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Blockchain and the Banking Sector: Benefits, Challenges and Perspectives

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Abstract

The banking sector, being essential to the global economy, has benefited from significant technological advancements in recent decades. However, it continues to face structural challenges such as high costs, dependence on centralized intermediaries, and security risks. In this context, blockchain has emerged as a disruptive technology, promising to fundamentally transform financial infrastructure. Defined by characteristics such as decentralization, immutability, and security, blockchain offers a modern alternative to traditional centralized systems, ensuring transparency, cost reduction, and the automation of complex processes through smart contracts. Beyond its evident advantages, such as lower operational costs, enhanced efficiency in cross-border payments, and increased transaction security, blockchain technology also significantly contributes to financial inclusion by providing banking access to underbanked populations. However, its large-scale adoption is limited by challenges such as scalability, underdeveloped regulatory frameworks, and complex infrastructure requirements. Studies have shown that hybrid blockchain models, which combine the transparency of public blockchains with the control of private platforms, may represent the optimal solution for integrating this technology into the banking sector. This paper explores the evolution of blockchain, its practical applications in the financial domain, and the challenges associated with its implementation. The conclusions highlight the need for standardization, investments in infrastructure, and collaboration between financial institutions and regulatory authorities to enable the gradual and efficient adoption of this revolutionary technology.

Keywords

Crypto, Blockchain, Financial, Banks

1. Introduction

The banking sector represents the backbone of the global economy, playing a fun-

damental role in managing financial flows, facilitating payments, and providing credit solutions. In recent decades, financial technologies have evolved rapidly, transforming the way banks operate and interact with customers. The digitization of services, the introduction of online banking, and the integration of mobile platforms have significantly improved efficiency and accessibility. However, these advancements have not completely resolved the structural issues of financial systems, such as high costs, reliance on centralized intermediaries, and outdated security risks.

In this context, blockchain has emerged as a disruptive technology, promising to fundamentally transform the financial industry. Initially created to support cryptocurrencies like Bitcoin, blockchain is now seen as a broader solution for numerous challenges in the banking sector. Characterized by decentralization, immutability, and security, blockchain offers a modern alternative to traditional centralized server-client systems.

Blockchain operates based on distributed ledger technology (DLT), which records transactions in a transparent and secure manner. Unlike traditional systems, where data is managed by a central entity, blockchain enables each participant in the network to maintain a copy of the ledger. This reduces risks associated with a single point of failure and enhances operational transparency (Dashkevich et al., 2020). For example, transactions are secured by complex cryptographic mechanisms, and once recorded, data becomes immutable, providing a high level of security against fraud and cyberattacks (Sanyaolu et al., 2024).

The relevance of blockchain in the banking sector is amplified by the urgent need to address structural problems. Traditional financial systems are often criticized for their high operational costs, lack of transparency, and the extended time required for processing transactions, especially in cross-border payments (Cocco et al., 2017). For instance, international transfers through traditional intermediaries like SWIFT involve significant fees and delays, whereas blockchain allows direct, fast, and low-cost payments (Tikhomirova & Soia, 2019).

Moreover, blockchain technology can tackle financial inclusion issues. According to recent statistics, over 1.7 billion people worldwide remain unbanked, particularly in underdeveloped regions. Blockchain can facilitate access to banking services through digital wallets and peer-to-peer transactions, eliminating the need for traditional banking infrastructure (Sanyaolu et al., 2024). These solutions are essential for reducing economic disparities and integrating marginalized populations into the global financial ecosystem.

Nevertheless, the adoption of blockchain in the banking sector faces significant challenges. Scalability issues, interoperability constraints, and underdeveloped regulatory frameworks need to be addressed to ensure the efficient integration of this technology. Additionally, resistance from traditional financial institutions and public perception regarding cryptocurrencies complicate the adoption process (Dashkevich et al., 2020).

Thus, studying the impact of blockchain on the banking sector is crucial to un-

derstanding both its potential benefits and the limitations and challenges that must be overcome. As banks explore new operational models and emerging technologies, blockchain is shaping up to be a viable solution for modernizing and optimizing global financial infrastructure.

2. Revue Literature

Technological progress has influenced and will continue to shape the historical evolution of societies and nations globally. It has been, is, and will persist as an essential engine for the development of human activities, a means of emancipation both individually and institutionally, and a catalyst for the continuous transformation of business conduct and economic conceptualization (Jianu et al., 2011).

Digitalization, including the introduction of electronic funds, and the dynamism of the banking system have created new loopholes for money laundering by banks and added complexity for Central Banks and law enforcement authorities to detect and eliminate such violations at an early stage (Herteliu et al., 2019).

2.1. The Evolution of Blockchain and Its Impact on the Banking Sector

The system underlying cryptocurrencies emerged as an innovative solution to the limitations of traditional financial systems. Bitcoin, launched in 2008 by Satoshi Nakamoto, introduced the concept of a decentralized payment system based on blockchain technology (Nakamoto, 2008a).

Another key advantage of blockchain is the increased transparency and data security. All transactions are recorded in an immutable ledger, which reduces the risks of fraud and manipulation. Additionally, the advanced cryptography used in blockchain ensures data protection against cyberattacks. However, studies highlight that public blockchain may expose sensitive information, raising concerns about privacy and compliance with GDPR regulations (Dashkevich et al., 2020).

Blockchain provides transparency, security, and eliminates the need for a centralized intermediary, giving users greater control over their funds. By 2024, the cryptocurrency market had evolved rapidly, with over 9,000 available cryptocurrencies and a total market capitalization exceeding $2.18 trillion. However, cryptocurrencies remain controversial, being criticized for their high volatility, lack of clear regulations, and limited adoption within traditional economic systems (Tapscott & Tapscott, 2016).

2.2. Current State of Research

The evolution of blockchain began in 2008 with the publication of Satoshi Nakamoto's paper, which introduced Bitcoin as the first cryptocurrency. This innovation utilized blockchain as its fundamental technology, providing a distributed ledger that recorded transactions in a transparent and immutable manner (Nakamoto, 2008b). Over time, blockchain has developed significantly beyond Bitcoin's original scope. Ethereum, launched in 2015, was the first blockchain to introduce

the concept of smart contracts, expanding the technology's applications beyond cryptocurrencies (Guo & Liang, 2016).

In subsequent years, private and consortium-based blockchains, such as Hyperledger and R3 Corda, emerged, specifically designed for corporate and financial environments. Unlike public blockchains like Bitcoin and Ethereum, these systems restrict access to selected participants, ensuring greater compliance with regulations and offering enhanced control over data (Dashkevich et al., 2020). This diversification of blockchain technologies has enabled the exploration of complex applications, including digital identity management, cross-border payments, and even the issuance of digital currencies by central banks.

The adoption of blockchain in the banking sector was further accelerated by the 2008 global financial crisis, which highlighted the vulnerabilities of centralized financial infrastructures. This crisis created an opportunity for blockchain to offer an alternative model—one that is more transparent and resilient, reducing dependency on centralized intermediaries (Varma, 2019).

Existing studies on blockchain emphasize the significant benefits of this technology in the banking sector. Key advantages include reducing operational costs, improving transaction security, and enhancing transparency. For example, (Guo and Liang, 2016) emphasize that blockchain can transform clearing and settlement systems by eliminating intermediaries and optimizing financial processes.

Additionally, research conducted by (Cocco, Pinna, & Marchesi, 2017) highlights the economic benefits of blockchain adoption. Their findings suggest that blockchain can significantly reduce operational costs in the banking sector by eliminating data duplication, automating processes, and minimizing errors. Other studies have examined blockchain's role in regulatory compliance. For instance, (Odejide, 2024) indicates that blockchain can simplify audit and compliance procedures by creating transparent records that facilitate transaction tracking and mitigate fraud risks. The study by (Cocco, Pinna, & Marchesi, 2017) analyzed cost reductions related to clearing, settlement, and transaction reconciliation, with results suggesting that blockchain can generate savings of up to 70% for these operations.

Empirical evidence supporting the claim that blockchain technology reduces transaction costs by up to 70% comes from studies comparing the cost structures of traditional financial systems with blockchain-based solutions. According to a study conducted by Ripple, financial institutions that utilized their blockchain-based solutions recorded an average cost reduction of approximately 46% compared to traditional methods (Owolabi et al., 2024). Additionally, a pilot study conducted by Banco Santander demonstrated a 50% reduction in costs for international transactions performed through blockchain (Owolabi et al., 2024).

Traditional cross-border payment systems, such as SWIFT, involve multiple intermediaries, each charging fees for processing transactions. These fees contribute significantly to the overall transaction cost, which can range from 5% to 20% of the transferred amount (Owolabi et al., 2024). In contrast, blockchain enables di-

rect peer-to-peer transactions, eliminating the need for intermediaries and thereby reducing associated costs. Furthermore, the decentralized nature of blockchain allows for the automation of settlement processes through smart contracts, leading to a further reduction in operational expenses (Owolabi et al., 2024).

Blockchain networks such as RippleNet and Stellar have demonstrated substantial cost savings by improving transaction processing efficiency. The use of cryptographic tokens or stablecoins helps minimize foreign exchange costs and mitigate the volatility risks associated with traditional currency conversions (Mbaidin et al., 2023). The combination of these factors enables financial institutions and businesses to achieve significant savings in remittance and cross-border settlement processes, reinforcing the assertion that blockchain can reduce transaction costs by up to 70%.

Beyond its evident advantages, research also highlights the challenges associated with blockchain adoption. These include scalability issues, underdeveloped regulatory frameworks, and interoperability challenges between different platforms (Mafike & Mawela, 2022). For example, (Dashkevich et al., 2020) conducted a systematic analysis of blockchain adoption by central banks and concluded that the absence of global standards limits the large-scale implementation of this technology.

To overcome blockchain scalability limitations in large-scale banking applications, financial institutions can adopt technical solutions such as sharding, Layer 2 solutions, and consortium blockchains. Sharding involves dividing the network into smaller fragments (shards) that process transactions in parallel, thereby reducing congestion and increasing processing speed (Guo & Liang, 2016). This technique allows for efficient task distribution among blockchain nodes, improving performance without compromising security.

Another promising solution is the use of Layer 2 networks, such as Lightning Network for Bitcoin or Plasma for Ethereum. These solutions create off-chain payment channels that process transactions outside the main blockchain, reducing the network load and associated costs (Tikhomirova & Soia, 2019). Once transactions are completed, the results are recorded on the main blockchain, ensuring the transparency and security of the system.

Additionally, financial institutions can implement consortium blockchains, where a limited number of participants verify transactions, ensuring a balance between decentralization and efficiency (Dashkevich et al., 2020). These networks provide stricter access control and can be optimized for the specific needs of banks, facilitating the management of a high volume of financial transactions.

Another important aspect discussed in the literature is blockchain's potential for financial inclusion. According to (Sanyaolu et al., 2024), blockchain provides banking access to unbanked populations through digital wallets and peer-to-peer transactions, eliminating the need for traditional banking infrastructure. This has a significant impact in regions where access to financial services is limited.

2.3. Key Blockchain-Based Banking Projects and Initiatives

Major Banking Projects and Initiatives Based on Blockchain:

HSBC & R3 Corda: HSBC successfully conducted an international trade finance transaction using the R3 Corda blockchain platform. This example demonstrates how blockchain can simplify international transactions by reducing bureaucracy and settlement time (Hassani et al., 2018).

BNP Paribas & Blockchain in Order Processing: The French bank BNP Paribas tested blockchain technology for foreign exchange fund processing and order execution, aiming to improve efficiency and reduce operational costs (Hassani et al., 2018).

Ripple Adoption in Japan: Over 60 Japanese banks, covering 80% of Japan's banking industry, partnered with Ripple to facilitate fast international money transfers, providing an alternative to the SWIFT system (Hassani et al., 2018).

Agricultural Bank of China (ABC) & Blockchain-Based Loans: ABC successfully issued a $300,000 loan using blockchain technology, demonstrating its potential for secure and efficient lending (Hassani et al., 2018).

IBM & Forex Settlement Giant CLS: IBM collaborated with CLS to create a blockchain-based app store for banks, aiming to standardize global forex markets and reduce operational costs (Hassani et al., 2018).

Santander's Use of RippleNet: Santander Bank adopted RippleNet to facilitate international transfers, achieving near-instant settlement and reducing costs by up to 50% (Cocco et al., 2017).

South African Reserve Bank & Blockchain-Based Payments: The South African Reserve Bank used blockchain to settle 70,000 daily transactions in just two hours, significantly improving transaction speed while maintaining anonymity (Hassani et al., 2018).

Commonwealth Bank of Australia & Smart Contracts: The bank used blockchain-based smart contracts to monitor the shipment of 17 tons of almonds, illustrating blockchain's potential in supply chain management and trade finance (Hassani et al., 2018).

One of the most important areas of blockchain application in the banking sector is central bank digital currencies (CBDCs). These initiatives aim to improve payment system efficiency and reduce reliance on cash. For example, the Bank of Canada's Project Jasper and Singapore's Project Ubin are notable cases of blockchain being used for interbank settlements and fast cross-border transactions (Dashkevich et al., 2020). Similarly, the People's Bank of China has implemented the Digital Yuan, a CBDC that leverages blockchain technology for transaction monitoring and financial flow control.

R3 Corda is another blockchain platform designed for financial applications, developed by the R3 consortium, which includes over 200 banks and financial institutions. Corda enables fast and secure transactions between participants, ensuring compliance with international regulations. For example, ING and HSBC have implemented Corda to optimize trade finance operations, reducing transaction processing time from several days to just a few hours (Tikhomirova & Soia, 2019).

Hyperledger, managed by the Linux Foundation, is an open-source platform

that allows financial institutions to develop customized blockchain solutions for various applications, such as digital identity management and automated financial contracts. Deutsche Bank and BNP Paribas utilize Hyperledger to lower transaction costs and improve data security in cross-border payments (Cocco et al., 2017).

Ripple is a blockchain platform designed for cross-border payments, eliminating traditional intermediaries like SWIFT. RippleNet enables nearly instantaneous transactions at reduced costs, making it an ideal solution for international transfers (Tikhomirova & Soia, 2019). Although Ripple operates with a more centralized approach compared to other blockchain networks, its platform is integrated into existing banking infrastructures and collaborates with financial institutions like Santander and American Express.

3. Research Methodology

This research adopts a methodology based exclusively on a literature review, with the objective of analyzing the impact of blockchain on the banking sector, exploring its technological advantages and implementation challenges, and identifying integration models of this technology in the global financial infrastructure. The choice of this method is justified by the need for a conceptual and analytical perspective on a continuously evolving field, where practical experiences are still limited, and empirical studies are in their early stages.

To conduct a comprehensive analysis, academic sources, articles published in scientific journals, and reports issued by financial institutions and international organizations were consulted. The selection process was based on rigorous criteria, including thematic relevance, up-to-date information, and source credibility. Studies published in the last ten years were prioritized to reflect the latest technological advancements and regulations regarding the use of blockchain in the banking sector. Additionally, research examining the impact of blockchain technology from economic, legal, and operational perspectives was considered, providing a broad view of its implications on the financial ecosystem.

The literature analysis focused on extracting and comparing key arguments regarding blockchain adoption in banking systems. A central aspect of the research was highlighting the benefits of this technology, such as lowering transaction costs, improving transparency and security, automating financial processes through smart contracts, and enabling decentralized banking operations. At the same time, challenges related to blockchain implementation were identified, including scalability issues, the lack of standardized regulations, and difficulties associated with data confidentiality. Special attention was given to comparing public, private, and hybrid blockchains, analyzing the advantages and disadvantages of each model in the context of current banking requirements.

Regarding the data analysis process, the research adopted a systematic review approach, identifying common trends and contradictory perspectives in the specialized literature. By comparing various studies, convergence points between ex-

isting research and gaps requiring further investigation were highlighted. In particular, it was observed that while most studies agree on the potential of blockchain to revolutionize the banking industry, significant differences exist regarding estimates of its large-scale implementation viability and its impact on global financial regulations.

The methodological limitations of this research are determined by its exclusively theoretical nature, lacking an empirical component that evaluates the real impact of blockchain on banking institutions. Moreover, the conclusions drawn are influenced by the quality and availability of the sources used, particularly regarding data on the actual implementation of blockchain technology in various financial institutions. However, the results provide a solid foundation for future research, which could include detailed case studies and comparative analyses of blockchain implementations across different banking systems. Thus, this literature review contributes to a deeper understanding of blockchain's role in the banking sector and highlights aspects that require further investigation before this technology can be widely adopted in traditional financial systems.

4. Results

4.1. Blockchain's Role in Reducing Transaction Costs and Enhancing Financial Processes

Blockchain provides an efficient solution for reducing transaction costs and accelerating financial processes. Unlike traditional systems that involve multiple intermediaries and long processing times, blockchain technology enables direct transactions between parties without requiring third-party intervention. For example, the study conducted by (Cocco, Pinna, & Marchesi, 2017) found that blockchain can generate significant cost savings in clearing and settlement operations, reducing costs by up to 70%. Additionally, RippleNet, a blockchain platform used by banks such as Santander and American Express, facilitates near-instant cross-border transfers, eliminating delays associated with traditional processes (Tikhomirova & Soia, 2019).

These improvements are particularly important for international payments, where time and costs are critical factors. Compared to traditional systems such as SWIFT, which can take several days to complete a transaction, blockchain significantly reduces processing time, sometimes to just a few seconds for specific transactions (Guo & Liang, 2016).

4.2. Enhancing Transparency and Security

One of the greatest advantages of blockchain technology is its ability to ensure transaction transparency and data security. All transactions are recorded in a distributed ledger, which can be accessed by all authorized participants, thereby reducing fraud risks. Unlike centralized systems, where a single point of failure can compromise the entire network, blockchain uses advanced cryptography and consensus mechanisms to protect data and ensure transaction integrity (Dashkevich

et al., 2020).

Furthermore, the use of blockchain can improve compliance with regulatory requirements, such as Anti-Money Laundering (AML) and Know Your Customer (KYC) policies. Real-time reporting and the ability to track transactions transparently facilitate compliance verification and reduce risks associated with money laundering or terrorist financing (Odejide, 2024). This level of transparency is particularly beneficial for regulatory authorities and banks operating in multiple jurisdictions.

The Potential of Smart Contracts for Lending and Complex Transactions

Smart contracts represent another major benefit of blockchain technology. These self-executing digital contracts enable the automation of complex financial processes such as loan issuance, insurance management, and trade finance transactions. For example, R3 Corda, a blockchain platform used by global financial institutions, supports the implementation of smart contracts for trade finance processes, reducing the risk of errors and accelerating financial workflows (Tikhomirova & Soia, 2019).

Smart contracts eliminate the need for intermediaries, which reduces costs and increases transaction speed. Additionally, they ensure that contractual terms are executed automatically when predefined conditions are met, reducing the risk of non-compliance (Guo & Liang, 2016).

4.3. Challenges in Blockchain Adoption

Despite the evident benefits of blockchain, its large-scale implementation in the banking sector faces significant challenges. The infrastructure required for the widespread adoption of blockchain is complex and costly. According to (Dashkevich et al., 2020), banks must make substantial investments in developing and integrating blockchain technology into their existing systems, which can be a long and challenging process.

Additionally, scalability is a major concern. Public blockchains such as Bitcoin and Ethereum face limitations in the number of transactions they can process simultaneously, leading to delays and higher costs during periods of high activity (Guo & Liang, 2016). These limitations currently prevent blockchain from being a completely viable solution for large-scale financial transactions.

Another major obstacle to blockchain adoption in the banking sector is the lack of a clear regulatory framework. Existing regulations do not fully cover blockchain usage, creating uncertainties for banks and other financial institutions (Mafike & Mawela, 2022). For instance, central bank digital currency (CBDC) projects raise questions regarding the supervision and management of these digital currencies in a manner that complies with local and international regulations (Dashkevich et al., 2020).

Moreover, compliance with AML and KYC regulations can be complicated by the inherent anonymity of public blockchains. While blockchain offers transparency, the absence of a standardized identity verification mechanism can create

difficulties in monitoring and reporting suspicious transactions (Odejide, 2024).

Although blockchain provides a high level of security, it is not immune to cyberattacks. One example is the risk of 51% attacks, where a group of miners could take control of the network and manipulate transactions (Guo & Liang, 2016). Additionally, data privacy remains a critical issue. While blockchain ensures transparency, sensitive client information could be exposed if data access is not properly managed (Sanyaolu et al., 2024).

For traditional financial institutions to overcome resistance to blockchain technology, it is essential to focus on its gradual integration with existing infrastructures. Adopting a hybrid model, which combines the advantages of blockchain with centralized systems, can facilitate the transition and reduce associated risks. For example, using blockchain in clearing and settlement operations can significantly reduce costs and processing time (Cocco, Pinna, & Marchesi, 2017). Banks can implement blockchain in stages, starting with specific applications such as international payments or smart contracts, allowing them to test its efficiency and security without disrupting the entire system (Tikhomirova & Soia, 2019).

Another important strategy is collaborating with regulatory authorities to clarify and adapt the legal framework to blockchain technology. Financial institutions must actively participate in the development of rules governing blockchain usage to reduce uncertainty and compliance-related risks (Mafike & Mawela, 2022). Additionally, blockchain solutions can be integrated with AML and KYC mechanisms to ensure data transparency and security, facilitating their acceptance in the banking sector (Odejide, 2024).

Another key aspect is investment in security and scalability. Financial institutions must develop blockchain infrastructures capable of handling large transaction volumes without compromising speed or security (Guo & Liang, 2016). By using private or consortium blockchains, banks can maintain better control over data access and protect sensitive customer information (Sanyaolu et al., 2024). Furthermore, partnerships with technology firms can accelerate blockchain adoption and optimize it for the specific needs of financial institutions (Dashkevich et al., 2020).

Hybrid blockchain models are the best solution for integration into the banking sector as they combine the transparency and decentralization of public blockchains with the security and control of private blockchains. One of the main advantages is balancing accessibility and confidentiality. While public blockchains allow full transparency, they are not suitable for banks due to the lack of control over sensitive data. On the other hand, private blockchains provide security but limit participation and may become centralized (Guo & Liang, 2016).

Another benefit of hybrid blockchains is improved scalability, allowing banks to manage large transaction volumes through selected validators, reducing processing times (Dashkevich et al., 2020). This model also facilitates regulatory compliance, granting authorities access to essential data without compromising client confidentiality (Odejide, 2024).

Additionally, hybrid blockchains enable process automation through smart contracts while maintaining control over financial flows. This combination of partial decentralization and controlled governance makes hybrid models the optimal solution for banks (Tikhomirova & Soia, 2019).

Despite its evident benefits, blockchain adoption in the banking sector is limited by scalability issues and the lack of a clear regulatory framework (Dashkevich et al., 2020). Public blockchains, such as Bitcoin and Ethereum, have a limited transaction processing capacity, which can lead to delays and high costs during peak activity periods. Moreover, the absence of standardized regulations for blockchain usage in the banking sector creates uncertainty for financial institutions, slowing down widespread adoption (Hassani et al., 2018).

5. Conclusion

Public blockchains, such as Bitcoin and Ethereum, are decentralized and accessible to everyone, making them ideal for transactions that require complete transparency. However, they face challenges related to scalability and privacy, which limit their applicability in the banking sector (Cocco et al., 2017).

On the other hand, private or permissioned blockchains, such as Hyperledger and R3 Corda, provide greater control over access and better compliance with regulatory requirements. These platforms are more suitable for banks that seek to implement customized solutions while maintaining control over sensitive data (Dashkevich et al., 2020).

A hybrid model, combining the characteristics of public and private blockchains, could serve as a viable solution for blockchain integration in the banking sector. Such a model would ensure transparency where needed while maintaining confidentiality and control over data (Guo & Liang, 2016).

The analysis highlights the significant potential of blockchain to transform the banking sector by offering solutions to numerous challenges faced by financial institutions. This technology provides major advantages, such as reducing transaction costs and processing times, which are essential for optimizing cross-border payments. Solutions like RippleNet and R3 Corda-based platforms demonstrate the efficiency and feasibility of blockchain in reducing costs and accelerating transactions. At the same time, blockchain offers enhanced transparency and security due to its distributed ledger system, which allows for real-time transaction tracking and protection against fraud and cyberattacks. Additionally, smart contracts automate complex processes such as lending and trade finance management, reducing operational risks and creating faster and more efficient financial workflows.

However, significant challenges must be addressed for blockchain to be widely adopted. Scalability issues and complex infrastructure requirements represent major technical obstacles, especially in processing high transaction volumes. Moreover, underdeveloped regulatory frameworks create legal uncertainties for banks, while compliance with AML (Anti-Money Laundering) and KYC (Know Your

Customer) requirements is complicated by the decentralized and sometimes anonymous nature of public blockchains. Data privacy is another critical aspect, as sensitive user information must be carefully managed to prevent unauthorized exposure.

A comparison between public and private blockchains reveals that permissioned solutions are more suitable for the banking sector due to greater control over access and regulatory compliance. However, a hybrid model, which combines the transparency of public blockchains with the control provided by private blockchains, could represent the optimal solution for integrating this technology into the global financial infrastructure.

In conclusion, blockchain has the potential to significantly modernize global financial infrastructure, reducing costs, increasing security, and automating complex financial processes. However, achieving this transition requires substantial investments in infrastructure, standardization, and collaboration between financial institutions and regulatory authorities. Ongoing research into blockchain applications, alongside pilot projects, will contribute to a gradual and efficient adoption of this revolutionary technology.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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