

An Examination of the Opportunities and Challenges of Adopting Blockchain Technology in the Nigerian Corporate Governance Framework

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Abstract

The adoption of blockchain technology into Nigeria's corporate governance framework presents significant opportunities and challenges. Blockchain, characterized by its decentralized, immutable, and transparent nature, offers transformative opportunities for enhancing corporate governance frameworks. By increased transparency, accountability, improved security, compliance and reduced bureaucratic inefficiencies, blockchain can bolster investor confidence and reduce fraudulent activities. Using doctrinal research methodology, this paper explored the opportunities and challenges of the adoption of blockchain technology into the Nigerian corporate governance framework. The findings of this paper revealed that despite the opportunities of blockchain adoption, the effective implementation of blockchain in Nigeria's corporate governance framework faces significant challenges which include the absence of a clear regulatory framework, limited technological infrastructure, digital literacy gap and data privacy concerns. To overcome these challenges, it is recommended among others that policymakers must establish clear regulatory framework to promote blockchain use. There should also be investment in infrastructure, education and awareness programs.

Keywords: Opportunities, Challenges, Blockchain Technology, Corporate Governance, Nigeria

1. Introduction

Corporate governance plays a crucial role in ensuring accountability, transparency, protecting stakeholder interests and ethical management in organizations. It establishes the framework for decision-making, regulatory compliance, and stakeholder engagement, which are essential for sustainable business practices.¹ In Nigeria, corporate governance continues to struggle with persistent challenges that impede transparency, accountability, and efficiency. Issues such as financial mismanagement, corruption, and weak regulatory compliance have led to corporate failures and diminished investor confidence.² The adoption of emerging technologies, such as blockchain, has been proposed as a potential solution to address these challenges and enhance corporate governance practices in the country. According to Yermack, blockchain tends to provide solution to the main issues facing the corporate governance structure of many institutions.³

Blockchain technology, a decentralized and distributed ledger system, ensures transparency, immutability, and traceability in transactions.⁴ Blockchain's potential to address these systemic challenges stems from its ability to create a secure, auditable, and transparent record of transactions and decisions.⁵ These characteristics make it a powerful tool for addressing corporate governance challenges, particularly in developing countries like Nigeria, where issues such as corruption,

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¹ 'G20/OECD Principles of Corporate Governance', Organisation for Economic Co-operation and Development, 2015.

² E Adegbite, K Amaeshi, & C Nakajima, 'Corporate Governance in Nigeria: Concepts and Issues' (2013) 22(2) *Business Ethics: A European Review*, 178; J K Olowookere & H T Fasina, 'Corporate Governance in Nigeria: Challenges and Prospects', (2020) 15 (2) *African Journal of Business and Economic Research*, 145.

³ S Ahluwalia, R V Mahto & M Guerrero, 'Blockchain Technology and Startup Financing: A Transaction Cost Economics Perspective', (2020) *Technological Forecasting and Social Change*, 151, <<https://doi.org/10.1016/j.techfore.2019.119854>> accessed 10 March 2024

⁴ S Nakamoto, 'Bitcoin: A Peer-to-Peer Electronic Cash System', <<https://bitcoin.org/bitcoin.pdf>> accessed 10 March 2024

⁵ M Iansiti, & K R Lakhani, 'The Truth About Blockchain', (2017) 95 (1) *Harvard Business Review*, 118.

inefficiencies, and lack of transparency have hindered effective governance.⁶ By leveraging blockchain, Nigerian corporations can reduce fraudulent activities, streamline shareholder voting processes, and enhance regulatory oversight.

The potential benefits of blockchain adoption extend beyond transparency and accountability. By reducing reliance on intermediaries and automating processes, blockchain can enhance efficiency and lower operational costs. Moreover, the technology has the potential to increase investor confidence by ensuring accurate, real-time data sharing. Yet, despite these advantages, the adoption of blockchain into Nigerian corporate governance framework is not without its challenges. The regulatory environment remains uncertain, as the absence of a comprehensive regulatory framework, creates uncertainties for businesses and investors.⁷ Additionally, the country's infrastructural limitations, including inadequate internet connectivity and low digital literacy rates, pose significant barriers to widespread blockchain adoption in Nigeria.

This paper examines the opportunities and challenges associated with adopting blockchain technology into the Nigerian corporate governance framework. It examines how blockchain can enhance transparency, accountability, and efficiency in corporate management while addressing the barriers that limit its adoption. The paper also highlights global best practices to facilitate blockchain adoption in Nigeria's corporate sector. Exploring global use cases provides valuable insights into blockchain's impact on corporate governance in Nigeria.

2. The Concept of Blockchain Technology

Blockchain technology is a decentralized and immutable digital ledger that records transactions across a network of computers, allowing for secure, transparent, and tamper-proof storage and exchange of information.⁸ The ledger is immutable, meaning once data is recorded, it cannot be altered without the consensus of the network, thereby ensuring integrity and trust.⁹ Cong and He¹⁰ described blockchain as a distributed and disseminated ledger technology, classically managed in a decentralized pattern. Blockchain, being a distributed ledger technology, has been found as a better replacement for the traditional double entry bookkeeping in a general ledger of a firm's financial records.¹¹

Moreover, Wright and Filippi, provide an outstanding definition of blockchain by describing blockchain as a “distributed, shared, encrypted-database that serves as an irreversible and incorruptible public repository of information”.¹² Originally introduced as the underlying

⁶Transparency International, ‘Corruption Perceptions Index’, <<https://www.transparency.org/>>accessed 11 March 2024. For instance, the implementation of blockchain-based voting systems could enhance shareholder participation and reduce electoral fraud, while smart contracts could automate compliance processes and minimize administrative overhead.

⁷C A Okonkwo, R A Ezejiofor, & C C Nwosu, ‘Blockchain Technology and Its Potential Applications in Nigeria’, (2021) 12 (1) *Journal of Information Technology and Economic Development*, 23.

⁸A Narayanan, *et al*, *Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction* (Princeton University Press, 2016).

⁹Nakamoto, (n 4).

¹⁰L W Cong, & Z He, ‘Blockchain Disruption and Smart Contracts’, (2019) 32 (5) *The Review of Financial Studies*, 1754.

¹¹D Yermack, ‘Corporate Governance and Blockchains’, (2017) 21 (1) *Review of Finance*, 7.

¹²A Wright & P D Filippi, ‘Decentralized Blockchain Technology and The Rise of Lex Cryptographia’, <<https://doi.org/10.2139/ssrn.2580664>> accessed 11 March 2025.

technology for bitcoin,¹³ blockchain has since evolved beyond cryptocurrency applications to influence various industries, including corporate governance, supply chain management, healthcare, and finance. Its ability to provide secure, transparent, and tamper-proof records makes it a revolutionary technology for modern business and regulatory frameworks. The essence of blockchain technology is how information is recorded. Each transaction originates a unique cryptographic key, created based on a code verification and validation network, which guarantees a safe transaction.¹⁴

Blockchain can be categorized into two primary types: public (permissionless) or private (permissioned) blockchains. Public blockchains are open to anyone who wants to participate in the network while private blockchains are restricted networks where access is limited to specific participants.¹⁵

Thus, the cryptographic access keys for a blockchain categorize it as being a public or private network, since the wide access and anonymous keys are related to public networks, while the controlled keys are related to the private blockchain network.

Regardless of how blockchain is technologically structured, at the core of blockchain technology are several fundamental principles that define its functionality and advantages over traditional systems. These fundamental principles underpinning blockchain technology include decentralization, immutability, transparency, security, and consensus.¹⁶

Decentralization¹⁷ eliminates the need for a central authority to verify transactions. Unlike traditional centralized databases controlled by a single entity, a blockchain is distributed across a network of computers, or nodes. In essence, data is stored across a network of nodes, making it resistant to censorship and single points of failure.¹⁸ This decentralized nature ensures that no single entity has undue control over the system and thus, enhances trust, reduces reliance on intermediaries, and minimizes the risk of fraud and manipulation.

Another principle of blockchain technology is immutability, which ensures that once data is recorded on the blockchain, it cannot be altered or deleted.¹⁹ Immutability, or the unchangeable nature of the blockchain ledger, is achieved through cryptographic hashing and consensus mechanisms, which secure transaction records against unauthorized modifications.²⁰ Each block of data in the chain contains a cryptographic hash of the previous block, linking them together in a continuous chain thereby creating a secure and tamper-resistant structure. Any attempt to alter past data would require re-computation of all subsequent blocks, making fraudulent changes

¹³ Nakamoto, (n 4).

¹⁴ M Swan, *Blockchain: Blueprint for a New Economy*. (Boston: O'Reilly Media, 2015).

¹⁵ Yermack (n 11).

¹⁶ M U Yilmaz, 'Blockchain Technology and Corporate Governance', (2020) 9 (2) *Journal of Governance and Regulation*, 8.

¹⁷ Decentralization in blockchain refers to transferring control and decision making from a centralized entity.

¹⁸ Swan, (n 14).

¹⁹ G J Buhari, 'An Analysis of Block Chain Technology's Role in Nigerian Governmental Agencies: A Review of its Uses and Consequences', (2025) 7 (7) *Journal of Management Science and Career Development*, 63

²⁰ A Wright, & P De Filippi, 'Decentralized Blockchain Technology and the Rise of Lex Cryptographia' https://www.researchgate.net/publication/314892724_Decentralized_Blockchain_Technology_and_the_Rise_of_Lex_Cryptographia accessed 12 March 2025.

practically impossible.²¹ In essence, any attempt to modify a block would change its hash, breaking the chain and making the tampering evident. Immutability therefore ensures the integrity and trustworthiness of the data, providing the reliability and verifiable record of all transactions.

Transparency is also fundamental principles of blockchain technology. Transparency refers to the fact that all transactions recorded on the blockchain are visible to network participants and since transaction records are publicly accessible²² or shared among authorized participants, stakeholders can independently verify data integrity. Transparency fosters accountability, trust, eliminates likelihood of corruption and fraud, as all parties can see the entire history of transactions and data.²³ However, transparency does not compromise privacy, as blockchain employs advanced cryptographic techniques to ensure that sensitive data remains secure.

Another essential principle is security, reinforced by its decentralized architecture and cryptographic features. Blockchain uses advanced encryption methods to secure transactions and verify identities, protecting the system against unauthorized access and fraud. Additionally, the distributed nature of blockchain makes it highly resilient to cyberattacks, as compromising a single node does not jeopardize the entire network.²⁴

Furthermore, consensus refers to the process by which the network of computers agrees on the validity of transactions and data.²⁵ This consensus is typically achieved through the use of consensus mechanisms, such as proof of work and proof of stake, prevent unauthorized modifications and ensure that only valid transactions are added to the blockchain.²⁶ These security features make blockchain resistant to cyberattacks and data breaches, providing a robust framework for secure record-keeping.

Smart contracts, which is a self-executing digital agreement stored on the blockchain, further enhance automation and efficiency in business processes. These contracts automatically execute predefined conditions without the need for intermediaries, reducing operational costs and human errors.²⁷ In corporate governance, smart contracts can be used to automate shareholder voting, compliance monitoring, and financial transactions, ensuring seamless and transparent execution of governance policies.

The inherent security, transparency, and decentralized nature of blockchain technology are the bedrock of its ability to manage data and transactions effectively. This transformative potential has been recognized across various industries like finance, healthcare, supply chain, and governance. As blockchain continues to evolve, its fundamental principles will remain critical to its success and widespread adoption.

²¹M Pilkington, *Blockchain Technology: Principles and Applications*. <https://download.ssrn.com/16/01/06/ssrn_id2711756_code450933.pdf?response-content-disposition=inline&X-Amz-Security-> accessed 14 March 2025.

²² In public blockchains.

²³D Tapscott, & A Tapscott, 'Blockchain Revolution: How the Technology Behind Bitcoin is Changing Money, Business, and the World', <<https://icdt.osu.edu/blockchain-revolution-how-technology-behind-bitcoin-changing-money-business-and-world>> accessed 11 March 2025

²⁴A M Antonopoulos, *Mastering Bitcoin: Unlocking Digital Crypto currencies* (O'Reilly Media Inc, 2017).

²⁵A Narayana *et al*, *Bitcoin and Crypto currency Technologies: A Comprehensive Introduction* (Princeton University Press, 2016).

²⁶ V Buterin, 'A Next-Generation Smart Contract and Decentralized Application Platform', <<https://ethereum.org/en/whitepaper>> accessed 11 March 2025.

²⁷ N Szabo, 'The Idea of Smart Contracts', 1997 *Nick Szabo's Papers and Concise Tutorials*, 6

3. Adoption of Blockchain Technology in Nigeria

Blockchain technology adoption in Nigeria has gained significant momentum in recent years, driven by its potential to enhance transparency, efficiency, and security across various sectors. In Nigeria, blockchain is initially associated with crypto currency and the refusal of the Central Bank of Nigeria to approve its use in Nigeria. However, the Nigerian government has recognized the transformative power of blockchain and has taken steps to integrate it into the nation's digital economy. In May 2023, the Nigerian government approved the National Blockchain Policy aimed at fostering the safe and responsible use of blockchain in various sectors. This strategy outlines key areas such as financial services, digital identity management, and supply chain optimization, emphasizing the importance of blockchain in fostering trust and reducing inefficiencies.

One notable application of blockchain in Nigeria is in the financial sector, where it is being used to improve payment systems and promote financial inclusion. Blockchain-based solutions have enabled faster and more secure transactions, particularly in rural areas with limited access to traditional banking services. Additionally, blockchain is being explored for use in land registry systems to address issues of fraud and lack of transparency in property ownership.²⁸

Beyond finance, governance and land registry, industries such as healthcare and logistics are also beginning to integrate blockchain technology. Moreover, the private sector has also embraced blockchain, with startups and tech companies developing innovative solutions for various industries. For instance, blockchain is being utilized in agriculture to enhance supply chain traceability and ensure fair pricing for farmers. In addition, the technology is being adopted in the energy sector to facilitate peer-to-peer energy trading and improve grid efficiency.²⁹ The scope for widening application of blockchain technology is part of the National Blockchain Policy, and it may well be embraced by the public given the awareness of the benefits of the technology in their daily lives.³⁰

4. Blockchain Technology and Corporate Governance

The application of blockchain technology in corporate governance is increasingly gaining attention for its potential to revolutionize the way companies operate, make decisions, and engage with stakeholders.³¹ One of the key areas where blockchain technology can be applied in corporate governance is in the shareholder voting. Traditional shareholder voting systems are often susceptible to manipulation, inefficiencies, and lack of accessibility, leading to low voter turnout and governance loopholes.³² Blockchain-based voting systems, however, can provide a secure and auditable platform, where each vote is recorded immutably on the ledger, ensuring its integrity and verifiability.³³ Thus, adopting blockchain-based smart contracts, shareholder votes can be securely recorded, counted, and executed in a transparent and automated manner. Additionally, blockchain

²⁸ National Blockchain Adoption Strategy Streamlining into a Digital Future', <<https://nitda.gov.ng/wp-content/uploads/2023/01/BlockChainAdoptionStrategy-compressed-1.pdf>> accessed 12 March 2025.

²⁹ *Ibid.*

³⁰ C Kuppaswamy *et al.*, 'A Blockchain for Nigeria' – Exploring Blockchain Policy and Adoption in Nigeria', <https://uhra.herts.ac.uk/bitstream/handle/2299/27969/A_Blockchain_for_Nigeria_-_White_Paper_-_Oct_2023_.pdf?sequence=1> accessed 11 March 2025.

³¹ M U Yilmaz, 'Blockchain Technology and Corporate Governance. (2020) 9 (2) *Journal of Governance and Regulation*, 8.

³² Wright & De Filippi, (n 20).

³³ Nakamoto, (n 4).

technology can enable the creation of digital proxies, allowing shareholders to vote remotely and securely, which can increase shareholder participation and engagement.³⁴

Another area where blockchain technology can be applied in corporate governance is in the disclosure and reporting of financial information.³⁵ Many corporations struggle with compliance due to complex regulatory frameworks and manual auditing processes, which are time-consuming and prone to errors. Blockchain-based systems can provide a secure and transparent platform for the disclosure of financial information, such as annual reports and financial statements, which can increase transparency and accountability.³⁶ Furthermore, blockchain technology can enable the creation of smart contracts, which can automate the reporting and disclosure of financial information, reducing the risk of errors and non-compliance.³⁷

Blockchain can also revolutionize record-keeping and auditing. Corporate governance relies heavily on accurate and reliable records of financial transactions, contracts, and other critical information. Traditional record-keeping systems can be vulnerable to tampering and loss, leading to disputes and inefficiencies. By storing records on an immutable blockchain ledger, corporations can ensure the integrity and accessibility of their data, streamlining auditing processes and reducing the risk of fraud. This is especially pertinent for financial reporting, where blockchain can offer a transparent and auditable trail of transactions, enhancing investor confidence and regulatory compliance.

Moreover, blockchain technology can be applied in corporate governance to enhance board governance and decision-making. Blockchain-based systems can provide a secure and transparent platform for board members to access and share information, which can increase efficiency and effectiveness.³⁸ Additionally, blockchain technology can enable the creation of digital boardrooms, allowing board members to participate in meetings and make decisions remotely and securely.³⁹

In addition, blockchain technology can be applied in corporate governance to enhance compliance processes.⁴⁰ Blockchain-based systems can provide a secure and transparent platform for auditors to access and review financial information, which can increase efficiency and effectiveness.⁴¹ Perhaps, blockchain technology can enable the creation of smart contracts, which can automate the audit and compliance processes, reducing the risk of errors and non-compliance.⁴²

Smart contracts are another key application of blockchain in corporate governance. These self-executing contracts, with the terms of the agreement directly written into code, can automate various governance processes, such as compliance monitoring and dividend distribution. By automating these processes, companies can reduce administrative overhead, minimize the risk of human error, and ensure that contractual obligations are met transparently and efficiently.⁴³ For

³⁴P De Filippi & A Wright, 'Blockchain and The Law: The Rule of Code', <https://www.researchgate.net/publication/326048334_Blockchain_and_the_Law_The_Rule_of_Code> 26 February 2025.

³⁵ Yilmaz, (n 31).

³⁶ Narayanan (n 25).

³⁷ Swan, (n 11).

³⁸ Yilmaz, (n 31).

³⁹ Narayanan, (n 25).

⁴⁰ Swan, (n 11).

⁴¹ Yilmaz, (n 31).

⁴² De Filippi, & Wright (n 34).

⁴³M Iansiti & K R Lakhani, 'The Truth about Blockchain'. (2017) 95 (1) *Harvard Business Review*, 118.

example, smart contracts could automatically distribute dividends to shareholders based on pre-defined criteria, eliminating the need for manual intervention.

Indeed, the blockchain technology can be applied in various areas of corporate governance including shareholder voting, disclosure and reporting of financial information, record-keeping, auditing, board governance and decision-making thereby increasing transparency, accountability, efficiency, and reducing the risk of errors and non-compliance. As noted by Swan,⁴⁴ blockchain technology can provide a secure, transparent, and tamper-proof platform for companies to operate, make decisions, and engage with stakeholders.

5. Opportunities of Blockchain Adoption into Nigerian Corporate Governance Framework

The adoption of blockchain technology into Nigerian corporate governance framework presents several opportunities for addressing persistent challenges and enhancing operational efficiency, transparency, accountability and trust. As a decentralized and immutable ledger technology, blockchain provides several opportunities that can significantly strengthen Nigerian corporate governance landscape. Some of these opportunities are:

A. Transparency and Accountability

Blockchain technology has emerged as a powerful tool for promoting transparency and accountability within corporate governance, particularly in financial reporting and transaction tracking. Corporate governance in Nigeria has often been criticized for its obscurity, with issues such as corruption, financial mismanagement, and lack of accountability undermining stakeholder confidence.⁴⁵ By leveraging its unique properties, corporations can ensure that financial data is more reliable, verifiable, and accessible. This transparency enables stakeholders, including investors, regulators, and auditors, to verify financial statements and trace transactions back to their origins, thereby reducing the risks of fraud and misreporting. Transparency is achieved through the public accessibility of the blockchain. All participants can view the entire transaction history, which fosters trust among stakeholders.

As Tapscott and Tapscott⁴⁶ assert, blockchain's transparency fosters trust among shareholders, regulators, and other stakeholders, thus mitigating risks associated with corruption and financial misconduct. Moreover, blockchain's immutable ledger ensures that all transactions and decisions are recorded permanently, making it nearly impossible to manipulate or falsify data.

In addition, Singh *et al.*,⁴⁷ opined that, through creating transparency, increasing liquidity, and decreasing costs, blockchain technology would improve the whole aspects of organizational governance; thus, the entire groups of stakeholders of the company, including customers, might enjoy the advantages of deploying blockchain technology. For instance, futuristic and financial investors could take the opportunity to buy a corporation share at a reduced cost and sell it with profit on the market with large liquidity. Moreover, managers who have gotten incentives from a

⁴⁴ Swan (n 11).

⁴⁵ 'The Collapse of Heritage Bank in Nigeria: A Lesson in Financial Mismanagement and Ethical Banking', <https://probitasreport.com/the-collapse-of-heritage-bank-in-nigeria-a-lesson-in-financial-mismanagement-and-ethical-banking?utm_source=chatgpt.com> accessed 12 March 2025.

⁴⁶ D Tapscott, & A Tapscott, (n 23).

⁴⁷ H Singh *et al.*, 'Blockchain Technology in Corporate Governance: Disrupting Chain Reaction or Not? (2019) 20 (1) *Corporate Governance: The International Journal of Business in Society*, 67.

compensation that is stock based will lose opportunities for profit legally from an insider trading, because of the huge visibility of all their business transactions.

Additionally, blockchain can facilitate greater accountability in corporate governance. With every transaction being recorded on a public ledger, organizations can establish a higher level of responsibility among their executives and employees. The ability to audit transactions in real-time fosters a culture of ethical behavior and compliance, as individuals know that their actions are traceable.⁴⁸ This level of scrutiny is particularly beneficial in industries that are prone to corruption and malpractice, ensuring that organizations adhere to regulatory requirements and ethical standards. Blockchain therefore enhances transparency and accountability in corporate governance.

B. Security of Data

Decentralization, one of the fundamental principle of blockchain, ensures the distribution of control across a network rather than being concentrated in a single entity. In traditional systems, a central authority manages and verifies transactions, which can lead to inefficiencies and vulnerabilities. In contrast, blockchain operates on a peer-to-peer network where each participant maintains a copy of the entire ledger. This decentralized structure enhances security and reduces the risk of fraud, as no single entity can manipulate the data without the agreement of the majority of network participants.⁴⁹

Immutability, another critical characteristic of blockchain ensures that once a transaction is added to the blockchain, it is cryptographically linked to the previous block and cannot be altered without altering all subsequent blocks, which would require the consensus of the majority of participants.⁵⁰ This makes blockchain highly resistant to tampering and fraud, ensuring data security.

C. Automation of Governance Processes

Smart contracts, a key feature of blockchain, enable the automation of governance processes. Smart contracts are self-executing agreements coded into the blockchain, which are triggered when predefined conditions are met.⁵¹ Corporate governance activities such as shareholder voting, dividend distribution, and compliance checks can be streamlined using smart contracts. This automation eliminates manual errors and bureaucratic delays, enabling faster and more efficient decision-making. For instance, shareholder voting can be conducted transparently and efficiently through blockchain-based smart voting systems, ensuring real-time vote tallying and eliminating concerns over fraudulent practices.⁵² Again, smart contracts have the potential to automate the distribution of dividends to shareholders. When the board of directors announces a dividend, the smart contract can execute payments to eligible shareholders automatically, based on the

⁴⁸ Z Zheng, 'An Overview of Blockchain Technology: Architecture, Consensus, and Future Trends.' <<https://doi.org/10.1109/BigDataSecurity.2017>> accessed 11 March 2025.

⁴⁹ M Crosby *et al*, 'Blockchain Technology: Beyond Bitcoin', (2016) 2 Applied Innovation Review, 6.

⁵⁰ W Mougayar, 'The Business Blockchain: Promise, Practice, and the Application of the Next Internet Technology', <<https://www.wiley.com/en-be/The+Business+Blockchain%3A+Promise%2C+Practice%2C+and+Application+of+the+Next+Internet+Technology-p-9781119300311>> accessed 26 February 2025.

⁵¹ Smart Contract Basics, https://stellar.org/learn/smart-contract-basics?utm_source=chatgpt.com

⁵² Pilkington, M. (2016). *Blockchain Technology: Principles and Applications*. In Research

predefined terms set in the contract. This eliminates manual processing and significantly reduces administrative workload.⁵³

Thus, one notable advantage of smart contracts is their ability to simplify compliance and reporting processes in corporate governance. For corporations, compliance with regulations and internal policies is essential, as non-compliance may result in severe penalties, reputational harm, or legal consequences. By employing smart contracts, corporations can automate these processes thereby improving efficiency and their capacity to meet regulatory standards.

Moreover, smart contracts can be programmed to monitor transactions and ensure compliance with relevant laws and regulations in real-time.⁵⁴ This proactive approach to compliance reduces the burden on compliance teams and minimizes the risk of regulatory breaches. Hence, by automating the governance processes through smart contracts, corporations can minimize human errors and improve the efficiency of financial reporting.⁵⁵

D. Regulatory Compliance

Regulatory compliance is a critical component of corporate governance, and blockchain enhances regulatory compliance by providing a reliable audit trail.⁵⁶ Nigerian corporations often face challenges in meeting regulatory requirements due to fragmented record-keeping and weak audit trails. Perhaps, regulatory requirements often mandate detailed documentation of financial and operational activities. However, blockchain's ability to securely store and timestamp records ensures that companies can meet these compliance obligations without ambiguity. According to Swan,⁵⁷ this characteristic simplifies the auditing process, saving time and resources while ensuring accuracy and accountability.

E. Speed Decision-Making Processes

Blockchain integration can also enhance decision-making processes.⁵⁸ Blockchain-based systems can provide a secure and transparent platform for board members to access and share information, increasing efficiency and effectiveness.⁵⁹ Additionally, blockchain technology can enable the creation of digital boardrooms, allowing board members to participate in meetings and make decisions remotely and securely.⁶⁰

Moreover, the adoption of blockchain technology for recording shareholdings can resolve long-standing issues associated with inaccurate and delayed records of shareholder ownership.⁶¹ By leveraging blockchain, corporations can eliminate manual updates of shares and automate

⁵³ Zohar, A. (2019). Bitcoin: Under the hood. *Communications of the ACM*, 62(9), 103-113. <https://doi.org/10.1145/3341649>

⁵⁴ N Kshetri, (2018). The Emerging Role of Blockchain Technology in the Financial Services Industry. In *The Blockchain Revolution in Financial Services* (pp. 1-21). Palgrave Macmillan. https://doi.org/10.1007/978-3-030-01366-0_1

⁵⁵ G W Peters, & E Panayi, (2016). Understanding Blockchain Technology for Financial Services. In *Banking beyond banks and money* (pp. 201-211). Springer. https://doi.org/10.1007/978-3-319-42448-4_12

⁵⁶ Ibid

⁵⁷ M Swan, (2015). *Blockchain: Blueprint for a New Economy*. O'Reilly Media.

⁵⁸ P De Filippi, (2017). *Blockchain and the Law: The Rule of Code*. Harvard University Press.

⁵⁹ Ibid

⁶⁰ A Narayanan, J Bonneau, E Felten, A Miller, & S Goldfeder, (2016). *Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction*. Princeton University Press

⁶¹ W A Kaal, (2021). Blockchain Solutions for Agency Problems in Corporate Governance. In *Information for Efficient Decision-making: Big Data, Blockchain and Relevance* (pp. 313-329). World Scientific.

shareholder notifications for issued or transferred shares. Thus, implementing blockchain can accelerate decision-making processes.

6. Challenges of Blockchain adoption in the Nigerian Corporate Governance Framework

Despite several opportunities provided by blockchain adoption into the Nigerian corporate governance framework, several challenges hinder its effective adoption and implementation in Nigeria. These challenges range from regulatory uncertainty, high Cost of implementation, data privacy and protection concern, infrastructure deficits and digital literacy gaps and lack of education and awareness.

I. Regulatory Uncertainty

One of the most significant challenges is regulatory uncertainty. Nigeria, like many developing economies, lacks a clear and comprehensive regulatory framework to govern blockchain-based applications in corporate governance.⁶² The absence of specific laws addressing smart contracts, decentralized ledgers, and digital governance structures creates uncertainty for businesses and investors, making it difficult to implement blockchain-based solutions.⁶³ Regulatory bodies, such as the Securities and Exchange Commission and the Corporate Affairs Commission, have yet to establish standardized guidelines for blockchain adoption in corporate governance.⁶⁴

II. High Cost of Implementation and Technical Complexity

Another critical challenge is the high cost of implementation and technical complexity. Blockchain technology requires significant investment in terms of hardware, software, and skilled professionals.⁶⁵ The initial costs of adopting blockchain technology, including hardware, software, and training, are prohibitively high for many Nigerian corporations. Many Nigerian corporations, particularly small and medium-sized enterprises (SMEs), lack the financial resources to deploy blockchain solutions effectively. Additionally, blockchain technology involves sophisticated cryptographic protocols and complex consensus mechanisms, which demand specialized expertise.⁶⁶ The shortage of blockchain professionals in Nigeria further exacerbates the challenge, making it difficult for corporations to implement and maintain blockchain-based governance systems.

III. Data Privacy and Protection Concern

Blockchain's transparency, while advantageous, raises concerns about data privacy. Blockchain-based systems require the collection and storage of large amounts of data, which can create concerns about data security and confidentiality.⁶⁷ Nigerian corporations must balance the need for transparency with the protection of sensitive information. Additionally, blockchain's

⁶² Okonkwo, C. (2021). Blockchain and Regulatory Challenges in Nigeria. *African Journal of Business and Law*, 5(1), 34-50.

⁶³ Ibid.

⁶⁴ E Adegbite, K Amaeshi, & C Nakajima, C. (2013). Corporate Governance in Nigeria: Concepts and Issues. *Business Ethics: A European Review*, 22(2), 178-192.

⁶⁵ Z Zheng, S Xie, H Dai, X Chen, & H Wang, (2017). An Overview of Blockchain Technology: Architecture, Consensus, and Future Trends. *Proceedings of the IEEE International Congress on Big Data*, 557-564. Retrieved from <https://doi.org/10.1109/BigDataCongress.2017.85>

⁶⁶ A Wright, & P De Filippi, (2015). Decentralized Blockchain Technology and the Rise of Lex Cryptographia. *SSRN Electronic Journal*. Retrieved from <https://doi.org/10.2139/ssrn.2580664>

⁶⁷ (Yilmaz, 2020).

immutable nature means that errors in governance records cannot be easily rectified, posing a challenge for businesses that require flexibility in data management.⁶⁸

IV. Infrastructure Deficits and Digital Literacy Gaps

The adoption of blockchain technology into the Nigerian corporate governance framework can require significant investment in infrastructure, technology, and human capital. Nigeria's technological infrastructure is not yet robust enough to support widespread blockchain adoption. This presents practical barriers to blockchain implementation, particularly small and medium-sized enterprises (SMEs), which may not have the necessary resources and expertise to implement and maintain blockchain-based systems.⁶⁹ Thus, reliable internet connectivity, stable electricity supply, and high-speed computing infrastructure are essential for blockchain operations.⁷⁰ Moreover, the country's limited internet connection, inadequate power supply, and insufficient technological expertise can make it difficult to implement and maintain blockchain-based systems. Perhaps, the level of digital literacy among corporate stakeholders remains relatively low, making it difficult for companies to transition to blockchain-based governance models.⁷¹

V. Lack of Education and Awareness

There is a lack of education and awareness about blockchain technology among corporate stakeholders in Nigeria.⁷² Many corporate leaders and stakeholders may not fully understand the benefits and risks of blockchain technology, which can make it difficult to implement and integrate into existing corporate governance framework. As such, this knowledge gap hinders informed decision-making and slows the adoption process.

VI. Scalability and Interoperability Issues

Scalability and Interoperability Issues may pose technical constraints. Many blockchain-based systems are not designed to handle large volumes of transactions, which can create scalability issues.⁷³ Perhaps, most blockchain networks experience scalability challenges such as slow transaction speeds and high energy consumption, particularly when processing a large volume of transactions.⁷⁴ As such, Nigerian corporations, especially those operating on a large scale, may find it difficult to integrate blockchain systems that can handle their governance needs efficiently. Additionally, interoperability between different blockchain platforms and existing corporate governance software is still a work in progress, making seamless integration a challenge.⁷⁵ Thus,

⁶⁸ Okonkwo, C. (2021). Blockchain and Regulatory Challenges in Nigeria. *African Journal of Business and Law*, 5(1), 34-50.

⁶⁹ Narayanan, A., Bonneau, J., Felten, E., Miller, A., & Goldfeder, S. (2016). *Bitcoin and cryptocurrency Technologies: A comprehensive introduction*. Princeton University Press.

⁷⁰ Zheng, Z., Xie, S., Dai, H., Chen, X., & Wang, H. (2017). An Overview of Blockchain Technology: Architecture, Consensus, and Future Trends. *Proceedings of the IEEE International Congress on Big Data*, 557-564. Retrieved from <https://doi.org/10.1109/BigDataCongress.2017.85>

⁷¹ Okonkwo, (2021).

⁷² A Adeyeye, (2018). Corporate governance in Nigeria: Issues and Challenges. *Journal of Business and Management*, 10(2), 1-9.

⁷³ A Narayanan, J Bonneau, E Felten, A Miller, & S Goldfeder, (2016). *Bitcoin and cryptocurrency technologies: A comprehensive introduction*. Princeton University Press.

⁷⁴ De Filippi, P. (2017). *Blockchain and the Law: The Rule of Code*. Harvard University Press.

⁷⁵ Z Zheng, S Xie, H Dai, X Chen, & H Wang, (2017). An Overview of Blockchain Technology: Architecture, Consensus, and Future Trends. *Proceedings of the IEEE International Congress on Big Data*, 557-564. Retrieved from <https://doi.org/10.1109/BigDataCongress.2017.85>

the lack of standardization and interoperability between different blockchain-based systems can make it difficult to integrate them into existing Nigerian corporate governance frameworks.

Indeed, while blockchain technology has the potentials of enhancing corporate governance in Nigeria, its integration into the Nigerian corporate governance framework is not without its challenges. Addressing these challenges will require a coordinated effort from corporate stakeholders, regulators, and policymakers to create a supportive environment for blockchain adoption.

7. Conclusion and Recommendations

The adoption of blockchain technology into the Nigerian corporate governance framework presents a unique opportunity for enhancing transparency, accountability, and efficiency. However, despite these opportunities, challenges such as regulatory uncertainty, limited infrastructure, lack of education and awareness may hinder the successful adoption of blockchain technology in Nigeria.

To successfully adopt blockchain technology into Nigerian corporate governance framework, Nigeria must address these challenges through development of clear regulatory framework and for blockchain adoption in corporate governance. This will provide certainty and clarity for corporate stakeholders and facilitate the adoption of blockchain technology. Nigerian corporations should invest in infrastructure and technology development to support the adoption of blockchain technology. This includes investing in secure and reliable internet connectivity, data storage, and processing power. Corporate stakeholders, including board members, executives, and shareholders, should undergo education and awareness programs to understand the benefits and risks of blockchain technology. Nigerian companies should collaborate with other stakeholders, including regulators, industry associations, and technology providers, to develop standardized blockchain-based solutions for corporate governance.

By implementing these recommendations, Nigerian corporations can harness the benefits of blockchain technology and enhance transparency, accountability, and efficiency in corporate governance.