Blockchain Technology and Supply Chain Management in Nigeria: A Literature Review

Emmanuel Abiji ABIJI[1]
emmanuelabiji@gmail.com
https://orcid.org/0009-0000-9537-4811
Aneozeng Awo EGBE[2]
anegbe06@gmail.com
Paul Boniface OTIALA[3]
paulotiala@unicross.edu.ng
Julius Adebola AGADA[4]
agadajulius19761402@gmail.com
https://orcid.org/0009-0009-3679-3640

[1,4]Department of Business Administration, Thomas McGettrick Institute of Technology, Ogoja-Nigeria.
[2,3]Department of Business Administration, University of Cross River State, Calabar – Nigeria.

ABSTRACT
This study examined the effect of blockchain technology on supply chain management in Nigeria. The study was motivated by persistent challenges in Nigerian supply chains, including poor transparency, weak traceability, data insecurity, counterfeiting, fragmented records, and low trust among supply chain actors. Specifically, the study focused on the effect of decentralization on supply chain transparency, effect of data security on supply chain performance and the effect of smart contract utilization on supply chain sustainability. The study adopted a systematic literature review approach guided by the PRISMA framework. Relevant studies published from 2019 to 2025 were sourced from academic databases such as Scopus, Web of Science, Google Scholar, ScienceDirect, Emerald Insight, and SpringerLink, with emphasis on recent literature relating to blockchain technology, supply chain transparency, supply chain performance, and sustainability, hence, a total of fifty-five articles were included in the study out of the 105 found. The review found that blockchain technology can improve supply chain management by creating shared, secure, and tamper-resistant records that support transparency and accountability. Decentralization enhances visibility among supply chain actors, while data security improves trust, reduces fraud, and supports better supply chain performance. Smart contracts also promote sustainability by automating agreements, reducing opportunistic behaviour, and improving compliance with economic, social, and environmental standards. However, the review also showed that blockchain adoption in Nigeria is limited by poor infrastructure, low technological readiness, high implementation cost, weak regulation, and resistance to change. The study concluded that blockchain technology has strong potential to improve supply chain management in Nigeria, but its success depends on the alignment of technological capacity, organizational readiness, and institutional support. The study recommends greater investment in digital infrastructure, staff training, regulatory support, and sector-specific blockchain adoption strategies.

Keywords**:** *Blockchain technology; Supply chain management; Decentralization; Supply chain sustainability; Supply chain transparency; Supply chain performance.*

1. INTRODUCTION

Today, blockchain technology is increasingly regarded as a key concern among the supply chain management and operation management communities, owing to the challenges that organizations face with regard to transparency, trust, and efficiency within their supply chains. In fact, the adoption of blockchain is not seen as a technological trend anymore, but a strategic infrastructure that has the potential to influence the supply chain, its design, coordination, and eventually its governance (Queiroz et al., 2020; Wang et al., 2019). The inherent nature of blockchain, which is based on decentralization, immutability, and real-time transparency, has been proven effective in solving long-standing problems, including information asymmetry, fraud, counterfeiting, and coordination among supply chain members (Cole et al., 2019; Zelbst et al., 2020). As the size and complexity of global supply chains continue to increase, blockchain technology is increasingly being viewed as a foundational technology that has the potential to enable trust, collaboration, and supply chain performance improvement (Saberi et al., 2019; Rejeb et al., 2021). There is emerging empirical evidence from developed and emerging markets that blockchain technology adoption has the potential to improve supply chain transparency, traceability, sustainability, and performance when properly deployed (Park & Li, 2021; Kim & Shin, 2019; Di Vaio & Varriale, 2020). However, the benefits are not automatic. They are realized only if the organization is ready, has the necessary technological capabilities, good governance, and operates in a conducive institutional environment that supports supply chains (Agi & Jha, 2022; Tönnissen & Teuteberg, 2020). Therefore, the concept of blockchain technology changed from a purely technological solution to a socio-technical system that depends on contextual factors like regulations, infrastructures, and management expertise (Wamba & Queiroz, 2020; Lohmer et al., 2022).

In the case of emerging economies, the context plays a relatively more significant role. In this regard, the phenomenon of the use of blockchain technology can be considered both challenging and opportune. Nigeria can be considered a relatively more salient case in this regard, owing to the fact that it is the largest economy and the most populated country on the African continent (Asuquo et al, 2004; Akpan & Uford, 2024). The country's intricately complex and intricate supply chains involve the construction industry, the agricultural sector, the pharmaceutical industry, food products, the energy sector, and the manufacturing sector, among others. The supply chains are characterized by a general lack of formality, fragmented record-keeping, poor regulation and regulatory practices, and a general lack of trust between the participants of the supply chains (Labaran & Hamma-Adama, 2021; Ebekozien et al., 2023). In this regard, the use of blockchain technology can act as a solution to the general issues and inefficiencies in the supply chains. This arises due to its ability to ensure the creation of unalterable records and shared data environments. Indeed, blockchain has come to be increasingly recognized as a potential solution to such systemic issues and inefficiencies. Nigeria-based research has shown that investigations into the construction sector have identified transparency and accountability as the main drivers for blockchain adoption. These investigations have also shown that the main barriers to blockchain adoption are costs associated with its implementation and a general lack of technical and organizational capabilities (Okanlawon et al., 2023; Okanlawon et al., 2024). Similar results have been observed within the food and pharmaceutical supply chains. Indeed, blockchain has been recognized as a potential solution for issues such as counterfeits. Its adoption has also been hindered by the lack of appropriate infrastructure and institutional support (Akazue et al., 2023; Labaran & Hamma-Adama, 2021). The study's findings are in line with the situation in developing economies, and it reinforces the assertion that the potential impact of blockchain relies on the synergy between the environment and the technological advantages of the technology (Chittipaka et al., 2023; Mubarik et al., 2021).

However, further research reveals that the impact of blockchain technology on the supply chain can be understood in several dimensions: transparency, collaboration, sustainability, and production strategies. Among these, transparency appears to be the primary consequence of the integration of blockchain technology in the supply chain, as it enables the sharing of information in real-time among the various actors of the supply chain, thus reducing opportunistic behavior and increasing trust among the actors (Zelbst et al., 2020; Xu et al., 2021). Collaboration in the supply chain also benefits from the integration of blockchain technology, as the technology enables the actors of the supply chain to work in a coordinated fashion (Rejeb et al., 2021; Xia et al., 2023). In the context of sustainability, the integration of blockchain technology in the supply chain can be a major step towards the sustainable development of the supply chains of the emerging economies of the world (Saberi et al., 2019; Mubarik et al., 2021). In addition, the integration of blockchain technology in the supply chain may also have an impact on the strategies of production (Javadi et al., 2025; Tokkozhina et al., 2023).

However, even with such favorable outcomes, the case of Nigeria shows that the adoption of blockchain technology is neither universal nor assured. This is because, in Nigeria, small and medium-sized enterprises, which constitute the core of Nigeria's economic landscape, lack the necessary resources to undergo widespread digitalization (Musa & Musa, 2025). Considering the superficial, pilot, or externally driven nature of the adoption of blockchain technology, this case mirrors the situation in other developing economies where the benefits of adopting blockchain technology are dependent on the size of the organization, digital literacy, and institutional support (Alazab et al., 2021; Deng et al., 2025). In light of the significant role of the supply chain in the economic development and industrialization of the Nigerian economy, it is of both empirical and theoretical importance to elucidate the role of blockchain technology in the Nigerian supply chain. The Nigerian case would present an interesting context for examining the interplay between transparency, cooperation, and sustainability, and would thus qualify for an empirical case study on the role of blockchain technology in the Nigerian supply chain, with significant implications for the role of technology in the development of the Nigerian economy, and the limitations of technology in the context of the developing world.

Objectives of the Study

The central objective of this study was to examine the effect of blockchain technology on supply chain management in Nigeria. The specific objectives were:

1. To examine the effect of decentralization on supply chain transparency in Nigeria
2. To ascertain the effect of data security on supply chain performance in Nigeria
3. To determine the effect of smart contract utilization on supply chain sustainability in Nigeria

2. LITERATURE REVIEW

Conceptual Review

Blockchain technology

Blockchain, therefore, can be defined as a digital ledger system that facilitates the recording of digital transactions in a secure, transparent, and unalterable way on a network of different participants. Unlike a conventional database, the system operates without a central controlling entity and uses a process of achieving a consensus on the validation and recording of data in blocks (Wang et al., 2019). Once validated, the transaction is recorded on the digital ledger, making it impossible to change the data involved. This is the core foundation upon which the system is built, and it is this that has enabled the management of complex

systems, especially those involving numerous actors, such as supply chains, where the issue of trust is a concern (Gurtu & Johny, 2019; Cole et al., 2019). From a technical point of view, the technology utilizes cryptography, distributed computing, and consensus technology, which enables direct interactions between different actors and thus eliminates the need for middlemen or intermediaries. In relation to supply chains, this means that all actors within the supply chain, including suppliers, manufacturers, and distributors, will have an identical and timely view of transaction data (Batwa & Norrman, 2020; Alsmadi et al., 2023). The technology may use either public or private blockchains, with private blockchains being more common in supply chain management due to concerns over data privacy, control, and scalability (Batwa & Norrman, 2020; Alsmadi et al., 2023). Recent studies have located blockchain technology within the broader debate on sustainability and Industry 4.0. The technology has emerged as an enabler of sustainable supply chain management by making sustainable practices more traceable and thus promoting greater auditability and compliance with regulations and ethics in supply chain management (Esmaeilian et al., 2020; Yousefi & Tosarkani, 2022). When integrated with other technologies, such as the Internet of Things, RFID, and analytics, blockchain technology improves data accuracy, thus allowing real-time monitoring of supply chain activities (Rejeb et al., 2019; Gohil & Thakker, 2021). Despite its conceptual appeal, however, blockchain technology has its limitations and challenges, which several studies have identified as potential barriers to its adoption (Wamba & Queiroz, 2020; Raj et al., 2024). Therefore, recent debates and studies view blockchain technology not as an independent technology but as a socio-technical system, in which benefits accrue from interactions between technology, organizations, and society (Agi & Jha, 2022; Manzoor et al., 2025).

Supply Chain Management

Supply chain management refers to the planning, execution, and governance of the end-to-end supply chain, from the procurement of raw materials, conversion into a finished product, and finally delivering the product to the end customer. It is the movement of goods, as well as the flow of information and money, among a wide range of participants, including the supplier, manufacturer, distributor, retailer, or service provider, as well as the relationships that bind these individuals together. Traditionally, supply chain management has been focused on the reduction of costs as well as the enhancement of efficiency in the supply chain. This has been achieved through the optimization of the inventory, transportation, as well as the supplier side. However, due to the globalization, increased complexities, as well as the vulnerabilities, in the current supply chains, the scope of the discipline has been broadened beyond the traditional boundaries. The current supply chain management has been focused on the resiliency, as well as the sustainability, of the supply chain. In this regard, the term “chain” has been replaced by the term “network.” This is attributed to the increased level of trust as well as the level of information sharing, as noted in the studies by Wang et al. (2019) as well as Queiroz et al. (2020). In recent years, the digital technology has transformed the perception as well as the practice in the supply chain management (Uford, 2026). The recent advancement in the digital technology, such as the utilization of the blockchain technology, the Internet of Things, as well as the RFID, has been increasingly leveraged in the supply chain management. This has been attributed to the fact that digital technology enables the real-time information sharing, transparency, as well as the coordination, as noted in the studies by Rejeb et al. (2019), Zelbst et al. (2020), as well as Gohil & Thakker (2021). In this regard, the supply chain management is considered a technology-driven as well as a data-driven discipline.

Decentralization and supply chain transparency

The decentralization of the blockchain is such that the storage, validation, and control of the data are distributed among different individual nodes, rather than a single central authority. This helps participants to jointly verify transactions and share ownership within the network (Gurtu & Johny, 2019; Wang et al., 2019). Supply chain transparency refers to the level of openness with which different stakeholders are able to access relevant information about the supply chain in terms of where the product comes from and how processes are carried out from the starting point to the end point. The decentralization of the blockchain impacts supply chain transparency by affecting the way information is created, verified, and shared among different participants, thereby reducing information gaps and opportunistic behavior among different actors in the supply chain (Cole et al., 2019; Xu et al., 2021). The integration of transparency into the architecture of the supply chain through the use of shared and immutable ledgers, which is made possible by the decentralization of the blockchain, helps to reduce the level of unilateral data manipulation, thereby enhancing transparency among different tiers of the supply chain, which is especially important in a highly fragmented and trust-deficient environment (Zelbst et al., 2020; Rejeb et al., 2019).

In the context of decentralized blockchain technology, the transparency of the system can be improved since various stakeholders can verify the transactions and trace the movement of products in real time, which in turn can enhance the accountability and trust of the various actors in the supply chain (Kim & Shin, 2019; Chang et al., 2022). In the context of emerging economies, where the enforcement of institutions is generally poor, the concept of decentralization can be viewed as an alternative form of governance in which procedural trust can be replaced with technological trust (Saberi et al., 2019; Mubarik et al., 2021). Such a problem is of particular interest in a country like Nigeria, given that the supply chain is largely informal, permeated with counterfeit goods, and lacks traceability. In the context of Nigeria, the empirical studies of the effectiveness of decentralized blockchain technology in improving traceability, reducing information opacity, and promoting trust in the supply chain have been conducted in the context of various sectors such as food, construction, and pharmaceuticals (Akazue et al., 2023; Labaran & Hamma-Adama, 2021; Okanlawon et al., 2025).

However, it is important to note that the decentralization potential of blockchain technology is not automatic. It is subject to the level of preparedness of the organization to adopt the technology, as well as the level of preparedness of the organization to share information. Unless decentralization is effectively implemented, and there is sufficient technical knowledge, decentralization is unlikely to lead to an increase in transparency, with a possibility of becoming more exclusive to smaller players in the supply chain (Ebekozien et al., 2023; Musa & Musa, 2025). The application of blockchain decentralization as a major driver of supply chain transparency in Nigeria is subject to an enabling environment, with its level of effectiveness under conditions of low capability being much lower.

Data security and supply chain performance

Data security has progressively emerged as a deciding factor in the secure creation and exchange of data among connected stakeholders in the supply chain. In complex supply chains, as in the case in Nigeria, characterized by a fragmented, informal, counterfeiting-prone, and weak institutional environment, data security has emerged as a critical determinant in the performance of the supply chain. Supply chains that function in environments with poor data security face a heightened probability of increased risks of fraud, manipulation, and disruption, hence affecting reliability and cost efficiency (Xu et al., 2021; Wamba & Queiroz, 2020). Data security in the supply chain means the protection of transactional data, operational data, as well as traceability data against unauthorized access, change, or loss. A

secure data supply chain aims to guarantee the integrity, confidentiality, and availability of data shared by the different stakeholders in the supply chain. This has been recognized as a vital component in the performance enhancement of the supply chain. In the context of developing economies, as in the case in Nigeria, weak data governance structures and digital trust have been recognized as significant challenges in the performance of the supply chain, as evident in the construction, food, pharmaceutical, and energy supply chains (Labaran & Hamma-Adama, 2021; Okanlawon et al., 2024).

Further, the empirical findings in Nigeria also underscore the implications of data security for the performance of the supply chain. In the construction value chain, for example, Okanlawon et al. (2023, 2025) show that the adoption of blockchain technology, which is largely driven by the need for a secure and transparent data system, has a positive impact on the efficiency of value chain coordination, contract execution, and cost control. In the food value chain in Nigeria, Akazue et al. (2023) also show that the adoption of blockchain technology for the secure traceability of food products enhances service reliability and accountability, thus improving the performance of the value chain. In the pharmaceutical value chain, for example, Labaran and Hamma-Adama (2021) show that a secure data system is very important in the fight against counterfeits in the pharmaceutical value chain, which in turn impacts the performance of the value chain. In addition to efficiency, data security also impacts the relational and collaborative performance of the value chain. In a value chain, a secure and unalterable data system can be used to build trust among the actors in the value chain, which in turn impacts the relational and collaborative performance of the value chain (Rejeb et al., 2021; Xia et al., 2023). In the Nigerian value chain, for example, Ebekozien et al. (2023) show that the value chain actors often rely on informal relationships in the value chain, which underscores the importance of a secure and unalterable data system in building trust among the actors in the value chain. In a value chain where the data system is trusted, the actors in the value chain become more willing to collaborate and cooperate in the value chain (Philsoophian et al., 2022; Xu et al., 2021).

Smart contract utilization and supply chain sustainability

Smart contract utilization means the utilization of self-executing digital contracts that are embedded in a blockchain system to execute specific rules and transactions among supply chain entities in a bid to reduce human interventions and opportunistic behaviors (Gurtu & Johny, 2019; Cole et al., 2019). Supply chain sustainability means the level at which supply chain activities are executed in a bid to ensure long-term economic viability, environmental sustainability, and social responsibility (Azevedo et al., 2019). Smart contract utilization plays a crucial role in ensuring supply chain sustainability, considering that the execution of contractual agreements among entities ensures efficiency, minimizes conflict, and ensures that all entities in the supply chain are adhering to sustainability requirements (Saberi et al., 2019; Park & Li, 2021). Smart contract utilization ensures that environmental and social sustainability requirements are embedded in the contracts, ensuring that organizations are able to monitor their environmental and social responsibilities (Mubarik et al., 2021; Yousefi & Tosarkani, 2022).

The deployment and adoption of smart contracts can therefore promote economic sustainability through cost reduction, payment accuracy, and supply chain coordination and management. This can help ensure the long-term sustainability of supply chain operations. This has been argued by Sheel and Nath (2019) and Di Vaio and Varriale (2020). In a supply chain setting such as that which obtains in Nigeria, smart contracts can help promote sustainability by improving trust and supply chain traceability and accountability. This can be particularly important in supply chains such as those that obtain in the construction, food, and pharmaceutical industries (Labaran & Hamma-Adama, 2021; Okanlawon et al. 2023).

However, the deployment and adoption of smart contracts are not totally free from challenges that can affect supply chain sustainability. These challenges can arise from issues such as technical complexity and limited digital infrastructure and readiness, which can affect supply chains in emerging economies such as Nigeria. This has been argued by Bag et al. (2021) and Okanlawon et al. (2024). The deployment and adoption of smart contracts can also affect supply chain sustainability through issues such as rigidity and the exclusion of smaller supply chain actors. This can affect social sustainability. This has been argued by Raj et al. (2024) and Alsmadi et al. (2023). The deployment and adoption of smart contracts can therefore have a positive or negative impact on supply chain sustainability. This depends on issues such as technological and governance environments. This has been argued by Agi and Jha (2022) and Chittipaka et al. (2023).

Theoretical Framework

This study is anchored on Transaction Cost Theory and Resource-Based View (RBV) Theory.

Transaction Cost Theory

Transaction Cost Theory (TCT), was postulated by Ronald Coase and developed by Williamson (1979), builds on the previous econometric studies on the efficiency of transactions, contractual agreements, and opportunistic behavior. TCT provides a clear perspective on the mechanisms by which the structure of the organization and the systems of governance are designed to ensure the reduction of transactional costs. In the context of supply chain management, TCT suggests that the presence of multiple actors in the supply chain creates inefficiencies caused by mistrust, lack of information, and opportunistic behavior (Sheel & Nath, 2019; Kim & Shin, 2019).

Blockchain technology follows the TCT approach by eliminating information asymmetry and reducing transactional costs. The use of a distributed ledger provides all the stakeholders in the supply chain with the same, unchangeable information regarding the history of transactions (Gurtu & Johny, 2019; Cole, Stevenson, & Aitken, 2019). Smart contracts remove intermediaries and the opportunity cost of opportunistic actions (Batwa & Norrman, 2020; Javadi, Raeisi, & Bohlool, 2025). Blockchain helps improve supply chain efficiency, transparency, and accountability (Zelbst et al., 2020; Rejeb, Keogh, & Treiblmaier, 2019). Transaction Cost Theory (TCT) can be employed to understand how blockchain is being accepted and applied in Nigeria, considering that there is a problem of trust, complexity, and counterfeits affecting supply chains. TCT can also help understand the advantages of blockchain in Nigeria's food, pharmaceutical, and construction industries (Akazue et al., 2023; Labaran & Hamma-Adama, 2021; Okanlawon, Oyewobi, & Jimoh, 2025).

Resource-Based View (RBV) Theory

The Resource-Based View (RBV) was first introduced by Wernerfelt (1984), and the concept was later extended by Barney (1991). The RBV posits that firms can attain competitive advantage by developing, acquiring, and leveraging resources that are valuable, rare, inimitable, and non-substitutable (VRIN). In the context of the supply chain, technological competencies, including blockchain, are considered a strategic resource that can improve the performance of the supply chain, differentiate the firm from its competitors, and enhance the sustainability of the supply chain (Saberi et al., 2019; Di Vaio & Varriale, 2020).

Blockchain can improve the supply chain by providing unique benefits in terms of transparency, traceability, and data security (Tokkozhina, Lucia Martins, & Ferreira, 2023;

Park & Li, 2021). The supply chain can improve its coordination and alignment with environmental and societal standards, including the use of sustainable practices (Mubarik et al., 2021; Daghighi & Shoushtari, 2023). In addition, the use of blockchain can improve knowledge sharing and collaborative decision-making, which are critical resources used to improve the performance of the supply chain (Philsoophian, Akhavan, & Namvar, 2022; Xia, Li, & He, 2023). In the context of Nigeria, the RBV can explain the benefits of using blockchain technology, including the use of technological resources to overcome supply chain issues, including a lack of transparency, insufficient traceability, and fragmented supply chains (Ebekozien, Aigbavboa, & Samsurijan, 2023; Musa & Musa, 2025). The case studies on the use of blockchain in the Nigerian food and pharmaceutical supply chains show that the use of the technology can improve the performance of the supply chains, including the use of sustainable supply chain practices (Akazue et al., 2023; Labaran & Hamma-Adama, 2021). The RBV can, therefore, explain the use of blockchain as a strategic resource used to improve the sustainability and competitiveness of the supply chains.

Empirical Review

Ebekozien et al., (2023) did an appraisal of appraisal of blockchain technology relevance in the 21st century Nigerian construction industry: perspective from the built environment professionals. 20 semi-structured virtual interviews were conducted across Lagos and Abuja cities. The collated data were coded, analysed and presented in themes via a thematic approach. The study found that automating construction progress payments in smart contracts, financial management and supply chain management reduces transaction costs emerged as the key areas where blockchain technology can benefit the Nigerian BEP if well implemented. Others are blockchain-based BIM and prevents forgery and alteration of data, contract management and blockchain-based building information modelling (BIM).

Alsmadi et al., (2023) examines the adoption of blockchain technology in supply chain in Malaysia. Data were collected through questionnaire designed as open-ended question through 300 respondents while only 256 is used according to completed surveys, statistical analysis of the data obtained in this study was carried out by one sample t-test using the statistical software package (SPSS). The study found that, perceived ease, Inter-Organizational Trust, Perceived Usefulness, Data transparency and confidentiality have significant impact on adoption Blockchain in supply chain, while Blockchain technology simplifies inventory financing.

Chittipaka et al. (2023) used empirical data from firms in emerging markets to investigate the phenomenon of blockchain adoption using the Technology-Organization-Environment (TOE) approach. The study points out that the major factors for the adoption of the technology are technological readiness, organizational culture, and regulatory support. The benefits of using the blockchain approach are increased transparency and reduced operational risks, but the major barriers are infrastructure and cost issues.

Alazab et al. (2021) undertook empirical research to investigate the factors that influence user adoption of blockchain technology in supply chain management. Based on a cross-sector survey of 449 industries, the research investigates factors that hinder or facilitate the adoption of blockchain technology in supply chains. To investigate the most significant aspects of blockchain technology adoption, Alazab et al. (2021) integrated the unified theory of acceptance and use of technology (UTAUT) with task-technology fit (TTF) and information system success (ISS) models, including constructs of trust in innovation adoption in information technology. Structural equation modeling revealed that ISS, TTF, and UTAUT models each have a positive influence on factors that influence supply chain employees' willingness to adopt blockchain technology. The research revealed that social influence in UTAUT does not influence the intention to adopt blockchain technology, whereas inter-

organisational trust moderates the relationship between UTAUT constructs and intention to adopt blockchain technology.

Kim and Shin (2019) investigated the impact of the adoption of blockchain technology on supply chain partnerships and performance in South Korean manufacturing companies. Using a survey design, the authors collected 306 responses from managers in charge of managing the companies' supply chains. Using a structural equation modeling technique, the authors found that the adoption of blockchain technology has a positive impact on supply chain partnerships, collaboration, and performance. They recommended the adoption of blockchain technology as a tool for improving inter-organizational coordination, reducing transaction costs, and improving the responsiveness of the supply chain.

Gaps in Literature

However, despite these significant findings in respect to blockchain technology in supply chain management, there exist some lacunae in the existing literature, which necessitate further empirical research to fill these gaps. Firstly, although there exist a number of studies that investigate the adoption of blockchain technology in various industries, including construction, food distribution, and manufacturing, there is a need to conduct further research in emerging economies, such as Nigeria, to gain a better understanding of its implications for supply chain management in these economies (Musa & Musa, 2025; Ndaeyo et al., 2025; Akazue et al., 2023; Labaran & Hamma-Adama, 2021). Secondly, although earlier studies have established some of the benefits of adopting blockchain technology in supply chain management, including its implications for supply chain risk management, collaboration, and sustainability, there is a need to investigate further its long-term implications for supply chain management, particularly in industries that face significant challenges in respect to regulations (Philsoophian, Akhavan, & Namvar, 2022; Xia, Li, & He, 2023). Thirdly, although earlier studies have established some of the benefits of adopting blockchain technology in supply chain management, there is a need to investigate further some of the barriers to its adoption, including technological, organizational, and regulatory barriers, which could affect its effectiveness in supply chain management (Raj et al., 2024; Ebekozien, Aigbavboa, & Samsurijan, 2023). Fourthly, although earlier studies have established some of the benefits of adopting blockchain technology in supply chain management, including its implications for supply chain sustainability, there is a need to investigate further its long-term implications for supply chain management, particularly in emerging economies, such as Nigeria (Park & Li, 2021; Sheel & Nath, 2019; Javadi, Raeisi, & Bohlool, 2025).

3. METHODOLOGY

The methodology adopted in this study involves a systematic review of literature using the PRISMA guidelines in order to assess the influence of blockchain technology on supply chain management in Nigeria. Since the research is conducted without primary data collection, but through secondary sources, the use of PRISMA ensures an objective approach in the selection of studies. The literature used in the study is drawn from reputable sources such as Scopus, Web of Science, Google Scholar, ScienceDirect, Emerald Insight, and SpringerLink, with priority being given to articles published within the period of 2019 to 2025, although some older studies are included when necessary. Search keywords are created based on the research questions, which include blockchain technology, supply chain management, transparency, data security, smart contracts, sustainability, and Nigeria, among others. There was clear use of inclusion and exclusion criteria to make sure the literature met the right criteria in terms of both quality and relevancy. It involved peer-reviewed articles and conference papers, as well as other credible academic materials discussing the role of

blockchain technology in supply chain management, especially within Nigeria and other similar emerging economies. Articles that only talked about cryptocurrency or other unrelated financial uses of blockchain technology were not considered. Identification, screening, eligibility, and inclusion were done in accordance with the PRISMA guidelines. Systematic data extraction was done from the included studies based on variables such as author, publication date, setting, industry, research design, and main results. The review analysis was conducted using narrative thematic synthesis, focusing on issues such as blockchain technology, transparency, data security, performance, sustainability, and adoption challenges. This literature review being was based entirely on secondary sources, ethical approval was not needed.

4. CONCLUSION

The literature review reveals that the technology has a great potential for improving the management of the country's supply chains in Nigeria in terms of transparency, security, and sustainability. The literature reviewed has shown that the technology has the potential to reduce information asymmetry, enhance trust among players in the supply chain, increase efficiency, and promote sustainability in different sectors, including construction, food, and pharmaceuticals. However, the study also indicates some challenges that may be an impediment to the adoption of the technology in Nigeria, including low technology, infrastructure, regulatory, and organizational challenges. In conclusion, although the technology has provided a strategic approach to supply chain management, its adoption in Nigeria will depend on the matching of technology with organizational capabilities, thus the need for more empirical research to understand the benefits and challenges of the technology.

REFERENCES

Agi, M. A., & Jha, A. K. (2022). Blockchain technology in the supply chain: An integrated theoretical perspective of organizational adoption. *International Journal of Production Economics, 247*, 108458. https://doi.org/10.1016/j.ijpe.2022.108458

Akazue, M. I., Yoro, R. E., Malasowe, B. O., Nwankwo, O., & Ojugo, A. A. (2023). Improved services traceability and management of a food value chain using blockchain network: A case of Nigeria. *Indonesian Journal of Electrical Engineering and Computer Science, 29*(3), 1623–1633. https://doi.org/10.11591/ijeecs.v29.i3.pp1623-1633

Akinbamini, E., Vargas, A., Traill, A., Boza, A., & Cuenca, L. (2025). Critical analysis of technologies enhancing supply chain collaboration in the food industry: A Nigerian survey. *Logistics, 9*(1), 8. https://doi.org/10.3390/logistics9010008

Akpan, S. J., & Uford, I. C. (2024). Effect of Fuel subsidy Removal on Purchase of Consumer Goods in Nigeria: A Literature Review. *International Journal of Economics, Business and Social Science Research, 2*(4), 30-38.

Alazab, M., Alhyari, S., Awajan, A., & Abdallah, A. B. (2021). Blockchain technology in supply chain management: An empirical study of the factors affecting user adoption/acceptance. *Cluster Computing, 24*(1), 83–101. https://doi.org/10.1007/s10586-020-03200-4

Almutairi, K., Hosseini Dehshiri, S. J., Hosseini Dehshiri, S. S., Hoa, A. X., Arockia Dhanraj, J., Mostafaeipour, A., & Techato, K. (2023). Blockchain technology application challenges in renewable energy supply chain management. *Environmental Science and Pollution Research, 30*(28), 72041–72058. https://doi.org/10.1007/s11356-021-18311-7

Alsmadi, A. A., Alrawashdeh, N., Al-Gasaymeh, A., Alhawamdeh, L. N., & Al_Hazimeh, A. M. D. (2023). Adoption of blockchain technology in supply chain. *SAGE Open, 13*(1), 21582440231160143. https://doi.org/10.1177/21582440231160143

Asuquo, E. E., Akpan, E. D., & Ntuen, D. D. (2024). Economic Development and Sustainable Poverty Alleviation Policies in Nigeria. *AKSU Annals of Sustainable Development, 2*(1),

Bag, S., Viktorovich, D. A., Sahu, A. K., & Sahu, A. K. (2021). Barriers to adoption of blockchain technology in green supply chain management. *Journal of Global Operations and Strategic Sourcing, 14*(1), 104–133. https://doi.org/10.1108/JGOSS-06-2020-0027

Batwa, A., & Norrman, A. (2020). A framework for exploring blockchain technology in supply chain management. *Operations and Supply Chain Management: An International Journal, 13*(3), 294–306. https://doi.org/10.31387/oscm0420271

Budak, A., & Çoban, V. (2021). Evaluation of the impact of blockchain technology on supply chain using cognitive maps. *Expert Systems with Applications, 184,* 115455. https://doi.org/10.1016/j.eswa.2021.115455

Chang, A., El-Rayes, N., & Shi, J. (2022). Blockchain technology for supply chain management: A comprehensive review. *FinTech, 1*(2), 191–205. https://doi.org/10.3390/fintech1020015

Chittipaka, V., Kumar, S., Sivarajah, U., Bowden, J. L. H., & Baral, M. M. (2023). Blockchain technology for supply chains operating in emerging markets: An empirical examination of technology-organization-environment (TOE) framework. *Annals of Operations Research, 327*(1), 465–492. https://doi.org/10.1007/s10479-022-04801-5

Chowdhury, R. H. (2024). Automating supply chain management with blockchain technology. *World Journal of Advanced Research and Reviews, 22*(3), 1568–1574. https://doi.org/10.30574/wjarr.2024.22.3.1895

Chowdhury, S., Rodriguez-Espindola, O., Dey, P., & Budhwar, P. (2023). Blockchain technology adoption for managing risks in operations and supply chain management: Evidence from the UK. *Annals of Operations Research, 327*(1), 539–574. https://doi.org/10.1007/s10479-021-04487-1

Cole, R., Stevenson, M., & Aitken, J. (2019). Blockchain technology: Implications for operations and supply chain management. *Supply Chain Management: An International Journal, 24*(4), 469–483. https://doi.org/10.1108/SCM-09-2018-0309

Daghighi, A., & Shoushtari, F. (2023). Toward sustainability of supply chain by applying blockchain technology. *International Journal of Industrial Engineering and Operational Research, 5*(2), 60–72. https://doi.org/10.22034/ijieor.v5i2.44

Deng, N., Shi, Y., Wang, J., & Gaur, J. (2025). Testing the adoption of blockchain technology in supply chain management among MSMEs in China. *Annals of Operations Research, 350*(2), 629–648. https://doi.org/10.1007/s10479-022-04856-4

Di Vaio, A., & Varriale, L. (2020). Blockchain technology in supply chain management for sustainable performance: Evidence from the airport industry. *International Journal of Information Management, 52,* 102014. https://doi.org/10.1016/j.ijinfomgt.2019.09.010

Difrancesco, R. M., Meena, P., & Kumar, G. (2023). How blockchain technology improves sustainable supply chain processes: A practical guide. *Operations Management Research, 16*(2), 620–641. https://doi.org/10.1007/s12063-022-00343-y

Ebekozien, A., Aigbavboa, C., & Samsurijan, M. S. (2023). An appraisal of blockchain technology relevance in the 21st century Nigerian construction industry: Perspective from the built environment professionals. *Journal of Global Operations and Strategic Sourcing, 16*(1), 142–160. https://doi.org/10.1108/JGOSS-01-2022-0005

Esmaeilian, B., Sarkis, J., Lewis, K., & Behdad, S. (2020). Blockchain for the future of sustainable supply chain management in Industry 4.0. *Resources, Conservation and Recycling, 163*, 105064. https://doi.org/10.1016/j.resconrec.2020.105064

Gohil, D., & Thakker, S. V. (2021). Blockchain-integrated technologies for solving supply chain challenges. *Modern Supply Chain Research and Applications, 3*(2), 78–97. https://doi.org/10.1108/MSCRA-10-2020-0028

Gurtu, A., & Johny, J. (2019). Potential of blockchain technology in supply chain management: A literature review. *International Journal of Physical Distribution & Logistics Management, 49*(9), 881–900. https://doi.org/10.1108/IJPDLM-11-2018-0371

Hader, M., Elmhamedi, A., & Abouabdellah, A. (2020, December). Blockchain technology in supply chain management and loyalty programs: Toward blockchain implementation in retail market. In *2020 IEEE 13th International Colloquium of Logistics and Supply Chain Management (LOGISTIQUA)* (pp. 1–6). IEEE. https://doi.org/10.1109/LOGISTIQUA49782.2020.9353879

Hirata, E., Lambrou, M., & Watanabe, D. (2021). Blockchain technology in supply chain management: Insights from machine learning algorithms. *Maritime Business Review, 6*(2), 114–128. https://doi.org/10.1108/MABR-07-2020-0043

Javadi, M., Raeisi, Z., & Bohlool, A. (2025). The impact of blockchain technology on supply chain production strategies. *Journal of Business and Management Studies, 7*(4), 103–118. https://doi.org/10.32996/jbms.2025.7.4.5

Khan, S. A., Mubarik, M. S., Kusi-Sarpong, S., Gupta, H., Zaman, S. I., & Mubarik, M. (2022). Blockchain technologies as enablers of supply chain mapping for sustainable supply chains. *Business Strategy and the Environment, 31*(8), 3742–3756. https://doi.org/10.1002/bse.3029

Khanfar, A. A., Iranmanesh, M., Ghobakhloo, M., Senali, M. G., & Fathi, M. (2021). Applications of blockchain technology in sustainable manufacturing and supply chain management: A systematic review. *Sustainability, 13*(14), 7870. https://doi.org/10.3390/su13147870

Kim, J. S., & Shin, N. (2019). The impact of blockchain technology application on supply chain partnership and performance. *Sustainability, 11*(21), 6181. https://doi.org/10.3390/su11216181

Labaran, M. J., & Hamma-Adama, M. (2021). The Nigerian pharmaceutical supply chain: Blockchain adoption, counterfeit drugs and successful deployment of COVID-19 vaccine in Nigeria. *Journal of Scientific Research and Reports, 27*(2), 20–36.

Lohmer, J., Ribeiro da Silva, E., & Lasch, R. (2022). Blockchain technology in operations & supply chain management: A content analysis. *Sustainability, 14*(10), 6192. https://doi.org/10.3390/su14106192

Manzoor, R., Sahay, B. S., & Singh, S. K. (2025). Blockchain technology in supply chain management: An organizational theoretic overview and research agenda. *Annals of Operations Research, 348*(3), 1307–1354. https://doi.org/10.1007/s10479-022-05069-5

Meidute-Kavaliauskiene, I., Yıldız, B., Çiğdem, Ş., & Činčikaitė, R. (2021). An integrated impact of blockchain on supply chain applications. *Logistics, 5*(2), 33. https://doi.org/10.3390/logistics5020033

Mubarik, M., Raja Mohd Rasi, R. Z., Mubarak, M. F., & Ashraf, R. (2021). Impact of blockchain technology on green supply chain practices: Evidence from emerging economy. *Management of Environmental Quality: An International Journal, 32*(5), 1023–1039. https://doi.org/10.1108/MEQ-11-2020-0277

Musa, A., & Musa, A. I. (2025). Blockchain implementation in supply chains: Adoption barriers and transparency outcomes in Ogun State, Nigeria. *Journal of Applied Research in Technology & Engineering, 6*(2). https://doi.org/10.4995/jarte.2025.23760

Ndaeyo, E. A., Atakpa, O. E., Akpan, E. D., & Paul, K. U. (2025). Tertiary education trust fund (TETFUND) and manpower development in Akwa Ibom State University, Nigeria (2012-2024). *International Journal of Innovative Research in Social Sciences and Strategic Management Techniques, 11*(1), 240-260.

Okanlawon, T. T., Oyewobi, L. O., & Jimoh, R. A. (2023). Evaluation of the drivers to the implementation of blockchain technology in the construction supply chain management in Nigeria. *Journal of Financial Management of Property and Construction, 28*(3), 459–476. https://doi.org/10.1108/JFMPC-11-2022-0058

Okanlawon, T. T., Oyewobi, L. O., & Jimoh, R. A. (2024). Assessment of barriers to the implementation of blockchain technology in construction supply chain management in Nigeria. *Frontiers in Engineering and Built Environment, 4*(1), 59–73. https://doi.org/10.1108/FEBE-04-2023-0017

Okanlawon, T. T., Oyewobi, L. O., & Jimoh, R. A. (2025). Effect of blockchain technology adoption on construction supply chain: A structural equation modelling (SEM) approach. *Journal of Facilities Management, 23*(3), 407–428. https://doi.org/10.1108/JFM-07-2023-0077

Onukwulu, E. C., Agho, M. O., & Eyo-Udo, N. L. (2023). Decentralized energy supply chain networks using blockchain and IoT. *International Journal of Scholarly Research in Multidisciplinary Studies, 2*(2), 66–85. https://doi.org/10.56781/ijsrms.2023.2.2.0055

Park, A., & Li, H. (2021). The effect of blockchain technology on supply chain sustainability performances. *Sustainability, 13*(4), 1726. https://doi.org/10.3390/su13041726

Philsoophian, M., Akhavan, P., & Namvar, M. (2022). The mediating role of blockchain technology in improvement of knowledge sharing for supply chain management. *Management Decision, 60*(3), 784–805. https://doi.org/10.1108/MD-08-2020-1122

Qian, X., & Papadonikolaki, E. (2021). Shifting trust in construction supply chains through blockchain technology. *Engineering, Construction and Architectural Management, 28*(2), 584–602. https://doi.org/10.1108/ECAM-12-2019-0676

Queiroz, M. M., Telles, R., & Bonilla, S. H. (2020). Blockchain and supply chain management integration: A systematic review of the literature. *Supply Chain Management: An International Journal, 25*(2), 241–254. https://doi.org/10.1108/SCM-03-2018-0143

Raj, R., Singh, A., Kumar, V., & Verma, P. (2024). Challenges in adopting blockchain technology in supply chain management: A too far fetched idea? *International Journal of Quality & Reliability Management, 41*(8), 2146–2180. https://doi.org/10.1108/IJQRM-12-2022-0366

Rejeb, A., Keogh, J. G., & Treiblmaier, H. (2019). Leveraging the internet of things and blockchain technology in supply chain management. *Future Internet, 11*(7), 161. https://doi.org/10.3390/fi11070161

Rejeb, A., Keogh, J. G., Simske, S. J., Stafford, T., & Treiblmaier, H. (2021). Potentials of blockchain technologies for supply chain collaboration: A conceptual framework. *The International Journal of Logistics Management, 32*(3), 973–994. https://doi.org/10.1108/IJLM-02-2020-0098

Saberi, S., Kouhizadeh, M., Sarkis, J., & Shen, L. (2019). Blockchain technology and its relationships to sustainable supply chain management. *International Journal of Production Research, 57*(7), 2117–2135. https://doi.org/10.1080/00207543.2018.1533261

Sheel, A., & Nath, V. (2019). Effect of blockchain technology adoption on supply chain adaptability, agility, alignment and performance. *Management Research Review, 42*(12), 1353–1374. https://doi.org/10.1108/MRR-12-2018-0490

Tokkozhina, U., Lucia Martins, A., & Ferreira, J. C. (2023). Uncovering dimensions of the impact of blockchain technology in supply chain management. *Operations Management Research, 16*(1), 99–125. https://doi.org/10.1007/s12063-022-00273-9

Tönnissen, S., & Teuteberg, F. (2020). Analysing the impact of blockchain-technology for operations and supply chain management: An explanatory model drawn from multiple case studies. *International Journal of Information Management, 52*, 101953. https://doi.org/10.1016/j.ijinfomgt.2019.05.009

Uford, I. C. (2026). Competitive Marketing Tools and Customer Patronage of Fintech Companies in Uyo Metropolis, Nigeria: Optimizing AI Opportunities. *British Journal of Marketing Studies, 14*(1), 17-27.

Wamba, S. F., & Queiroz, M. M. (2020). Blockchain in the operations and supply chain management: Benefits, challenges and future research opportunities. *International Journal of Information Management, 52*, 102064. https://doi.org/10.1016/j.ijinfomgt.2019.102064

Wang, Y., Han, J. H., & Beynon-Davies, P. (2019). Understanding blockchain technology for future supply chains: A systematic literature review and research agenda. *Supply Chain Management: An International Journal, 24*(1), 62–84. https://doi.org/10.1108/SCM-03-2018-0148

Xia, J., Li, H., & He, Z. (2023). The effect of blockchain technology on supply chain collaboration: A case study of Lenovo. *Systems, 11*(6), 299. https://doi.org/10.3390/systems11060299

Xu, P., Lee, J., Barth, J. R., & Richey, R. G. (2021). Blockchain as supply chain technology: Considering transparency and security. *International Journal of Physical Distribution & Logistics Management, 51*(3), 305–324. https://doi.org/10.1108/IJPDLM-08-2019-0234

Yousefi, S., & Tosarkani, B. M. (2022). An analytical approach for evaluating the impact of blockchain technology on sustainable supply chain performance. *International Journal of Production Economics, 246*, 108429. https://doi.org/10.1016/j.ijpe.2022.108429

Zelbst, P. J., Green, K. W., Sower, V. E., & Bond, P. L. (2020). The impact of RFID, IIoT, and blockchain technologies on supply chain transparency. *Journal of Manufacturing Technology Management, 31*(3), 441–457. https://doi.org/10.1108/JMTM-03-2019-0118