

Uncertain Supply Chain Management

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Key success drivers for implementation blockchain technology in UAE Islamic banking

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ABSTRACT

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The utilization of blockchain technology is increasingly emerging as a catalyst for significant changes across multiple industries, including the domain of Islamic finance. This study examines the influence of blockchain technology on the factors that contribute to the successful adoption of blockchain in Islamic banks located in the United Arab Emirates (UAE). The present study employs a cross-sectional survey methodology, encompassing a sample of 344 banking professionals. The investigation utilizes Partial Least Squares Structural Equation Modeling (PLS-SEM) as a statistical technique to examine the association between several crucial variables, namely Trust, Financial Transfers, Operating Expenses, Safety and Security, and the effective implementation of blockchain technology. The results indicate that these variables have a major impact on the effectiveness of implementing blockchain technology, confirming its ability to boost the efficiency of transactions, decrease expenses, and enhance security while adhering to Shariah law. This work makes a vital contribution to the scholarly discourse around the deployment of technology in the context of Islamic banking. In particular, it emphasizes blockchain technology's part in fostering innovation within the sector and fostering a culture of compliance with the sector's ethical and operational standards.

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1. Introduction

The global landscape is currently experiencing rapid transformation. At present, studies find us at a significant turning point in history, as our society is undergoing a transition from an industrialized economy to one that is being influenced by a new range of technologies (Mbaidin et al., 2024). The phenomenon of digitalization has been prevalent in the early twenty-first century, creating a link between technology and society and enabling intelligent and efficient support for individuals (Urfiyya & Sulastiningsih, 2021). The introduction of Blockchain Technology has been identified as a notable advancement in the field of digitalization (Guo & Yu, 2022). Blockchain innovation is a distributed, decentralized ledger technology that securely records information or transactions across several locations and individuals. The potential use of blockchain technology has been proved across a range of areas, including the financial and health sectors (Dutta et al., 2020). This research will additionally examine the application of Blockchain technology within the context of Islamic banking, with a particular emphasis on the United Arab Emirates (UAE). The utilization of this technology inside Islamic banks in the United Arab Emirates (UAE) is unparalleled, underscoring its contemporary and progressive characteristics. The application of this technology is expected to have substantial ramifications and breakthroughs in the field of technology, encompassing not only Islamic banks in UAE, but also spreading to the wider context of the UAE as a nation. Haridan et al. (2023) posit that the incorporation of Blockchain technology is anticipated to exert a significant influence on the Islamic sector and Islamic banking. The study's relevance is rooted in its unique and groundbreaking character, as it delves into an unexplored area of research: the adoption of Blockchain Technology within Islamic banks in the United Arab Emirates (UAE). Moreover, the

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research posits that the integration of Blockchain technology into Islamic institutions will provide notable progress and a fundamental transformation. Therefore, the application of this technology holds great importance in the current era, which is marked by an unparalleled technological change (Moll, 2023).

1.1 Research Problem

As an emerging technology, blockchain has changed various businesses, and it has opened up a variety of study possibilities across a wide range of industries, generating plenty of interest among researchers (Abdulrahman et al, 2022). As blockchain research papers have evolved rapidly in recent years, it has become necessary to conduct research studies analyzing the current body of knowledge regarding blockchain technology (Dabbagh et al., 2019). People are more open to embracing new technologies as the necessity for modernity in our daily lives grows. Blockchain technology is a cutting-edge, disruptive digital technology that is causing a paradigm shift in business structures across industries worldwide. Furthermore, the twenty-first century is all about technology. From this perspective, we focused our research on the success drivers and road map for the implementation of Blockchain technology especially in UAE Islamic banks (Vijai et al., 2019).

1.2 Research Importance

The significance of this study is derived from the following key points:

- 1) The importance of this study is derived from the importance of Blockchain Technology and the success drivers for implementing it in Islamic banks.
- 2) As the research conducted in this area has been limited in quantity, it adds a uniqueness to the study and may serve as a foundation for future research.

1.3 Research Aim

- 1) To explain the concept of Blockchain Technology.
- 2) To study the impact of using Blockchain Technology through technology.
- 3) To examine the success drivers of Blockchain Technology in UAE Islamic banks.
- 4) To investigate the performance of Islamic banks using Blockchain Technology
- 5) To explain the study's results and recommendations.

2. Theoretical framework and Literature Review

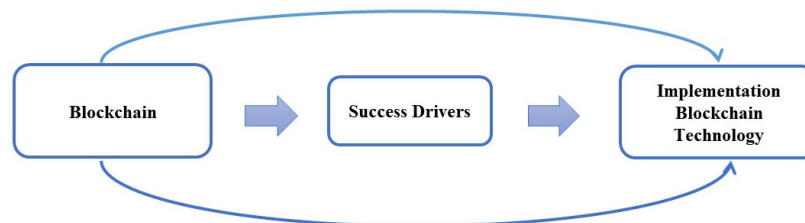


Fig. 1. Theoretical research framework

2.2 Blockchain Technology

2.2.1 Brief History and Development of Blockchain Technology

The blockchain technology has attracted considerable scholarly interest owing to its intriguing characteristics (Abdulrahman, et al, 2022). The incorporation of cryptographic concepts into the domains of decentralization, immutability, and transparency yields a substantial influence on the sharing of information among peers (Mbaidin, et, al 2023; Tenorio-Fornés et al., 2021). Since its inception by Satoshi Nakamoto in 2008, Blockchain technology has undergone significant transformation. Bitcoin, which represents the initial iteration of Blockchain technology, emerged as a decentralized form of digital currency that operated on a peer-to-peer network, devoid of any dependence on centralized entities such as financial institutions or middlemen (Cunha et al., 2021). In order to uphold the principles of authenticity and integrity inside its network, Bitcoin employs consensus models. According to Ali et al. (2020), subsequent progress was made in expanding the application of Blockchain beyond the financial sector, considering the initial limitations of its capabilities in the first generation. According to Ma et al. (2020), Ethereum, a second-generation platform, holds significant potential for crowdsourcing because to its reliability in smart contract terms. A "smart contract" refers to a self-executing agreement wherein the intentions of both the buyer and seller are expressly defined through code, which is subsequently transmitted across a decentralized and distributed blockchain network. The integrated verification mechanism in the third generation of Blockchain enhances its speed, affordability, and efficiency compared to previous iterations. Third-generation Blockchains are faster, cheaper, and more

efficient than their predecessors thanks to an integrated verification mechanism. Fourth-generation blockchains have emerged thanks to AI integration (Lashkari & Musilek, 2021; Alawadhi et al., 2022; Foud et al., 2022; Hassan et al., 2022; Salhab et al., 2023; Salhab et al., 2023).

2.2.2 What is Blockchain Technology?

Blockchain is an innovative, technological, and great idea. When we divide the term "Blockchain", we discover that the word "Block" refers to a record or ledger that contains information, while the word "chain" is like a series linked to each other (Rehman Khan et al., 2022). Andoni et al. (2019) said in their research that Blockchain is a digital database that contains a record of transactions in chronological order. It is a shared and distributed database. It consists of a ledger that contains digital transactions, data records, and executables. The chain of records, or the blockchain, is determined by the time-stamped and cryptographically linked blocks forming a chain of records that reveals the sequential order of events. Also (Dabbagh et al., 2019) described Blockchain as a decentralized ledger that safely, transparently, and verifiably records every transaction that has taken place across a peer-to-peer network. According to (Padmavathi & Narendran, 2021), the Blockchain is a distributed ledger technology that allows people to control and manage their information without the use of intermediaries. with the potential to be used in any possible domain, such as finance, manufacturing, educational institutions, etc.

2.2.3 Components of Blockchain Technology

Decentralized and secure blockchain technology is made up of various components. Cryptography provides data security, it operates on a distributed ledger that connects nodes, then it groups data into blocks to form a chain, after that, it employs consensus mechanisms such as Proof of Work or Proof of Stake for agreement, following it automates processes with smart contracts. In addition to enhancing security, decentralization facilitates transactions with native tokens and wallets (Mbaidin, 2024). Nodes validate and govern changes on blockchains, which can be public or private. Some networks use mining, while others use forks to create new chains. In the process of recording and verifying transactions and data, these components combine to create a secure, transparent, and tamper-proof system. Moreover, these multi-components of Blockchain Technology allow it to have diverse applications beyond cryptocurrencies, such as managing supply chains and verifying identities.

2.2.4 Blockchain Technology Functions

Blockchain technology has a wide range of applications and functions. The main objectives of this technology are ensuring data security and transparency, enabling the storage, sharing, and recording of information, simplifying peer-to-peer transactions, and enabling the development of smart contracts that automate intricate business procedures (Naz et al., 2019). Blockchain technology offers several advantages, including the enhancement of supply chain management, the improvement of data security and privacy, and the creation of new revenue streams and business models. Blockchain technology has the potential to bring about revolutionary changes in various areas, ranging from finance and banking to healthcare and retail (Reiff, 2022). According to Samuelson et al. (2022), Blockchain Technology has been identified as a potential remedy for the issue of centralization. The described system is designed to maintain comprehensive records of individuals without relying on a central governing body, hence exemplifying a decentralized ledger mechanism that possesses a high degree of resistance against fraudulent activities (Lemieux, 2019).

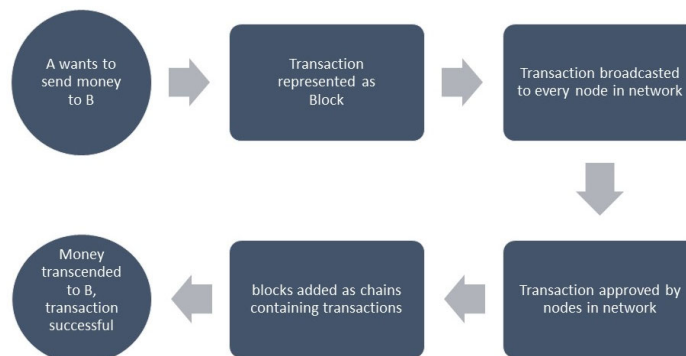


Fig. 2. The working mechanism of Blockchain Technology (Priyadarshini, 2019)

2.2.5 The Benefits of Blockchain Technology

A study completed by Torky and Hassanein (2020) outlined the importance of Blockchain technology in implementing innovative practices that help save time and money, whilst also fostering transparency and trust among individuals. The core

objectives of Blockchain are to make strides in technology, enable digital data to be registered and distributed without being modified, enhance the pace of transferring financial transactions, medical records, land titles, etc., boost investments, and ensure secure transactions. According to (Ertz & Boily, 2019; Tseng & Shang, 2021), the primary advantage of Blockchain over other technologies is its ability to allow two parties to engage in secure transactions over the internet without the involvement of a third party. Eliminating the third party can cut processing costs while increasing transaction security and efficiency. (Mohammed et al., 2023) stated that Blockchain has several benefits, but the most significant ones include improving performance and sustainability, promoting trust and collaboration, saving money, enhancing security and privacy, providing significant technological advances, improving efficiency and speed, and saving a considerable amount of time, which is our most valuable resource (Mbaidin et al., 2023).

2.2.6 *Who can benefit from Blockchain technology?*

The adoption and utilization of Blockchain Technology has witnessed significant and continuous growth across diverse industries, serving as a catalyst for corporate expansion. Blockchain or distributed ledger technology (DLT) is a nascent technological innovation that has garnered significant attention from several stakeholders, including energy providers, entrepreneurial ventures, technological pioneers, financial establishments, governmental bodies, and scholars. Due to the aforementioned backgrounds, some scholarly sources assert that blockchains have the potential to yield substantial advantages and foster innovation on a global scale (Andoni et al., 2019; Zheng et al., 2017). According to Tan et al. (2023, p. 230), disruptive technologies have had a substantial impact on the operational practices of industries and enterprises in recent years. Nevertheless, it is important to acknowledge that although there is a degree of truth in this statement, organizations that neglect to contemplate the impact of these technologies may ultimately face the consequence of losing their market position to rivals who have made the strategic decision to incorporate these technologies into their operational framework. According to Erol et al. (2021), it is possible that Blockchain Technology may eventually be recognized as the most noteworthy advancement across many industries.

2.2.7 *Potential Applications of Blockchain Technology*

The decentralized, transparent, secure, and immutable characteristics of Blockchain technology make it highly applicable to a wide range of sectors. The following are some significant potential applications for blockchain technology:

Healthcare: The healthcare sector is recognized as a prominent industry that generates a substantial volume of data (Jena & Dash, 2021). According to Elangovan et al. (2022), Blockchain Technology has demonstrated its utility in various healthcare institutions, encompassing electronic medical record management, biomedical research and education, remote patient monitoring, pharmaceutical supply chains, health insurance claims, health data analytics, and other prospective applications. The implementation of blockchain technology in the healthcare sector has the potential to facilitate decentralization of operations, enabling patients, physicians, and insurance companies to assume the roles of users while managing records. According to Dutta et al. (2020), the implementation of blockchain technology in the healthcare sector has promise for enhancing patient outcomes, reducing expenses, enhancing adherence to regulations, and ensuring the security, transparency, and optimal utilization of healthcare data.

Smart contracts: A further significant utilization of Blockchain Technology is in its capacity to serve as a framework for the execution of smart contracts. According to Hamza (2020), Blockchain Technology and smart contracts are widely regarded as significant advancements in the realm of financial affairs. Within the context of a blockchain ecosystem, a smart contract represents a state-of-the-art technological instrument capable of autonomously facilitating, executing, and upholding the conditions stipulated within a legally binding contractual arrangement (Rouhani & Deters, 2019). According to McGhin et al. (2019), smart contracts represent a significant use of Blockchain Technology, facilitating the creation of legally binding documents within the Blockchain system by users or agents. The utilization of smart contracts and blockchain technology has facilitated the expeditious and cost-effective development, design, and implementation of solutions for many real-world challenges, surpassing the capabilities of traditional third-party systems (Mohanta et al., 2018; Rouhani & Deters, 2019).

Cryptocurrencies: Cryptocurrency stands as a prominent innovation within the realm of finance, emerging as a consequential outcome of the advent of Blockchain Technology. Cryptocurrency is a globally accessible digital payment system that operates only through internet platforms. The process of documenting transactions related to the acquisition, trade, or utilization of bitcoin is facilitated by the implementation of a decentralized digital ledger referred to as a Blockchain. The growing acceptance of cryptocurrencies has the capacity to facilitate the wider dissemination of Blockchain technology (Rodeck, 2023). In contemporary times, conventional cross-border money transfers often rely on the Interbank system, which has long been recognized for its ability to provide secure and precise fund transfers. Blockchain technology has gained significant popularity since the introduction of Bitcoin, the first cryptocurrency, in 2009. Subsequently, numerous cryptocurrencies have been created to cater to various requirements and serve distinct objectives (Hashemi Joo et al., 2020; Kamdzhlov, 2020). Digital currencies have been recognized as a highly efficient means of facilitating transactions. Consumers possess the capacity to obtain goods and services through the utilization of units of digital currency. Cryptocurrencies possess promising prospects as a viable alternative currency on a global scale due to their inherent attributes

of simplicity, flexibility, and decentralization (Wartoyo & Haerisma, 2022).

Financial services: The contributions of businesses, especially in the field of finance, are crucial to the health of economies around the world (Hezabr et al., 2023; Jahmani et al., 2023; Jawabreh et al., 2023; Saleh et al., 2023). Banks, finance businesses, and insurance agencies are all included in this category (Al-Rawashdeh et al., 2023; Ali et al., 2023). Financial institutions are vitally important because they facilitate commerce, mitigate risk, and supply necessary monetary resources to individuals and businesses. Authorities such as financial regulators and central banks provide this function of oversight and supervision to maintain stability and protect the interests of customers. To be successful in the financial services business, one must have a deep comprehension of economic principles, risk management practices, and market dynamics (Binsaddig, et al., 2023; Hatamlah, et al., 2023; Hayek, et al., 2023) (all cited in Binsaddig, et al., 2023). Extensive scholarly research and literature have concentrated on the issues of banking rules, investment techniques, and the impact of technological advances on the financial services sector. According to Abdulrahman et al. (2022), the adoption of blockchain technology has the potential to bring about significant changes in the banking sector. The World Economic Forum has been recognized by Saleh et al. (2023), Saleh (2023), and Salhab et al. (2023) as attributing the central driving force of the finance industry to it.

There is a growing trend among financial institutions to incorporate Blockchain technology into their operations as a means of facilitating the implementation of advanced features like smart contracts. The widespread adoption of Blockchain Technology in the financial sector can be attributed to the significant rise of bitcoin and other cryptocurrencies. According to Dutta et al. (2020), the utilization of blockchain technology holds promise in facilitating and streamlining cross-border payments, enhancing stock trading activities, enhancing identity management processes, and simplifying financial sector operations.

2.2.8 *Who can benefit from Blockchain Technology?*

Blockchain Technology continues to be a rapidly expanding area of growth for businesses in a variety of industries. Blockchain or distributed ledger technology is an emerging technology that has attracted considerable interest from energy suppliers, startups, technology developers, financial institutions, national governments, and academicians. Given these contexts, consensus exists among a wide range of experts that blockchains have promise for global innovation and significant benefits (Andoni et al., 2019). The introduction of these disruptive technologies has caused a noticeable change in the way that businesses and sectors operate today. While this may be true to some extent, businesses that don't plan for the potential effects of emerging technologies risk losing ground in the marketplace as their competitors adopt similar strategies (Tan et al., 2023) because of the advantages they provide. In the not-too-distant future, blockchain technology may come to be seen as a groundbreaking innovation in many fields.

2.2.9 *Blockchain in the Islamic Sector*

A recent study by Alaeddin et al. (2021) indicates that Blockchain Technology is gaining traction in the international banking industry. This trend is particularly visible among decision-makers at Islamic financial institutions, who are increasingly interested in integrating this new technology into their operational structure. They consider Blockchain Technology as a promising way to handle the different concerns and challenges they confront. Due to its foundation in Sharia, Islamic FinTech has the potential to become a global leader in the financial sector. According to Rabbani et al. (2020), this approach offers notable benefits in terms of transparency, accessibility, and simplicity. According to a study conducted by Alaeddin et al. (2021), there exist novel applications of Blockchain technology within Islamic financial institutions, including Waqf, Zakat, and Sukuk. Based on a study conducted by Urfiyya and Sulastiningsih (2021), the incorporation of the Blockchain idea inside zakat institutions is proposed as a potential remedy for prevailing challenges in the realm of Islamic practices, namely pertaining to the collection and distribution of zakat funds. According to Azganin's (2019) research, Blockchain has the potential to enhance transparency by enabling individuals to monitor their donations in the context of Waqf project lands that require development. Additionally, Blockchain was identified as a technology that may effectively facilitate the management of transaction data. One notable benefit of Blockchain technology is its potential to offer a well-suited solution for the implementation of Islamic banking practices (Chong, 2021). Developing nations possess several prospects to leverage the advancement of Islamic Fintech, as it presents a cost-efficient avenue for accessing financial services. In addition to preserving stability, it serves to safeguard investors and institutions against fraudulent trading practices through the examination of regulatory organizations (Rabbani et al., 2020).

2.2.10 *Islamic banks in the UAE and how they can benefit from Blockchain Technology*

Developing countries have many opportunities to benefit from Islamic Fintech's development as it offers a cost-effective solution to financial services. As well as maintaining stability, it ensures that investors and institutions are protected from fraudulent trade practices by testing the regulating bodies (Saba et al., 2019). In Muslim countries, Islamic finance, and particularly Islamic FinTech, has a bright future. Presently, Malaysia, Indonesia, Bahrain, UAE, and Saudi Arabia have the most well-developed Islamic finance markets (Dahdal et al., 2021). Nowadays Blockchain Technology has been used brilliantly in the banking industry in foreign countries. The banks in the UAE used to transfer the fees of the people, which

can be both time-consuming and expensive for people, also the exchange rate and other hidden costs make it even harder to send money overseas. (Hasan et al., 2020) indicated in their research that the application of Blockchain-based technologies can assist Islamic banks to manage profit-sharing agreements and minimize the rising cost of transactions (Mbaidin et al., 2024). Many studies encourage Islamic banks in various countries to use Blockchain Technology and one of them (Septiana & Sanjayawati, 2021) said in their research that the Islamic Development Bank and the OIC should take a more proactive role in developing the infrastructure required for the issuing of Blockchain Technology. Therefore, Islamic banks in the UAE use Blockchain Technology an intermediary person is no longer required for this technology. By providing a peer-to-peer payment system with the highest level of security, the shortest duration of time, and the lowest fees for people, Blockchain is disrupting the banking system (Cocco et al., 2017; Ducas & Wilner, 2017). Therefore, in this way, Islamic banks in the UAE are made technologically advanced, and create a compatible technology with the conditions of the religion, thus, increasing the number of users and investors in banks, and making the profit value greater for them in the long run (Kamdzhlov, 2020).

2.3 Success Drivers for Implementing Blockchain Technology

The digital economy is rapidly expanding all over the world (Mbaidin, 2024). It is one of the most important drivers of advancement, intensity, and production (Yuhelson et al., 2020). For blockchain technology to be implemented successfully in Islamic banks, trust is essential (Abdeen et al., 2019). For blockchain initiatives in the Islamic banking sector to succeed and effectively be adopted and sustained, they must be based on transparency, compliance with ethical principles, credibility, security, and collaboration (Aziz et al., 2023; Nazim et al., 2021). Blockchain technology provides Islamic banks with numerous advantages when it comes to efficient financial transfers. It contributes to a more resilient, competitive Islamic banking ecosystem by reducing transaction times, reducing costs, improving liquidity, and expanding global accessibility (Unal & Aysan, 2022). In addition to that, Islamic banks can significantly increase their success and sustainability by implementing blockchain technology, which results in lower operating expenses. In the evolving Islamic finance landscape, these banks are positioned to offer competitive and cost-effective financial services due to the cost efficiencies achieved through automation, reduced intermediaries, and improved operational processes (Rabbani et al., 2020; Rodeck, 2023). Furthermore, providing Islamic banks with a high level of safety and security in blockchain implementations is crucial to their success. In addition to addressing fraud, privacy, and compliance concerns, it provides the Islamic banking sector with a foundation of trust necessary for the widespread adoption of blockchain technology (Sabry et al., 2019). Moreover, ensuring a high level of safety and security in blockchain implementations is crucial for the success of Islamic banks. In addition to addressing concerns related to fraud, privacy, and compliance, it establishes a foundation of trust that is necessary for the widespread adoption of blockchain technology in the Islamic banking sector (Nazim et al., 2021).

2.4 Hypothesis Development

Based on the literature, the researchers developed the following hypotheses as shows in Fig. 3:

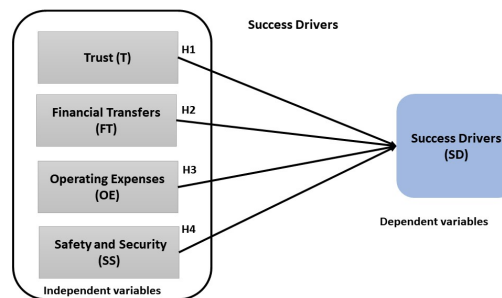


Fig. 3. Study Model

H₁: *There is a significant relationship between confidence in blockchain technology (T) and success drivers (SD) for blockchain adoption in UAE Islamic banks.*

H₂: *The ability of blockchain technology to allow financial transfers (FT) is strongly related to the success drivers (SD) for blockchain adoption in UAE Islamic banks.*

H₃: *The impact of blockchain technology on operating expenses (OE) is strongly related to the success drivers (SD) for blockchain adoption in UAE Islamic institutions.*

H₄: *The level of safety and security (SS) supplied by blockchain technology is strongly related to the success drivers (SD) for blockchain implementation in UAE Islamic institutions.*

3. Methodology

The factors impacting the effective application of blockchain technology in UAE Islamic banks are investigated using a quantitative research design in this paper. Because data were collected at a single point in time, the research design is cross-sectional. The study's primary goal is to comprehend the relationship between independent variables such as Trust, Financial

Transfers, Operating Expenses, and Safety and Security and their impact on the dependent variable, Success Drivers for Blockchain Implementation.

3.1 Sample and Data Collection

The survey's target audience consisted of professionals working in the UAE banking sector. Bank employees, management, IT specialists, regulators, clients, and others involved with the industry comprise the sample. A total of 416 people participated in the survey.

3.1.1 Data Collection Procedure

An online questionnaire was used to run the survey, which was circulated via email and professional social media channels. The questionnaire was developed to elicit feedback on several concepts linked to the use of blockchain technology in Islamic institutions. There were no incentives presented to encourage participation. Respondents were guaranteed anonymity and that their responses would be handled anonymously.

3.1.2 Response Rate and Data Handling

344 of the 416 questionnaires issued were returned fully completed, for an approximate response rate of 82.7%. To protect data integrity, the remaining 72 questionnaires were either partially completed or not completed at all. The final dataset of 344 replies was found enough for analysis, exceeding the recommended sample size for complicated statistical analyses such as structural equation modeling.

3.2 Demographic Profile of Respondents

The demographics of the responders are as follows:

- Gender distribution: 221 men (55.2%) and 154 women (44.8%).
- Age range: 18 under the age of 25, 166 between the ages of 25 and 35 (48.3%), 106 between the ages of 36 and 45 (30.8%), 41 between the ages of 46 and 55 (11.9%), and 13 over the age of 55 (3.8%).
- Position: The banking sector is represented by 61 bank employees (17.7%), 61 in management (17.7%), 53 IT professionals (15.4%), 73 regulators (21.2%), 73 customers (21.2%), and 23 others (6.7%).

4. Data Analysis

SmartPLS, a software tool for Partial Least Squares Structural Equation Modeling (PLS-SEM), was used to evaluate the data. The analysis was divided into two stages: the assessment of the measurement model and the assessment of the structural model.

Table 1
PLS-SEM Analysis

Constructs	Observed	Loadings	VIF	C alpha	rho_a	rho_c	AVE	F ²	R ²	Adjusted R ²
Trust (T)	T1	0.855	2.58	0.921	0.924	0.938	0.718	1.812		
	T2	0.836	2.308							
	T3	0.873	2.848							
	T4	0.852	2.622							
	T5	0.834	2.409							
	T6	0.832	2.418							
Financial Transfers (FT)	FT1	0.892	3.041	0.922	0.924	0.941	0.762	4.6		
	FT2	0.874	2.784							
	FT3	0.868	2.739							
	FT4	0.868	2.654							
	FT5	0.862	2.662							
Operating Expenses (OE)	OE1	0.86	2.183	0.872	0.882	0.912	0.721	0.083	0.887	0.885
	OE2	0.812	1.951							
	OE3	0.87	2.174							
	OE4	0.855	2.204							
Safety and Security (SS)	SS1	0.595	1.285	0.757	0.768	0.835	0.504	1.357		
	SS2	0.723	1.351							
	SS3	0.731	1.399							
	SS4	0.729	1.475							
	SS5	0.761	1.561							
Success Drivers (SD)	SD1	0.8	1.632	0.812	0.812	0.876	0.639			
	SD2	0.805	1.693							
	SD3	0.803	1.667							
	SD4	0.79	1.66							

3.3 Constructs and Observed Variables

Table 1 shows that a Trust (T), Financial Transfers (FT), Operating Expenses (OE), Safety and Security (SS), and Success Drivers (SD) are latent constructs, which are theoretical ideas that are represented by the observed variables.

Loadings: The numerical values indicate the extent to which each observed variable, such as a survey item, effectively represents the underlying latent construct. Values that are above 0.7 are typically seen as favorable, as they suggest a robust association between the item and the construct.

The Variance Inflation Factor (VIF) is a statistical measure used to assess the presence of multicollinearity. Typically, VIF values exceeding 5 or 10 are considered indicative of severe multicollinearity (Hair et al., 2021). However, in this model, none of the VIF values surpass these thresholds, implying that multicollinearity is not a significant worry.

3.4 Reliability and Validity

Cronbach's Alpha ($C\alpha$), rho_a, and rho_c are often used indices to assess the internal consistency dependability of a measure. Values greater than 0.7 are deemed satisfactory, suggesting that the items within each construct exhibit a high level of internal consistency in measuring the shared underlying notion. The Average Variance Extracted (AVE) is a measure used to assess the extent to which a construct accounts for the variance in observed variables. AVE values exceeding 0.5 indicate that the construct explains a significant portion of the variance in the observed variables (Alomari, 2022). In this context, it is observed that all the constructions surpass the established threshold, hence demonstrating a favorable level of convergent validity. The squared F statistic, denoted as F^2 , serves as a metric for effect size within a statistical model. It quantifies the magnitude of influence that a latent variable exerts on an endogenous construct. In general, the values of 0.02, 0.15, and 0.35 are commonly used to represent modest, medium, and significant effects, respectively.

3.5 Model Fit

The coefficients R^2 and R^2 adjusted are used to quantify the amount of variance that is accounted for by the constructs included in the model. The adjusted R^2 metric takes into consideration the number of variables included in the model, so offering a more precise representation within the framework of multiple predictors. A higher proximity to the value of 1 indicates a stronger explanatory power of the model in relation to the data.

3.6 Discriminant Validity

The Heterotrait-Monotrait Ratio (HTMT) is a statistical measure used to evaluate the discriminant validity of constructs, specifically assessing the degree to which they are separate and distinct from one another. Values lower than 0.85 or 0.90 indicate that constructs exhibit significant dissimilarity from others, implying that these constructs are assessing distinct concepts rather than merely reflecting the same underlying phenomenon. The HTMT values presented in the Table 2 exhibit values that are significantly lower than the established thresholds. This indicates a robust level of discriminant validity among the constructs within your model. An illustrative instance is the HTMT value of 0.072 observed between Financial Transfers (FT) and Operating Expenses (OE), which is much below the threshold of 0.85. This finding indicates that these two constructs can be considered as separate and distinct from each other.

Table 2
Heterotrait-Monotrait Ratio (HTMT) Analysis

	FT	OE	SD	SS	T
FT					
OE	0.072				
SD	0.836	0.15			
SS	0.067	0.084	0.506		
T	0.06	0.077	0.477	0.04	

3.7 Hypothesis Testing

The data presented in Table 3 provides a clear representation of the findings obtained from hypothesis testing carried out using Structural Equation Modeling. The hypotheses under consideration, labeled as H1 to H4, aim to examine the claimed causal connections between different dimensions, such as Trust and Success Drivers. The first study's theoretical predictions are supported by the observed effect sizes, which are represented by the original sample estimates.

Table 3
Hypothesis Testing

H	Path	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P	Decision
H1	T → SD	0.454	0.452	0.026	17.514	0.00	supported
H2	FT → SD	0.724	0.72	0.029	24.958	0.00	supported
H3	OE → SD	0.097	0.097	0.021	4.603	0.00	supported
H4	SS → SD	0.393	0.392	0.027	14.751	0.00	supported

In addition to these estimations, the sample means obtained using bootstrapping techniques shows in Fig. 4 offer a comprehensive indicator of the effect sizes, thereby confirming the consistency of these estimations across numerous samples. The standard deviations that are provided indicate the intrinsic variability present in the bootstrap samples, serving as a measure for the spread of the estimations.

The t-statistics, derived by dividing the original sample values by their corresponding standard deviations, provide a reliable and robust indicator of the dependability and magnitude of the associations. The presence of high T-values across all hypotheses highlights the reliability and strength of the observed effects, providing support for the anticipated links within the model. The P-values, which play a crucial role in inferential statistics, are uniformly zero for all hypotheses in the current investigation. The data demonstrate a clear and significant statistical significance, thus refuting the null hypothesis that suggests the absence of any correlations between the constructs.

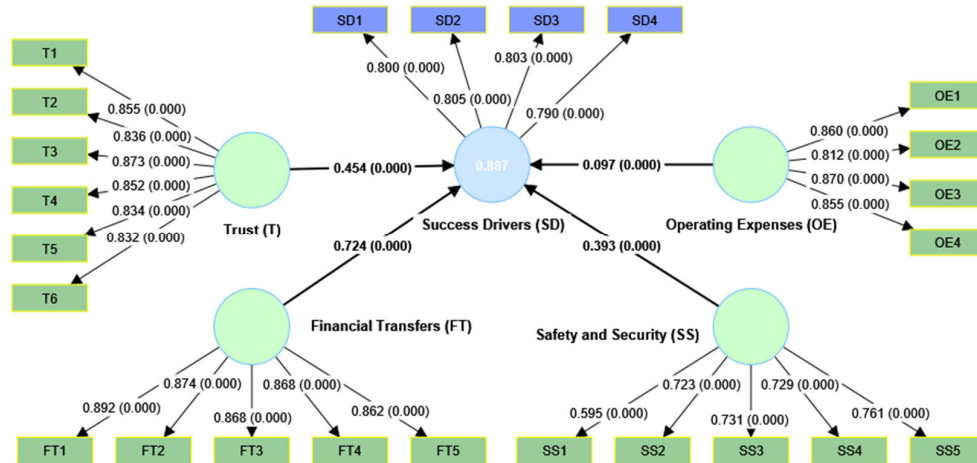


Fig. 4. bootstrapping Model

4. Results and Discussion

The present study examines the effective utilization of blockchain technology inside Islamic banks in the United Arab Emirates (UAE). Specifically, it investigates the impact of several independent variables on the Success Drivers for Blockchain Implementation. The data used in this study was obtained from a large sample of experts working in the banking industry. The data was subjected to a rigorous analysis using SmartPLS, which allowed for a comprehensive application of Partial Least Squares Structural Equation Modeling (PLS-SEM).

The components being studied, namely Trust (T), Financial Transfers (FT), Operating Expenses (OE), and Safety and Security (SS), were represented by observable variables that exhibited robust loadings, showing a substantial and positive association with the underlying structures. The VIF scores provided proof of the absence of multicollinearity, hence confirming the distinctiveness and individual impact of each independent variable on the model. The reliability metrics, such as Cronbach's Alpha and composite reliability (ρ_a , ρ_c), provided empirical evidence supporting the internal consistency and precision of the constructs.

The Average Variance Extracted (AVE) for each construct surpassed the established criterion of 0.5, indicating a model with a substantial level of convergent validity. This suggests that a significant proportion of the variability in the observed variables is adequately explained by the constructs they are designed to assess. The evaluation of the structural model, represented by the R^2 and adjusted R^2 values, indicated a substantial level of explanatory capability for the dependent variable, Success Drivers for Blockchain Implementation. This suggests that a considerable proportion of the variability in the dependent variable can be accounted for by the independent factors.

Discriminant validity was demonstrated by evaluating the HTMT ratios, which exhibited values significantly lower than the predetermined threshold. This suggests that there are distinct differences between the constructs under investigation. The results of hypothesis testing indicated that there was statistical significance in all the paths examined, including Trust, Financial Transfers, Operating Expenses, and Safety and Security, in relation to Success Drivers. This highlights the significance of these elements in determining the effectiveness of implementing blockchain technology.

The study's empirical findings provide light on the complex aspects of blockchain adoption within the specific context of Islamic banking in the United Arab Emirates. Trust has been identified as a fundamental component, indicating that the technology's effective implementation relies heavily on confidence in it. The enhancement of financial transfers through blockchain technology demonstrates a significant correlation with the effective adoption of this technology, aligning with its

potential to revolutionize banking activities. Additionally, the research findings indicate that the influence of blockchain on Operating Expenses is a noteworthy factor to be considered, as the cost implications play a pivotal part in the adoption of this technology.

Finally, the significance of safety and security offered by blockchain technology is emphasized as essential factors that align with the sector's focus on maintaining integrity and safeguarding the security of financial transactions. The correlation between the Safety and Security construct and Success Drivers for Blockchain Implementation indicates that the perceived effectiveness of blockchain in preventing fraudulent activities and improving transaction security plays a crucial role in the adoption of this technology by Islamic banks in the UAE.

When analyzing the consequences of these findings, it is crucial to consider the specific circumstances of the Islamic banking sector in the UAE, where there is a strong emphasis on trust and adherence to Shariah law. The integration of blockchain technology within this industry is not solely a matter of technical or financial consideration, but rather a decision that is intricately tied to the cultural and religious foundations of the establishments and their customer base. The connection of blockchain technology with the key principles of Islamic banking is underscored by the favorable associations discovered between these constructs and the Success Drivers.

Moreover, the findings of the study indicate the possibility of a paradigm shift in the operating frameworks of Islamic banks in the United Arab Emirates, propelled by the adoption of blockchain technology. The analysis demonstrates that blockchain technology has the potential to improve operational efficiency and security. Also, it aligns well with the core principles of trust and ethical financial practices that are integral to the principles of Islamic banking.

The findings of this research add to the emerging collection of scholarly works on the application of blockchain technology in the financial industry. These results offer empirical support for the strategic choices made by banking practitioners, policymakers, and regulatory bodies. This research provides a fundamental framework for the examination and advancement of blockchain strategies in Islamic banking and other domains by analyzing and measuring the influence of significant variables on the achievement of blockchain adoption.

5. Conclusion

The relentless progression of technical progress has introduced what is frequently celebrated as the era of digitalization, marked by a multitude of groundbreaking developments that are poised to transform the future terrain. Among these options, blockchain technology has emerged as a significant innovation, widely recognized for its potential to bring about revolutionary changes in several industries because to its inherent attributes of convenience, transparency, and efficiency. The authors Alaeddin, Al Dakash, and Azrak (2021) have extensively discussed the concept of blockchain in their influential works. Additionally, Tijan, Aksentijević, Ivanić, and Jardas (2019) have also supported and reinforced the ideas put forth by former scholars. According to these researchers, blockchain technology is positioned as a leading force in the ongoing digital revolution. It provides a reliable framework for conducting secure, transparent, and efficient transactions in diverse fields.

This study examines the significant ramifications of blockchain technology in the Islamic banking sector of the United Arab Emirates (UAE), investigating its capacity to stimulate achievements and advancements. The empirical evidence highlights the significant importance of Trust, Financial Transfers, Operating Expenses, and Safety and Security as crucial factors that contribute to the effective adoption and deployment of blockchain technology. The comprehensive statistical research, supported by strong levels of reliability and validity, provides support for the claim that these constructions play a crucial role in the acceptance and efficient utilization of blockchain technology in Islamic institutions within the region.

This study proposes that blockchain technology has the potential to significantly impact the Islamic banking sector in the UAE, by offering remarkable developments that align with the sector's rigorous standards. The study not only supports the practicality of blockchain as a valuable resource for the financial sector, but also paves the way for additional academic investigation into its diverse uses, notably in the context of Islamic finance. The advent of the digital era has brought forth blockchain technology, which offers a wide range of features and uses. This technology is expected to play a pivotal role in driving innovation and advancement, particularly in the Islamic banking industry of the United Arab Emirates.

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