

Interlinking Globalization, Digitalization, and Financial Inclusion in Islamic Banking

Prof. Dr. Aijaz Ali Khoso

Professor, Al-Hamd University, Islamabad Campus, aijaz.khoso80@gmail.com

Dr. Ahmed Raza Khan

Visiting Faculty, Bahria University, Karachi Campus, Pakistan, raza8428@gmail.com

Dr. Muhammad Shoaib Khan

Associate Professor (Economics), Department of Economics, GC University Hyderabad, Sindh,
(Corresponding Author) dr.m.shoaib@gcuh.edu.pk

Abstract

The fast growth of Islamic banking, along with the rise of financial technologies, has brought major challenges for banks that follow Sharia rules. It is very important to deal with these issues because more people around the world are interested in Islamic banking as an alternative to regular banks. This chapter looks at how financial technologies and digital globalization are affecting Islamic banking, and it explores the main difficulties and ways to solve them. The chapter also highlights the need to improve the digital experience and build better systems and human resources. It also points out some risks linked to digital financial inclusion, like the use of third parties, agency networks, higher costs, and worries about keeping personal data safe. The chapter suggests that lawmakers and leaders should work harder to create laws, systems, policies, and rules that help use fintech and digital financial inclusion in Islamic banking.

Keywords: Islamic banking, financial technology (fintech), Sharia compliance, digital globalization, digital financial inclusion, Islamic fintech, regulatory framework, protection and security of personal data, financial infrastructure, policy and governance

INTRODUCTION

The world is more connected now because of globalization, and countries that are still developing now take part in more than half of all international trade (World Bank, 2020a). Trade between countries in the South has grown a lot. However, the usual way of sending goods and services across borders has gone down, and more people are using digital ways to trade, share information, communicate, and exchange technology and ideas. Digital platforms are now important parts of national economies and international business. They help reduce costs and reach many customers around the world. This has let businesses of all sizes and types build large customer lists and improve how they communicate. These small businesses now act like big multinational companies, using platforms like Amazon, Facebook, Alibaba, and eBay (Jayathilaka & Park, 2022; Schilirò, 2020). These small multinational companies can now reach new markets and connect easily with customers and suppliers worldwide (Gopal & Schnabl, 2022). People in different countries are already using digital platforms to find jobs, show their products and skills, get education and research opportunities, get training, and build relationships – whether they are personal, academic, or business-related (Thrassou et al, 2020).

Globalization is a complex and multifaceted idea that shows how people and countries are becoming more connected (Bankolet and Karim, 2017; Gulmez, 2017; Gutal, 2007; Wilson, 2012); Pathan, M.S.K 2023. From an economic angle, globalization means that economies around the world are closely linked. This includes moving goods, services, information, technology, and research across borders. This connection is clearly seen in the growing global trade in e-

commerce and digital transactions, which has gone beyond traditional ways of doing business. Even developing countries have seen their GDP grow more because of their involvement in digital globalization (World Bank Group, 2020); Pathan, M.S.K 2023. Globalization and digitalization are closely connected, and globalization can be measured through cross-border trade, international money flows, and the movement of data, ideas, and innovations. Digitalization, which is a new form of globalization, has changed how we do transactions, run businesses, and conduct commerce. Digital tools have strengthened global economic, financial, and social links by increasing the amount and quality of information we share. Recent global events like the COVID-19 pandemic have made the shift to digital globalization and the digital economy clearer. This change shows how important information and communication technology is for global trade and business (Telukdarie et al., 2023).

Significant progress in big data, artificial intelligence, cloud computing, and blockchain has taken Islamic banking institutions to a new level. This change helps them be more competitive in a fast-changing world, allowing them to deal with local and global issues and help reach the Sustainable Development Goals, all while keeping ethical values. The use of information and communication technologies (ICTs) and digital tools has helped financial institutions offer more varied and better services. The Islamic banking sector has taken up financial technology (FinTech); Pathan, M.S.K 2023 and uses it to provide a wide range of banking, investment, and insurance services.

Modern financial technology has greatly affected three important areas of Islamic banking and the financial sector (Bashir, 2022):

A. Helping to modernize financial and banking services by turning traditional services into digital options.

B. Encouraging positive changes in how people spend, what trends are happening in the market, and how rules and oversight are managed.

C. Making more connections with fintech companies and pushing for the development and research of apps and programs that fit the specific needs of financial institutions.

According to the 2022 Global Islamic Fintech Report, over 250; Pathan, M.S.K 2023 Islamic fintech companies are active in OIC member countries and non-member countries. The total value of transactions in the Islamic fintech market was about \$79 billion in 2021, and it is expected to grow by around 18% each year, reaching about \$179 billion by 2026 (Dinar Standard & Elipses, 2022). The top six Islamic fintech markets in the OIC are Saudi Arabia, the United Arab Emirates, Malaysia, Turkey, Indonesia, and Iran. Together, these countries make up 81% of the total size of the Islamic fintech market within the organization, showing their strong influence and leadership in the sector.

The chapter aims to explain how globalization and digitalization play a role in helping achieve financial inclusion in the Islamic banking sector. It also wants to understand the challenges Islamic banking faces in this context and find ways to deal with them. Quick advances in Islamic banking and the changing digital technologies in finance have created serious problems that need good solutions. This is especially important since there is growing interest in Islamic banking as an alternative to traditional banking and finance. These changes bring up questions about how Islamic banking can achieve financial inclusion by using digital changes in a global world. It also looks at other related issues.

The positive effect of globalization and digitalization on Islamic banking includes dealing with main challenges in those areas and suggesting ways to reduce these challenges and adjust to them. The study's importance comes from discussing how globalization and digitalization help achieve financial inclusion in Islamic banking by solving issues related to institutions, technology, and Sharia (Islamic) law. Its practical value is in creating guidelines and standards for using digital tools in the context of globalization to support the growth of Islamic banking. This chapter focuses on the challenges brought by digital globalization in Islamic banking and suggests evidence-based policies to deal with them in order to reach the best possible results in financial inclusion within the context of digital globalization.

The chapter is structured with an introduction, three main parts, and a conclusion. The first part looks at financial technology (fintech); Pathan, M.S.K 2023 and digital banking, explaining what they are and highlighting their main differences. The second part explores the role of fintech in Islamic banking, discussing its benefits, requirements, and challenges. The third part examines financial inclusion, explaining its importance and the challenges it faces in

Islamic banking, and suggests possible solutions. The chapter ends with key points, showing that Islamic banking has successfully used financial technology to offer digital banking services that meet customer needs and preferences.

Fintech and Digital Banking

This section looks at fintech and digital banking, covering how financial technology has developed, the features of digital financial services, and the technological solutions used.

It explains how banks, the fintech industry, and the globalization of banking services are connected. It also looks at the differences between digital banks and fintech companies, as well as between traditional banks and digital banking.

Definition of Financial Technology and Digital Banking

The term "financial technology" was first used in 1972, when Abraham Leon Bettinger defined it as "the interaction of banking experience and information technology" (Bettinger, 1972, p. 62); Muhammad, S. K. P. (2023). The Polish Institute for Digital Research later defined fintech as "the latest technological innovations and inventions in the financial sector," including digital programs used in banks' financial transactions and services provided to customers, such as currencies, interest rates, profit-sharing accounts, investment return projections, and various financial transactions (Rabbani et al., 2020; Zeid and Budraa, 2018). Fintech, also called financial technology, refers to using technology to create new ways of doing business in finance, like new products, services, or processes that have a big impact on financial markets and institutions, as well as how financial services are offered. (FSB, 2019; Naceur et al., 2023; World Bank, 2016). Fintech has grown because of improvements in big data, secure data encryption, the widespread use of smartphones, increased internet access, and changing customer preferences for faster, easier, and cheaper financial services (Alshater et al., 2022). One major technology in fintech is blockchain, which stores data across a network of computers without central authority. This can change how information is processed and shared (Basdekis et al., 2022); Muhammad, S. K. P. (2023). For example, blockchain enables people to send digital money directly to each other without needing banks or other middlemen. This reduces the role of middlemen in areas like banking, insurance, entertainment, and public services. Blockchain can also make transactions faster and cheaper, increase transparency, help people get more access to money, and improve security in banking (Abojeib & Habib, 2019; Milian et al., 2019).

Because of this, fintech uses modern financial tools to provide better services and respond to customer needs more quickly and efficiently. The Financial Stability Board (FSB) lists five main areas of fintech: payment and fund transfer services, deposit and loan services, raising money, insurance services, and investment and market support (FSB, 2017).

Fintech has created new companies that are changing how financial services are delivered through innovative technology, making financial service providers and banks compete more with traditional methods (Karsh & Abufara, 2020; Navaretti et al., 2018). It covers a wide range of technologies, products, and new business models that have changed how customers experience services in different areas, like payments, money transfers, lending, and investments. Recent financial crises, environmental problems, and global health issues have pushed more people to adopt fintech solutions to handle these challenges, which has helped build modern digital systems and improve their use in the economy and business (Asif et al., 2023; Demirguc-, 2017; Gomber et al., 2017; Skare and Soriano, 2021).

Digital banking is about changing traditional banking into a digital format, allowing people to do banking tasks like making payments and accessing services online without needing to visit a bank branch. This change moves banking from the physical world to the online world through the internet. It offers a lot of automation and financial services via websites, mobile apps, tablets, and other electronic devices Muhammad, S. K. P. (2023); (Yin et al., 2022).

The development of financial technologies has gone through several stages.

- A. Telegraph and cable technology stage (1860–1987): During this time, the invention of the telegraph and transatlantic cables made it possible to move ships and trains quickly, which helped with fast financial

transactions, money transfers, and payments. A major development during this period was the creation of Bloomberg terminals, which supported electronic trading on financial exchanges (Mohamed & Ali, 2019).

B. Fax and telex stage (1987–2008): This period introduced electronic-based financial services between different parts of the financial industry.

Fax and telex technologies helped create customer-focused financial products, such as payment processors like PayPal and online marketplaces like eBay.

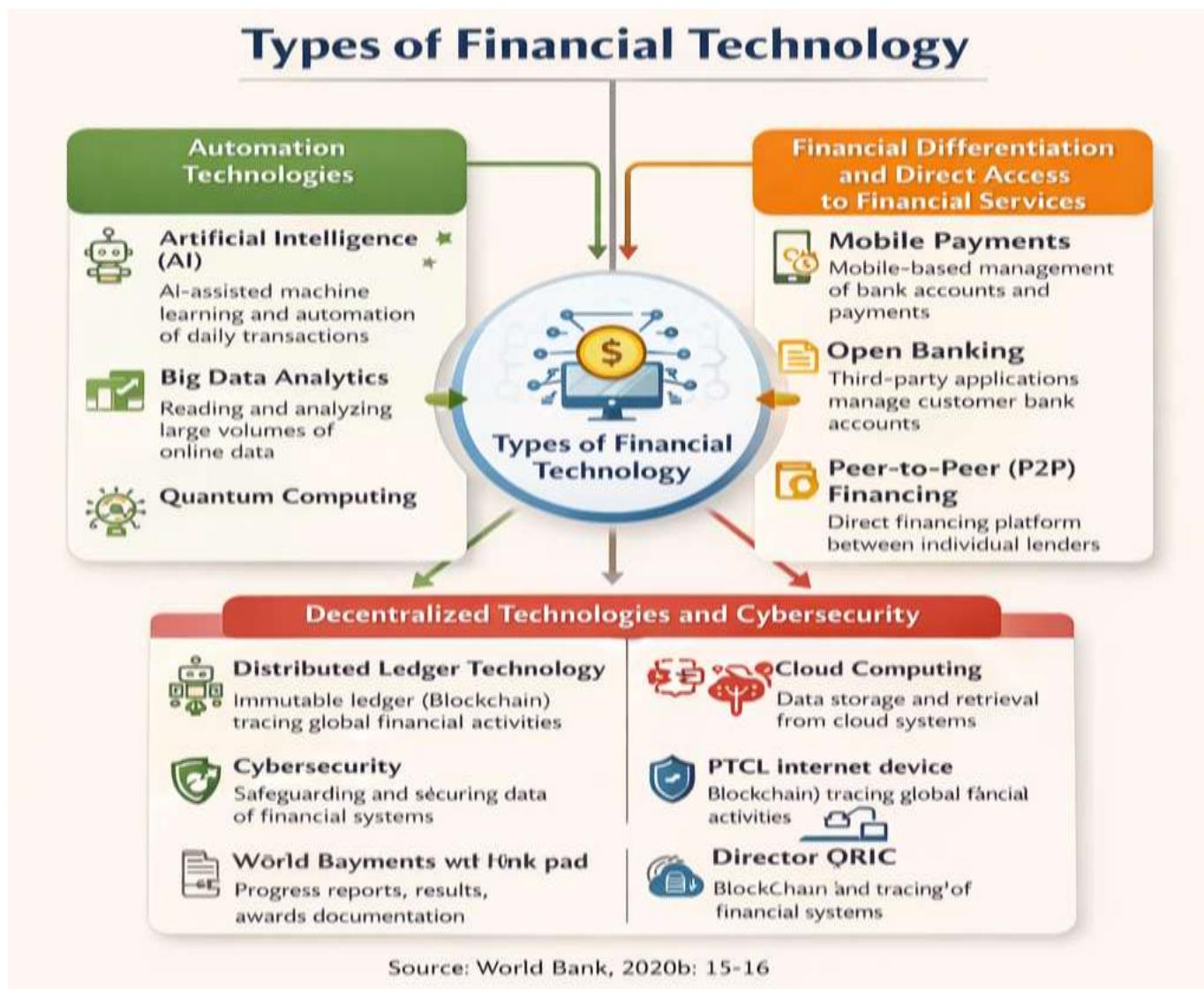
C. Crypto stage (2008–present): After the 2008 financial crisis, new players in financial technology started to appear.

One of the biggest developments was the introduction of Bitcoin in 2009 as a new type of asset and investment option (Mohamed & Ali, 2019); Muhammad, S. K. P. (2023). The COVID-19 pandemic has made this stage move faster, pushing fintech companies, banks, and government regulators to create more digital financial solutions. It has also encouraged innovation in fintech applications within the banking sector and helped make the banking and financial industry more global.

Because of these changes in financial technology and the growing use of digital tools in banking, many different financial technologies and digital applications have emerged.

Table I explains what fintech is and its main categories, including automation methods, solutions that reduce the need for physical banking, decentralized technologies, and security systems.

Table I

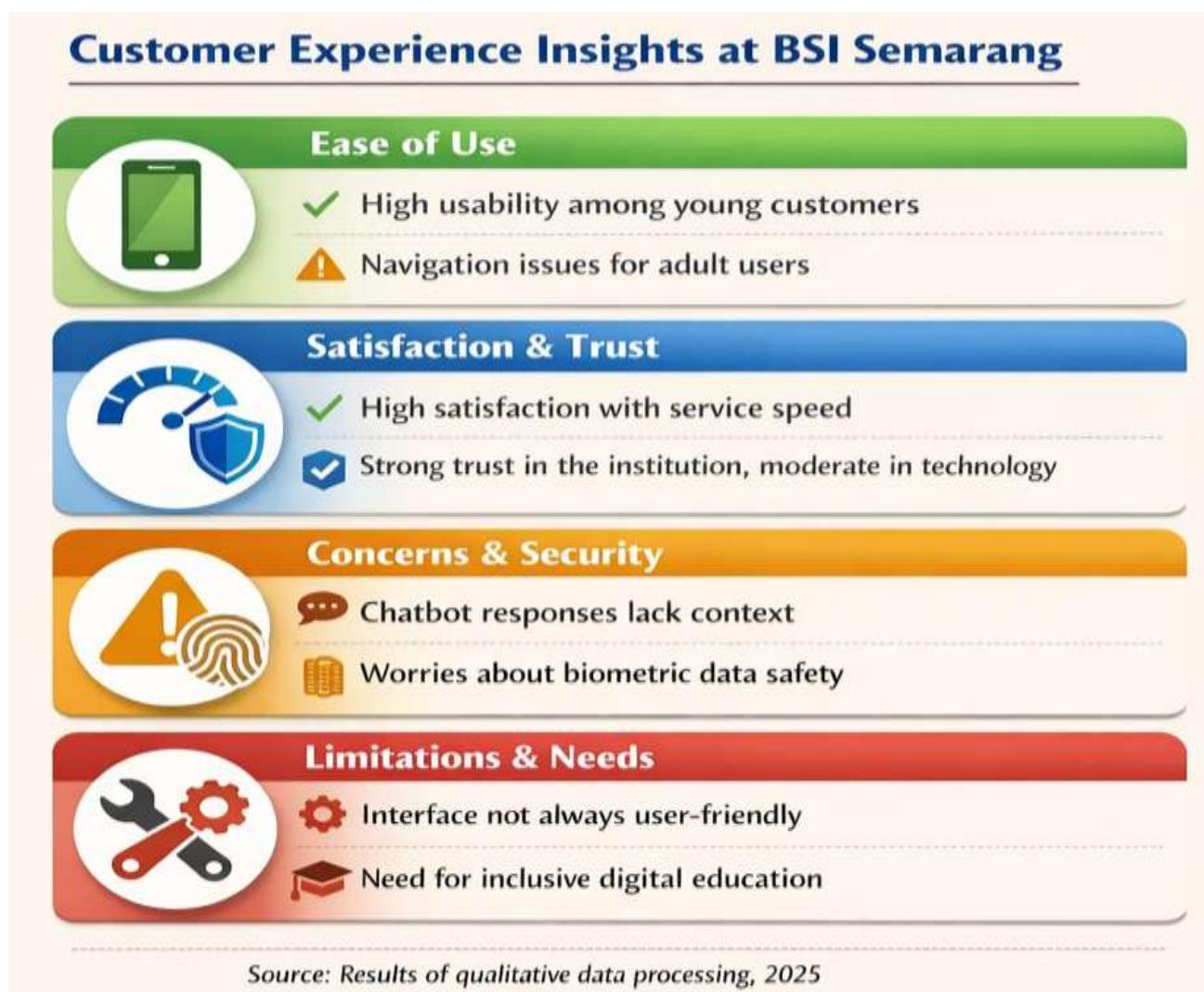


Financial technology has made it easier to provide financial services to more people, anytime and anywhere. This has allowed businesses to reach more customers and has increased competition between banks and tech companies. Fintech includes various services like lending, payments, managing risks, analyzing data, insurance, and managing wealth. It helps to bring new and better ways to use technology in banking and finance.

Services like paying bills, moving money, getting loans, and buying insurance are now done more quickly and effectively. Banking and finance industries are heavily influenced by financial technology Muhammad, S. K. P. (2023). They have improved how transactions are handled and how services are delivered. They also use digital tools for investments, financial transactions, online shopping, managing financial data, and handling money resources.

Table 2 shows the different types of financial services that have improved because of technological advancements in the banking and finance sectors.

Table 2.



The Relationship Between Fintech and Banks, and the Globalization of Banking Services

The connection between fintech and banks is strong, and new technology is helping to close the gap between them. Banks are more and more using fintech tools, incorporating them into their daily operations to better serve their customers. Even though banking is heavily regulated, the use of fintech tools in banking systems allows access to

global fintech solutions and services.

Although fintech and digital banks share some similarities, there are differences. Fintech companies usually provide one or more financial services directly to consumers or businesses, while digital banks offer a full range of financial products through digital platforms for both personal and business users. New technologies are changing how financial services are delivered through features like big data, better access, cloud computing, personalization, and ease of use, which puts them up against traditional banking methods. Digital banking is just a traditional banking service provided through online platforms, mobile apps, and the internet.

Fintech not only makes using financial services easier, but also changes how people pay, send money, borrow, and invest, reshaping the financial market with new banking options. For instance, PayPal was one of the first fintech companies that changed how people make digital payments, including mobile and transfer services. AlRajhi Bank, a major bank in Saudi Arabia, has also moved towards digital banking, offering mobile banking services that include payments and investments, and uses chatbots and AI to improve its digital services. These services include things like paying with credit cards, checking account statements, sending money, and paying bills (Bashir, 2022; IMF, 2022).

Research shows that the global spread of banking services is growing faster. This growth and stability happen in two main ways: first, by using physical resources, skilled people, and modern technology to better meet customer needs and make local financial systems more competitive both locally and globally; second, through managing risks better and spreading them out, which helps protect local banks and financial institutions from financial problems (Demirgürç-Kuça, 2017).

Differences between fintech and digital banks

There are several differences between fintech companies and digital banks when it comes to their goals, the services they offer, the way they use technology, how they are structured, how they operate, and the tools they use. Here are the details (Khillar, 2021; Puntiyo, 2021):Muhammad, S. K. P. (2023)

A. Main Goal

Fintechs aim to build trust and make things more transparent by using better and more efficient ways of doing business. This helps users benefit from faster and more efficient financial processes. This often means automating financial tasks and reducing the need for middlemen, which makes things better for customers and gives them a better experience through new technology. On the other hand, digital banking services are mainly about making it easier and faster for customers to interact with banks through digital tools, like mobile payment services.

B. Scope of Activities and Areas Covered

Digital banking is all about using online tools to provide basic banking services and removing the need for paper-based actions like writing checks, making payment vouchers, or applying for loans. These services are mostly limited to online banking tasks such as transferring money, paying bills, using digital wallets, digital vouchers, and managing personal finances. Fintech, however, covers a much broader range of business models, both inside and outside traditional banks, offering a wide variety of financial services and products.

C. Technology Perspective

Digital banking means moving from traditional banking methods to digital ones, so customers can access bank services through their phones or computers. This change has changed how finance and banking work for people, focusing more on customers by improving the ways services are delivered, the products offered, and the support provided. Technologies like automation, chatbots, algorithmic advice, blockchain, crowdfunding platforms, machine learning, customer relationship management, artificial intelligence, and big data all play a big role in making these services better (Ahmed, 2023); Muhammad, S. K. P. (2023). Because of this, fintech has had a major impact on the financial system, changing how people access banking services such as payments, money transfers, loans, savings, and investments. This change focuses on making everything more efficient.

Differences Between Fintech and Digital Banks

There are several differences between fintech companies and digital banks when it comes to their goals, the services they offer, the way they use technology, how they are structured, how they operate, and the tools they use. Here are the details (Khilla, 2021; Puntiyo, 2021):

A. Main Goal

FinTech's aim to build trust and make things more transparent by using better and more efficient ways of doing business. This helps users benefit from faster and more efficient financial processes. This often means automating financial tasks and reducing the need for middlemen, which makes things better for customers and gives them a better experience through new technology. On the other hand, digital banking services are mainly about making it easier and faster for customers to interact with banks through digital tools, like mobile payment services.

B. Scope of Activities and Areas Covered

Digital banking is all about using online tools to provide basic banking services and removing the need for paper-based actions like writing checks, making payment vouchers, or applying for loans. These services are mostly limited to online banking tasks such as transferring money, paying bills, using digital wallets, digital vouchers, and managing personal finances. Fintech, however, covers a much broader range of business models, both inside and outside traditional banks, offering a wide variety of financial services and products.

C. Technology Perspective

Digital banking means moving from traditional banking methods to digital ones, so customers can access bank services through their phones or computers. This change has changed how finance and banking work for people, focusing more on customers by improving the ways services are delivered, the products offered, and the support provided. Technologies like automation, chatbots, algorithmic advice, blockchain, crowdfunding platforms, machine learning, customer relationship management, artificial intelligence, and big data all play a big role in making these services better (Ahmed, 2023); Muhammad, S. K. P. (2023). Because of this, fintech has had a major impact on the financial system, changing how people access banking services such as payments, money transfers, loans, savings, and investments. This change focuses on making everything more efficient.

A. Online Banking:

Since the mid-90s, this service has been available, letting customers sign up, create login information, and use their internet devices to access the bank's online platform. With the online banking dashboard, customers can do many things, including:

- Move money between checking and savings accounts.
- Check current deposits and loan balances.
- Look at recent transactions.
- View and confirm account statements online.
- Set up one-time or regular payments.

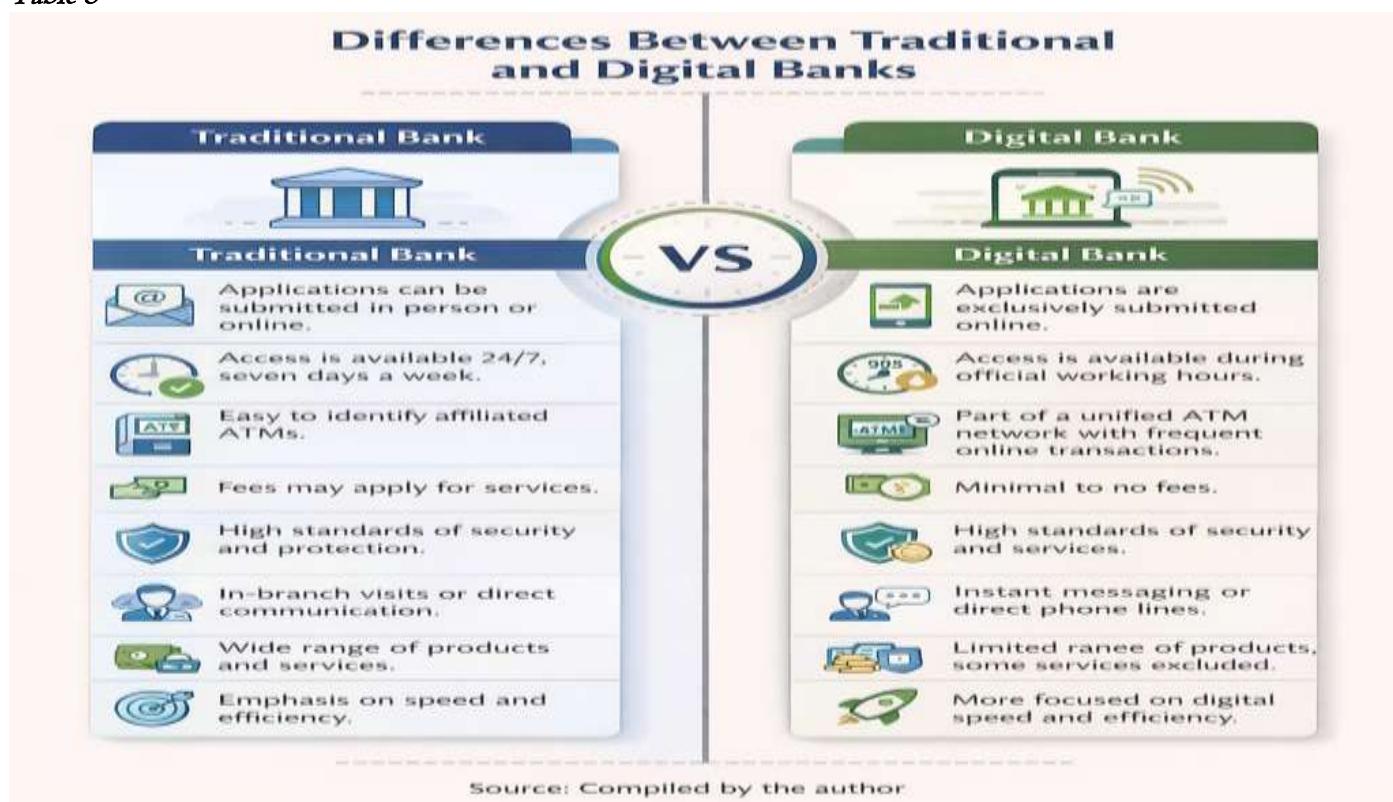
B. Mobile Banking Services

Online banking is usually done from a computer or laptop, but mobile banking is available through apps on devices like iPads, iPhones, and Android phones. Mobile banking offers the same features as online banking, but it's easier to use when you're on the go, as long as you have internet. Some special features of mobile banking include remote check deposit, which lets customers quickly add paper checks by using their mobile app and the device's camera.

Many customers like using a mobile app for banking instead of going to a traditional bank. This way, they can check their accounts and make transactions from a computer or phone. Traditional banks, on the other hand, usually require customers to go to a physical branch and talk to a bank employee to handle their financial business (Galazova and

Magomaeva, 2019; Pathan, M. S. K. (2022) Temelkov, 2020). Table 3 shows the difference between traditional and digital banks.

Table 3



Many Islamic banks are working hard to adopt digital changes to satisfy their customers' increasing needs and stay ahead in the market (Qudah et al., 2023). This change is happening because of the advantages of fintech, which provides quick, affordable, and user-friendly digital tools. These tools help attract more customers, make banking easier to access, and allow banks to serve different groups of people using big data analysis. This way of analyzing data helps banks make smarter decisions and take full advantage of marketing opportunities (Zuhroh, 2021).

Fintech is when financial services and technology come together. It includes all the new ways technology is used to change how businesses operate, create new products, and provide financial services. This covers digital tools used in banks, like new ways to use the internet and devices connected to the internet. Fintech is not just about things like blockchain and cryptocurrencies; it also includes online banking and other internet-based financial services. In Islamic banking, fintech means using technology to improve and make banking services more efficient and easier to use but always following Islamic rules. So, it works within a set of ethical standards and guidelines; Pathan, M. S. K. (2022); (Ali et al., 2019; Dinar Standard & Elipses, 2022).

Over the last twenty years, Islamic banking has grown a lot. This growth has come from different things, like more Islamic banks being set up and traditional banks offering Shariah-compliant products. Also, people have started preferring Islamic banking products more. Studies about fintech and digital tools in Islamic banking show that fintech helps make financial services more available and competitive in this sector. Even though Islamic finance is smaller than traditional finance, it is very dynamic and has lots of opportunities for new ideas in fintech. But these opportunities also bring challenges that need smart strategies (Aysan et al., 2022; Chafai and Hassan, 2019).

Fintech in Islamic banks uses digital tools that work with Islamic finance principles. This helps banks offer banking and financial services in a way that follows Sharia rules. Because of this, fintech makes banks run more efficiently and saves

money on transactions. This helps people who are not able to get traditional banking services because they earn less or are not included in the financial system. Islamic banks and financial institutions are ready to use new tech, as long as it follows Islamic laws and doesn't allow forbidden transactions.

Fintech Requirements in Islamic Banking

Islamic banking involves institutions that operate according to the principles and rules of Shariah. To grow Islamic banking and use financial technologies effectively, certain requirements must be met (Bashir, 2022; Hasan, 2023):

- A. Create a legal, regulatory, and supervisory system that fits the special nature of Islamic banking. This system should support both fintech and artificial intelligence, as well as traditional Islamic banking and financial industry models.
- B. Build agreement on fintech systems, programs, and apps to keep up with fast changes in the industry and customer needs. This is important for including more people and businesses in finance, especially in a competitive market. It will also help Islamic banks and financial institutions feel confident about investing in Islamic fintech and training staff.
- C. Expand and diversify the areas fintech companies work in, moving beyond just a few like deposits, loans, insurance payments, and investment management. This includes benefits from growing virtual banking.

Advantages of Financial Technologies in Islamic Banking

Using financial technology in Islamic banking brings several benefits:

- A. It helps make banking and financial services more efficient, better quality, and more effective (Phan et al., 2020; Mónica et al., 2021).
- B. It reduces the number of middlemen, lowers service costs, improves access, and makes transactions faster.
- C. New tools for managing businesses, marketing, and assessing risks help attract more customers and offer a variety of new and innovative services through the Internet, computers, or mobile phones.
- D. Encouraging teamwork between banks and regulators has been a priority. Central banks have set up rules and guidelines to help oversee and manage fintech activities properly.
- E. There are opportunities for research and development focused on creating new financial solutions and tools, especially in Islamic banking. These efforts combine Islamic principles with cost-effective practices. This helps Islamic banks offer better, more efficient services and become more competitive.

Many Islamic countries, including Malaysia, Indonesia, Turkey, and the Gulf Cooperation Council (GCC) nations, have made big progress in using fintech within their Islamic banking systems.

This has greatly helped Islamic banks perform better. Although most Islamic banks have used fintech mainly for simple online payments and phone banking, these improvements help them promote their services, improve their operations, be more efficient, and compete better in their local markets. Some Islamic banks have changed how they

operate, invested in better infrastructure, trained their staff, and formed partnerships with fintech companies (Mhadjibia and Berriche, 2022); Pathan, M. S. K. (2022).

Fintech applications in the Islamic banking sector are grouped based on the types of activities done by Islamic and financial institutions. These activities include payments and settling transactions through mobile phones and the Internet, as well as remote payments and digital processes. Also important are new lending methods, fundraising among participants, market lending, and crowd funding. Other supporting activities include electronic networks, smart contracts, big data analysis, and digital identity systems. Investment management includes automated services and e-commerce tools. Overall, the use of technology in Islamic banking covers a broader range than other areas within Islamic finance. It goes beyond traditional areas and opens up new possibilities, especially in regulation, auditing, compliance, and governance.

Islamic banks are working closely with fintech companies, both in the Middle East and globally, to push forward digital innovation. This is a smart strategy because fintech plays a big part in helping Islamic banks grow and stay strong.

But working with fintech companies can be tough for Islamic banks. Most fintech firms focus on traditional banks, so there are not many companies offering services that are specifically designed for Islamic finance. These specialized fintech solutions are still in their early stages. Still, the need for fintech services and Islamic banking solutions is increasing quickly. This demand isn't just for regular banking or online services—it also includes areas like wealth management, treasury services, lending, and risk management.

For fintech companies, this rising demand is a big business opportunity. It's a good time to invest in products, services, and solutions that follow Sharia law. As more money flows from both banks and fintech firms, Islamic banking is likely to see benefits across many areas.

The benefits of fintech in Islamic banking can be broken down into 10 main growth factors:

- A. Customer Experience Fintech helps improve the customer experience by making Islamic banking services easier to access and more flexible. A better customer experience leads to higher interest and demand for digital banking products and services.
- B. Market Timing Customers are changing their expectations, so banks need to quickly develop and introduce advanced digital tools. Working with fintech experts helps banks speed up service delivery and meet higher customer service standards.
- C. Sharia Compliance Even though Islamic banks are forming partnerships; many small and medium-sized banks don't have the resources to train their tech partners to follow Sharia rules. Fintech partners are expected to understand and follow Islamic finance principles.
- D. Scalability: Islamic fintech offers the ability to scale up and manage the growing number of customers. As more people use Islamic banking, scalable digital services are needed to effectively meet their needs.

A. Financial inclusion

Islamic banking has greatly expanded access to settlements that are unbanked or underserved by traditional banks. Customers who initially did not want to turn to conventional banking services can now take advantage of them, leading to significant improvements in financial inclusion in different countries. The inclusion of a wider part of the population in banking services is vital for economic development. FinTech has played a key role in accelerating the implementation of this program by introducing innovative digital solutions such as digital ingestion, thereby supporting banks in their efforts to improve financial inclusion.

B. Future Generations

With a median age of 24, the world's Muslim population is a young and fast-growing community (World

Population Review, 2024). Banks need to invest in financial technologies such as mobile banking to meet the changing needs of this demographic by integrating apps with third-party services to meet non-banking needs.

C. Access to investments

The growing demand for Islamic banking products is attracting investment in Islamic fintech companies, providing excellent capital resources. These investments drive innovation, increasing competitive advantage both locally and globally.

D. Investment in research and development

Specialized Islamic fintech companies should strategically focus their R&D investments on priority areas identified by Islamic bank clients, paying attention to the specific needs of Islamic finance as a whole. Currently, there is a shortage of players offering fintech solutions focused on Islamic banking and the financial sector. Many fintech companies initially develop solutions for traditional banks and then adapt them to the requirements of Islamic banking. Therefore, the priority is to develop solutions that are closely aligned with Islam. The Principles can expand the availability and provision of a wider range of technological solutions for Islamic banking products and services.

E. Fintech Ecosystem in Islamic Banking

With the growing presence of fintech companies in Islamic banking, banks are able to leverage the collaborative aspects of the ecosystem. Islamic banks are well prepared to harness the potential of new technologies such as open banking, blockchain, artificial intelligence, and others.

The fintech ecosystem, both regional and global, plays a key role, as consumer preferences and needs vary depending on the local culture. For example, countries with significant Islamic populations, such as Malaysia, Indonesia, Turkey, Iran, Saudi Arabia, Kuwait, and the United Arab Emirates, as well as non-Muslim countries, such as the United Kingdom and Germany, offer Islamic banking services. Despite the diversity of customer needs, the need for innovation remains similar and is ultimately driven by local requirements

F. Continuous innovation

Islamic fintech players with significant capital resources enjoy a real advantage in continuous investment in innovation. In addition, Islamic banks may benefit from exploring strategic partnerships or investments with fintech companies to promote and develop innovative long-term solutions.

Challenges of Digital Globalization in Islamic Banking

Despite the benefits of digital globalization, Islamic banking faces several challenges:

A. Limited capital investment in fintech innovation

Equity investments in Islamic fintech are still in their infancy. More than 275 Islamic fintech companies operate predominantly in traditional areas such as crowdfunding, deposits, lending, wealth management, payments, and alternative finance (World Bank, 2020b); Pathan, M. S. K. (2022).

B. Insufficient attractiveness of qualified personnel:

Islamic fintech companies are under similar pressure as traditional fintech companies, but the low position of OIC countries in the Global Fintech Index indicates a lack of incentives to attract fintech talent and skills in Islamic financial institutions.

C. Lack of rules and regulations that would regulate it:

A significant long-term problem is the lack of uniform norms and standards governing the industry. There is a lack of globally recognized regulatory bodies, which slows down development. Regulators are usually only involved in meaningful activities, as seen in the case of the Central Bank of Malaysia, the Malaysian Securities Commission, the Indonesian Financial Authority, and the Central Bank of Saudi Arabia (SAMA) (Dinar Standard and Ellipses, 2022).

D. Shortage of consumer culture:

There is a lack of consumer culture and awareness of the application of fintech in Islamic banking (Rafika & Soraya, 2021); Pathan, M. S. K. (2022). This deficit also extends to market knowledge of Shariah-compliant products and services.

Fierce competition from non-banking companies, especially big tech companies: non-banking, especially big tech companies like Amazon, Facebook, and The Book and Apple became serious competitors. They offer specific financial opportunities. Services such as electronic money transfers are positioning themselves as financial intermediaries, taking advantage of the rapid evolution of financial digitalization. Effectively addressing these challenges requires the involvement of central banks, official supervisors, and regulators. Cooperation with other organizations providing public services in interconnected networks is necessary to improve efficiency, accelerate the implementation of financial systems, and integrate them with the services provided by the Ministry of Finance, the Ministry of Internal Affairs, and the Central Bank, such as data updates, payment of bills, and public payment services. In terms of competition, Islamic banks can meet these challenges by partnering with fintech companies, especially in e-commerce and financial payments. Developing apps that reduce costs, expand the customer base, and create new business models is crucial.

FINANCIAL INCLUSION AND THE CHALLENGES OF ISLAMIC BANKING

This section defines financial inclusion, describes its goals, and discusses its meaning, as well as related fintech tools and strategies. Problems specific to Islamic banking are also considered.

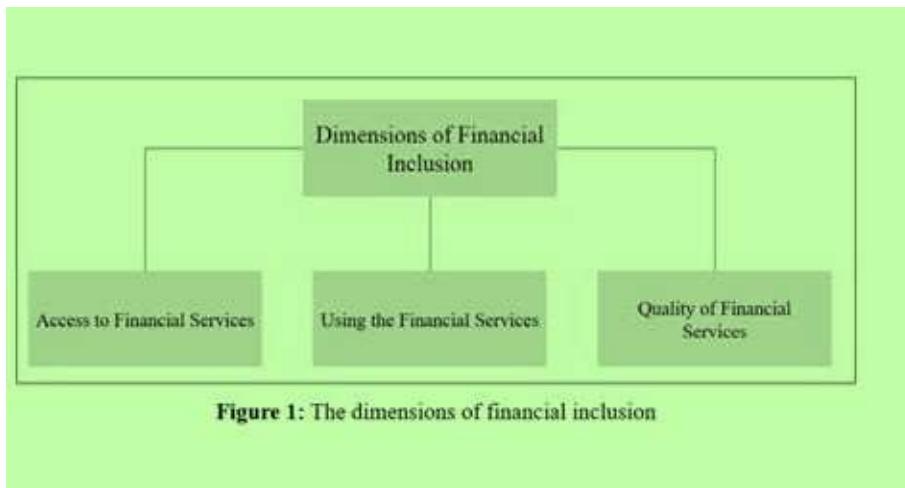
Definition of Financial Inclusion

Financial inclusion refers to the ability of individuals, companies, and business organizations to receive and receive financial products and services at affordable prices tailored to their needs. Its goal is to ensure timely and sufficient access to financial and credit services, especially for vulnerable and low-income groups, at reasonable costs and interest rates (World Bank, 2020b); Pathan, M. S. K. (2022). in a low-cost, fair, and transparent way to all segments of society, especially those with limited incomes, as provided by service providers (Derradji and Widad, 2023). The Organisation for Economic Co-operation and Development (OECD) adds another dimension by focusing on services and products that are readily available and subject to appropriate time and price controls. It also includes expanding the coverage of services through innovative methods such as financial awareness and education, to promote financial well-being and socio-economic inclusion (OECD, 2019). services at reasonable prices with a sense of responsibility and sustainability, avoiding temporary solutions and covering all financial services, not just banking (World Bank Group, 2020). Thus, financial inclusion encompasses three dimensions:

- A. Easy access to financial services:** This refers to the accessibility and convenience of access to service delivery channels. Financial digitalization has facilitated access by removing barriers in time and place. Traditional bank branches are no longer required, as customers can use mobile phones and online applications to securely and conveniently access services around the clock.
- B. Offer affordable services:** Prices for financial services should be reasonable for customers to use them. Metrics to measure the use of financial services include the number of mobile payment transactions, the percentage of adults with at least one regular deposit account, and the number of non-cash business transactions per person.

C. **Quality of financial services:** Services must respond to customer needs promptly. Indicators to assess the quality of financial services include the availability of bank accounts, especially for low-income people. Transparency is essential for service providers to provide customers with accurate and understandable information about their services. Laws and regulations are created to protect consumer rights. In addition, encouraging clients to manage their finances properly helps them avoid informal channels without oversight and charge excessive fees (Yasmina and Mohammed, 2021). Figure 1 illustrates the three dimensions of financial inclusion.

D. *Figure 1.*



Financial inclusion aims to make financial products and services accessible and accessible to all individuals and companies, regardless of their wealth or the size of the company. Its goal is to remove barriers that prevent people from participating in the financial sector and using financial services to improve their lives. Financial inclusion advocates for the provision of banking services in a cost-effective and easily accessible way, especially for those who are unbanked or have difficulty accessing banking and financial services. These efforts provide them with the opportunity to participate in the formal financial system. The provision of barrier-free savings accounts and low-cost transactional accounts paves the way for broad financial inclusion for vulnerable and marginalized segments of society, promoting savings and improving financial security. Achieving financial inclusion in Islamic banking depends on the development of innovation and related financial products and services that improve access opportunities for all social groups and segments (Haridan et al., 2020).

Financial inclusion goals

The goals of financial inclusion are twofold: to integrate segments that do not interact with banks and suffer from financial deficits, to provide them with sustainable financial services, and to remove barriers to the supply and demand of financial and banking services. These barriers include high account opening costs, documentation requirements for financial products and services, lack of financial education, and insufficient financial literacy. The promotion of digital financial inclusion opens up new horizons for both traditional and Islamic banks, allowing them to reach many customers without financial services. This is achieved through digital technologies and multi-channel access platforms for digital transactions, allowing customers to make payments, transfers, and store electronic value. Devices such as mobile phones, digital financial instruments such as payment cards connected to digital terminals, merchants, and digital financial services provided by banks and non-bank institutions are contributing to the expansion of financial inclusion of excluded and underserved people.

Planned business models, regulatory policies, open banking, and new payment methods are also impacting financial inclusion, expanding the scope and depth of financial services. The growth of open banking services contributes to digital financial inclusion. Significant advances in financial inclusion include artificial intelligence used in auditing and oversight, big data, and blockchain technologies that act as an immutable ledger of information and

transactions. Biometric measurement methods determine a user's identity, and alternative authentication methods, such as iris and facial recognition, provide fast online access to financial products and services via the internet, smartphones, mobile devices, and digital networks.

The Importance of Financial Inclusion

Numerous rationales and benefits highlight the importance of financial inclusion, including the following (Derradji and Widad, 2023):

- A. **Reducing poverty and inequality:** Financial inclusion provides marginalized people and low-income groups with access to formal financial services such as savings, credit, and insurance. By providing them with tools to manage finances and invest in income-generating activities, financial inclusion can reduce poverty and reduce income inequality.
- B. **Stimulate economic growth:** Greater financial inclusion allows more people to actively participate in the economy, leading to higher levels of savings, investment, and entrepreneurship. This, in turn, contributes to economic growth and stability in both local and national economies.
- C. **Support for small businesses:** Small businesses often have difficulty obtaining credit from traditional banks. Financial inclusion can introduce innovative lending models and online platforms that offer the necessary financial solutions to grow entrepreneurs' businesses.
- D. **Empowering the vulnerable and marginalized:** Financial inclusion initiatives targeting women can improve gender equality and economic expansion. Access to financial services allows women to manage their resources more effectively, leading to benefits such as better educational opportunities, better health, and a greater role in household decision-making.
- E. **Encourage and drive innovation:** Financial inclusion drives innovation in the banking and financial sectors, leading to the development of new technologies and fintech solutions that target vulnerable and underserved groups. These innovations benefit the financial system as a whole, leading to progress and improvements in financial services.
- F. **Promoting digital inclusion:** As technology plays a key role in financial closure, improved access to digital financial services also contributes to digital inclusion. This enables greater participation in the digital economy, highlighting the significant role of technology in modern financial inclusion efforts.

Tools and methods in fintech to achieve financial inclusion

Several technological tools are improving financial inclusion in the banking sector. Modern innovations have used these tools to better serve merchants and businesses:

A. Mobile banking services

Mobile banking apps offer a wide range of services, including account management, money transfers, bill payments, and loan processing. These simple apps are available around the clock, allowing people to transact financially from their smartphones without having to go to bank branches. For example, in 2021, 46% of US households used online payment services, offering a variety of cashless transaction options. However, there are significant differences between countries in the prevalence of non-monetary transactions. While Sweden leads by a wide margin

As 90% of transactions are cashless, Germany uses cash more than any other G7 economy, showing a cashless payment ratio of 40% in 2020. In the developing country of Saudi Arabia, the level of non-cash payments to consumers is 57%, slightly higher than the average of 56% in some G20 countries (Saudi Central Bank, 2021). Mobile wallets allow users to store money on Italian pages and make payments through smartphones. Contactless payment methods such as Near Field Communication (NFC) and Quick Response (QR) codes offer fast and secure payment options, especially at retail locations, reducing the risks associated with transporting money.

B. Agency Banking

Fintech models use agent banking, equipping agents with mobile devices and software to act as intermediaries for financial institutions in remote regions where a traditional branch is not possible. These agents offer services such as account opening, deposits, withdrawals, and money transfers to people who don't have easy access to traditional banks.

C. Online lending platforms

Fintech lending platforms directly connect lenders and borrowers through online platforms. Borrowers can apply for loans, and lenders assess their creditworthiness through data analysis and alternative credit scoring. These platforms simplify the lending process and increase access to credit for individuals and companies excluded from traditional banks due to qualification requirements and restrictions.

D. Blockchain and cryptocurrencies

Blockchain technology works as a decentralized and immutable ledger for secure financial transactions. Cryptocurrencies allow people who do not have access to traditional banking services to participate in the digital economy by providing an alternative to traditional banking systems. These technologies are seen as solutions to improve transaction speeds, mitigate problems with weak national currencies, and increase the accessibility of financial systems, especially in developing countries.

E. Financial Education Apps

Financial education apps and online platforms offer interactive and engaging content to improve basic knowledge of financial and banking principles, thereby promoting financial education and awareness. Users can access modules covering basic topics such as budgeting tools, investment techniques, and strategies to better understand financial concepts, allowing them to make informed financial decisions. In addition, improving financial education and literacy can encourage financial service providers to develop products that increase savings rates and reduce defaults and defaults.

f. Crowdfunding

Like peer-to-peer lending, crowdfunding allows people from different regions to jointly support specific projects or events through donations or capital contributions. Crowdfunding platforms allow startups, social projects, and individuals to easily raise funds, expanding access to capital beyond traditional methods for entrepreneurs and initiatives aimed at positive impact.

Islamic Banking and Financial Inclusion

Islamic banking and finance approaches financial inclusion through two main approaches: first, by promoting risk-sharing contracts as an alternative to traditional debt financing, and second, by introducing special mechanisms for the redistribution of wealth in society. Using risk-sharing financing instruments such as SME financing, microinsurance, and Sharia microfinance, Islamic banking promotes financial inclusion. In addition, additional redistributive instruments such as *Qard al-Hassan* (charitable distribution), *Sadaqat* (charity), *Waqf* (Islamic donations) and *Zaq* aim to reduce poverty and strengthen economic strength. Islamic banking significantly contributes to financial inclusion by offering attractive alternative products to borrowers in small and micro-producing sectors (Akhter et al., 2019). Empirical studies have shown that Islamic banking practices have been effective in increasing financial inclusion, especially among those with strong religious affiliations (Khmous & Besim, 2020; Kilic and Türkan, 2023); Pathan, M. S. K. (2022). In conclusion, Islamic financial institutions are in a better position than conventional banks to achieve the goals of financial inclusion, due to their foundation in the principles of equality and social justice embedded in the concept and doctrine of Islamic finance.

Challenges of Financial Inclusion for Islamic Banking

Islamic banking faces the following challenges in the pursuit of financial inclusion (Muneeza & Zakariyah, 2021; Joty, 2021; Beik and Arsyianti, 2021):

- A. **Over-indebtedness and exploitation risk:** Financial inclusion can be associated with risks such as over-indebtedness and potential exploitation by unscrupulous lenders. Data privacy issues also arise when using digital financial services.
- B. **Lack of knowledge and awareness:** One of the main challenges is the lack of knowledge and knowledge about formal financial services, especially in rural and marginalized areas. Cultural and social norms can influence financial behavior and trust in formal financial systems.
- C. **Regulatory barriers and policies:** Regulatory barriers and government policies can prevent financial institutions from serving low-income customers and entering underserved markets. These barriers contribute to social and economic inequalities, and women and marginalized groups face greater difficulties in accessing financial resources.
- D. **Market Data and Information:** The lack of market data and information about people who do not interact with banks or are unbanked makes it difficult to develop specific financial inclusion strategies. Geopolitical challenges and disputes can also disrupt financial infrastructure and stability in some regions.
- E. **Privacy and security issues:** Privacy and security issues hinder the adoption of digital financial services, especially in regions with insufficient data protection measures. Some people may refuse to participate financially due to a lack of trust in digital services.
- F. **Regulatory issues of digital financial inclusion:** Digital financial inclusion poses regulatory challenges such as combating money laundering, terrorist financing, electronic money regulation, consumer protection, regulation of payment systems, and competition. Effective communication and cooperation between local and international regulators are crucial to create adequate legislation and control in the field of digital financial inclusion.

CONCLUSION AND RECOMMENDATIONS

The main goal of this chapter was to identify the role of fintech and digital globalization in Islamic banking and discuss the main challenges on the way to achieving financial inclusion. Ways to respond to these issues from an institutional, regulatory and technical perspective were also considered. Quality of services, to meet the needs of the client with viable alternatives and competitive solutions, while adhering to the principles and regulatory standards in accordance with Shariah.

The head concludes that Islamic banking has successfully improved its banking services -thanks to financial technology, despite the difficulties. The Company uses these achievements to achieve financial inclusion goals and provide digital banking services tailored to customer needs. This underscores the need to develop digital capabilities, improve infrastructure, and invest in human resources. The sector is effectively using a variety of digital tools and methods to advance financial inclusion efforts.

Significant technological advances in big data, artificial intelligence, cloud computing, and blockchain have prompted Islamic banking institutions to strengthen their competitive capabilities in this new environment. They are quick to respond to these advancements in fintech, constantly striving to improve their offerings in a more sustainable and diverse way.

The chapter highlights a number of challenges related to digital globalization for Islamic banking, including insufficient capital investment in new fintech innovations, lack of incentives to attract skilled workers, lack of standardized management systems, low consumer awareness and increasing competition from fintech companies. Despite these difficulties, they are seen as opportunities for Islamic banking. Addressing each challenge positively and finding alternative solutions can enable Islamic banking institutions to strengthen their competitiveness and promote growth. For example, despite strong competition from fintech companies Pathan, M. S. K. (2022), it also gives Islamic banks the opportunity to innovate and increase their competitive advantage in a dynamic market environment alongside traditional partners and competitors. Some key recommendations that can be adopted to promote a dynamic and inclusive Islamic banking sector include:

Islamic banking should prioritize the development of service delivery, moving from traditional methods to modern digital technologies. These changes require improvements in the technological infrastructure of Islamic banks.

- The integration of fintech into Islamic banking should contribute to economic growth by stimulating entrepreneurship, increasing savings and expanding investment opportunities. Such an approach can create jobs, increase productivity and contribute to the achievement of the Sustainable Development Goals.
- Demand for Islamic banking services is expected to grow rapidly, with specialized Islamic fintech companies striving to meet changing customer expectations. These companies must focus on innovation, collaborate in networks, and offer end-to-end solutions. A diverse mix of fintech players can effectively span the digital banking value chain, contributing to a sustainable ecosystem both regionally and internationally.
- Islamic fintech companies should focus on key areas such as digital infrastructure, process automation, and the digitalization of wealth management (including robotic consulting and digital lending). In addition, specialized areas such as Islamic treasury, sukuk (Islamic bonds), and takaful (Islamic insurance) offer promising opportunities for innovation in fintech.
- Governments play a key role in promoting financial inclusion through supportive policies and regulatory frameworks. Effective implementation measures should reduce barriers and incentivize Islamic banks to serve marginalized groups. Governments can also improve financial literacy and invest in digital infrastructure to support these efforts.
- Islamic banking institutions should put financial inclusion at the centre of their policies, ensuring access to adequate financial services for all people, especially vulnerable groups. Special programs should facilitate access to services such as savings accounts, credit services, insurance, and digital payments, allowing people to effectively manage their finances within the formal financial system.
- The future of digital financial inclusion depends on innovations in financial technology, including artificial intelligence and blockchain. It is crucial to prioritize data privacy, information security, and the responsible use of these technologies. Coordinated policies and governance frameworks at the local and global levels are essential to protect the interests of consumers.
- New fintech companies must fill market gaps with robust business models that put customer needs ahead of intermediaries. Islamic banks need to improve their digital services to meet changing consumer expectations and improve the overall customer experience.
- Accelerating the adoption of modern digital financial technologies requires upskilling human resources through education and training. Higher education institutions should work closely with Islamic banks to train graduates with skills in both Islamic finance and technological advancement, providing a competitive advantage to Islamic banking institutions.

References

Abojeib, M., & Habib, F. (2019). Blockchain for Islamic social responsibility institutions. In Rafay, A. (Ed.), *Fintech as a disruptive technology for financial institutions* (pp. 221–240). IGI Global. 10.4018/978-1-5225-7805-5.ch010

Ahmed, E. M. (2023). Big data analytics implications on central banking green technological progress. *International Journal of Information Technology & Decision Making*, 2(3), 2–31. 10.1142/S0219622023500669

Ahmed, F., Ali, Z., Khan, M. S., & Mullazai, M. (2023). A syntactic analysis of compound noun phrase of Balochi within the perspective of X-bar theory. *International Research Journal of Management and Social Sciences*, 4(3), 289–304.

Akhter, W., Majeed, M. U., & Roubaud, D. (2019). Islamic banking and financial inclusion: Evidence from Asian and African markets. *Journal of Islamic Business and Management*, 9(2), 341–354. 10.26501/jibm/2019.0902-007

Ali, H., Mohamed, H., Hashimi, H. S., & Abbas, M. (2019). Global landscape of the Islamic fintech: Opportunities, challenges and future ahead. *COMSATS Journal of Islamic Finance*, 4(2), 29–53. 10.26652/cjif.4201923

Ali, M., Raza, S. A., Khamis, B., Puah, C. H., & Amin, H. (2021). How perceived risk, benefit and trust determine user Fintech adoption: A new dimension for Islamic finance. *Foresight*, 23(2), 403–420. 10.1108/FS-09-2020-0095

Alshater, M. M., Saba, I., Supriani, I., & Rabbani, M. R. (2022). Fintech in Islamic finance literature: A review. *Heliyon*, 8(9), 10–85. 10.1016/j.heliyon.2022.e1038536060472

Asif, M., Khan, M. N., Tiwari, S., Wani, S. K., & Alam, F. (2023). The impact of fintech and digital financial services on financial inclusion in India. *Journal of Risk and Financial Management*, 16(2), 122–134. 10.3390/jrfm16020122

Aysan, A. F., Belatik, A., Unal, I. M., & Ettaai, R. (2022). Fintech strategies of Islamic banks: A global empirical analysis. *FinTech*, 1(3), 206–215. 10.3390/fintech1020016

Bankole, A. S., & Kareem, M. K. (2017). The impact of financial services globalization on Islamic and conventional bank performance in GCC and MENA countries. *Journal of Islamic Finance*, 6(2), 001–012. 10.31436/jif.v6i2.193

Basdekis, C., Christopoulos, A., Katsampoxakis, I., & Vlachou, A. (2022). FinTech's rapid growth and its effect on the banking sector. *Journal of Banking and Financial Technology*, 6(3), 159–176. 10.1007/s42786-022-00045-w

Bashir, M. S. (2022). Financial technology in Islamic banking and finance sector.

Beik, I. F., & Arsyanti, L. D. (2021). Digital technology and Its Impact on Islamic social finance literacy. In Billah, M. M. (Ed.), *Islamic FinTech- Insights and solutions* (pp. 429–448). Palgrave Macmillan. 10.1007/978-3-030-45827-0_23

Bettinger, A. (1972). Fintech: A series of 40-time-shared models used at Manufac- tures Hanover Trust Company. *Interfaces*, 2(4), 62–63. <https://www.jstor.org/stable/i25058917>

Billah, M. M. (2021) (Ed.). *Islamic FinTech- Insights and solutions*. Palgrave Mac- Millan. 10.1007/978-3-030-45827-0

Burlacu, S., Diaconu, A., Mocanu, V., & Gombos, S. P. (2022). The effects of digital globalization on economics and society. In: Pamfilie, R., Dinu, V., Vasiliu, C., Pleea, D., & Tăchiciu, L. (eds.). *8th BASIQ International Conference on New Trends in Sustainable Business and Consumption*. Bucharest: ASE. 10.24818/BASIQ/2022/08/01I

Chaffai, M., & Hassan, M. K. (2019). Technology gap and managerial efficiency: A comparison between Islamic and conventional banks in MENA. *Journal of Productivity Analysis*, 51(3), 39–53. 10.1007/s11123-019-00544-x

Deloitte and SAS. (2022). Tech trends report 2022. Deloitte. <https://www2.deloitte>

Demirgür-Kunt, A. (2017, July 5). Globalization and banking. World Bank Blogs.

Desky, H., & Maulina, I. (2022). Digital transformation in Islamic banking. *International Journal of Multidisciplinary Research and Analysis*, 5(12), 3616–3622. 10.47191/ijmra/v5-i12-42

Dinar Standard and Elipses. (2022). Global Islamic fintech report. Shopify. <https://cdn.shopify.com/s/files/1/0598/2185/0802/files/Global-Islamic-FintechReport-2022>

Financial Stability Board (FSB). (2017 June 27). Financial stability implications from FinTech. FSB. <https://www.fsb.org/wp-content/uploads/R270617.pdf>

Galazova, S. S., & Magomaeva, L. R. (2019). The transformation of traditional banking activity in digital. *International Journal of Economics and Business Administration*, 7(2), 41–51. 10.35808/ijeba/369

Gomber, P., Koch, J. A., & Siering, M. (2017). Digital finance and FinTech: Current research and future research directions. *Journal of Business Economics*, 87(2), 537–580. 10.1007/s11573-017-0852-x

Gopal, M., & Schnabl, P. (2022). The rise of finance companies and FinTech lenders in small business lending. *Review of Financial Studies*, 35(11), 2–23. 10.1093/rfs/hhac034

Gulmez, D. B. (2017). Globalization. In Turner, B. S. (Ed.), Wiley-Blackwell encyclopedia of social theory., 10.1002/9781118430873.est0842

Guttal, S. (2007). Globalisation. *Development in Practice*, 17(4–5), 523–531. 10.1080/09614520701469492

Haridan, N. M., Hassan, A. F. S., & Alahmadi, H. A. (2020). Financial technology inclusion in Islamic banks: Implication on Sharī‘ah compliance assurance. *International Journal of Academic Research in Business & Social Sciences*, 10(14), 38–48. 10.6007/IJARBSS/v10-i14/7361

Hasan, M. (2023 February 23). The impact of financial technology (Fintech) on the financial and banking services sector and its applications in the Islamic financial industry. <http://dx.doi.org/10.2139/ssrn.4369683>

Hidajat, T. (2020). Financial technology in Islamic view. *Perisai: Islamic Banking and Finance Journal*, 4(2), 102–112. <https://journal.umsida.ac.id/index.php/perisai/article/view/465>

International Labour Organization (ILO). (2021). Digitalization and the future of work in the financial services sector. International Labour Office, Sectoral Policies Department, Geneva. https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/

International Monetary Fund (IMF). (2022). Global Financial Stability Report. IMF. <https://www.imf.org/en/Publications/GFSR/Issues/2022/04/19/global-financial>

Investopedia. <https://www.investopedia.com/terms/f/fintech.asp> Islamic Finance Magazine, 2(3), 34–36. 10.13140/RG.2.2.13053.03047

Jayathilaka, U. R., & Park, G.-C. (2022). The impact of Amazon's global selling on the innovation performance of SMEs. *Journal of Artificial Intelligence and Machine Learning in Management*, 6(2), 1–13. <https://journals.sagepub.com/index.php/jamm/article/view/21>

Jouti, A. T. (2021). Islamic Fintech and financial inclusion. In Billah, M. M. (Ed.), *Islamic FinTech - Insights and solutions* (pp. 209–229). Palgrave Macmillan. 10.1007/978-3-030-45827-0_12

Kaci, Y., & Boulesnam, M. (2022). The role of the financial technology industry in enhancing financial inclusion in the Arab countries. *Al-Mieyar Journal*, 12(2), 678–691. <https://www.asjp.cerist.dz/en/article/180406>

Kagan, J. (2024). Financial technology (Fintech): Its uses and impact on our lives.

Karsh, S. A., & Abufara, Y. (2020). The new era of financial technology in banking industry. *Journal of Southwest Jiaotong University*, 55(4), 2–29. 10.35741/issn.0258-2724.55.4.54

Khan, M. S., Ali, Z., Burlea-Sciopiu, A., Ilyas, M., Shaikh, M. A., & Malik, M. K. (2024). Integrative Approaches To Complex Optimization: Stochastic Simulation, Multi-Criteria Fuzzy Decision Making, Super Economics, And The Interface Of Mathematical Economics And Nanotechnology. *Kurdish Studies*, 12(3), 311–325.

Khan, M. S., Rahpoto, M. S., & Mangnejo, G. M. (2020). The effect of the financial crisis on corporal well-being: Apparent impact matters: Assessment of contagion to developing economies. *Research Journal of Social Sciences and Economics Review*, 1(3), 232–238.

Khan, M. S., Rahpoto, M. S., & Talpur, U. (2021). The effect of the financial crisis on corporate well-being: Apparent impact matters. In *Internet of Everything and Big Data* (pp. 25–34). CRC Press.

Khous, D. F., & Besim, M. (2020). Impact of Islamic banking share on financial inclusion: Evidence from MENA. *International Journal of Islamic and Middle Eastern Finance and Management*, 13(4), 655–673. 10.1108/IMEFM-07-2019-0279

Khoso, A. A. K., Pathan, M. S. K., & Ahmed, M. (2022). Exploring the impacts and aftershocks of COVID-19 on Islamic banking and conventional banking in Pakistan. *International Research Journal of Management and Social Sciences*, 3(1), 179-192.

Khoso, A. A., & Pathan, M. S. K. (2021). The role of the Islamic banking industry from the perspective of the global financial sector and its impact on Pakistan's economic growth. *International Research Journal of Education and Innovation*, 2(2), 81-91.

Khoso, A. A., & Pathan, M. S. K. (2023). The mediating role of job satisfaction in the relationship between organizational culture and employee commitment in Islamic banking. *International Research Journal of Management and Social Sciences*, 4(2), 13-30.

Khoso, A. A., Ahmed, M., & Pathan, M. S. K. (2022). Customer satisfaction standards according to the Islamic and conventional banking systems in Pakistan. *International Research Journal of Education and Innovation*, 3(2), 185-194.

Khowaja, I. A., Talpur, U., Soomro, S. H., & Khan, M. S. (2021). The non-banking financial institutions in the perspective of the economic growth of Pakistan. *Applied Economics Letters*, 28(8), 701-706.

Kilic, G. (2023). The emergence of Islamic fintech and its applications. *International Journal of Islamic Economics and Finance Studies*, 9(2), 212–236. 10.54427/ijisef.1328087

Lee, Y. Y., Falahat, M., & Sia, B. K. (2020). Drivers of digital adoption: A multiple case analysis among low and high-tech industries in Malaysia. *Asia-Pacific Journal of Business Administration*, 13(1), 80–97. 10.1108/APJBA-05-2019-0093

Mehadjebia, N., & Berriche, R. (2022). Use of financial technology techniques in the financial industry- Case study of OIC countries. *Annals of Guelma University for Social and Human Sciences Journal*, 16(2), 93–116. <https://www.asjp.cerist.dz/en/article/206831>

Memon, A., & Khan, M. S. (2019). Industry academia linkages of Jamshoro universities: The case of University of Sindh, Mehran University of Engineering and Technology & Liaquat University of Medical and Health Sciences. *Mediterranean Journal of Basic and Applied Sciences (MJBAS)*, 3(3), 13-52.

Milian, E., Spinola, M., & Carvalho, M. (2019). Fintechs: A literature review and research agenda. *Electronic Commerce Research and Applications*, 34(C), 10–33. 10.1016/j.elerap.2019.100833

Mohamed, H., & Ali, H. (2019). *Blockchain, fintech and Islamic finance*. Walter de Gruyter Inc.

Mohieldin, M., Iqbal, Z., Rostom, A., & Fu, X. (2012). The role of Islamic finance in enhancing financial inclusion in Organization of Islamic Cooperation (OIC) countries. *Islamic Economic Studies*, 20(2), 55–120. <https://ideas.repec.org/a/ris/iseest/0018.html>

Monika, A., Azam, A. N., & Teguh, S. I. (2021). The impact of fintech development to profitability of an Islamic bank. *International Journal of Research and Review*, 8(1), 250–258.

Moody National Bank. (2023, April 4). Digital banks vs. digital banking with traditional banks. Moody Bank. <https://www.moodybank.com/news/post/digital-banks>

Muhammad, S. K. P. (2023). The influence of organizational culture on employee commitment and turnover intentions: A study of the importance of positive culture for retaining employees. *Global Research Journal of Management and Social Sciences (GRJMSS)*, 1(1), 85-94.

Mullazai, M., Ali, Z., Khan, M. S., & Ahmed, F. (2023). Agent and theme theta roles in Balochi: A morphosemantic analysis. *International Research Journal of Management and Social Sciences*, 4(3), 332-347.

Muneeza, A., & Mustapha, Z. (2021). Islamic fintech and financial inclusion. In Billah, M. M. (Ed.), *Islamic FinTech- Insights and solutions* (pp. 173–190). Palgrave Macmillan. 10.1007/978-3-030-45827-0_10

Naceur, S. B., & Candelon, B., Elekdag, S., & Emrullah, D. (2023). Is FinTech eating the bank's lunch? (IMF Working Paper, Institute for Capacity Development WP/23/239).

Navaretti, G. B., Calzolari, G., Mansilla-Fernandez, J. M., & Pozzolo, A. F. (2018). Fintech and banking. Friends or foes? SSRN Electronic Journal, 2(4), 2-29. 10.2139/ssrn.3099337

OECD Economic Outlook, 1, 55-83. OECD Publishing, Paris. 10.1787/5713bd7d-en

OECD. (2019). Digitalization and productivity: A story of complementarities. In

Panjwani, D. K., & Shili, D. N. (2020). The impact of fintech on development of Islamic banking sector in the contemporary world. Saudi Journal of Economics and Finance, 4(7), 346-350. 10.36348/sjef.2020.v04i07.006

Pathan, M. S. K. (2022). The impact of emotional intelligence on leadership effectiveness. International Research Journal of Management and Social Sciences, 3(3), 1-7.

Pathan, M. S. K. (2022). The influence of organizational culture on employee commitment and turnover intentions. International Research Journal of Management and Social Sciences, 3(4), 34-43.

Pathan, M. S. K. (2023). Assessing the mediating role of job satisfaction in the relationship between organizational culture and employee commitment. International Research Journal of Education and Innovation, 4(1), 1-11.

Pathan, M. S. K., & Khoso, A. A. (2023). Misfortune tragedy findings in Pakistan: A public learning perspective on virtue of economic recovery mindset. International Research Journal of Management and Social Sciences, 4(2), 1-12.

Pathan, M. S. K., Khoso, A. A., & Ahmed, M. (2022). Digital model anecdotes through artificial intelligence in socioeconomic and Islamic investments. International Research Journal of Education and Innovation, 3(2), 195-209.

Pathan, M. S., Ahmed, M., & Khoso, A. A. (2022). Islamic banking under vision of green finance: The case of development, ecosystem and prospects. International Research Journal of Management and Social Sciences, 3(1), 193-210.

Phan, D. H. B., Narayan, P. K., Rahman, R. E., & Hutabarat, A. R. (2020). Do financial technology firms influence bank performance? Pacific-Basin Finance Journal, 62(2), 101-120. 10.1016/j.pacfin.2019.101210

Qudah, H., Malahim, S., Airout, R., Alomari, M., Hamour, A. A., & Alqudah, M. (2023). Islamic finance in the era of financial technology: A bibliometric review of future trends. International Journal of Financial Studies, 11(2), 76-100. 10.3390/ijfs11020076

Rabbani, M. R., & Khan, S. (2021). Agility and fintech is the future of Islamic finance: A study from Islamic banks in Bahrain. SSRN, 9(3), 6955-6957. 10.2139/ssrn.3783171

Rabbani, M. R., Khan, S., & Thalassinos, E. (2020). Fintech, blockchain, and Islamic finance. An extensive literature review. International Journal of Economics and Business Administration, 8(2), 65-86. 10.35808/ijeba/444

Rafika, B., & Soraya, S. (2021). Islamic financial technology opportunities and challenges. Strategic and Development Review, 11(4), 119-136. <https://www.asjp>

Rahat, S., & Pathan, M. S. K. (2021). Sustainable climate approach and in context of environment economy: A classical analyze matters. Neutron, 21(1), 40-45.

Saudi Central Bank. (2021). National payments usage study 2021- Saudi Arabia: Riyadh. SAMA.https://www.sama.gov.sa/en-US/Documents/National_Payments

Schilirò, D. (2020). Towards digital globalization and the covid-19 challenge. International Journal of Business Management and Economic Research, 2(11), 1710-1716. <https://mpra.ub.uni-muenchen.de/100504/> -sector/documents/meeting document/wcms_824708.pdf

Shokhsanam, S. (2022). Features of digitalization of the banking structure in the context of globalization. 5th- International Conference on Research in Humanities, Applied Sciences and Education, Berlin, Germany. <https://www.conferencea.org/index.php/conferences/article/view/1154T>

Skare, M., & Soriano, D. R. (2021). How globalization is changing digital technology adoption. An international perspective. *Journal of Innovation and Knowledge*, 6(4), 222–233. [10.1016/j.jik.2021.04.001-stability-report-april-2022-tech-trends-2022-english.pdf](https://doi.org/10.1016/j.jik.2021.04.001)

Telukdarie, A., Dube, T., Matjuta, P., & Philbin, S. (2023). The opportunities and challenges of digitalization for SME's. *Procedia Computer Science*, 217, 689–698. [10.1016/j.procs.2022.12.265](https://doi.org/10.1016/j.procs.2022.12.265)

Temelkov, Z., & Miteva, N. (2022). Areas and activities influenced by the fintech industry. *Journal of Economics*, 7(2), 68–77. [10.46763/JOE227.2068t](https://doi.org/10.46763/JOE227.2068t)

Thrassou, A., Uzunboylu, N., Vrontis, D., & Christofi, M. (2020). Digitalization of SMEs: A review of opportunities and challenges. In *Palgrave Studies of Cross-Disciplinary Business Research*, in Association with EuroMed Academy of Business (pp. 179-200). Palgrave Macmillan. <https://doi.org/10.1007/978-3-030>

Unal, I. M., & Aysan, A. F. (2022). Fintech, digitalization, and blockchain in Islamic finance: Retrospective investigation. *FinTech*, 1(4), 388–398. [10.3390/fintech1040029 -vs-digital-banking-with-traditional-banks](https://doi.org/10.3390/fintech1040029)

Wilson, M. (2012). Globalization. In Healy, L. M., & Link, R. J. (Eds.), *Handbook of International Social Work: Human Rights, Development, and the Global Profession* (pp. 16–23). Academic. [10.1093/acprof:oso/9780195333619.003.0003](https://doi.org/10.1093/acprof:oso/9780195333619.003.0003)

World Bank Group. (2020). Digital dividends digital adoption index (DAI): Measuring the global spread of digital technologies. World Bank. <https://www.worldbank.org/en/publication/wdr2016>

World Bank. (2016). Digital adoption index (DAI): Measuring the global spread of digital technologies (2016) in World Bank Development Report 2016. World Bank. <https://www.worldbank.org/en/publication/wdr2016>

World Bank. (2020a). World Bank open data. World Bank. <https://data.worldbank.org/>

World Bank. (2020b). Leveraging Islamic fintech to improve financial inclusion. World Bank, Kuala Lumpur. <http://hdl.handle.net/10986/34520>

World Bank. <https://blogs.worldbank.org/allaboutfinance/globalization-and-banking>

World Population Review. (2024). Muslim Majority Countries 2024. World Population Review. <https://worldpopulationreview.com/>

Yin, F., Jiao, X., Zhou, J., Yin, X., Ibeke, E., Iwendi, M. G. P., & Biamba, C. (2022). Fintech application on banking stability using big data of an emerging economy. *Journal of Cloud Computing (Heidelberg, Germany)*, 11(2), 43–52. [10.1186/s13677-022-00320-7](https://doi.org/10.1186/s13677-022-00320-7)

Zeid, A., & Boudraa, A. (2018). Islamic financial technology and the need for innovation: The experience of the three banks. *Al-Ijtihad Journal for Economic and Legal Studies*, 7(3), 142-160. <https://www.asjp.cerist.dz/en/article/59860>

Zuhroh, I. (2021). The impact of fintech on Islamic banking and the collaboration model: A systematic review studies in Indonesia. *Jurnal Perspektif Pembiayaan Dan Pembangunan Daerah*, 9(4), 301–312. [10.22437/ppd.v9i4.12054](https://doi.org/10.22437/ppd.v9i4.12054).