital financial service by Islamic financial institutions using the latest modern software technology, user-friendly, and does not include forbidden elements in Islam.

Challenges of Fintech Application in Islamic Financial Industry

The application of Fintech into the Islamic financial system required a deep observation and detailed consideration from the scholars and financial experts to ensure the adoption of current technology into the services is not contradict Sharia rules. Undeniably, the adoption of the new technology of Fintech into the Islamic financial system eases the transaction process, more transparent, disclosure, and effective costs, increases the public trust, and saves time but, there are some challenges encountered by the Islamic financial institutions in the industry in applying the Fintech. Lestari & Rahmanto, (2021)found out the fast growth of Fintech with new innovative technology can disrupt the financial sector if the financial institution has poor management strategy and weak regulation by policymaker. Additionally, the financial institution is positively responsive, competitive, and innovative towards any challenges of the new Fintech tools. Unresponsive financial institutions towards the current development of Fintech will seize its reputation, which will cause public distrust, and the Fintech companies will get rid of all the financial institutions easily.

Another study highlighted a lack of research about Islamic Fintech, unskilled staff, unstable government, improper sharia decision-making, hackers, and low confident level of investors among the challenges of

Fintech in the Islamic financial industry (Rabbani et al., 2020). Meanwhile, the fragility of cyber security, weak regulatory of Fintech, high competition of Fintech companies, customer trust, decrease in market share and increase in customer churn rate are the fundamental challenges of Fintech adaption(Saba, Kouser & Chaudhry, 2019). These statements supported by Ebrahim, Kumaraswamy & Abdulla,(2020); Rahman, Rahiman, Meero & Amin, (2022)where the studies figured out the responsiveness of financial institutions towards new adaptation of Fintech advancement, cyber-attack problem, Fintech regulation, maintaining the talented staffs and unskilled staffs are among the challenges encountered by financial institutions. In the meantime, the regulatory environment and regulation of Fintech are the critical challenges faced in the industry and therefore, review, innovate and enact the new existing regulatory framework to ensure the modern technology is compatible with the transactions including its transparency and disclosure (Islamic Financial Services Board, 2017).Besides that, according to Yateem, (2019), the Islamic financial industry encountered some challenges in adopting Fintech such as unsophisticated staffs and clients, financial risks on a huge amount of transaction, highly competitive with Fintech companies, breach of data privacy that led to the cybercriminal, and uncontrollable regulation if it is beyond the regulatory boundaries in the event money laundering.

All these challenges can be addressed with the interference of policymakers to control all scope of financial transactions in a country with a digital security defense system, and strict digital regulation. However, Islamic Financial Services Industry Stability Report 2017 clarified in its annual report that the usage of Fintech helps the financial institution in reducing the risks, lowering the effective cost, no involvement of intermediary in lending, advance access of various funding options for small and medium enterprises (SMEs), and shorten the processing time of the financial transaction(Islamic Financial Services Board, 2017).Fintech is very useful, especially during the Covid19 pandemic where all the transactions and processes are compulsory to do by online or using modern platforms or Apps such as Finterra crowdfunding, and QR Scan Code due to Movement Control Order to prevent the spreading of deadly coronavirus. Thus, a study proposed Islamic Fintech Model for post Covid19 which is divided into three stages, short-term, medium-term and long-term recovery by applying Fintech to sharia contracts such as artificial intelligence in

zakat, crowdfunding in sadaqa, waqf blockchain, qardhassan P2P lending, and smart contract in sukuk (Hassan et al., 2020; Rabbani, Bashar, Nawaz, Karim, Mohd Ali, Rahiman, & Alam, 2021). Indeed, the adoption of Fintech gives benefits to all industries including the Islamic financial industry and eases all the processes within some clicks on a mobile phone or any gadgets that required the internet.

Conversely, the usage of Fintech affects the industries too especially in the Islamic financial industry where the scholars need to ensure its transparency, its processes, and its invisible transactions are sharia compliant without harming the whole system. Legal issues, security issues such as cyber-attacks, sharia-compliant issues, changes in technology infrastructure, and the perception of experts are the most common challenges faced in the industry (Alaeddin, Dakash, & Azrak, 2021). Meanwhile, Dawood, Al Zadjali, Al Rawahi, Karim, & Hazik (2022); Elasarag, (2019) highlighted the interference of government, underdeveloped ecosystem including the market players, uncertain Fintech regulation, unstandardized system, weak security to protect the privacy data, high costs to implement the technology, lack of expertise by employees, and weak software development tools are among the challenges too. Other studies by Akdeniz, (2022); Krishna Priya & Anusha, (2019) found out uneasy to enter the market due to very restricted regulation, poor internet connection, elderly people who are unfamiliar with online transactions, exposure to frauds, government support, and clients' trust are the major problems that contributed to the challenges. The challenges mentioned above had happened in the Islamic financial industry and thus, precautions and deep observation shall be considered carefully to ensure it gives benefits to both sides, customers, and Islamic financial institutions side.

Likewise, Islamic Fintech tools such as blockchain, online banking, QR Scan Code, credit card, PayWave debit card, smart contract, crowdfunding, artificial intelligence, and P2P lending as mentioned above are used in current days. Prior to the application of these tools in the Islamic financial industry, the industry faced some challenges such as various interpretations from scholars, unclear *Fatwa*, and no official sharia standardization for all the *madhab* (Dahdal, Truby, Ismailov, 2022). Over and above, lack of talented labor from university, stability of a nation, lack of policies, no accelerators, less of venture capital, poor security, and lack of technology cooperation are the obstacles that hindered the establishment

and execution of Fintech (Alswad & Saleh, 2020). Mehrotra & Menon, (2021) also agreed that lack of skills by human resources, unclear Fintech regulation, and adaptation of new Fintech tools are significant problems that need to be addressed. The Islamic financial institutions can adopt new comprehensive strategic planning by using Fintech advancement, create a new digital security system to control the financial data movement to protect from hackers, provide regular training to the staff, a strict discussion between scholars to issue Fatwa, and adoption of digital regulation to ensure the consistency of financial institutions' reputation in the eyes of public.

Meanwhile, Albarrak & Alokley, (2021) clarified that Fintech for startups faced some obstacles such as improper regulation, limited training of human resources, unready to penetrate the international market, impermissible to operate directly, and undiversified funding options. In addition to this, the empirical study showed that the Fintech startups are having difficulty accessing the financing, failed to adapt the Fintech due to a lack of skills, and failing in intangible assets management planning (Kijkasiwat, 2021). However, Hwang, Thorogood, & Toorn, (2022) identified six main challenges for Fintech in partnership with financial institutions: untalented staff in Fintech field, the lengthy financing process, weak business model, uncreative stakeholders, difficulty in market penetration due to market complexity, and improper management of the financial institution. Undeniably, the development of Fintech advancement has disrupted financial institutions and therefore, there is a positive relationship between the challenges faced by the industry and the adoption of Fintech in terms of business model, knowledge and skills, operating process, Compatibility of Information Technology (IT), varied management, security, investment market and unclear regulation Rahman, Ahmed, & Shakil, (2021). The past studies have shown many challenges faced by the industry in applying Fintech to benefit the modern world.

The establishment of new fintech is mostly developed and designed by developed countries with sophisticated facility tools available in their countries such as the United State of America, Hong Kong, China, and Japan. For developing and underdeveloped countries, it might take a long process time of adaptation and required a long time to make more improvements because of lack of expertise and shortage of sophisticated facility tools. However, it needs a deep observation to be implemented in

the Islamic financial industry to ensure its permissibility. Thus, this paper highlights the fundamental challenges of Fintech application for a modern Islamic financial industry and approaches practical solutions to address these new challenges.

C. RESEARCH METHODOLOGY

This qualitative paper is fully relying on secondary data from the past literature, past studies, published reports, online news, and official website portals related to the selected topic. The past literature and past studies are taken from 2019 up to the latest year, 2022. Twenty (20) past studies are collected with publication between 2019 to 2022 from various sources, such as Google Scholars, ResearchGate, SSRN, and Munich Personal RePEc Archive. Along with the past literature studies, two published annual reports, six sources from the official online finance news, and two official website portals of Fintech are collected for this paper. Most of the collected sources are published in 2020, 2021, and 2022. Microsoft Excel is used to analyze the Fintech data from the published report without copying from the original source. Hence, the table below shows the collected secondary data of past literature studies, the sources, and the year of publication.

Table 1.0: The Collection of Past Studies Related to Topic In Between 2019 to 2022

<i>Past Studies</i>	Sources	Publication Year
<i>1. Fintech and Islamic Finance-challenges and Opportunities</i>	Research Gate	2019
<i>2. Blockchains for Islamic Finance: Obstacles & Challenges</i>	Munich Personal RepEc Archive	2019
<i>3. Fintech Issues and Challenges in India</i>	Research Gate	2019
<i>4. The Challenges of Financial Technology in Libya Applied Study on The Stakeholders of Financial Technology</i>	Research Gate	2020
<i>5. FinTech in Banks: Opportunities and Challenges</i>	Research Gate	2020

6. <i>Challenges for The Islamic Finance and Banking in Post COVID Era and The Role of Fintech</i>	Research Gate	2020
7. <i>FinTech, Blockchain and Islamic Finance: An Extensive Literature Review</i>	Research Gate	2020
8. <i>Implementing the Blockchain Technology in Islamic Financial Industry: Opportunities and Challenges</i>	Research Gate	2021
9. <i>Fintech and Its Challenge for Banking Sector</i>	Research Gate	2021
10. <i>Exploring The Role of Islamic Fintech in Combating the Aftershocks of Covid-19: The Open Social Innovation of the Islamic Financial System.</i>	Research Gate	2021
11. <i>A Viewpoint of Islamic Financial Technology (I-Fintech) In Malaysia</i>	Google Scholars	2021
12. <i>Second Round of Fintech- Trends and Challenges</i>	Research Gate	2021
13. <i>FinTech: Ecosystem, Opportunities and Challenges in Saudi Arabia</i>	Google Scholars	2021
14. <i>Opportunities and Challenges for Fintech Startups: The Case Study of Thailand</i>	Research Gate	2021
15. <i>Fintech in Bangladesh: Ecosystem, Opportunities and Challenges</i>	Research Gate	2021
16. <i>The Role and Potential of Blockchain Technology in Islamic Finance.</i>	SSRN	2022
17. <i>Utilization of Fintech Applications during the Covid-19 Pandemic</i>	Google Scholars	2022
18. <i>FinTech Innovations and Islamic Banking Performance: Post pandemic Challenges and Opportunities</i>	Google Scholars	2022
19. <i>Business Trends & Challenges in Islamic Fintech</i>	Google Scholars	2022
20. <i>The FinTech Perspective on Banks: Collaboration, Challenges and Recommendations</i>	Google Scholars	2022

Source: Compilation by Author

D. FINDINGS AND DISCUSSION

The past literature studies are collected up to the latest year as shown in Table 1.0 to evaluate the current challenges encountered by Islamic financial industry towards the application of Fintech advancement to benefit the current needs and fulfill customer satisfaction. The findings are observed based on the selected 20 past studies related to the topic. The findings will fill in the research gap where it provides the latest major challenges faced by the Islamic financial industry and contributes practical solutions to the policy makers for Islamic Fintech improvement. The compilation of past studies regarding the current fundamental challenges faced by the Islamic financial industry is summarized and discussed in the figure below for a clear result.

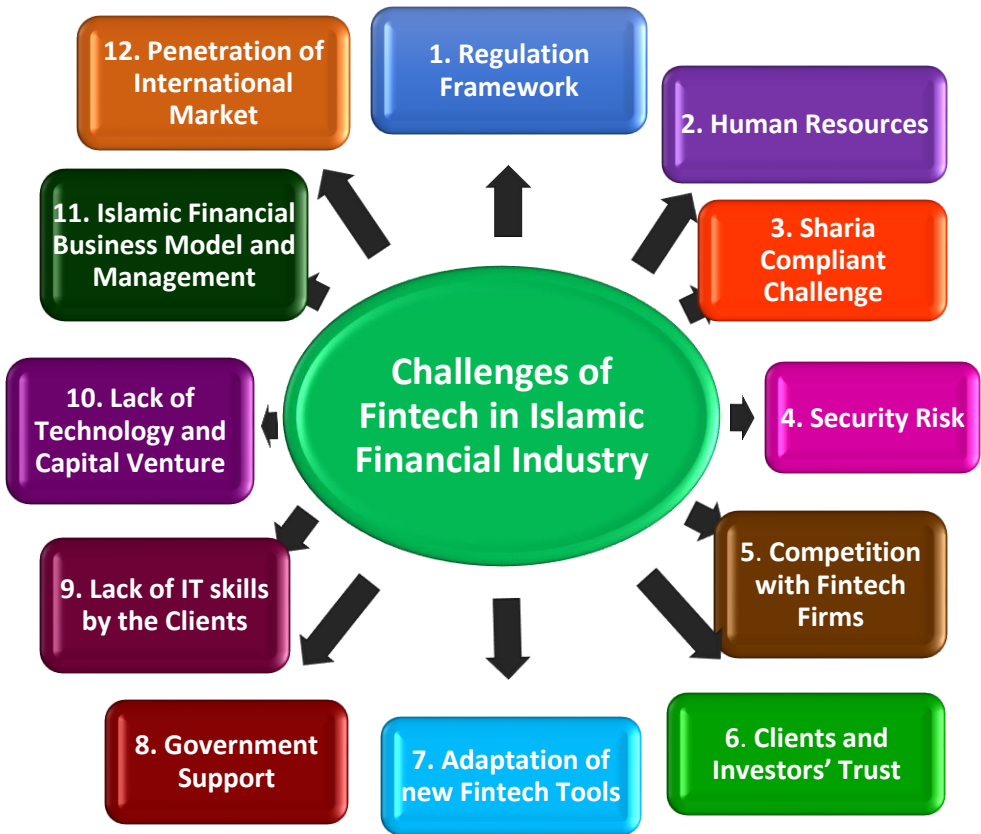


Figure 1.0: Current Challenges of Fintech Encountered by Islamic Financial Industry

Source: Figure Is Prepared Based on Literature Review Analysis, Compilation by Author

As in figure 1.0 above, it shows 12 current challenges of fintech application in Islamic financial industry and therefore, each challenge will be discussed in detail in this section.

1. Regulation Framework

A restricted and clear Fintech regulation framework helps to address all the sharia issues pertaining to the legality and permissibility of Fintech tools. It also prevents the breach of security privacy data by hackers. Policymakers such as Central Bank and the government shall concern about the Fintech regulation to protect the country's data from being breached by international hackers, and to avoid from being a cybercriminal victim. Weak, unrestricted, unclear, and uncertain Fintech regulation framework, and improper Fintech regulation policies are the major challenge faced by the industry including the Islamic financial industry. Somehow, Krishna Priya et al., (2019) highlighted that a very strict Fintech regulation framework can cause difficulty for the market players, and investors to penetrate the market because they need to follow many complicated procedures for a long processing time.

2. Human Resources

Living in the modern world, employers and employees are required to have good IT skills including the skill in using the modern advanced Fintech tools. Most of the staffs lack of IT skill to adapt with the Fintech advancement tools because they get used to the traditional transaction method. Unskilled staff in the Fintech field can cause the wrong key in data, wrong financial data transfer, incorrect account calculation, and unable to explain the digital services to the clients. Nevertheless, strong IT skills and skilled staffs help to improve the performance of a financial institution but maintaining them in the institution is one of the challenges (Ebrahim et al., 2020). Hence, the employers must provide a good salary and comfortable workplace to maintain the talented staff in the institution.

3. Sharia Compliant Challenge

Improper sharia decision-making, different interpretations by the scholars, unclear issuance of Fatwa, unstandardized Sharia rules, and no official Islamic Fintech standard for all the Madhabs are among the sharia issue faced by the Islamic financial industry. Vary interpretations by the

scholars due to different Madhab and this required the official Islamic Fintech standard from the Islamic Financial Services Board (IFSB), Organization of Islamic Countries (OIC) Fiqh Academy, and Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI) to enable the scholars to follow the rules without debating and pointing fingers at each other. Thus, the issuance of a Fatwa in a country must be clear and based on the global Islamic standard of regulation. Islam encouraged the innovation of Fintech. If the processes clearly contradicted the sharia rules, so, it is totally impermissible to practice in the industry because the Islamic finance industry prioritized ethical values and fairness in business transactions.

4. Security Risk

Indeed, digital financial transactions are exposed to fraud, cyber-attack, cyberbullying, and cybercriminal. Strong security digital system is compulsory for every Islamic financial institution to prevent the data from being stolen, scammers, breaching the privacy data, and hackers. For instance, 12 accounts of CIMB Berhad had been frozen, and increasing the account holders' debts. This happened due to the processing errors by the third party, and it is considered the bank's fault for breaching the privacy data of the account holders (Nambiar, 2022). Weak and fragile security are the main causes of the breach of privacy data by the hackers and increase the scammers' victims, especially the elderly.

5. Competition with Fintech Firms

Many Fintech companies had been established and it does not require a financial institution for processing the documentation. For instance, Hello Gold Apps enable clients to buy digital gold electronically and save e-gold in account by using online transaction and smartphones. High competition from Fintech companies can seize the reputation financial industry including the Islamic financial industry because it can provide convenience and fulfill the current needs of customers. Hence, the emergence of Fintech companies can get rid of the function of financial institutions.

6. Clients and Investors' Trust

Obtaining the client's and investor's trust is a challenge faced by the Islamic financial industry because the major business of Islamic financial institutions is taking deposits and providing financing (Hassan et al., 2020;

Krishna Priya & Anusha, 2019; Saba et al., 2019). The transparency and disclosure of Fintech services provided by the institution can gain the client's trust and increase the involvement of investors in the market share. However, the traditional transaction method and complicated procedure process of the Fintech financing services will make the client and investor distrust the financial institutions and they might prefer to invest and deposit their money to the trusted Fintech companies.

7. Adaptation of new Fintech Tools

Weak development of software technology, the responsiveness of the Islamic financial industry towards the Fintech advancement tools, the absence of acceleration, difficulty to access the financing, and compatibility of IT are among the challenges faced by the industry to adapt to the new Fintech tools. The Fintech infrastructure and its processes are changing from time to time according to the changes in the technology ecosystem including the trends of market players. Therefore, a positive response from the Islamic financial industry is obligatory to ensure the compatibility the Fintech usage in providing the services and the efficiency of Fintech services to the clients. For instance, the robot chatbot can ease the client to engage with the financial institution in an easy way rather than calling of busy line or walking in through appointment.

8. Government Support

Government support in terms of restricted regulation and policy is needed to address the rising problems. The financial system in a country will collapse without sufficient support from the government. The government can provide free training to the staff to help them to be more proficient in using the Fintech tools and promotion through TV advertisements to educate the public about the current Fintech tools. Anyway, a nation's political stability also has a significant impact on the development of Fintech advancement (Alswad et al., 2020; Hassan et al., 2020). Most of the developed countries with national political stability have made significant improvements on Fintech compared to underdeveloped countries where conflicts happen frequently.

9. Lack of IT skills by Clients

The Covid-19 pandemic has forced everyone to use the internet for mobile banking, online buying groceries, and other digital payment transfers such as E-wallet, and QR Scan Code. Despite saving time, and convenient and easy access online, but still, most of the elderly lack of IT skills because they did not get to use these online platforms and they preferred cash transaction methods. Thus, the elderly clients who lacked IT skills and knowledge are one of the challenges faced by the financial industry (Akdeniz, 2022; Krishna Priya et al., 2019). So, the application of Fintech in the Islamic financial industry is not fully utilized because the clients are lacked IT skills and knowledge. Indeed, they are unable to perform an online or digital payment transaction.

10. Lack of Technology and Capital Venture

Lack of technology and capital venture are the main obstacles that hindered the developing countries to develop Fintech (Alswad et al., 2020). Therefore, a joint venture is vital to sustaining the consistency of Islamic financial institutions and the Fintech companies. The joint venture in terms of technology and capital benefited the institutions on both sides. The public trusted the Islamic financial institution more than Fintech companies. By having a joint venture, the Fintech companies can gain the public trust and conversely, the Islamic financial institution can adopt the Fintech tools to provide inconvenient financing services to the clients. Contrarily, the conventional company can also adopt Islamic Fintech to provide halal financial solutions for clients. For instance, Manzil has adopted Islamic Fintech for startups specifically for home financing and investment funds, and it has successfully collected US\$1.91 million in seed funding (Dorbian, 2022).

11. Islamic Financial Business Model and Management

A comprehensive business framework model and systematic business management planning are important to sustain the business including the Islamic financial institution. Many companies failed to design a comprehensive business framework model to align with the emergence of Fintech. As a result, the companies failed to manage the business properly due to being unable to adapt with the Fintech and those companies suffer much. Poor business model framework and undiversified Fintech asset

management will cause a decrease in the involvement of investors, customers' difficulty to access the financing option, complexity in the operating process, and length of financing disbursement. The past studies also emphasized that business model and business management strategic planning are significantly related to the challenges of Fintech application in the industry (Hwang et al., 2022; Kijkasiwat, 2021; Rahman et al., 2022).

12. Penetration of International Market

The local Fintech companies are not brave enough to penetrate the international market due to a lack of confidence and knowledge. Albarrak highlighted that the local Fintech startups are unready to penetrate the international market is a challenge for the industry. Sometimes, the market players cannot penetrate the international market due to very strict Fintech regulations and procedures (Krishna Priya et al., 2019). Moreover, complexity in the international market has caused difficulty for the local Fintech to move internationally and the local Fintech capital sources are not enough to penetrate the international market (Hwang et al., 2022). Apart from this, Islamic financial institutions can penetrate the international market due to the high demands for Islamic finance products around the globe by issuing blockchain Sukuk or crowdfunding *Sadaqat*. Along with this issuance, it must be aligned with the Fintech and sharia compliance so that any controversies from the other Madhabs' scholars is avoidable.

Practical Solutions

Practical solutions are suggested in this section to address all the challenges of Fintech application in a modern Islamic financial industry. These solutions are applicable and executable by the national policymakers such as the government, Ministry of Finance, and the global policymakers for sharia rulings such as AAIOFI, IFSB, and OIC Fiqh Academy.

The national policymakers shall take serious actions to improve the national security from being breached by international hackers and develop advanced Fintech aligned with the developed countries. As for global policymakers, it is important to enact a standardized Islamic Fintech regulation with an official Fatwa to avoid wrong, and different interpretations by the scholars from different Madhabs. With a uniform standard of Islamic Fintech regulation, the Islamic experts can innovate

financial services in permissible ways and increase the Islamic finance performance in the industry.

Table 2.0 shows the practical solutions for national policymakers, the government, and the Ministry of Finance.

For National Policymakers (Government, Ministry of Finance)

<i>Challenges</i>	<i>Practical Solutions</i>
1. Regulation Framework	<ul style="list-style-type: none"> • Establish a national Islamic Fintech regulation framework • Restrict and update the regulation according to the changes in Fintech environment
2. Human Resources	<ul style="list-style-type: none"> • Provides a regular IT training for the staffs • Short Briefing and provide free seminar to empower Fintech knowledge
3. Sharia Compliant	<ul style="list-style-type: none"> • Establish a national sharia financial screening • Issuance of Fatwa by the National of Fatwa Committee
4. Security Risk	<ul style="list-style-type: none"> • Establish a strong national cybersecurity defense system • Strengthen the Anti Money Laundering Act Regulation to detect illegal finance activities in a country • Penalty to the staffs who breached the security of privacy data
5. Competitive Fintech Firms	<ul style="list-style-type: none"> • Islamic financial institutions shall adopt the latest Fintech into the services such as <i>qardhassan</i> P2P lending • Provide convenient in accessing the financing

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|---|---|
| 6. Clients' and Investors' Trust | <ul style="list-style-type: none">• Give dividend or bonus to the investors• Distribute <i>Hibah</i> or saving dividend for depositors of account saving or rebate for early settlement |
| 7. Adaptation of New Fintech Tools | <ul style="list-style-type: none">• Innovate the services using the latest technology such as credit card, PayWave debit card, e banking, Robot Chatbox, and other digital services |
| 8. Government Support | <ul style="list-style-type: none">• Enforce the regulation with strict action to the culprit• Free training to the civil servants• Promotion of Fintech tools through TV shows or TV advertisements |
| 9. Lack of IT Skills by The Clients | <ul style="list-style-type: none">• The youngsters shall teach the elderly• Free online classes to educate the youngsters and elderly |
| 10. Lack of Technology and Capital Ventures | <ul style="list-style-type: none">• Joint venture between the Islamic financial institution with Fintech company or vice versa |
| 11. Islamic Financial Business Model and Management | <ul style="list-style-type: none">• Create a comprehensive Islamic financial business model with a strategic management planning.• Monitor the business framework and its business strategic plan monthly |
| 12. Penetration of International Market | <ul style="list-style-type: none">• Provide easy procedures to enable the Islamic finance industry entering the global market• Innovate a new unique model of Islamic finance that can be practiced globally |

Source: Author

Table 3.0 below shows the practical solutions for global policymakers
(AAIOFI, IFSB and OIC Fiqh Academy).

For global policymakers (AAIOFI, IFSB and OIC Fiqh Academy)

<i>Challenges</i>	<i>Practical Solutions</i>
1. Regulation Framework	<ul style="list-style-type: none"> • Establish Sharia Resolution in a publish report for all the current rising issues • Establish Global Sharia Standard for Islamic Fintech Regulation
2. Human Resources	<ul style="list-style-type: none"> • Provide free online learning for all global Sharia bankers
3. Sharia Compliant	<ul style="list-style-type: none"> • Frequent meeting with the scholars and shall get consent from other scholars in decision-making • Issuance the official global Fatwa
4. Security Risk	<ul style="list-style-type: none"> • Create a sharia global cybersecurity standard system
5. Competitive Fintech Firms	<ul style="list-style-type: none"> • Provide the sharia guidelines to the global Islamic financial industry to innovate their products that are user-friendly, and applicable for all companies
6. Clients' and Investors' Trust	<ul style="list-style-type: none"> • Demonstrate a clear process of Islamic Fintech tools such as blockchain or cryptocurrency with detailed explanation in a report
7. Adaptation of New Fintech Tools	<ul style="list-style-type: none"> • Monthly or Quarterly meeting to encourage the Islamic financial experts and sharia scholars to implement Islamic

	Fintech, so that it can benefit the current needs
8. Government Support	<ul style="list-style-type: none"> • *Not Available
9. Lack of IT Skills by The Clients	<ul style="list-style-type: none"> • *Not Available
10. Lack of Technology and Capital Ventures	<ul style="list-style-type: none"> • Provide a standard that enable the Islamic financial institution to collaborate with the Fintech company that does not engage with fraudulent, and prohibited elements
11. Islamic Financial Business Model and Management	<ul style="list-style-type: none"> • Create a comprehensive sharia standard guideline to ensure the sustaining Islamic finance business and its sharia-compliant business reputation
12. Penetration of International Market	<ul style="list-style-type: none"> • Enforce, amend, and update the Islamic Fintech regulation to enable the sharia products and services penetrate the international market

Source: Author

*Not Available means there is no practical solution for the government support challenge and the lack of IT skills by clients at the global policymaker. This is because the sharia global policymakers are unrelated in the case of political issues or government issue in a country. Moreover, the enrichment of IT skill for the client is fully depending on the government effort, and it has no relation with the global sharia standards.

E. CONCLUSION

Nowadays, Fintech is very important in the business modern world including the Islamic financial industry. Fintech provides online and digital financial services to fulfill customer satisfaction. Somehow, the absence of Fintech in the business model will seize the company out of the market. Even so, the application of Fintech is uneasy to execute due to some challenges arise that hindered the Fintech development in the Islamic financial industry. Thus, this paper is successfully identified the current challenges of Fintech application in the modern Islamic financial industry. This study focused on the qualitative method by reviewing 20 past literature studies related to the topic. The past literature sources are clarified vividly in the Methodology section with the latest publication, from 2019 to 2022. From the reviewing method, this study found 12 major challenges of Fintech application encountered by the industry, which are; (1) Regulation framework; (2) Human resources; (3) Sharia-compliant issue; (4) Security risk; (5) High competition from Fintech Firms; (6) Clients' and Investors' trust; (7) Adaptation of new Fintech tools; (8) Government support; (9) Lack of IT skills by the client; (10) Lack of technology and capital venture; (11) Islamic Financial Business Model and its management; and lastly (12) Penetration of international market.

Each of the challenges is explained clearly by the author in the Findings and Discussion section. Figure 1.0 also has been mapped in this section for a vivid simplification to achieve the objectives of this paper. Next, this paper contributes extensive practical solutions for the policymakers, nationally and globally to bring modernization into the industry aligned with the development of Fintech advancement. For the national authority bodies, this paper focused on the government and the Ministry of Finance whereas, AAI OFI, IFSB, and OIC Fiqh Academy at the global policymakers. Practical solutions are important and highlighted in this study to address the current challenges so that, the policymakers will make an advance move as soon as possible to improve the future usage of Fintech in the industry. Additionally, there is no practical solution for the 8th challenge (Government support) and the 9th challenge (Lack of IT skill by the client) at the global policymakers because these challenges are unrelated to the sharia standard guidelines issued by the global policymakers.

This paper is limited for 20 past literature studies only due to inaccessible of articles, and limited sources of related topic. No published book is collected for this paper because this paper based on past literature reviews, and most of the collected articles focused on Fintech challenges. The sources are collected from Research Gate, Google Scholars, SSRN and Munich Personal RePEc Archive. This paper is limited for Fintech challenges faced by the modern Islamic financial industry only and identified its practical solutions. Moreover, there is no article focusses on practical solutions to address the challenges. Besides that, there is a limited sources for this topic because many studies focus on the specific Fintech such as blockchain and cryptocurrency. This paper is conducted in latest year of 2022 and focused on Islamic financial industry in general.

Technology is growing rapidly from time to time, and thus, it is advisable to conduct the future research up to the latest year which aligned to the development of Fintech. No article focusses on practical solutions to address the challenges and therefore, the future researcher shall make more research on this related topic especially the practical solutions. The future researcher can find published articles and published books other than the sources mentioned above for a quality paper. The future research shall specific the topic related to Fintech challenges in a selected country.

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