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Original Article

Financial Modernization in the Digital Era: Blockchain Technology and Its Economic Impact on Global Business Systems

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Abstract: *Finance modernization in the digital age has transformed the whole world's financial system along with the operational structure of businesses by the use of different digital technologies such as artificial intelligence, cloud computing, big data analytics, mobile banking, and blockchain technology. Blockchain technology represents one of the revolutionary decentralization technologies that enhances transparency, security, efficiency, and reliability in financial transactions. This research paper seeks to investigate financial modernization concepts and evaluate the economics of blockchain technology in business. The study examines the evolution and development of financial systems, traditional banking systems, digital payment mechanisms, and different blockchain types including public, private, consortium and hybrid blockchains. Theory explains how blockchain enables innovation, organizational adaptation, trust, and digital transformation in current financial ecosystems, therefore examines the impact of blockchain technology on cross-border transactions, digital payment systems, cryptocurrencies, supply chain management, investments, and capital markets. In addition, the current literature review has critically examined some of the major challenges that limit the application of blockchain, such as scalability problems, technical challenges, higher energy consumption, environmental challenges, and regulatory problems. It has been found from the literature search that the application of blockchain technology makes finance more efficient, more secure, increases transparency and organizational effectiveness, reduces cost, and minimizes the number of intermediaries. Despite all these benefits, however, some technological, regulatory, and environmental challenges still play roles in the extensive use of blockchain. The findings of this study reveal that blockchain technology holds enormous possibilities for changing the world's financial systems through economic modernization and digital transformation.*

Keywords: *Financial Modernization, Blockchain Technology, Digital Transformation, Decentralized Networks, Cryptocurrency, Cross-Border Transactions, Cybersecurity and Green Blockchain.*

I. INTRODUCTION

The modern economic system in the global world is experiencing significant changes due to the advancement in technology and innovation in the digital world. Banks across the globe are transitioning from traditional banking systems that operate manually to a digitalized and decentralized system. Such a transition within the finance industry is referred to as financial modernization. Financial modernization has improved the efficiency and accessibility of such operations [1][2][3]. Technologies such as artificial intelligence, cloud computing, big data analytics, mobile banking, and many more are examples of the kind of innovation that the financial industry has experienced across the globe. While blockchain technology is just one among many such innovative technologies, it is one of those that have attracted significant interest in recent times. This is largely attributed to the ability of the technology to create decentralized networks in the recording of financial transactions. The interest in blockchain was first sparked when the cryptocurrency known as Bitcoin was introduced by Satoshi Nakamoto in 2008. Originally used in cryptocurrencies, the technology is increasingly becoming revolutionary in the fields of banking, logistics, health care, insurance, e-commerce, international transactions, and governance, among others [4].

The emergence of digital finance has changed not only the finance industry but also the entire global business. When it came to transactions and other financial matters in the past, problems such as delays, increase in transaction costs, manipulation of data, fraud, and lack of transparency occurred [5][6]. These problems, however, were mitigated using the technology of blockchain by making digital records that cannot be tampered with, securing them cryptographically, and providing instant validation of transactions. With smart contracts and distributed ledgers, blockchain provides the means to make transactions in an efficient manner without the requirement for centralization. In this day and age of globalization, there is a need for effective finance tools to keep up with the competition [7]. In this respect, blockchain technology can satisfy these requirements by virtue of being able to conduct cross-border transactions, manage supply chains, identity verification, and

asset management. Moreover, blockchain technology also contributes to financial inclusion, which allows people who do not have a bank account to be able to enjoy the services of a digital bank. Some other applications of blockchain in finance may include the introduction of CBDCs, tax systems, digital government, and data management [8].

Therefore, the research on financial modernization utilizing blockchain technology is growing importance to comprehend the future of the global economy. business processes [9].

A. Aim and Objective

The paper seeks to examine the potential applications, benefits, drawbacks, and future outlook of blockchain technology in revolutionizing the modern financial landscape.

a) Objective

- To study the phenomenon of financial modernization in the digital age.
- To study the role of the blockchain technology in the world business system.
- To study the economic impact of blockchain on financial processes.
- To find out the difficulties in using blockchain technology.
- To find out possible future prospects for blockchain technology.

B. Structure of the paper

The paper has been segmented into various parts which discuss about the idea behind the financial modernization process and the use of blockchain technology in the global business environment. It starts with the introduction and then moves forward towards the evolution of the idea of financial modernization along with the discussion regarding the conventional financial structure, digital payment system, and the economic impact of blockchain technology. Moreover, it discusses the models of blockchain technology, the effects of blockchain technology on the investment system and logistics management system, key problems faced during blockchain implementation, and related theoretical aspects.

II. METHODOLOGY

A. Research Design

The research methodology employed in the study was qualitative and review based. This helped in investigating the phenomenon of financial modernization, along with the economic implications of blockchain technology. In this context, the research was designed to help gain knowledge regarding blockchain technology applications.

B. Sources of Data

The data used for the research was gathered from secondary sources such as academic research articles, journals, books, papers, and various other online sources related to blockchain technology and digital finance.

C. Data Collection Method

Literature and research studies related to the topic have been gathered and studied to investigate how blockchain technology can be used in banking, payment, logistics, investment, and international business.

D. Scope of the Study

The research primarily focused on blockchain technology, financial modernization, digital payment systems, investment markets, supply chain transformation, and blockchain's economic impact on international commercial operations.

III. LITERATURE REVIEW

A. Emergence of Financial Modernization and Blockchain Technology

Financial modernization and Blockchain technology are some of the greatest revolutions experienced in the global economy and the business environment. While earlier financial processes relied mostly on physical activities, the present day is defined by rapid technical development that has transformed the whole procedure. There has been fast expansion of internet, globalization, digital banking, and other innovations within the field of finance [10]. In addition, there has been an advent of technologies such as blockchain which have brought about major changes in financial systems, businesses, and even trade networks [11].

a) Historical Development of Financial Systems

The evolution of financial systems is characterized by the development of economic exchanges and financial management from primitive techniques to sophisticated financial ecosystems. The early financial dealings relied mostly on the system of barter trading, which involved the exchange of goods and services without any money being used. As trade expanded, money in the form of metallic and paper money was introduced, thereby making monetary transactions more organized. Medieval societies made use of banks and money lenders, thus laying the foundations of their modern financial systems. The Industrial Revolution continued to advance the progress of the financial system as there were many commercial transactions, industrial output, and global business [12]. There were many financial entities that provided services in terms of

giving out loans, investing funds, ensuring money, and managing the capital market. In the later decades of the twentieth century, technology like the computer and the internet changed the world of finance. The banks used Electronic Data Processing, ATMs, online banking, and electronic transactions to increase their speed and efficiency. Financial Technology firms began in the twenty-first century to bring about innovations like mobile banking, online stock exchanges, digital wallets, and P2P lending [13].

b) Traditional Banking and Financial Structures

The traditional banking system and financial infrastructure have been at the core of all economic and commercial dealings for hundreds of years before the beginning of digital finance [14]. The system was more centralized in its working pattern, where banks and financial institutions played a dominant role in managing finances, facilitating financial transactions, making loans, securing deposits, and controlling the finance-related affairs. The banking business was more reliant on physical branches, paper-based records, manual record-keeping, and personal dealings between customers and financial organizations. Any financial transaction like deposits, withdrawals, transferring funds, and issuing loans, involves considerable manual efforts. The traditional financial system worked in the form of a highly organized institutional setup that consisted of commercial banks, central banks, insurance firms, stock exchanges, and other financial intermediaries. Central banks controlled monetary policies, money supply, and overall financial stability in the country. Commercial banks provided services like saving accounts, creation of credit, and finance for businesses. Financial transactions carried out via traditional systems would be quite challenging due to the involvement of several intermediaries like correspondent banks, clearinghouses, and payment processors. Transaction costs and delays would be higher. Further, individuals could not access financial services beyond banking hours, making financial inclusion in many emerging economies difficult.

c) Development of Digital Payment Technologies

The development of digital payment systems has greatly changed the structure of the modern financial system and the way businesses operate through faster, more efficient, and secure money transactions [15]. Financial transactions used to be very reliant on cash payments and checks, as well as traditional banking practices that proved to be very inefficient. Nevertheless, because of the quick development of mobile technology, the internet, and financial advances, there came an era when the payment process became digital. Credit cards, debit cards, ATMs, internet banking services, and electronic funds transfers marked the start of this period. As a result of the extensive use of smartphones and other devices, the digital payment sphere was further diversified by mobile wallets, QR codes, contactless payments, and peer-to-peer money transfers [16]. E-commerce, globalization, and mobile internet adoption have even played an additional role in promoting digital payment transactions throughout the world by facilitating their growth [17][18]. The preference of businesses for digital payments is based on the fact that digital payments increase the speed and efficiency of operations and transactions, making them transparent and more convenient for customers. Moreover, governments and financial institutions promote cashless economies through digital payments for the same reasons [19].

B. Economic Impact of Blockchain on Global Business Systems

One of the major economic effects of blockchain technology includes reducing transaction and operation costs in business organizations. Financial transactions usually involve intermediaries such as banks, brokers, clearinghouses, and payment processors, thus increasing service fees and costs of processing. Blockchain technology enhances operational efficiency by automating financial and business processes through distributed ledger systems and smart contracts. Transactions are verified and recorded in real time [20].

a) Impact on Cross-Border Transactions and International Trade

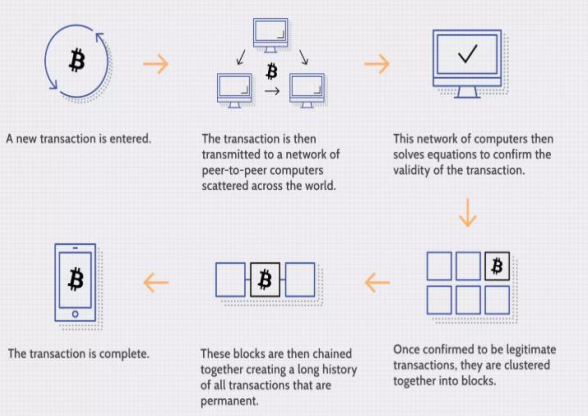

Figure 1: Blockchain Transaction Processing Cycle

Above Fig. 1 [21]: depicts the working process of blockchain technology in a decentralized network system. It starts when a new digital transaction is sent to a peer-to-peer network of computers. Network members check transaction authenticity and validity using cryptography and computing. A block of validated transactions is created after verification. A blockchain is created by securely connecting these blocks in chronological order to create a permanent, tamper-resistant digital record. Finally, the transaction is completed and stored transparently across the dispersed network, assuring blockchain security, transparency, and data integrity. However, Blockchain technology has brought considerable changes to cross-border transactions and international trade by facilitating efficient, fast, and safe transactions and making the system more transparent and efficient. Cross-border payments conducted using traditional banking methods take a couple of days to complete because of the currency exchange, verification process, and the whole documentation procedure [22]. Blockchain technology in international business facilitates good management of trade documents, clearance, logistics, and traceability within the supply chain. This is because trade deals and contracts can be managed using smart contracts which are designed to execute transactions based on predetermined factors. Furthermore, companies can keep track of the movement of the goods and money throughout the supply chain, thus fostering accountability and reducing opportunities for fraud such as alteration of data and dispute over delivery of goods [23].

b) Expansion of Cryptocurrency and Digital Currency

Technology has aided in the creation of digital currencies like bitcoin and ethereum, which have made it easier for people to make digital payments. Blockchain technology makes it possible to do borderless and secure transactions. Cryptocurrencies provide other forms of financing and have operational differences from the conventional banking system [24]. This development has created new opportunities for investments apart from broadening the horizons of digital business ventures. With the emergence of digital payments and cryptocurrencies, the entire financial sector has been transformed as people can now perform all their financial transactions digitally, swiftly, and securely. Financial transactions in the past were greatly dependent on cash transactions and the use of cash in the form of banknotes, which were very costly and geographically restricted [25]. But with technological innovations in internet technology, mobile communications, financial technology, and digitization, digital payment systems have become popular globally. Additionally, governments and central banks are investigating the potential of using blockchain technology for developing Central Bank Digital Currencies (CBDCs).

c) Transformation of Supply Chain and Logistics Systems

Blockchain technology has improved information security, traceability, operational coordination, and transparency in global corporate networks, transforming supply chain and logistics systems. Traditional supply chain systems include fragmented databases, manual paperwork, and various intermediates, which cause inefficiencies, delays, communication gaps, and fraud or counterfeit items. Shipping monitoring, inventory management, customs verification, and supply chain visibility issues are common for foreign businesses [26]. All supply chain parties may securely record, verify, and retrieve transaction data in real time using blockchain technology's decentralized and immutable digital ledger. Accounting and tracking items from manufacture to delivery becomes more accurate and efficient. Critically, blockchain technology can eliminate fraud, corruption, and counterfeit activities in global supply chains by generating tamper-resistant digital records. Consumers and companies have increased trust since information stored on the blockchain is difficult to change or falsify. Moreover, blockchain facilitates collaboration between manufacturers, suppliers, distributors, logistics providers, and regulatory agencies by allowing safe and transparent data sharing throughout the supply chain network [27]. This leads to faster decision-making, enhanced risk management and increased customer satisfaction.

C. Different Methods of Blockchain Modeling

The below Fig. 2 and Table I [28]: It shows the different models of blockchain systems categorized into four types, which include public blockchains, private blockchains, consortium blockchains, and hybrid blockchains. It shows the adaptability of the blockchain technology depending on the model of governance used.

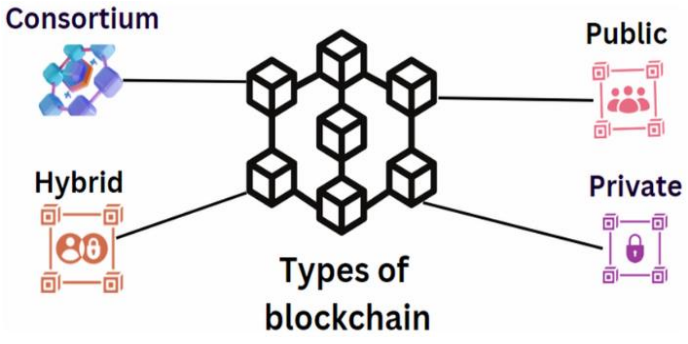

Figure 2: Types of Blockchain

Public blockchain has maximum transparency and decentralization, but at the same time, it can create challenges with regard to scalability and security issues. On the contrary, private blockchain is characterized by higher control and fast transactions, though lower transparency and decentralization. As for consortium blockchain, it helps promote cooperation between firms; however, it may cause some challenges concerning governance and cooperation among the companies.

Table 1: Comparison of Blockchain Models and Their Associated Challenges

Blockchain Model	Main Characteristics	Challenges Faced
Public Blockchain Model	Open, decentralized, transparent, and accessible to all participants	Transitioning to a private model may reduce transparency and decentralization, creating trust and governance concerns among users[29].
Private Blockchain Model	Controlled by a single organization with restricted access	Moving to a consortium model may create coordination difficulties among multiple organizations and require shared governance structures[30].
Consortium Blockchain Model	Managed collectively by multiple institutions or organizations	Transitioning to a hybrid model may create technical integration complexities between public and restricted systems[31].
Hybrid Blockchain Model	Integrates public and private blockchain capabilities to increase adaptability	Switching to a permissioned blockchain may reduce openness and limit accessibility for external participants[32].

D. Influence on Investment and Capital Markets

Blockchain technology has radically transformed the way investments are conducted and capital market activities are carried out through more streamlined, digital and efficient financial landscapes. Traditionally, capital markets are characterized by prolonged processes, heavy documentation, dependence on intermediaries, and substantial costs [33]. The blockchain solves the issues mentioned above in terms of efficiency via utilization of distributed ledger technologies for fast verification and transaction recording as well as near-instantaneous transaction settlements. With the help of simplifying processes, blockchain technology introduces efficiency in the market as well as ensures smooth flow of capital in domestic as well as international financial markets. Blockchain has immensely helped in the process of creation as well as tokenization of digital assets. This is possible with the help of digital representation of financial as well as physical assets including real estate, commodities, bonds, stocks, and art portfolios, among others. Fractional ownership, which has resulted in enhanced market liquidity, enables investments that had earlier been restricted only to the ultra-rich and large organizations [34]. Additionally, blockchain investment platforms ensure the safe transfer of assets and the maintenance of clear ownership records, thus promoting investor confidence and mitigating operational risk. The growth in decentralized investment platforms, like crowdfunding and decentralized finance systems, has been enabled through blockchain technology in recent times. Initial coin offerings, security token offerings, and decentralized crowdfunding systems are some of the mechanisms through which blockchain firms earn income. In providing alternative avenues of capital allocation that promote the emergence of new firms, these models offer an alternative means of doing away with conventional banking and stock market systems. The management of investments is additionally supported by the use of smart contracts, which ensure that human participation becomes unnecessary through such processes as dividend payments, compliance issues, and contractual terms implementation. On the downside, the following are major challenges facing the blockchain network in investments and finance. Banks and investors continue to fear issues related to market volatility, regulatory issues, cybersecurity risks, and global legality in relation to digital assets. Issues of financial instability, uncertainty, and fraud might arise due to speculative nature of trading and unawareness of some blockchain financial instruments by investors. Nevertheless, blockchain technology helps improve financial innovation, transparency, and involvement in investment platforms, which enhances financial market modernization [35].

E. Theoretical Foundations of Financial Modernization in Blockchain

Dynamic Capabilities Theory: The Dynamic Capabilities theory helps in understanding how organizations can use their abilities to adapt, integrate, and reallocate their resources both within the organization and from outside sources in response to changes in the business environment. In terms of modernization of finances, the blockchain concept allows financial institutions and companies to enhance their capacity for adaptability, digitization, and innovation. Organizations using blockchain technology will be in a position to improve their flexibility and even come up with new digital financial products [36].

Network Theory: The Network Theory shows how connections and relations play a role in the exchange of information and value within the digital environment. Blockchain works via decentralized networks where there is no centralized party involved and where transactions are validated among many parties. As for financial innovation, blockchain networks facilitate

cooperation between banks, organizations, government agencies, investors, and customers, making the information flow smooth, fast, and safe. Through the theory, one should understand that higher network involvement leads to more efficient global financial management [37].

Information Asymmetry Theory: The Information Asymmetry Theory addresses cases whereby one person or entity has access to information than the other party involved in business or finance dealings. Conventional finance is usually associated with imbalanced information sharing, risks that are difficult to determine, frauds, and lack of transparency. The application of blockchain technology lowers information asymmetries by developing transparent, immutable, and decentralized digital databases available only to those with permission to access such information [38].

Disruptive Innovation Theory: This theory gives an insight into how emerging technologies change existing sectors by disrupting existing ways of working and introducing better systems and approaches to the business. Blockchain technology is a disruptive innovation because it poses a challenge to centralized banking institutions, financial intermediaries, and conventional transaction systems. Using decentralized finance, smart contracts, and cryptocurrency, blockchain brings forth novel approaches to conducting financial activities that make such tasks easier, faster, and transparent [39].

Stakeholder Theory: focuses on the significance of organizations taking into account all stakeholders, which include investors, consumers, employees, government authorities, suppliers, and society. Financial modernization through blockchain helps in improving the relationship with stakeholders by bringing more transparency, security, and trustworthiness into the transactions. The use of blockchain facilitates smooth communication and exchange of information between various parties engaged in financial and commercial transactions [40].

Transaction Cost Economics Theory: Transaction Cost Economics Theory focuses on minimizing the costs associated with economic transactions, coordination, monitoring, and contractual enforcement. Blockchain technology helps improve modern finance by minimizing intermediary costs, administrative costs, documentation costs, and processing delays in financial institutions. The use of smart contracts and distributed ledger technology simplifies the verification process and makes financial operations more efficient and safer. It is suggested that companies implement blockchain technology in order to enhance their transaction management processes and minimize inefficiencies in their global operations [41].

Socio-Technical Systems Theory: This theory helps us understand the relationship between technological systems and organizational behavior. Financial modernization through blockchain technology involves more than just technological advancement; it also includes change in the organizational culture, skills of the workforce, consumer interaction, and management system. The implementation of blockchain technology needs integration among technology, human resources, organization, and operations. This theory emphasizes the importance of the fact that technological advancement is not sufficient for financial modernization [42].

Critically, these theories emphasize that blockchain technology can enhance trust among stakeholders, minimize transaction costs, increase stakeholder confidence, and enable organizations to adapt themselves to fast-moving digital contexts. Uncertainties in legislation, technical challenges, interoperability issues, organizational reluctance, and gaps in digital infrastructure across economies are some of the many factors that have kept blockchain technology at its infant stage of development. The core of disruptive innovations and dynamic capabilities revolves around innovation and competition; however, obstacles in the form of governance, cybersecurity, and integration of financial systems often hinder mass adoption of this new technology. Blockchain technology possesses the power to transform the world of finance completely, but for that it requires technological, institutional, regulatory, and stakeholder support.

F. Challenges Affecting Economic Impact

a) Scalability and Technical Limitations

The issue of scalability points to the conflicts in blockchain design where there is a struggle between decentralization, security, and efficiency. Among the key challenges facing the adoption of blockchain technology in international business include the challenges in scalability and technology. Decentralized blockchain systems can be more transparent and secure as compared to centralized blockchains but less efficient and scalable [43]. At the same time, in terms of faster transaction process, blockchain technology itself may become non-decentralized and centralized, and hence, it would prove to be ineffective. Moreover, currently, incorporating blockchain within existing processes is quite a complex task financially and technically for certain companies. The legacy system and centralization are chosen by certain organizations irrespective of the fact that they do not fit in blockchain technology. Furthermore, it can be said that while continuous efforts have been made for making blockchain technology scalable using techniques like layer two scaling, sharding, and proof-of-stake, still most of these techniques have not yet reached maturity and are under development Hence, although blockchain is capable of reshaping economics, scalability and technological complexities remain hurdles towards becoming a universal business solution [44].

b) High Energy Consumption and Environmental Concerns

There is a problem of excessive energy usage on the planet. In order for modern companies, transportation, and people to be able to function properly, they need to use both electric power and energy sources. This creates an issue of harming the environment since the emission of greenhouse gases takes place, thus provoking global warming. Moreover, the extraction of energy from the resources that are not renewable, namely, coal, oil, and natural gas, leads to pollution of the atmosphere and the water. Besides, energy loss occurs due to the growing energy demands [45]. Thus, there should be a move towards renewable energy sources and energy efficiency in order to solve these problems. In case the mentioned problems concerning energy consumption are not solved, the implications for the planet and people may be rather negative. On the other hand, from a critical point of view, environmental problems associated with blockchain technology can become a barrier for future financial innovations and sustainable economic development. There are advantages offered by the use of blockchain technologies, including transparency and efficiency and perhaps even financial inclusion; on the other hand, there are disadvantages [46].

c) Demand for Green Blockchain Solution.

Digital finance infrastructure is developing such that both businesses and governmental bodies have become worried about the ecological effect created because of the increased use of energy in blockchain networks. The problem has resulted in the creation of sustainable blockchains meant to minimize energy expenditure without undermining security and efficiency. In addition to proof-of-stake consensus and hybrid consensus that require far lesser computing power than proof-of-work consensus, there are various other models being considered by firms in finance and tech sectors [47]. Furthermore, the rising significance of sustainability initiatives and projects aimed at reducing carbon emissions, coupled with environmental consciousness within the business world, requires that blockchain-based systems utilize renewable energy sources and energy-efficient technologies. With regards to carbon credit trading and renewable energy management, a critical assessment of the firm makes it more attractive. However, the current level of demand faces various issues, among which is greenwashing and high costs associated with moving the infrastructure. The implementation process also suffers from unclear regulatory environment in different countries because there is no agreement on what qualifies as “green."

G. Previous Studies Analysis iterature Review

J. Hwang (2024) has been analyzing financial strategies of companies using blockchain technology. This dissertation used a mixed-method research approach to conduct a study into the use of blockchain technology through the analysis of quantitative data on markets and financial statements. The research aimed at examining the applications, challenges, and implications of blockchain technology in the field of financial services. Data were collected using the sampling technique. Qualitative research methods were applied to structure the data to provide empirical findings. Results indicated the revolutionary nature of blockchain technology in financial services with efficiency, transparency, and security being some of its characteristics. Nonetheless, there were some constraints in conducting this study, including legal and technological constraints that required better frameworks to manage them. Practical constraints involved technology and digitization, whereas social implications related to implementation and collaboration among stakeholders. These elements were identified as critical to the effective use of blockchain technology. The review gave important suggestions for business practitioners and enlightened scholars about the interaction between blockchain technology and financial services [48].

Blockchain technology has attracted great attention and been widely studied by scholars and practitioners, because of its capability of reducing transaction costs, enhancing transaction security and improving transparency. However, there remained a great deal of ambiguity as to the influence it would have, and the technology was in its early stages, with differing levels of acceptance by various monetary institutions. A Structural Equation Modeling (SEM) research was conducted to explore the effect on the efficiency of blockchain technology and its dynamic capacities in the top banks. The novel method explored how blockchain technology will be deployed to enhance bank performance. Abayomi Ogunrinde (2025) discovered a substantial relationship between banks' use of blockchain technology and the development of dynamic capabilities and financial outcomes. Therefore, the study's findings corroborated previous findings that blockchain-using banks were more likely to acquire dynamic capabilities compared to non-blockchain-using banks. As a result, blockchain technology was considered a crucial tool for enhancing banking performance and creating dynamic capabilities. “Based on the findings, the researchers suggested further research and highlighted factors must be considered while formulating policy surrounding the broader adoption of blockchain technology [49].

This research aims Alisher Izzatillayev (2025) examining the revolutionary effects of blockchain technology on the efficacy and effectiveness of financial transactions in banking and digital finance. For this purpose, a mixed-method approach was used in this two-year-long study involving 500 financial organizations in 25 countries. The survey and database methods were used along with qualitative data obtained through interviews of 100 executives as well as 50 case studies of companies implementing this technology. Descriptive statistical analysis and regression as well as thematic coding were used for

analyzing the collected data. As a result of using blockchain technology, financial organizations managed to reduce their transaction costs by 42.6%, processing time in cross-border transactions by 78.3%, and number of security issues faced by 56.2%. The share of traditional banks implementing blockchain technology rose by 47.3%, while that of fintech companies reached 68.9%. An R^2 value of 0.847 indicated a close correlation between the implementation of blockchain technology and the improvement of financial results. However, there were difficulties in integrating this technology into current operations (7.8 out of 10 for severity) [50].

The study integrates two different methods of investigation: theoretical and empirical. Ayman Mohammad Al Shanti and Mohammad Salim Elessa (2023) use blockchain technology in banks to investigate how digital transformation affects the efficacy of corporate governance and the accuracy of accounting information. Using a descriptive-analytical approach, the study's dimensions and variables were examined. Financial analysts, shareholders' account auditors, and financial managers from Jordanian banks were surveyed to compile field study data. Data list designs were produced for this purpose. In order to analyze the data collected from the field investigation, SPSS was used. Since the data disproved the third and first hypotheses, they may conclude that the alternative hypothesis is correct and reject the null. No evidence was found to support the second or fourth hypothesis. To take advantage of blockchain technology's benefits in improving the integrity of accounting information and corporate governance, businesses should undergo digital transformation and start using it in their operations [51]. Table II discuss literature review on blockchain technology and digital transformation in banking and financial services.

Table 2: Review of Blockchain Technology Adoption and Its Impact on Banking and Financial Performance

Author & Year	Title / Focus of Study	Research Objective	Methodology & Sample	Key Findings
Jinyoung Hwang (2024)	Financial solutions for firms using blockchain technology	This research aims to examine the banking industry from the perspective of blockchain technology, looking into its possible uses, challenges, and outcomes.	Mixed-methods approach using quantitative analysis of market data and financial reports along with qualitative research and sampling methods	Blockchain technology improved efficiency, transparency, and security within financial services
Abayomi Ogunrinde (2025)	Blockchain adoption and dynamic capabilities in Spanish banks	to evaluate the impact that dynamic capabilities and blockchain technology have had on financial organizations' efficiency.	Structural Equation Modeling (SEM) analysis conducted on top banks in Spain	The implementation of blockchain technology has enhanced the financial performance and dynamic capacities of financial institutions.
Alisher Izzatillayev (2025)	Repercussion of blockchain technology on the effectiveness of digital banking and finance.	To examine the effect of blockchain technology and dynamic capabilities on the efficiency of financial institutions.	Mixed-method study over two years involving 500 financial organizations in 25 countries, 100 executive interviews, and 50 case studies	Transaction costs decreased by 42.6%, cross-border transaction time reduced by 78.3%, and security issues declined by 56.2%
Ayman Mohammad Al Shanti and Mohammad Salim Elessa (2023)	Digital transformation, accounting quality, and blockchain in banking	The goal is to analyze how blockchain technology and digital transformation have affected the reliability of financial statements and other company records.	Theoretical and empirical investigation using descriptive-analytical methods and SPSS analysis of Jordanian banks	Blockchain-supported digital transformation improved accounting information quality and governance effectiveness

Research Gap: Even though multiple studies have looked into the purpose of blockchain in banking and digital payments, there is relatively little information available in terms of the economic impact of blockchain on global business systems and financial innovation. The current literature mostly concentrates on topics related to the security, transparency, efficiency, and effectiveness of banking operations through the use of blockchain technology, while not enough attention is paid to issues like international trade, integration of supply chains, investment systems, and sustainable development of blockchain systems. In addition, there are very few comparative studies on how effective various types of blockchains work in specific business settings. Even though some challenges were mentioned by other researchers such as scalability, interoperability, environmental concerns, cybersecurity, and legal uncertainty, it is difficult to find a standard solution.

IV. CONCLUSION

Modernization in finance has been greatly affected by the digital revolution due to the application of advanced digital technologies. One of the advanced digital technologies is blockchain technology, which has brought a great revolution in terms of transparency, security, efficiency, and decentralization within financial transactions and other business activities. Blockchain technology has been found to have impacted cross-border payments, digital payments, supply chain systems, investment markets, and financial inclusion. Depending on the requirements of organizations, several blockchain technologies may be utilized, including public, private, consortium, and hybrid blockchains. However, despite the advantages of the blockchain technology, there are still problems in the execution of the blockchain technology such as scalability, interoperability, cybersecurity, legal ambiguity and energy consumption. Blockchain's financial modernization theory highlights how digital change is affecting global banks and businesses. Blockchain technology improves transparency, efficiency, security, and organizational flexibility, according to Dynamic Capabilities Theory, Institutional Theory, Trust Theory, Innovation Ecosystem Theory, and Digital Transformation Theory. These concepts show that blockchain can modernize finance, integrate global corporations, and create decentralized, digital financial ecosystems. In general, blockchain technology has greatly affected financial modernization and holds great promise for the future of digital business systems. It is recommended that future researchers conduct further empirical and comparative studies on the long-term effects of blockchain technology on economic development in various industries and countries. It is essential for researchers to study the effectiveness of various blockchain models with regards to improved financial performance and efficiency as well as global business integration. Future researchers should also consider studying the implementation of blockchain technology alongside artificial intelligence, cloud computing, big data analysis, and the Internet of Things (IoT). Future research can focus on energy-efficient blockchain technology, green blockchain technology and solutions. For blockchain technology to work properly in the financial systems of different countries, governments, banks, and politicians must come up with clear, uniform rules. Consumer safety, transparency, privacy, and cybersecurity should be top priorities in the formation of public policies. International cooperation is necessary for forming standard regulations of blockchain technology that will facilitate secure global transactions and business operations. In order to increase preparation for the future and skills of employees, investments into digital infrastructure, technical education, and training in blockchain should be encouraged. Finally, environmental policies should be developed in such a way as to stimulate energy-efficient blockchain technology and the use of renewable energy sources.

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