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Islamic Finance and Digital Currencies: An Overview The development of Blockchain adoption in Iraq and Arab countries

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Abstract

This review paper provides a comprehensive examination of blockchain technology in Arab countries. This article examines the prospective uses of blockchain technology across several domains, including banking and public service delivery. The document delineates the limitations and opportunities associated with the use of blockchain technology in Arab nations, emphasizing the prospective advantages of this technology for the area, including improved communication, safety, and efficiency. The paper concludes with an examination of the future potential of blockchain technology in Arab nations, alongside the need for continuous research and development in this domain. This report enhances comprehension of blockchain technology's significance in Arab nations and provides insights to aid policymakers and business leaders in optimising its maximum potential.

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1.Introduction :

The implementation of blockchain technology in Islamic banking enables budding scholars to significantly modify contemporary financial institutions. The study assesses intricate blockchain implementation strategies for Sharia-compliant systems of finance inside the financial environment of Arab countries . The integration of blockchain technology with Islamic finance creates novel research avenues by enabling a detailed analysis of cryptocurrency applications in accordance with Sharia law (Baita & Lukito, 2024:83).

Blockchain technology has disrupted global financial institutions due to its decentralized roots and transparent operational needs. The Islamic finance sector, according to Sharia law principles, seeks to identify contemporary financial innovations that include its ethical basis via inventive tactics. This research aims to elucidate how the convergence of blockchain technology and Sharia principles facilitates the seamless integration of cryptocurrencies into Islamic financial institutions. Researchers have deliberately chosen to concentrate their investigation on Arabic nations (Al-Ansari & Aysan, 2024:263).

The substantial Muslim population, along with a growing passion for financial technology in Arab nations, establishes a unique environment to explore the practical integration of Islamic banking principles with blockchain technology. The study aims to illustrate how the integration of blockchain technology in Islamic finance systems would enhance financial inclusion while concurrently fostering openness and ensuring compliance with Sharia principles (Jihad et al., 2024:316).

This study necessitates comprehensive evaluations of fundamental ideas in blockchain technology, the principles of Islamic finance, and the dynamic landscape of cryptocurrencies. It is essential to delineate the intersections and distinctions between academic research partnerships and financial organizations, as well as policy-making entities. We want to understand operational dynamics while forecasting a financial environment in which technology is fully integrated with ethical and religious principles.

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2.Literature Review :

Blockchain technology has instigated a transformative shift in conventional financial institutions via its decentralized architecture and transparent design. Investigations investigating the compatibility of blockchain technology with Islamic banking principles indicate potential benefits for the unique financial systems of Arab nations. The Arab country urgently need comprehension of how blockchain technology aligns with Islamic ethical principles in banking (Aysan & Al-Ansari, 2022:98).

The integration of blockchain technology with Islamic banking establishes a new analytical domain especially relevant to the market. Arab nations, characterized by a substantial Muslim population and a growing interest in financial technology, are at the intersection of tradition and innovation. A global imperative exists to comprehend the integration of blockchain technology with Islamic finance principles, since both the potential and challenges presented by blockchain need adaptation within financial industry (Daraz Khan, 2020:171).

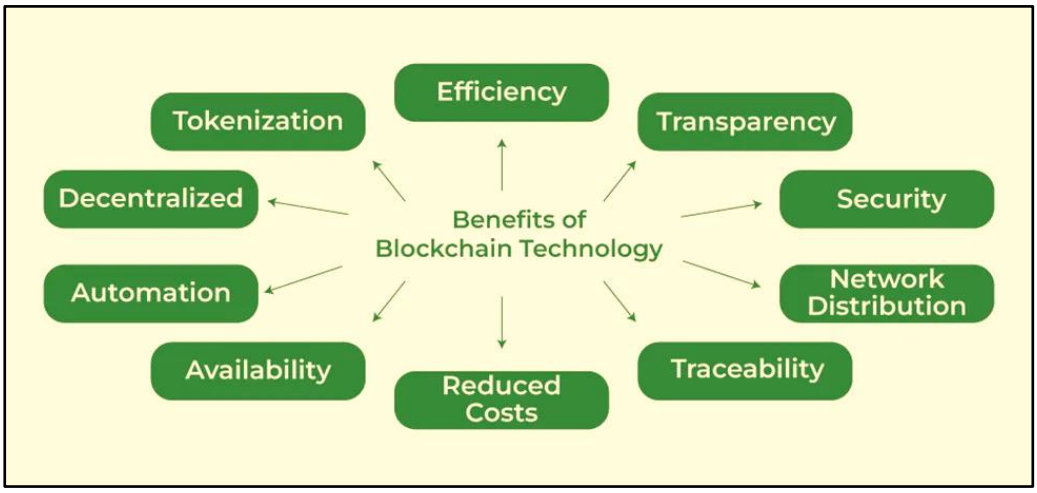

Figure (1,1): description of the benefit of Blockchain

The foundational framework for researching Blockchain dynamics in Islamic banking within the financial sector is established via several evaluative perspectives. Integrating digital currencies with Islamic finance enables organizations to establish transparent, efficient, and secure financial procedures that adhere to Sharia-compliant concepts of accountability and justice (Tok, 2020:148).

2.1 Background of Islamic Finance in Iraq:

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There are a total of 25 Islamic banks in Iraq after 2003, including one public bank and twenty-four private joint-stock institutions. Among these, the Iraqi bank stands out as a pioneer in the country's financial sector. Founded in Baghdad on 4/25/1993, the fifteen branches of this private shareholding bank adhere strictly to Shariah law and conduct all of their business in accordance with Islamic principles (Ahmad, 2025:9).

The low banking penetration rates and largely Muslim population of Iraq provide significant long-term development potential for the Islamic banking industry, according to Fitch Ratings, who released their report on October 16, 2024. The market share of Islamic banks has increased dramatically in recent years, reaching 9.7 percent by the end of 2023 (compared to 8.15 percent in 2022) and a total of (Iraqi Dinar) IQD19.81 trillion (equivalent to 15.1 billion USD) (Al Tamimi, 2025)

The banking industry as a whole is still underdeveloped and fundamentally weak, which leaves it vulnerable to significant compliance and foreign-currency risks and causes depositors to lose faith in the industry. A small number of state-owned banks with murky finances control the vast majority of the banking industry's shares. Compared to other Arab world nations, 81% of adults in this country did not have a bank account in 2021—a low penetration rate for banking, according to the World Bank. By the end of 2023, the ratio of loans to GDP in Iraq's banking industry was a meagre 20% (Wallace, 2024).

With one of the world's largest percentages of people who do not hold bank accounts due to religious concerns (around 21%), the Islamic banking business has great potential for expansion. Potentially boosting trust and sector development, the Central Bank of Iraq (CBI) has mandated that banks raise their minimum paid-up capital requirement by the end of 2024. But there is a dearth of Islamic liquidity management instruments, and public knowledge and the dispersion of Islamic bank branches are low (Department of State, 2024).

There are 79 banks in the country's financial system, 32 of which adhere to Islamic principles. But by the end of 2023, three state-owned banks had accumulated 79% of the sector's total assets. Due to a lack of available funding, many Islamic banks maintain very modest financing books in comparison to their overall assets. Having sufficient funds on hand, nevertheless, should allow for expansion in the event that favorable conditions arise - Despite having a somewhat lower percentage of the market for assets, Islamic banks' paid-up capital accounted for 39% of the overall paid-up capital in the banking industry as of the end of 2023.

Three Iraqi Islamic banks—Cihan Bank For Islamic Investment and Finance P.S.C., Ameen Al Iraq Bank for Islamic Investment and Finance, & Iraqi Islamic Bank for Investment and Development—have respective 'CCC+' ratings from Fitch. Two

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Islamic banks in Iraq, International Islamic Bank and Kurdistan International Islamic Bank, had their ratings removed by Fitch not long ago. With a 60% rise to IQD400 billion (USD307.7 million) in August 2023, the CBI raised the minimum paid-up capital requirement for Iraqi banks. Banks in Iraq must pay a total of at least IQD50 billion in three installments by the end of 2023, the end of the first half of 2024, and the end of 2024 in order to meet the new demand by the end of 2024 (Credit Ratings & Analysis, 2024).

The ability of the three rated Islamic banks to meet the additional capital criteria is uncertain at this time. If a bank fails to comply, CBI may demand a merger, acquisition, or liquidation. The CBI prohibited eight more Iraqi banks from handling US dollars in January 2024 owing to compliance concerns with US dollar transactions, mostly with international transfers, but permitted them to handle any other foreign currency including Iraqi dinar. This means that 32 banks, including 19 local Islamic banks, are subject to the prohibition (Islamic finance litigation, 2025).

Banks have considerable credit, market, and operational risks (which includes compliance, reputation, and penalties) as a result of the prohibition, which may eat away at their capital and jeopardize their continued existence. Low market capitalization (USD14.2 billion, or around 5% of GDP in 2023) indicates that Iraq's financial markets, particularly the sukuk market, are still in their early stages of development. International capital markets are inaccessible to Iraqi banks.

The CBI began the project in 2017, and by the end of 2023, the Iraqi parliament had adopted the sukuk legislation that covers both sovereign & corporate issuances. Following the CBI's issuance of takaful rules and the establishment of the first takaful insurance firm in 2019, there has been some development, although the takaful market is still in its early stages (Hassan, 2024:25).

2.2 Blockchain Technology and Innovation :

Blockchain technology, first presented in a white paper by bitcoin's anonymous creator Satoshi Nakamoto in 2008, is most often linked with the digital currency bitcoin (2008). The basic type of blockchain was defined by Satoshi Nakamoto. The term "blockchain" was defined by him as a series of interconnected data chunks. The term "blockchain" refers to a distributed ledger system that stores records in an ever-growing list of blocks. Data pertaining to transactions, a timestamp, and a hash reference to the block before it is the usual components of a block (Al-ani, 2013:129).

Connecting blocks that include the hash value of the preceding block forms a chain. Blockchain, according to Davidson et al. (2016), is a cryptographic marvel since it is a secure, transparent, and resilient ledger. Crosby et al. (2016) defines blockchain as

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a decentralized ledger that records every digital transaction that has ever taken place inside a network. He gave a general outline of blockchain technology and discussed various problems that blockchain can fix as well as certain restrictions that will need more research and development (Bolfing, 2020:199).

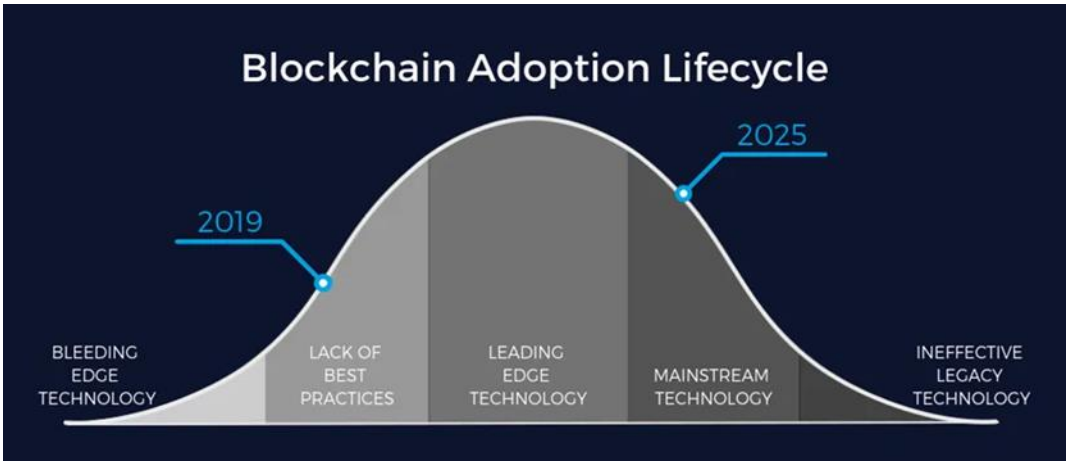

Figure (1,2): Block chain adoption life Cycle

Blockchain, according to Buterin (2015), is a cryptographically safe magic computer that stores all past and present states in a decentralized database and has self-executing programs. Blockchain technology is the foundation of all digital transactions, according to Carlozo (2017). Additionally, he said that blockchain technology will provide innovative methods for doing business. A standardized procedure is what makes blockchain work. Any user or node in a P2P network may initiate a transaction by sending out a request (Banafa, 2022:14).

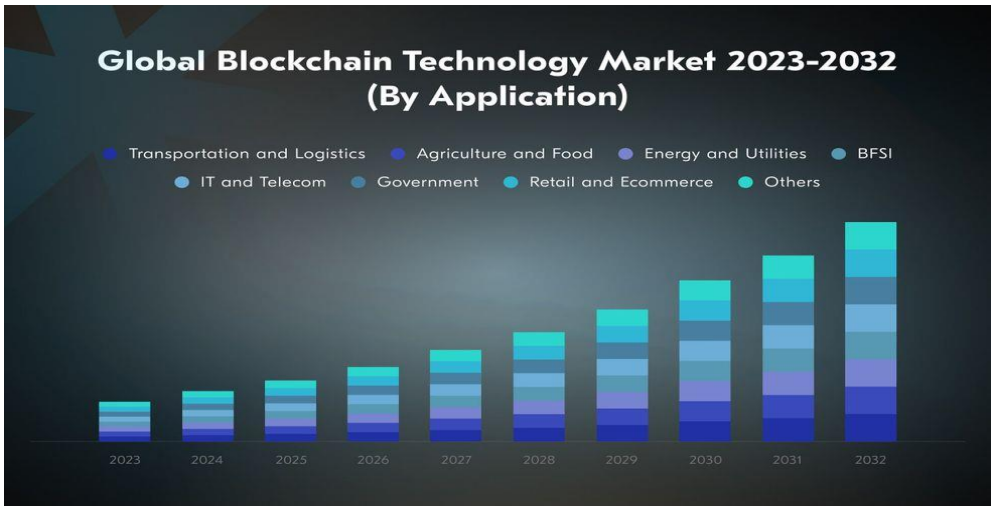

Figure (2,1): the development of blockchain and future aspect

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The next step is to notify every user on the network about the transaction. The next step is for all the nodes in the P2P network to use the hashes to confirm the transactions. A new block is used to hold the transaction data after the verification is finished. The last step in making a block permanent and immutable is to attach it to the blockchain using the hashed value of the information from the preceding block. The Genesis block serves as the chain's foundation and is the first block in every blockchain (Devi et al., 2023).

2.3 New Block Chain :

Blockchain technology, first presented in a white paper by bitcoin's anonymous creator Satoshi Nakamoto in 2008, is most often linked with the digital currency bitcoin (2008). The basic type of blockchain was defined by Satoshi Nakamoto. The term "blockchain" was defined by him as a series of interconnected data chunks. The term "blockchain" refers to a distributed ledger system that stores records in an ever-growing list of blocks. Data pertaining to transactions, a timestamp, and a hash reference to the block before it are the usual components of a block (Ramasamy & Khan, 2024:17).

Connecting blocks that include the hash value of the preceding block forms a chain. Blockchain, according to Davidson et al. (2016), is a cryptographic marvel since it is a secure, transparent, and resilient ledger. Crosby et al. (2016) defines blockchain as a decentralized ledger that records every digital transaction that has ever taken place inside a network. He gave a general outline of blockchain technology and discussed various problems that blockchain can fix as well as certain restrictions that will need more research and development. Blockchain, according to Buterin (2015), is a cryptographically safe magic computer that stores all past and present states in a decentralized database and has self-executing programs (Singh et al., 2021:18).

Blockchain technology is the foundation of all digital transactions, according to Carlozo (2017). Additionally, he said that blockchain technology will provide innovative methods for doing business. A standardized procedure is what makes blockchain work. Any user or node in a P2P network may initiate a transaction by sending out a request. The next step is to notify every user on the network about the transaction. The next step is for all the nodes in the P2P network to use the hashes to confirm the transactions. A new block is used to hold the transaction data after the verification is finished (Kianieff, 2019:36).

The last step in making a block permanent and immutable is to attach it to the blockchain using the hashed value of the information from the preceding block. The Genesis block serves as the chain's foundation and is the first block in every

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blockchain. Cryptocurrencies like Bitcoin, Litecoin, and Ripple all use blockchain technology. Blockchains might exist apart from cryptocurrencies, however it is important to note that cryptocurrencies are a result of blockchains (Urquhart & Yarovaya, 2020:8).

Bitcoin was the first cryptocurrency to leverage blockchain technology. Case by case, individuals use blockchain technology in different ways. Public, private, and consortium blockchains were the three main categories into which Buterin (2015) loosely classified blockchain systems. Another kind of blockchain, called a hybrid blockchain, exists alongside this one (Ahmad, 2021:9). What follows is a synopsis of each of these categories:

1. One kind of blockchain is the public one, which is accessible to everyone and does not need any special permissions to use. A blockchain platform allows everyone with an internet connection to join, become an authorized node, see all records, and validate transactions. Virtually all cryptocurrency mining and trading takes place on public blockchains. For instance, Litecoin, Bitcoin, and Ethereum (Al-ani, 2013:26).
2. Private blockchains: This kind of blockchain is known as a private blockchain, and it operates in an exclusive, closed network. In a private blockchain, only authorized users inside an organization may access the blockchain network. It is up to the governing organization to decide on the degree of security, authorizations, permissions, and accessibility. Voting, managing supply chains, digital identities, asset ownership, and other similar processes all make use of private blockchain networks. Fabric, Sawtooth, Corda, and other Hyperledger and Multichain projects are good examples (Alexander & Karametaxas, 2021:287).
3. Consortium blockchain: In this model, a designated set of individuals is permitted to see, verify, or contribute to the blockchain. Consequently, it is regulated only by authorized nodes. The primary distinction between private blockchains and consortium blockchains is that consortium blockchains are managed by a collective rather than an individual business. Multiple organizations may function as nodes in this blockchain, facilitating information sharing or engaging in mining activities. Consortium blockchains are often used by financial institutions, governmental entities, and similar organizations (Antonijević & Domazet, 2024:312).
4. Hybrid blockchain: This kind of blockchain combines elements of both public and private blockchains. This indicates that it amalgamates the privacy advantages of a private blockchain and the security and visibility benefits of a public blockchain. This hybrid network enables users to regulate access to

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specific data stored on the blockchain. A transaction in a private hybrid blockchain network is often validated inside that network. However, users may also publish it on the public blockchain for verification purposes. Only a designated subset of data or records within the blockchain may be made public, while the remainder remains secret inside the private network. Dragonchain serves as an example of a hybrid blockchain (Banafa, 2022:12).

2.4 Applications of Blockchain:

Cryptocurrencies are the first application of the technology's blockchain and serve as a significant domain for its use. A cryptocurrency is a digital means of exchange, like to Taka, that is generated and maintained by encryption methods to regulate the formation of monetary units and authenticate transactions. Cryptocurrency is distinctive due to its lack of inherent value, absence of physical form, and supply not being regulated by a central bank. The introduction of Bitcoin in January 2009 was the first practical implementation of blockchain technology. Subsequent to the introduction of Bitcoin, many other cryptocurrencies have been created (George, 2021:3).

Name coin was launched in April 2011, whereas Litecoin was introduced in October 2011. The primary emphasis is on the use of cryptocurrency as a payment method. Assume that user X wants to remit funds to user Y. Upon the occurrence of this transaction, it is encapsulated as a block and disseminated to every node/user inside the P2P network. Subsequently, users must authenticate the transaction's legitimacy. Users must solve a problem to be the first to verify the transaction. This challenge requires certain computing capabilities (Di Francesco Maesa & Ricci, 2023:114).

The process of solving puzzles is referred to as "mining," and the first miner to discover the answer receives a bitcoin reward, resulting in competition among miners to be the quickest in solving the challenge. The second type is E-government services for consumers, corporations, and governmental entities have been quickly developing in recent years. The use of blockchain technology inside government operations would enable an expansion of service offerings while enhancing the quality and efficiency of current services (Doğan, 2024:78).

Blockchain facilitates transactions related to the digitization of assets (such as currency, equities, and property rights) and enables decentralized exchanges (peer-to-peer transactions). The use of blockchain-based electronic voting systems may provide a transparent and secure voting process, ensuring that election manipulation is impossible since all participants can see and verify the votes. Hou (2017) examines a blockchain system that authenticates the origin and integrity of data

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during transmission in e-government and public services, applied in Chin (Ismailova, 2024:92).

The third type is The current land registration system is characterized by several middlemen, resulting in heightened fraud risk, delays, and excessive human involvement. Blockchain technology may be used in land registration to address these issues. Land information, including physical status and associated rights, may be recorded and disseminated on blockchain, enabling signatories to authenticate documents and allowing other users to check them as required. Modifications to the land, including transfers or the creation of mortgages, may be documented and administered on the blockchain (Calik, 2024:52).

Furthermore, the blockchain land registration platform enables the creation of a digital, decentralized identity for both sellers and buyers, facilitating ownership transfer more efficiently than conventional methods. While blockchain guarantees the legitimacy of transactions in the land registration system, meticulous attention is required to verify that the information entered into the blockchain is really truthful and correct. In light of its advantages, some industrialized nations, such as the United States, Netherlands, United Kingdom, and Sweden, have initiated efforts to incorporate blockchain technology into their current land registration systems (Ducrée, 2020:13).

2.5 Cyber Security in Blockchain

Fundamental Security Attributes of Blockchain is in Decentralization, which is the absence of a singular point of failure; data is disseminated among nodes. To provide safe transactions, cryptography employs public-private key encryption and hash algorithms such as SHA-256 and Keccak. Immutability : Once documented, data cannot be modified without the agreement of the network. Consensus Mechanisms - Protocols such as Byzantine Fault Tolerance (BFT), Proof of Stake (PoS), and Proof of Work (PoW) guarantee the legitimacy of transactions.

Principal Cybersecurity Threats in Blockchain can seen in the Vulnerabilities in Smart Contracts Reentrancy Attacks . Integer Overflows/Underflows — Exploited to alter token balances. Unregulated External Calls — Malicious entities may exploit contract logic (Lee & Yeon, 2021:107)..

One entity acquires over 50% of mining power (Proof of Work) or staking authority (Proof of Stake), facilitating double-spending and chain reorganization. Ethereum Classic (ETC) saw many 51% assaults. Theft of Private Keys and Phishing If a user's private key is compromised, attackers may deplete wallets. Counterfeit wallet applications and phishing websites deceive users into disclosing their keys. Another

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expel can be seen : Sybil Attacks when Malefactors establish counterfeit nodes to undermine consensus, a frequent occurrence in peer-to-peer networks. Alson in " Oracle Manipulation" when Decentralized applications (DApps) depend on external data sources (oracles) (Baston, 2025:77).

3. Technology Development in Arab Countries :

The operations of financial technology firms in several Arab nations have experienced significant growth in recent years, bolstered by substantial advancements in the IT and telecommunications sectors, as well as the availability of sophisticated communication networks, which facilitated a surge in the number of individuals and businesses utilizing Internet networks (Bizri, 2018:87).

The substantial rise in smartphone users has also facilitated the swift implementation of electronic payment apps in Arab nations. The availability of such applications has been improved by the efforts of supervisory authorities to develop payment or clearing systems, as well as to enact legislation that promotes the growth of electronic payment systems, particularly concerning electronic signatures, cybersecurity, and data protection (Wilson, 2021:22).

3.1 Ethereum blockchain technology for cross-border transactions

Despite blockchain technology's growing prominence as a disruptive force, there are substantial obstacles that are limiting its broad adoption, particularly in the cryptocurrency industry. Although cryptocurrencies such as Bitcoin and Ethereum have seen significant growth in popularity, their increased transaction fees and slowness have hindered their ability to gain broad adoption as a means of trade. With their limited processing power, cryptocurrencies like Bitcoin can only manage roughly seven transactions per second, in stark contrast to standard banking systems like Visa, which can handle hundreds of transactions per second. Cryptocurrencies are subject to unpredictable and highly fluctuating values (Baston, 2025:87).

Because it uses so much energy, mining leaves a significant carbon footprint; it is the mechanism by which the network verifies transactions by adding blocks. In response, less power-hungry consensus mechanisms like Proof of Stake are in development. The introduction of off-network "Layer 2" platforms is also helping to improve performance, make systems more scalable, and lessen the network's primary infrastructure. Blockchain technology is still growing in popularity in many different sectors throughout the globe, even if it has its share of problems (Palladino, 2019:155).

3.2 Blockchain in the Middle East and MENA

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Within May 2017, Al Rajhi Bank executed a cross-border transaction using Blockchain technology in just seconds. In February 2018, Saudi Arabia's central bank entered into an agreement with the U.S.-based company Ripple to facilitate the quick settlement of payments by banks in Saudi Arabia using Ripple's software for transactions entering and exiting the country. The government of Saudi Arabia launched a Financial Sector Growth Program as a component of its Vision 2030 initiative (Wang, 2021:324).

The initiative seeks to accomplish five objectives: financial diversity, inclusion in finance, financial stability, digital transformation, and depth in the financial sector. Authorities The Saudi Arabian Monetary Administration (SAMA) and the "Capital Market Authority (CMA)" serve as the principal financial regulators in the nation. In May 2017, SAMA published a Cyber Security Policy delineating the principles and goals for the commencement, implementation, maintenance, monitoring, and upgrading of cyber security procedures for Member Organizations (Wang et al., 2023:312).

Nonetheless, shifts are on the horizon as an increasing number of Arab countries test out the technology. Many obstacles stand in the way of widespread use of this technology, including an inadequate tax system, lax laws, an absence of qualified personnel, and general ignorance. Concerning data protection, the Middle East does not have data protection laws similar to the EU's (GDPR). Bahrain and Qatar enacted data protection measures in 2019 and 2016, respectively, whereas Saudi Arabia, Kuwait, Oman, and the UAE all have less comprehensive laws. Worldwide privacy regulations govern the United Arab Emirates' free zones, including the DIFC (Lee & Yeon, 2021:110).

Another way that the hasty adoption of blockchain technology raises the risk of cybercrime is by ignoring the need for suitable legal and regulatory frameworks. The extensive use of blockchain and cryptocurrencies in several Gulf States has greatly facilitated advancements in the MENA area. The United Arab Emirates (UAE), Bahrain, and Saudi Arabia are leading the pack in developing their blockchain policy and regulatory frameworks. Its significance has grown in recent times. Since the outlook for long-term oil production is worsening, it is necessary to create a new economic and sustainable future (Hussein & Hadiyan Nik Azman, 2024:231).

Hence, a number of countries have exerted great effort to develop cryptocurrency and blockchain governance frameworks. When compared to other MENA countries, the Gulf nations have been more quick to embrace blockchain and cryptocurrencies. They want to attract international investment to the area and encourage entrepreneurs to team up with conventional banks by passing progressive financial regulations.

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Rather from setting new trends in innovation, these nations have a habit of just following suit. But this is beginning to change in the financial technology industry, which is leading the charge for digital transformation and introducing groundbreaking legislative ideas that are impacting the world in a profound way (Nguyen et al., 2022:89).

Governments in these areas are stepping in to help fledgling businesses get off the ground by providing workspaces and enabling people to play around with technology in designated "sandboxes." They want to be at the forefront of the Fourth Industrial Revolution. As the bitcoin ecosystem grows, these areas are attracting the interest of foreign investors and entrepreneurs. Ripple Labs, a cryptocurrency payments business located in the US, is already collaborating with banks throughout Saudi Arabia and the UAE to legitimize and promote cryptocurrencies (Dondjio & Kazamias, 2025:185).

3.3 Adoption of Blockchain technology in Arab Countries:

The Iraqi Central Bank prohibited the usage of cryptocurrencies in 2017. Citizens have been compelled to pursue black market avenues for bitcoin transactions owing to this restriction and the absence of a regulated framework for the sector. While Bahrain to emerged as the leading supporter of new fintech and blockchain initiatives to establish itself as the premier technology center in the region. The Central Bank of Bahrain has introduced the Crypto-Asset Module, a regulatory framework for licensing crypto-asset enterprises (Naderi, 2022:29).

The government has further urged firms to test bitcoin goods and services in sanctioned sandboxes. A study was undertaken in 2020 to examine the nation's interoperability status and evaluate the level of e-government maturity . Blockchain technology has the capacity to enhance services in the Kingdom of Bahrain and elevate citizen contentment. In Kuwait, digital currencies such as Bitcoin, Ethereum, & Dogecoin have faced criticism by the Central Bank of Kuwait because of their volatility and susceptibility to fraud. Jordan was introduced in 2017 (Nawaz & Thowfeek, 2020:131).

The proposal connects the bank with the digital identification data of refugees, using Blockchain technology for financial transactions. The project enhances efficiency and transparency while facilitating the monitoring of funds used by the World Food Program's (WFP). The WFP officially announces that over 106,000 refugees are now receiving financial transfers. The WFP and UN Women started an investigation on the possibilities for female refugees to participate in the UN Women pay-for-work project in 2018 (Sharif, 2023:264).

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The UAE government aims to establish itself as a regional hub for corporate innovation by deploying blockchain technology nationwide. The Emirates Blockchain Strategy 2021, introduced in 2018, aimed to transition 50% of all governmental agreements on a blockchain framework by 2021. The plan's primary aim is to reduce labour costs related to regular transaction and processing of documents by millions of hours & billions of dollars. The AI and Blockchain Guide Initiative, intended to provide a standardized description of these new technologies at the federal level, was introduced in 2018 (Allen, 2019:218).

The Abu Dhabi administration, the capital of the United Arab Emirates & its administrative center, has been diligently investigating blockchain and cryptocurrency technologies as a means to foster future economic development. The Abu Dhabi Global Market (ADGM) was established to formulate policies that promote innovation in the transition to a digital economy. The ADGM's "digital assets" framework establishes standards for asset protection, governance, as well as anti-money laundering (Bekkaye, 2019:138).

It also developed the RegLab sandbox, a regulated area for firms to evaluate new financial innovations. Blockchain technology applications in the United Arab Emirates beyond the financial sector.

Recently, the Abu Dhabi National Oil Company, the biggest oil enterprise in the UAE, collaborated with IBM to oversee volumes and transactions inside its subsidiary operations employing a blockchain-based system. Blockchain has significantly progressed in Dubai. The Dubai government recently announced the Dubai Blockchain Strategy, aiming to establish Dubai as the first city globally to be fully powered by blockchain technology and to become the smartest and happiest city in the world. To govern the cryptocurrency sector, Dubai has implemented its first initiative, resulting in the establishment of the Dubai Virtual Supervisory Authority (Effiong et al., 2022:163).

The "Smart Dubai" agency, responsible for managing the change, has identified twenty-four possible blockchain applications now occurring in areas such as health, transportation, and education. The country supports the use of blockchain to optimize payment as well as law enforcement processes. Dubai is using blockchain technology in order to improve international commerce. The Digital Silk Road idea utilizes a private blockchain to modernize commerce. The program seeks to enhance Dubai's global commerce by establishing a reliable, secure, real-time network for trade data, therefore augmenting Dubai's reputation as the premier location for business worldwide (Kumar et al., 2019:31).

4. The Future of Blockchain Adoption in Arab Countries:

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The literature research indicates that blockchain usage is expanding across several industries in Arab nations. The use of blockchain technology throughout the Middle East is propelled by the need for safe and transparent transactions, cost savings, and enhanced efficiency. In the financial industry, some Middle Eastern nations, including the UAE, Bahrain, and Saudi Arabia, have initiated efforts to integrate blockchain technology into their financial systems to enhance transaction efficiency and security (Khasawneh & AlArmouty, 2019:213).

The UAE Central Bank has initiated a blockchain-based payment system named "Project Aber" to enable real-time transactions among banks. The Saudi Arabian Financial Authority (SAMA) has introduced "Aber," a digital currency intended to facilitate safe and expedited cross-border transactions. The healthcare industry in the Middle East has promise for blockchain use. Blockchain innovation in healthcare may enhance the safe and efficient management of patient information. A pilot initiative named "Dubai Health Authority Blockchain Initiative" was initiated in Dubai to securely and effectively manage electronic health records (EHRs) of patients (Musonda et al., 2025:45).

A blockchain-based platform named "Vezeeta" was introduced in Egypt to facilitate patient access to physicians and appointments. The education industry is investigating the possibilities of blockchain technology in Arab nations. A case study in Saudi Arabia demonstrated the potential of blockchain technology for educational purposes for verifying the legitimacy of degrees and certificates. A suggested framework for implementing blockchain technology in higher education institutions was established via a literature study (Cirera et al., 2022:75).

Various industries, including logistics, supply chain management, transportation, the public sector, and energy, are investigating the possibilities of blockchain technology in Arab nations. The research indicates that blockchain usage is expanding across several industries in the Middle East. Despite ongoing hurdles in the use of blockchain technology, including legal frameworks and interoperability concerns, the potential advantages are substantial. Additional study is required to investigate the possibilities of blockchain technology in Arab nations and to tackle the problems associated with its implementation (Baston, 2025:122).

The use of blockchain technology in Arab nations aligns with the worldwide trend. A Deloitte analysis indicates that the Middle East is actively investigating the use of blockchain technology across several industries, with substantial potential advantages from its adoption (Deloitte, 2019). The research emphasised that the UAE and Saudi Arabia are in the forefront of blockchain technology adoption in the region. Nonetheless, hurdles persist in the deployment of blockchain technology in Arab nations, including legal frameworks, insufficient knowledge, and

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interoperability concerns. Compared to other areas, such as North America and Europe, Arab nations and the Middle East continue to lag in the adoption of blockchain technology (Bekkaye, 2019:58).

Nonetheless, the prospective advantages of its implementation and the increasing interest in blockchain technology inside Arab nations indicate that it is aligning with the global trend. In conclusion, the usage of blockchain technology in Arab nations is expanding across several industries, propelled by the need for safe and transparent transactions, cost reduction, and enhanced efficiency. Despite ongoing hurdles in the implementation of blockchain technology, its possible advantages are substantial. Additional study is required to investigate the possibilities of blockchain technology in Arab countries and to tackle the problems associated with its implementation (Hussein & Hadiyan Nik Azman, 2024)

5- Conclusion:

The study discusses the implementation of blockchain technology in emerging markets, particularly focusing on Arab countries, which is a compelling and topical subject. The literature assessment indicates significant interest in blockchain, smart contracts, the Internet of Things (IoT), security, and its applications in the healthcare, government, supply chain, and financial sectors. Additionally, trust is identified as a critical factor in blockchain study inside developing nations and is positively correlated with the advantages of blockchain technology. The investigation also illustrated the relationship between cryptocurrencies as well as financial inclusion. The research indicates that blockchain technology is being extensively used in Arab nations, notably in the UAE and Saudi Arabia. The area is using the advantages of blockchain, including enhanced efficiency, transparency, and security, across multiple industries like as financial services, management of supply chains, and governmental operations. The use of blockchain technology in Arab nations is propelled by several variables, including governmental endorsement, the need for enhanced transparency, and the aspiration to diminish costs and augment efficiency. Furthermore, the proliferation of companies in the area is fostering the development of novel blockchain-based solutions. Notwithstanding advancements in blockchain technology adoption, difficulties persist, including the absence of legal frameworks, interoperability concerns, and the need for more coordination among stakeholders. The use of blockchain systems in the Middle East signifies a substantial possibility for the area to establish itself as a frontrunner in the advancement of innovative technologies. The prospective advantages of blockchain are extensive, and their actualization may result in substantial enhancements in residents' lives, alongside increased economic competitiveness as well as creativity inside the area.

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