Administrative And Financial Sciences Review

Volume: 07/ N°: 01 (2023), P: 464-486

Adoption Of Blockchain Technology In The Financial Sector: Lessons Learned from International Experiences

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Received: *26/03/2023* ***Accepted:*** *03/06/2023* ***Published:*** *30/06/2023*

Abstract:

This study aims to analyze the increasing interest in the adoption of Blockchain technology in the financial sector, as demonstrated by the experiences of countries such as the UAE, Egypt, and Saudi Arabia. These experiences provide valuable insights into the potential benefits and challenges of implementing Blockchain technology in the banking industry. Key lessons learned from these experiences include the importance of collaboration and partnerships in the adoption of Blockchain technology, the need for regulatory clarity and supportive legislative frameworks, and the potential benefits of Blockchain technology in improving the efficiency, transparency, and security of financial transactions.

Keywords: blochchain; islamic finance; financial sector; fintech**.**

JEL Classification:G21.

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Introduction

The Islamic world, like other countries in the world, witnessed several successive crises that resulted in major imbalances in financial transactions. These crises revealed the success of Islamic finance in solving previous financial crises. In addition, the great importance of financial technology and digitization has emerged to ensure the optimal functioning of financial transactions through modern financial techniques and mechanisms that would establish confidence in Islamic finance and increase the potential for developing Islamic financial technology more. Perhaps the most prominent of these technologies is the Blockchain technology, which is one of the most modern topics in the field of innovative applications, which many countries of the world have taken as a solution to bypass the weaknesses of central systems, including Malaysia, Dubai, Abu Dhabi, Indonesia**...**

In Algeria, signs have recently begun to appear to adopt modern technologies and to work on rooting the thought of financial technology and creating products that support the financial sector in Algeria. This is through the new reforms aimed at keeping pace with the developments taking place in the world, such as establishing laboratories, encouraging emerging institutions, and holding competitions and prizes for emerging companies in financial technology. The goal is to integrate Algerian innovators, benefit from their experiences, and build competencies capable of managing modern technologies when they are integrated in Algeria**.**

From the above, the following main question can be asked**:**

What is the potential impact of Blockchain technology on Islamic finance, and how have various countries leveraged its capabilities to enhance their financial sector?

Sub questions**:**

- ✓ What is the reality of adopting Blockchain technology in the Islamic world?
- ✓ What are the most important experiences of using Blockchain technology in Islamic countries?
- ✓ what are the significant lessons learned from these experiences?

From these questions, the following hypotheses emerge

- ✓ Blockchain technology has an effective role in supporting Islamic finance through the huge savings and returns it provides to its users,

modernizing Islamic financial transactions, facilitating them, and expanding the scope of their application**.**

- ✓ Blockchain has been relatively widespread in Islamic countries through its inclusion within their financial sector in support of their expenses and financial institutions in general**.**
- ✓ The use of Blockchain technology has appeared in many banks in Arab and foreign Islamic countries, including Malaysia, the UAE and Saudi Arabia**.**
- ✓ Blockchain technology is characterized by several features, including trust and decentralization, that appeal to governments worldwide for adoption. If utilized , it has the potential to modernize and enhance financial transactions and attract customers to Islamic finance. However, as with other countries, the implementation of this technology is not exempt from regulatory and infrastructure challenges**.**

The objectives of this research paper are threefold: Firstly, to investigate the significance of Blockchain technology in supporting Islamic finance by improving transparency and reducing financial risks. Secondly, to showcase successful applications of Blockchain technology in Islamic countries and draw valuable lessons that can be applied in other contexts. Additionally, we aim to dispel the misconception that Blockchain technology is only limited to cryptocurrency and explore its potential uses in the financial sector beyond encrypted currencies. Through this study, we hope to provide a comprehensive overview of Blockchain technology's potential in Islamic finance, highlight successful experiences of its application in several countries.

Several studies have explored the potential of Blockchain technology in Islamic finance.For instance, "The Role and Potential of Blockchain Technology in Islamic Finance" by Jon Truby, Andrew Dahdal, and Otabek Ismailov aimed to verify that Blockchain technology has the capability to comply with Islamic Sharia laws, thus allowing for the creation of a unified official market for Islamic financial products and services. The researchers concluded that the use of Blockchain technology is likely to significantly increase the scope of Islamic financial services. Digitalization and Blockchain can support and ensure compliance with Islamic financing

transactions, giving millions of people access to financing and helping to develop the industry, improve transaction efficiency, and enhance financial inclusion.

Another study, "GCC Cooperation Council's Strategies for Adopting Blockchain Technology and Potential Outcomes: A Review of the UAE Experience" by Truby Neder provides a general overview of the concept of Blockchain and identifies the key benefits it offers, while exploring the strategies and expected results of adopting Blockchain technology in the United Arab Emirates. The researcher concluded that the UAE has the necessary technological infrastructure for adopting Blockchain and that the efforts made are expected to result in benefits worth up to 11 billion dirhams.

The study "Reality and Challenges of Blockchain Technology in the Financial and Banking Sector: An Exploratory Study" by Mohammed Shersham and Mohammed Safar addressed the challenges of adopting Blockchain technology in the financial and banking sector and explored its potential impact. The study revealed the various challenges faced by the financial and banking sector in adopting Blockchain technology and offered suggestions for overcoming these challenges.

However, little is known about the specific experiences of Islamic countries in applying Blockchain technology to support Islamic finance. Therefore, the present study aims to fill this gap by presenting the most important experiences of Islamic countries. By focusing on these experiences, the study will provide a more specific and in-depth understanding of the practical implementation of Blockchain technology in Islamic finance. This will allow for a comprehensive analysis of the potential benefits of Blockchain technology and may provide insights that are not covered by previous studies that focus on more general or theoretical considerations.The study is divided as follows**:**

1) The general framework of the concept of Blockchain technology**.**
2) The reality of adopting Blockchain technology in the Islamic world - A presentation of the most important international Islamic experiences
3) Results and discussion : Lessons Learned from International Experiences

1-General Framework of the Blochchain technology concept

Most studies indicate that Blockchain technology has gone through several stages in its development, starting with its emergence in 2008 by Satochi NAKAMOTO as a term associated with the term digital bitcoin. The latter is considered as the first digital currency to use this modern technology, which has reached the stage of being applicable in many fields, which allows users to work as one unit despite the different platforms used among them. This technology is currently considered one of the most prominent discoveries that emerged during the twenty-first century, which caused a boom in the digital economy and other sectors, especially financial ones. This technology allows the implementation of financial transactions in an encrypted and secure way away from centralization and the intervention of banks as a primary intermediary in traditional financial transactions.

1-1- The concept of Blockchain

Blockchain technology is one of the most prominent innovative technologies that has been very popular in the current era as an innovative mechanism for databases, whose theoretical concept can be presented as follows:

1.1.1. Definition of Blockchain Technology

The name of the Blockchain refers to the nature of its work and the way transactions are recorded and saved. It records every transaction that takes place within the network in a block, linking the blocks together. Therefore, it is called the Blockchain It enables the exchange of value between two parties without a central system. The value here can be sums of money or property, that is, anything of value that is usually exchanged between two parties under a central system that confirms and documents. This exchange relies on encryption techniques and agreement algorithms, as well as a decentralized exchange network without a central system. Based on this definition, Blockchain technology can be considered as one of the solutions provided by technology for the purpose of facilitating transactions and eliminating the problem of centralization and mediation. It is a network in the form of sequential blocks interconnected with each other through which transactions that take place between the parties are recorded in an

encrypted and direct manner without the presence of an intermediary. It mainly consists of blocks, hash code, timestamp, nonce, and data.

It was also defined as: a new generation technology for conducting transactions that establishes trust, responsibility and transparency thanks to the mechanism of public consensus associated with the use of the large public ledge" (LELOUP, 2017). It saves all transactions that take place within the network, and every transaction that takes place between two devices is subject to verification and confirmation of its validity by the rest of the network devices (Jaddou, 2021). That is, in addition to being decentralized, it is also considered the ideal solution for concluding deals and executing operations with full transparency and confidence without thinking about security risks.

1.1.2. Characteristics of Blockchain

Through the previous definitions, the most important characteristics and advantages of Blockchain technology are:

- Decentralization

Unlike the traditional system, which relies in its dealings on the need for a third party represented in a reliable central intermediary such as banks in financial transactions that guarantee the conduct of transactions in return for specific costs, Blockchain technology came as a solution for executing transactions directly. This is done without the need for the intervention of a central authority thanks to the mechanism of public voting, using algorithms and blocks linked to each other that allow any dealer to know the data of users without revealing their identity.

- Transparency

Any party to the transactions that take place at the level of the Blockchain network can view and keep a copy of the users' data without knowing their identity. That is, it adopts the idea of adopting the principle of disclosing information to everyone in a transparent manner.

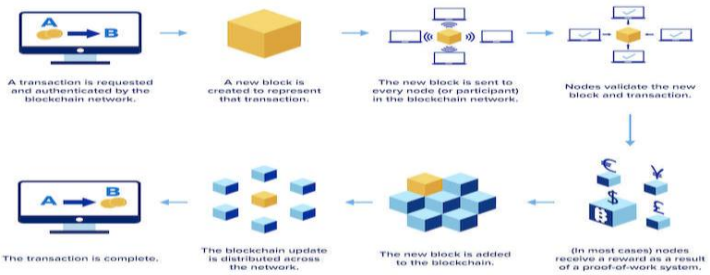
- Encryptions and information security

It is possible to deal via the Blockchain without revealing the true identity of the user, that is, in a secret way, because this technology adopts the encryption mechanism. It registers any user and includes his/her information through special algorithms and codes that allow saving his/her personal identity information during the disclosure process.

1.1.3. Blockchain Process

Blockchain allows a network of individuals to share potentially valuable data in a tamper-proof way. The type of data in question often depends on the Blockchain's industry or purpose. For example, a cryptocurrency-based Blockchain stores information on crypto transactions, including the trader, recipient, and amount of currency being exchanged.

Figure number (01): The Blockchain process



Source :)BOOTCAMP(

Blockchains are also streamlined via smart contracts, or programs that activate when predetermined conditions are met. Smart contracts are essentially lines of code acting as an agreement between two parties, and in a Blockchain, they are used to automatically process transactions without the need for a third party to oversee the exchange.

1.2. The most important companies and platforms active in Blockchain technology

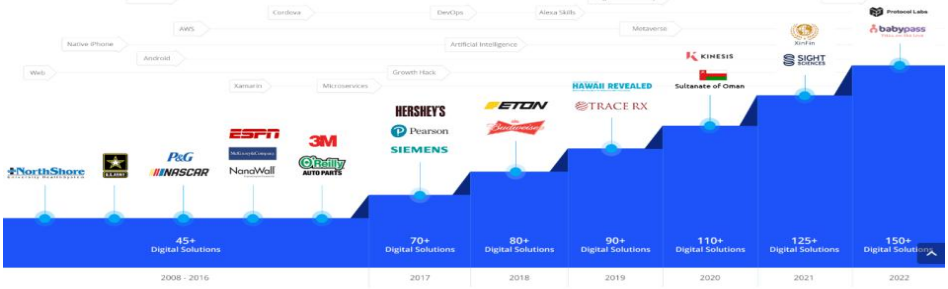
Among the most important companies and platforms that provide Blockchain services, or what is known as Baas (block chain as a service), we mention:

1.2.1. Leeway Hertz platform

According to (leewayhertz) the official website of this platform, Leeway Hertz is a company with more than 14 years of experience. It primarily provides Web3 solutions for emerging companies in the field of technology, expansions and institutions. It produced more than 100 digital platforms for these companies using the most advanced web 3 technologies. It is also specialized in designing and developing Blockchain technology solutions, in which it has presented more than 50 Blockchain projects for several international companies. Among the most prominent companies to

which this platform has provided digital solutions are: SIEMENS, NORTHSHORE, ETON, PEARSON…

Figure number (02): most companies that benefit from the digital solutions provided by the Leeway Hertz platform



source : (leewayhertz)

It is also considered one of the first organizations to offer a commercial application for the iPhone. In addition, it adopts a software development approach that consists of five main steps:

- Strategy workshop,
- Design and prototyping,
- Product development,
- Testing and optimization,
- Deployment, support and maintenance.

The responsible team on the platform conducts numerous researches on the latest technologies and development strategies, achieving high results for customer satisfaction in each project.

1.2.1. Chain Company

It is a Blockchain-based technology company on a mission to enable a smarter, more connected economy. It builds the encrypted ledgers and cloud infrastructure that powers transformative financial products and services. Founded in 2014, it has raised more than $40 million in funding from Khosla Ventures, Pantera Capital, Capital One, Citigroup, Fiserv, Nasdaq, Orange and Visa. (chain)

1.2.1. Ripple Company

Through Blockchain technology, Ripple enables global financial institutions, businesses, governments, and developers to move, manage, and tokenize value, helping to unlock greater economic opportunity for everyone, everywhere.

1.2.1. Sciencessoft Company

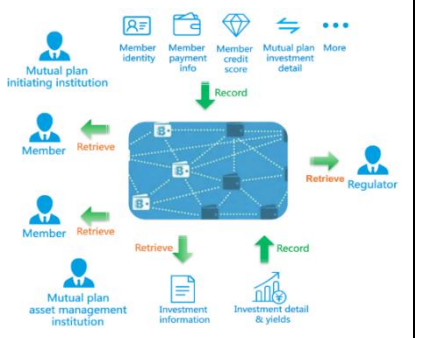
This company works to support and transform companies by providing powerful digital solutions through developing software and updating outdated software. It enables its customers to obtain solutions based on Blockchain technology, and it has provided these services to millions of users since 1989. (Sciencessoft)

1.2.1. Alibaba Cloud

Founded in 2009, Alibaba Cloud is a global leader in cloud computing and artificial intelligence. It provides services to thousands of companies, developers and government organizations in more than 200 countries and regions. Alibaba Cloud provides reliable and secure cloud computing and data processing capabilities as part of its online solutions.

Table number (01): The services provided by Alibaba company through blockchain technology

Service	Feature	workflow diagram
Product traceability	The information of traditional retail operations is exposed to the risk of falsification and manipulation, as it is not possible to track consumer and product information, or to locate the responsible party. Therefore, the Alibaba Cloud BaaS platform provides tamper-proof shared transaction ledgers. This service supports consumer inquiry and audit. At the same time, the Blockchain ensures that the source information is confirmed by all participants as no one can tamper with the information. The entire transaction history on the Blockchain can be audited to meet policy and regulatory requirements.	

supply chain financing	For supply chains, Alibaba Cloud BaaS platform enables key corporate information to be shared securely between suppliers, merchants and financial institutions. Blockchain service can protect private data while sharing transaction data between companies. In addition, the smart contract supports automatic fund clearing and corporate bond trading, to improve business operations and capital flow efficiency. Thus, it has provided a practical solution for securing financing operations.	
The possibility of tracking charitable projects	End-to-end charitable projects can be tracked through a transparent and reliable ledger and timely disclosure. Blockchain service enhances mutual trust between donors and public interest organizations, and improves the efficiency of charitable organizations. According to the company's data, it has carried out more than 38 operations with charitable organizations via the Blockchain and more than 355 charitable projects.	
Takaful insurance	This model is based on a group of people supporting each other within the decentralization feature. In this case, through Blockchain technologies, transparency and trust within the affiliate group are greatly enhanced, which builds a better future for the Takaful insurance model. Blockchain technology also provides secure disclosure of information which leads to better self-regulation, improves system availability	

	and reduces management cost.	

Source: prepared by the researcher based on the company's official website information. availibale at (alibabacloud)

1.3. The reality of adopting Blockchain technology in the world

Since the announcement of the Blockchain system and its invasion of the global financial market, very few experiences were recorded at that time through which shares were launched based on the Blockchain system. These experiments were led by the German company Telefónica and the World Bank. These experiments aimed to draw a preliminary vision of the extent to which sukuk can benefit from the new technological system (ISLAM ONLINE)until the global market size of Blockchain technology reached $5.92 billion in 2021. This number is expected to grow at a compound annual growth rate (CAGR) of 85.9% from 2022 to 2030. The growth of this market could lead to increased venture capital funding in Blockchain technology companies. For example, in May 2021, Circle Internet Financial Ltd, a Blockchain technology provider, announced that it had raised $440 million in funding from strategic and institutional investors. The company used this funding for organizational development and market expansion. The legalization of cryptocurrencies in countries like Ukraine and El Salvador is expected to create new opportunities for market growth.

2- The reality of adopting Blockchain technology in the Islamic word – a presentation of the most important international Islamic experiences

The Sharia boards that control financial transactions in financial institutions issue standards that control financial transactions according to the texts of Sharia rulings that Muslim scholars and supervisors of the boards agree upon. Among the standards, we find Sharia Standard No. 38 “Financial Transactions on the Internet” issued by The Accounting and Auditing Organization for Islamic Financial Institutions “AAOIFI”. It states: It is permissible to establish commercial websites on the Internet, provided that they are free of what is prohibited by Sharia, such as promoting prohibited goods, services or activities. It also permitted the conclusion of financial contracts via the Internet, and the contracts concluded by institutions with their customers via the Internet are subject to the general rules of financial transactions in Islamic law. For example: opening accounts, renting transfers, commercial contracts, and the like; The

standard also permits the institution to provide network connection service to users under subscription contracts or the like in return for a specific fee. Therefore, it is permissible to use the Blockchain as a network for financial transactions within a legitimate framework and legitimate activities that are compatible with Islamic teachings and provisions. (AAIOFI, 2017)

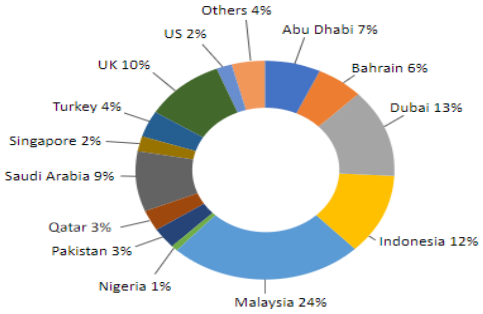
The first experiences of Blockchain technology led to new projects that touched the Islamic world, which were known as smart Sukuk, to be the first Islamic experiments in this modern technology. Indonesia was the first Islamic country to experiment with these sukuk through the Blossom Finance company, through which it seeks to launch sukuk that depend on the Blockchain system (ISLAM ONLINE).The adoption of the issuance and trading of smart sukuk has reflected positively on several different areas linked to attracting more customers, creating green development projects and promoting sustainable development. The developmental role of this type of sukuk can be generally summarized in the following points:

- Promoting financial technology in financial and banking institutions;
- The process of issuing and trading green smart sukuk is simple in terms of financial and time costs, and is characterized by greater flexibility in handing over sukuk to their owners;
- Adopting smart sukuk in general that can be used as a mechanism to enhance the attraction of banking customers, given that it does not require movement in addition to its low cost. Consequently, this is reflected in the trend towards enhancing indicators of financial inclusion. (Jaddou, 2021)

The experience of Blockchain technology was not limited to Indonesia only, but it was later spread to several countries. The Malaysian experience is one of the most successful international Islamic experiences in applying Blockchain technology as it is the most preferred destination for Islamic financial technology. According to a 2021 survey, Malaysia outperformed the country with 40% of respondents considering the Malaysian Islamic ecosystem as the most suitable for financial technology, ahead of the UAE by almost 25 percentage points. As for the year 2022, Malaysia still tops the ranking with a market share of 24%, followed by the UAE with 20%, while Indonesia rose to (12%) in the ranking from fifth place after it was in third place in 2021. This displaces the United Kingdom to fourth place at 10%, followed by Saudi Arabia (9%).

These top five ecosystems in the past 12 months have made significant progress. Malaysia, for example, has issued its digital banking licenses, two of which will fully comply with Islamic principles, as well as the Digital Takaful and Insurance Guidelines. The UAE has also set up the Virtual Assets Regulatory Authority in Dubai to regulate the business related to virtual assets. As for Indonesia, it has introduced stricter P2P financing laws. The UK also proposed changes to the Alternative Funding Order to broaden its scope and take advantage of P2P platforms. Saudi Arabia issued new crowdfunding rules and licensed digital banks. The ratings are largely in line with the current standings. The top five preferred Islamic FinTech destinations for CEOs and founders are currently the top five Islamic FinTech markets by headquarters. On October 20, 2022, IFN Islamic has identified 51 Fintech Landscape as an Islamic FinTech service provider in Indonesia, 49 in Malaysia, 41 in the UK, 32 in the UAE, and 27 in Saudi Arabia.

Figure number (03): Most conducive and supportive Islamic fintech ecosystems



Source : (IFN Fintech, 2022)

2.1- UAE experience

The UAE occupies the first positions in the use of digital technology in the Arab countries. The Center for the Fourth Industrial Revolution in the UAE is the fifth of its kind in the world. It was established within the framework of strategic cooperation between the UAE government and the World Economic Forum, and it is under the supervision of the Dubai Future Foundation. The latter's interests focus on studying the radical changes taking place in global economies, societies and policies, in order to

coordinate efforts and unify visions, to take advantage of new technology and digital transactions in the development of services and to discover creative initiatives in most future sectors (Al-Shayeb Al-Naqbi, 2020).

Within the framework of these concerns, the UAE government has adopted the technology of digital transactions (Blockchain) in executing government transactions. In order to achieve the desired results, the country launched the UAE Digital Transactions Strategy 2021 and the Dubai Digital Transactions Strategy. This strategy aims to adapt and employ advanced technologies to transfer 50% of government transactions at the federal level to the Blockchain platform by 2021. Moreover, the Dubai Blockchain Strategy will transform Dubai into the first city to be entirely managed by the Blockchain platform. This strategy is based on 3 pillars: government efficiency, establishment of industries, and global leadership.

According to the official portal of the government of the United Arab Emirates, and according to what was stated in the statement of the UAE strategy for digital transactions, the economic returns are represented in: 77 million work hours that the country's economy will provide from productivity annually. 11 billion dirhams are the total annual savings in transaction and document expenses, and 389 million government documents will be provided annually. According to the Dubai Digital Authority, with the success of this initiative, Dubai will become the first city to run its services using Blockchain technology. "The application of Blockchain technology will contribute to saving 5.5 billion dirhams annually from document processing alone, which is equivalent to the value spent in Burj Khalifa annually (digitaldubai).

Among the banks that have adopted Blockchain technology in their financial transactions, we mention:

2.1.1. Al Hilal Bank

Al Hilal Bank implemented a sukuk transaction using the Blockchain technology as the first Islamic bank in the world to use this technology to resell and market Islamic sukuk. Blockchain technology was used in the execution of a secondary market transaction for Al Hilal Bank's primary sukuk of US$ 500 million due in September 2023. With this, the world is witnessing the first use of Blockchain technology in the execution of a sukuk deal.

Islamic Sukuk has been very successful and is one of the fastest growing asset classes, with an estimated value of $97.9 billion in Sukuk issued in 2017 alone (50% increase over 2016).

Al Hilal Bank aims to transform the sukuk market by adopting Blockchain technology and integrating it into the infrastructure, paving the way for the innovative digital transformation of Islamic sukuk, which it calls "smart sukuk" (al-hilal-bank).

2.1.2. Abu Dhabi Islamic Bank

Abu Dhabi Islamic Bank is one of the leading Islamic banks with assets exceeding 124 billion dirhams. The bank, which was established in 1997, offers a wide range of banking solutions and services to individuals, companies and businesses. This is in addition to providing private banking and wealth management services, through its award-winning digital channels and wide branch network. ADIB has a strong presence in six strategic markets, including Egypt, where it has 70 branches, as well as Saudi Arabia, the United Kingdom, Sudan and Iraq. Its shares are traded on the Abu Dhabi Securities Exchange under the symbol(ADIB). (ZAWYA)

Abu Dhabi Islamic Bank is considered among the most pioneering banks in the field of innovation and the use of technology to provide the best financial services to customers, including the digital transformation strategy entitled "Express". The latter enables its customers to benefit from financing through the application of mobile devices within minutes. The bank won the "Best Islamic Bank in the World" award from the international magazine "The Banker". It is also considered the first bank in the Islamic banking sector to succeed in using Blockchain technology, which enabled it to carry out trade finance distribution transactions and cross-border transactions in partnership with many banks and platforms, including the TradeAssets platform that is specialized in trade finance and is supported by Blockchain technology. Through this partnership, Abu Dhabi Bank succeeded in automating trade finance transactions and executing successful transactions with its counterparts from other banks in emerging markets.

2.2. Experience of Smart Dubai

2.2.1. Dubai government strategy

In 2003 Dubai Smart Government launched the central "Dubai Pay" portal to collect government payments from more than 40 public and private entities. In 2018, the system conducted more than 10.4 million transactions worth 16 billion dirhams. However, each entity kept its own accounting records, which increased costs and slowed down work. Therefore, Dubai Smart Government decided to rely on Blockchain technology to develop the long and costly manual payment settlement process that used to take 45 days (emaratalyoum, 2022). According to a statement released by the Union of Arab Banks entitled, Dubai, the capital of the world in the development of "Blockchain" in which it was mentioned that, in a report published by the "Economic Times of India" newspaper, Dubai has become the capital of the world in the development of "Blockchain" technology. The use of this technology included 24 use cases across eight industry sectors ranging from finance, education, real estate, tourism, commerce, health, transportation, security, the launch of the "Blockchain" platform and the Dubai Digital Transactions Strategy. The report said that behind this development is the Smart Dubai Department, which is the government office charged with facilitating the smart transformation of Dubai at the city level, to enable, provide and enhance an efficient, smooth and safe city experience for residents and visitors. The Dubai Blockchain Strategy relies on three main pillars: government competence, industry creation, and international leadership. This strategy has led to many use cases.

2.2.2. The experience of Emirates NBD Bank

For Emirates NBD, Blockchain technology has been relied upon to combat fraudulent checks printed by fraudsters. For this reason, the Emirates NBD project team added a QR code to each page of the checkbook, while using Blockchain technology to verify the validity of that code.

2.3. Egypt's experience in adopting Blockchain technology

Egypt is also considered one of the Islamic countries that initiated the adoption of Blockchain technology, starting with the initiatives of the Central Bank of Egypt through the "Know Your Customer - KYC"

application, which was launched within the Corda Blockchain platform, in addition to the National Bank of Egypt.

2.3.1 The Central Bank of Egypt

The Central Bank of Egypt is primarily responsible for the country's financial policies, including issuing the local currency and managing the state's reserves, in addition to supervising the rest of the banks, of course. It had a great influence in the field of fighting digital currencies in the past years, before things started to improve since last year. For this year, the Bank implemented a new experience of the "Know Your Customer" network. With the online payment service provided by more than 30 banks in the region, this project aims to help users open new bank accounts remotely without the need to go to the bank or communicate with any customer. According to the Egyptian economic newspaper Al-Mal, the Central Bank is studying the idea of including this experiment with a system based on Blockchain. It indicated that it will soon announce new instructions regarding banking services via the Internet.

2.2.2 National Bank of Egypt

The National Bank of Egypt is the oldest and largest bank in Egypt. Today, it has more than 300 different branches inside the country. The bank offers many different financial services, in addition to having some branches in several places around the world. The bank has contracted with the famous Ripple platform to create a new remittance service, through its RippleNet payments network, which now includes more than 300 international banks.

This cooperation is an important step in expanding Blockchain and cryptocurrency activities in Egypt. The bank expects RippleNet to continue to grow as it enhances liquidity management in institutions and increases profits from forex trading. As a result of this cooperation, the National Bank of Egypt will join a series of other banks participating in the market within the Arab Gulf countries, in addition to some other financial centers and markets within the United States of America and the United Kingdom as well (ARAGIK, 2022).

2.4. The experience of Saudi Arabia

Saudi Arabia has also proven its experience in the field of financial technology by adopting Blockchain technology in its banking sector. This is through the recent use of the Saudi Arabian Monetary Authority (SAMA) of Blockchain technology, to deposit part of the liquidity that it announced pumping into the banking sector earlier, as part of its measures aimed at enhancing the sector's capabilities to continue its role in providing credit facilities.This step comes as an extension of SAMA's efforts to explore and experiment with the dimensions of modern technologies, and keep pace with the global trends of central banks in assessing their effects on the financial sector. It is noteworthy that the Saudi Arabian Monetary Agency was one of the first central banks to take the initiative to experiment with the use of Blockchain technology in money transfers. It is one of the innovative initiatives launched by the Corporation, as part of its efforts to enable and develop financial technologies in the Kingdom, such as the Saudi Fintech initiative (in partnership with the Capital Market Authority), the experimental legislative environment, digital banking services, and digital payments (alarabiya).

3. Results and discussion: Lessons Learned from International Experiences

Blockchain technology has shown significant potential for transforming the financial sector in the Islamic world, particularly through the use of smart Sukuk. The adoption of smart Sukuk has allowed for greater financial inclusion, promoting sustainable development and attracting more customers to the market. The simplicity and flexibility of the process of issuing and trading smart Sukuk have made it an attractive mechanism for customers and institutions alike.

Malaysia's experience in this field has been particularly successful, with the country becoming the most preferred destination for Islamic financial technology. This success can be attributed to the country's implementation of digital banking licenses and digital takaful and insurance guidelines, as well as its efforts to regulate virtual assets. Similarly, the UAE and Indonesia have made progress in regulating virtual assets and P2P financing, respectively, while the UK and Saudi Arabia have proposed

changes to broaden their scope in the P2P financing and crowdfunding sectors.

Investing in technology can yield significant benefits for the financial sector, as demonstrated by the UAE's focus on digital technology, including Blockchain. This focus has resulted in economic returns such as savings in transaction and document expenses, as well as increased productivity. This highlights the importance of investing in technology to drive economic growth and innovation.

Digital transformation can enhance customer experiences, as exemplified by Abu Dhabi Islamic Bank's digital transformation strategy, "Express," which allows customers to access financing through mobile devices within minutes. This highlights the potential of technology to provide faster and more efficient services to customers, leading to a better customer experience.

Blockchain technology can transform industries, as demonstrated by Al Hilal Bank and Abu Dhabi Islamic Bank's use of Blockchain technology in the sukuk market and trade finance transactions, respectively. This technology has the potential to improve transparency and security, reduce costs, and transform industries.

Collaboration and partnerships between the public and private sectors can drive innovation, as seen in the Dubai government's partnership with the World Economic Forum and the Dubai Future Foundation for the Center for the Fourth Industrial Revolution. This collaboration has advanced technology and driven innovation in their respective countries.

Governments can lead the way in digital transformation, as exemplified by the UAE's Digital Transactions Strategy and the Dubai Blockchain Strategy. These strategies encourage the adoption of technology and drive innovation in their respective countries.

The Central Bank of Egypt and the National Bank of Egypt are taking steps to leverage the benefits of Blockchain technology in the financial sector, as seen in the "Know Your Customer" application launched within the Corda Blockchain platform. This application streamlines the process of opening new bank accounts remotely, without the need for customers to physically visit the bank. This can make banking services more accessible

and convenient for people who may not have easy access to physical bank branches. The National Bank of Egypt's partnership with Ripple to create a new remittance service is also a significant development, showing how Blockchain can facilitate cross-border transactions that are faster and more cost-effective than traditional methods.

International experiences have shown the importance of collaboration between the public and private sectors, as well as the need to embrace innovation and adapt to changing consumer behavior. The adoption of Blockchain technology has helped enhance the efficiency and security of financial transactions, but it is important to establish regulations and guidelines to ensure its safe and responsible use in the financial sector. By embracing Blockchain technology and adapting to changing consumer behavior, financial institutions can stay ahead of the curve and continue to meet the evolving needs and preferences of their customers.

Hence, it can be deduced that:

- ✓ the adoption of Blockchain technology in the financial sector is becoming increasingly common, and countries around the world are recognizing the potential benefits it can bring.
- ✓ Central banks are playing a key role in driving the adoption of Blockchain technology in the financial sector, with many launching their own initiatives and projects to explore its potential uses.
- ✓ One of the main benefits of Blockchain technology is its ability to enhance security and reduce the risk of fraud and cyber-attacks. This is a key consideration for financial institutions, which are often targets of cyber-crime.
- ✓ Blockchain technology can also enable faster and more efficient payments and transactions, which can lead to cost savings and improved customer experiences.
- ✓ Collaboration and partnerships between different institutions and stakeholders are crucial for the successful adoption and implementation of Blockchain technology. This includes collaboration between central banks, financial institutions, and technology providers.
- ✓ Regulations and guidelines need to be developed to ensure the safe and responsible use of Blockchain technology, and to address issues such as data privacy and security.

- ✓ There is a need for greater awareness and education about Blockchain technology, both among financial institutions and the general public. This will be important for encouraging wider adoption and understanding of the potential benefits.
- ✓ Governments can play a key role in supporting the adoption of Blockchain technology, through funding initiatives and providing regulatory frameworks that encourage innovation and investment.
- ✓ Overall, the adoption of Blockchain technology in the financial sector is still in its early stages, and there are many opportunities for further exploration and development. However, the experiences of countries such as the UAE, Egypt, and Saudi Arabia provide valuable lessons and insights into the potential benefits and challenges of adopting this technology.

In addition, we recommend:

-To encourage collaboration and partnerships between government entities, banks, and Blockchain startups in order to facilitate the development and implementation of innovative solutions based on Blockchain technology:

Collaboration and partnerships are essential to facilitate the adoption of Blockchain technology in the financial sector. Governments, banks, and Blockchain startups must work together to develop and implement innovative solutions based on Blockchain technology. Governments can support this collaboration by organizing events and collaboration initiatives to encourage partnerships between entities in the financial sector.

-To promote regulatory clarity and favorable legislative frameworks to facilitate the adoption of Blockchain technology in the financial sector:

Regulatory clarity and favorable legislative frameworks are essential to encourage the adoption of Blockchain technology in the financial sector. Governments and regulators must work closely with Blockchain companies and startups to create favorable regulatory environments that encourage the adoption of Blockchain technology. Regulations should also be designed to preserve investor safety and ensure consumer protection.

-To continue exploring the possibilities of using Blockchain technology to improve efficiency, transparency, and security in financial transactions,

particularly in areas such as risk management, anti-money laundering, and counter-terrorism financing:

Blockchain technology offers great potential to improve the efficiency, transparency, and security of financial transactions. Governments, banks, and Blockchain startups must continue to explore the possibilities of using Blockchain technology to improve risk management, anti-money laundering, and counter-terrorism financing. Additionally, it is important to continue developing new applications for Blockchain technology in order to expand its reach and adoption.

Conclusion

The international experiences presented in this study provide valuable insights into the potential benefits and challenges of implementing Blockchain technology in the financial sector. The lessons learned from these experiences emphasize the importance of collaboration, regulatory clarity, and supportive legislative frameworks in facilitating the adoption of Blockchain technology. Furthermore, these experiences highlight the potential of Blockchain technology in improving the efficiency, transparency, and security of financial transactions, while also addressing some of the challenges and limitations of adoption. The future perspectives for Blockchain technology in the financial sector include continued collaboration and partnerships, regulatory developments, and innovations in interoperability solutions.

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