

Smart Contract in the Metaverse: A Comparative Legal Analysis of Nigeria and Uganda in the Age of Digital Transaction

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Abstract

The emergence of the Metaverse as a decentralized digital ecosystem has transformed traditional contract enforcement by introducing smart contracts, self-executing agreements embedded in blockchain systems. This study conducts a comparative legal analysis of the regulatory frameworks governing smart contracts within Metaverse operations in Nigeria and Uganda. Employing a doctrinal legal method, the research critically examines primary legal sources such as statutory laws and case law, alongside scholarly literature, to assess legal recognition, enforceability, and institutional preparedness. The study reveals a significant regulatory gap in Nigeria, where the absence of a comprehensive legal framework creates uncertainty in the enforceability of smart contracts, despite growing blockchain policy initiatives. In contrast, Uganda has established more definitive legal provisions, particularly through its Electronic Transactions and Signature Acts, which explicitly validate digital contracts. The novelty of this study lies in its regional comparative focus on emerging economies and its analysis of how traditional contract principles interact with decentralized digital platforms. The urgency of this inquiry is underscored by the rapid digitalization of commerce, which necessitates timely legal adaptation to prevent regulatory obsolescence and safeguard stakeholders. This research contributes to the discourse on digital governance by proposing a legal reform agenda for Nigeria, advocating for the adoption of a smart contract-enabling framework modeled after Uganda's approach. Ultimately, it calls for regional and international harmonization to ensure legal certainty, consumer protection, and dispute resolution within Metaverse-driven economies.

1. Introduction

Innovation and technological advancement have emerged as revolutionary tools with a lot of potential in every sphere of commercial transactions.¹ This new development has been pushed forth through the fast-evolving, ground-breaking innovative concepts of smart contracts and blockchain globally.² The impact of this world-breaking technology has brought a lot of hope and satisfactions to the masses. This is because smart contracts have been seen as viable tools useful for the dynamic nature of commercial transactions with maximum utility.³ The concept of smart contracts is believed to reduce the challenges attributed to the traditional contract, such as territorial and geographical limitation of execution of contracts; time constraint and delays in execution of a contract.⁴ With the introduction of the smart contract, one can opine that the challenges noticed under the traditional contracts would be prevented.

Furthermore, it suffices to state that technology has made contracts to be digitalized with automatic execution of the terms of the agreement through the concept regarded as smart contract.⁵ The automatic execution sets with the help of contract codes, the conditions to be met by the parties, without the involvement of any intermediaries to enforce the agreement.⁶ Smart Contract is a digital contract entered into by parties who contract on contingencies that are arrived at through a decentralized consensus and is set to self-execute on the performance of those contingencies.⁷ The concept of smart contracts has been widely recognize due to the potentials and innovative ideas it comes with in terms of business transactions and contractual dealings.⁸ As a result, several countries have put some laws in place to regulate smart contracts for usage, protection of parties' rights, and chance for further improvement, such as Uganda. Uganda though also a developing country, has scale through the challenges concerning legal validity and enforcement of smart

¹ Tega Edema, *Contract Law in an Era of Technology: Examining Liability in Smart Contract Transactions*, *ABUAD Law Journal* 8, no. 1 (2020): 74–93.

² Aidonojie Paul Atagamen, Wakili Saminu Abacha, and Ayuba David, "Effectiveness of the Administration of Justice in Nigeria under the Development of Digital Technologies," *Journal of Digital Technologies and Law* 1, no. 4 (2023): 1105–1131, <https://doi.org/10.21202/jdtl.2023.48>

³ Grace Osariemen Eghe-Ikhurhe, "The Relevance of Blockchain-Based Voting Adoption in Governance Structure: Evidence from Nigeria," *International Journal of Economics, Commerce and Management* 11, no. 2 (2023): 1–21

⁴ Aidonojie Paul Atagamen, Eregbuonye Obieshi, Inagbor Micheal, and Ogbemudia Ottah, "Legal and Socioeconomic Issues Concerning the Nigeria Higher Institution Loan Act 2023," *Jurnal Legalitas* 17, no. 1 (2024): 1–23, <https://doi.org/10.33756/jelta.v17i1.23143>

⁵ Aidonojie Paul Atagamen, "Challenges Concerning the Legal Framework of an Automated Personal Income Tax in Edo State, Nigeria," *Jurnal Hukum Replik* 12, no. 1 (2024): 83–115, <http://dx.doi.org/10.31000/jhr.v12i1.7717>

⁶ Aidonojie Paul Atagamen, Adebayo K. Adesoji, Eregbuonye Obieshi, and Wakili Saminu Abacha, "Breaking Legal and Socio-economic Challenges to Plastic Waste Regulation in Nigeria: Lessons Learned from Singapore," *Yustisia* 13, no. 1 (2024): 64–88, <https://doi.org/10.25041/aelr.v5i1.3230>

⁷ Shen Su et al., "Detecting Smart Contract Project Anomalies in Metaverse," in *Proceedings of the 2023 IEEE International Conference on Metaverse Computing, Networking and Applications (MetaCom)* (2023): 524–532.

⁸ Muhammad Adnan, "Smart Grid 3.0: Navigating the Future—Unleashing the Power of Metaverse, Blockchain, and Digital Twins in the Evolution of Smart Grids," *Blockchain, and Digital Twins in the Evolution of Smart Grids*, January 20, 2024; André Janssen, "Contract Law in the Metaverse," in *Research Handbook on the Metaverse and Law*, (2024): 279–291.

contracts.⁹ This is concerning the fact that Uganda has several laws concerning the regulation and enforcement of smart contracts of agreement. However, Nigeria is still at its nascent stage in understanding the nature of smart contracts compared to other developed nations.¹⁰ Thus, at present, there is no direct legal framework or legislation on the operation of smart contract in Nigeria. Hence reference are being made to other laws such as: Nigerian Startup Act,¹¹ Nigerian Data Protection Act,¹² Cybercrimes (Prohibition, Prevention, etc) Act,¹³ Money Laundering (Prohibition) Act,¹⁴ and so on when smart contracts related issues are being discussed in Nigeria,

The metaverse trending digital technological advancement mechanisms in terms of commercial transaction with a unique attribute such as virtual reality that operate side by side of the real or physical world. The concept of metaverse was first used in the scientific fiction novel entitled "Snow Crash" by Neal Stephenson in 1992, where he presents a 3D virtual reality realm that tends to show that people could exist in other unique realm in virtual form.¹⁵ However, in present day, the concept of metaverse has gained more attention and recognition globally giving it uniqueness and its relevance in virtually all sectors.¹⁶ This is concerning the fact that a majority of the activities that is capable of happening in the real or physical world could also occur in the digital metaverse. In this regard, it suffices to state that the metaverse concept is a virtual reality space is another digital advancement where a smart contract could occur.¹⁷ An individual could engage a transaction smart contract of agreement. Goods could be bought, sold and digital assets negotiated in virtual reality space. The metaverse concept provides immersive opportunity to the commercial sector allowing individual to transact business and negotiate contract of agreement, thereby encouraging international and local trade without having physical contact or distance serving as a barrier.¹⁸ Despite the gradual recognition of the potential and operation of the concept metaverse in Nigeria, there is no specific legislation that provides for its adoption, usage, execution and its enforcement under the Nigerian legal system as it. Although, in the year 2023, a policy was signed by the Federal government of Nigeria to regulate the usage of Block chain. These policies nevertheless are merely regulatory in nature without

⁹ Aidonojie Paul Atagamen, Majekodunmi T. Afolabi, and O. Janet Adeyemi-Balogun, "The Legal Issues Concerning the Operation of Fin-Tech in Nigeria," *Jurnal Media Hukum* 30, no. 2 (2023): 78–79.

¹⁰ Angela Maria Vargas Ariza, Marleny Corzo Marín, and Mayeth Lizeth Duran Duran, "The Metaverse: Financial Assurance Procedures in Smart Contracts and NFTs," *International Journal of Religion* 5, no. 11 (2024): 223–232.

¹¹ *Nigerian Startup Act*, 2022.

¹² *The Nigeria Data Protection Act (NDPA)*, 2023

¹³ *Cybercrimes (Prohibition, Prevention, etc) Act*, 2015

¹⁴ *The Money Laundering (Prohibition) Act*, 2022

¹⁵ Renaka Agusta, "Marketplace NFT untuk Metaverse Berbasis Smart Contract Blockchain Ethereum" (Master's thesis, Institut Teknologi Sepuluh Nopember, 2023).

¹⁶ Francesco Cannas and Rossella Spada, "The VAT Treatment of Crypto Art: Between NFTs, Smart Contracts and the Metaverse: How a Bundle of New Concepts Can Fit into the Existing Categories," *Intertax* 52, no. 1 (2024).

¹⁷ Longbing Cao, "Decentralized AI: Edge Intelligence and Smart Blockchain, Metaverse, Web3, and DeSci," *IEEE Intelligent Systems* 37, no. 3 (2022): 6–19.

¹⁸ Ahmad Tarmizan Kusuma and Suhono Harso Supangkat, "Metaverse Fundamental Technologies for Smart City: A Literature Review," in *Proceedings of the 2022 International Conference on ICT for Smart Society (ICISS)* (2022): 1–7.

having the force of law.¹⁹ This has generated a lot of challenges in terms of its legal validity recognition and enforcement in Nigeria due to absence of legislation on smart contract in the metaverse operation in Nigeria.

In view of this, this study aimed at examining the legal validity and enforcement of smart contracts in the operation of metaverse in Nigeria and Uganda, the benefits and challenges of smart contracts, the policies made by the Nigerian government and the lessons that can be drawn from Uganda to improve smart contracts in metaverse operation in Nigeria.

2. Method

Concerning the fact that the study focuses on the legal validity and enforcement of smart contract in metaverse operation in Nigeria, with a view of learning from the Uganda jurisdiction. The study in this regard, adopt a doctrinal method in examining primary legal sources of materials, such as statutory laws, judicial decisions, and international legal framework in Nigeria and Uganda. Secondary sources include scholarly academic journal articles and legal commentaries, are analysed using a comparative legal approach. Concerning this, a descriptive and analytical method of approach was adopted in analyzing the data obtained from the primary and secondary sources.

The essence of adopting the doctrinal method of study aims to critically examine the laws and scholarly literature concerning smart contract operation in the metaverse operation and Nigeria. This is considered best and cogent because the effectiveness and enforcement of the smart contract is determined by the operation of laws that provide for its regulation and validity.

3. Analysis or Discussion

3.1. Development of the Concept of Metaverse

The origins of the metaverse can be traced to Sir Charles Wheatstone, a renowned scientist in the 19th century, who in 1838 proposed the concept of "binocular vision," wherein two images are combined, one for each eye, to form a singular 3D image.²⁰ However, it was Neal Stephenson who coined the term "metaverse" in his science fiction novel "Snow Crash" in 1992. The metaverse refers to a collective virtual shared space that is typically created through the convergence of enhanced physical reality and persistent virtual reality.²¹ This concept has

¹⁹ National Blockchain Policy For Nigeria, 2023

²⁰ Aidonogie Paul Atagamen, Eregbuonye O., Majekodunmi T. Afolabi, and Inagbor Micheal, "The Prospect and Legal Issues of Income Tax in the Nigerian Metaverse," *Trunojoyo Law Review (TLR)* 6, no. 1 (2024): 17-50, <https://doi.org/10.21107/tlr.v6i1.23874>.

²¹ Aidonogie Paul Atagamen, Adesoji K. Adesoji, Eregbuonye Obieshi, Antai Godswill, Owoche Ogbemudia Ottah, and Muhammad Mutawalli, "The Prospect, Legal, and Socio-economic Implication of Metaverse Operation in Nigeria," *YURISDIKSI* 19, no. 4 (2024): 455, <https://doi.org/10.55173/yurisdiksi.v19i4.201>.

evolved over time and now encompasses a wide range of virtual experiences, social interactions, and economic activities, with significant milestones in its historical development that have paved the way for a more advanced cutting-edge technology called Web 3.0, with a stronger emphasis on the deployment of decentralized applications, use of blockchain technologies, machine learning, and artificial intelligence.²² The metaverse as conceived is a vast interconnected virtual universe, where individuals can engage in immersive digital environments for their living, working, and recreational activities.²³ The metaverse has continued to captivate the attention of everyone interested in the relationship between technology and business and their role in the future. Although the idea of the metaverse emerged from science fiction, it has through the years become more realistic and further shows the possibility of a correlation between technology, culture, and economic ideas and activities.²⁴

The significance of the metaverse lies in its transformative impact. It has unceasingly striven to erase any limitations between the physical and digital worlds. Its continuous development has shown profound implications in the fields of science, technology, and commerce, particularly as they relate to the economy, law, and society as a whole.²⁵ It is predicted that the metaverse will alter present modes of engaging and performing several activities in no distant time considering the trend of technological innovation, cultural imagination, and economic progression which its development relentlessly pursues.²⁶ There is a consensus that the metaverse developed out of various ideas and factors arising from a combination of science, commerce, technology, social action, and gaming, to mention but a few.²⁷ Its emergence was a response to the need for enhanced human interaction and several factors have been identified as the catalysts for the development of this groundbreaking concept.

First among these factors is the role of technological innovation. Rapid advancements in computing technologies, high-speed internet connectivity, and immersive display devices have paved the way for the creation of increasingly realistic and interactive virtual environments. These technological innovations paved the way for the metaverse by enabling the development of immersive digital experiences that bridge the lines between physical and virtual realities thereby fulfilling the pursuit of immersive experiences and virtual connectivity for

²² Aidonojie Paul Atagamen and Odojor Oyemwen, "Impact and Relevance of Modern Technological Legal Education Facilities Amidst the Covid-19 Pandemic: A Case Study of Law Students of Edo University Iyamho," *KIU Journal of Humanities* 5, no. 4 (2020): 7–17; Ikubanni O. Oluwaseye and Aidonojie Paul Atagamen, "The Legality of Virtual Marriage in Nigeria Given the Covid-19 Pandemic Social Distancing: An X-Ray of the Matrimonial Causes Act," *Madonna University, Nigeria Faculty of Law, Law Journal* 6, no. 1 (2021): 123–129.

²³ Ibid

²⁴ Ibid

²⁵ Ibid

²⁶ Aidonojie Paul Atagamen, Majekodunmi Toyin Afolabi, Eregbuonye Obieshi, and Adeyemi-Balogun Omolola Janet, "Potential and Legal Challenges of Metaverse for Environmental Awareness and Sustainable Practice in Nigeria: A Comparative Study with Singapore," *Administrative and Environmental Law Review* 5, no. 1 (2024): 37–64, <https://doi.org/10.25041/aclr.v5i1.3230>.

²⁷ Aidonojie Paul Atagamen, Nwazi Joseph, and Ugiomo Eruteya, "Illegality of Income Tax Evasion in Edo State: Adopting an Automated Income Tax System as a Panacea," *Jurnal Legalitas* 16, no. 1 (2023): 56–86.

humans.²⁸ The digital universe created therefrom offers an unprecedented virtual environment where individuals can live, work, and play thereby recreating themselves. As such, the attraction to engage in a virtual world in diverse activities hitherto un contemplated serves as an impetus for the development and progress of the metaverse.

The Metaverse has transformed the digital contract area, thereby introducing highly complex, decentralized, and automated transactional settings.²⁹ The traditional contract formation that prevails in countries such as Nigeria and Uganda are waiting to address the digital and smart contract contents supporting the Metaverse that has evolved into the blockchain and is based on smart contracts.³⁰ The smart contracts are expected to relieve the trust on intermediaries while, ironically, raising the efficiency limits. However, legal lacunae and lack of any comprehensive legislation on smart contracts applied to virtual life exist in both Nigeria and Uganda.³¹ Issues on the enforceability of smart contracts in the jurisdiction of such matters can be highlighted where there are still challenges to the practice, jurisdictional issues are still rife in the multimodal Metaverse context, thereby prompting a dramatic reconsideration of the legal paradigm in this respect. Comparing Nigeria with Uganda, it is clear that they have divergent paths toward regulating digital contracts within the Metaverse.³² Nigeria is now at the forefront of policy development in areas of blockchain, resulting in recognition of the digital assets by several regulatory authorities, for instance, its Securities and Exchange Commission (SEC), but smart contracts are not in any way covered by clear guidelines.³³ Whereas, Uganda is properly placed in respect to the blockchain, hence based on little to no provisions of the law on blockchain-based contracts.

Both situations feature common problems starting from a lack of legal precedence as regards the Metaverse, to data privacy, to the rights of consumers in Metaverse transactions.³⁴ Since the digital world is borderless, there must exist synergy in national laws with best practices that have gone international, towards legal assuredness for the participants of Metaverse-led transactions.³⁵ The onslaught of architecture known as the Metaverse indicates a necessary window of

²⁸ Aidonojie Paul Atagamen, Ikubanni O. Oluwaseye, and Okoughae Nosa, "The Prospect, Challenges and Legal Issues of Digital Banking in Nigeria," *Cogito Multidisciplinary Journal* 14, no. 2 (2022): 186–209.

²⁹ C. Kuppaswamy et al., *A Blockchain for Nigeria – Exploring Blockchain Policy and Adoption in Nigeria* (Hatfield: University of Hertfordshire, 2023), 1–61.

³⁰ Aidonojie Paul Atagamen, Joseph Nwazi, and Ugiomo Eruteya, "The Legality, Prospect, and Challenges of Adopting Automated Personal Income Tax by States in Nigeria: A Facile Study of Edo State," *Cogito Multidisciplinary Journal* 14, no. 2 (2022): 149–170.

³¹ Wieland Müller et al., "Metaverse, Ubi Es? A Transaction Cost-Based Analysis of the State of the Art of Smart Contracts in the Metaverse," in *Proceedings of the 57th Hawaii International Conference on System Sciences (HICSS)* (2024): 5038–5047.

³² Ibid

³³ Ibid

³⁴ Azza Mohamed and Rouhi Faisal, "Exploring Metaverse-Enabled Innovation in Banking: Leveraging NFTs, Blockchain, and Smart Contracts for Transformative Business Opportunities," *International Journal of Data & Network Science* 8, no. 1 (2024).

³⁵ Yuchuan Fu et al., "A Survey of Blockchain and Intelligent Networking for the Metaverse," *IEEE Internet of Things Journal* 10, no. 4 (2022): 3587–3610.

opportunity in Nigeria and Uganda to put into place smart contract-friendly legal frameworks. Upon the said aspect, those who are or stand to become decision-makers have to raise their voice to bring forth matters concerning legal recognition of all automated agreements, ways to solve conflicts within the decentralized platforms, and regulatory means that prevent fraud and exploitation.³⁶ The proposed approach shall need cooperation of stakeholders including governments, industry insiders, and legal professionals to frame laws that are balanced with the spirit of innovation and at the same time legal responsibilities.³⁷ The judiciary should follow the same lawmaking process that many developed jurisdictions have already tested, proclaimed safe for the Metaverse transactions.

As it continues to evolve, the metaverse has shown a propensity to reshape man's engagement with digital environments, thereby opening new possibilities for creativity, collaboration, and innovation in the digital era. For instance, the emergence of the innovative blockchain and decentralized finance technology, which has proven to be a watershed for the development of the decentralized metaverse concept with its introduction of smart contracts, is a cutting-edge innovation with the potential of transforming commerce in the 21st century. Despite the advantages derivable from the metaverse, there are fundamental challenges that have been identified in its development and operation.³⁸ These relate to legal and ethical issues of regulation, intellectual property rights, and data privacy, to mention a few. Notwithstanding, the assessments for now are in favor of the metaverse. There is however a consensus that its evolution requires constant examination to avoid pitfalls that could deny mankind the unprecedented opportunities it represents.

3.2. Common Law Contract Principles Application in Metaverse Smart Contract

The advent of smart contracts in the Metaverse raises the question as to whether traditional principles of contract law are really applicable to this type of application. Contract law is concerned with the elements of offer, acceptance, consideration, and the intention to create legal relations in determining an agreement's enforceability.³⁹ Smart contracts that operate on blockchain technology automate such contract execution through self-executing code, which does not need an intermediary.⁴⁰ This certainly increases efficiency but also provokes legal issues over the applicability of traditional contractual principles.⁴¹ The Metaverse, being decentralized in nature, complicates matters of enforcement, jurisdiction, and dispute resolution, requiring some serious consideration as to how

³⁶ Ibid

³⁷ Ibid

³⁸ T. Afolabi Majekodunmi, Oluwaseun Janet, Aidonojie Paul Atagamen, O. Oluwaseye Ikubanni, and Oyeade A. Adeniyi, "Legal Issues in Combating the Scourge of Terrorism; Its Impact on International Trade and Investment: Nigeria as a Case Study," *KIU Journal of Humanities* 7, no. 3 (2022): 129-139.

³⁹ Jihyeon Oh et al., "A Secure Content Trading for Cross-Platform in the Metaverse with Blockchain and Searchable Encryption," *IEEE Access* 11 (2023): 120680-120693.

⁴⁰ Sam Gilbert, "Crypto, Web3, and the Metaverse," *Bennett Institute for Public Policy, Cambridge*, Policy Brief, 2022.

⁴¹ Kaya Kuru and Kaan Kuru, "UMetaBE-DPPML: Urban Metaverse & Blockchain-Enabled Decentralised Privacy-Preserving Machine Learning Verification and Authentication with Metaverse Immersive Devices," *Internet of Things and Cyber-Physical Systems* 5, no. 1 (2025).

traditional principles of contract law intermingle with smart contracts.⁴² According to common law, a valid contract comes into existence when two parties make a valid offer and acceptance, thereby indicating their mutual consent. In the case of smart contracts, offer and acceptance are frequently invoked through the means of digital signatures, cryptographic keys, and automated protocols. Courts generally recognize agreements electronically signed as valid contracts by the Electronic Communications Act and/or UNCITRAL.⁴³

The tricky part really lies in determining at what point the explicit consent requirement is satisfied through execution of the contract. Given that smart contracts operate on certain defined conditions, one might say, sending of cryptocurrency or triggering a transaction could constitute acceptance of the contract. Nevertheless, issues may arise when users claim they did not understand the meaning of contract terms due to technical reasons; this would trigger possible litigation concerning the assessment of the contract in common law jurisdictions.⁴⁴

Consideration an element vital for the formation of contracts—means that both the parties must furnish something of value. The existence of consideration in an ordinary sense contract includes money, services, or goods.⁴⁵ In case of smart contracts, consideration often relates to digital assets, tokens, or cryptocurrencies, which are automatically executed over the blockchain network. The major issue remains whether fulfilling an obligation through a code established on blockchain will be treated as valid consideration under contract law.⁴⁶ Such an exchange typically happens in smart contracts, including the release of funds fulfilled upon meeting specified conditions. Courts may find this sufficient consideration by recognizing a blockchain-based execution requirement. Concerns arise, however, for scenarios where smart contracts interact with real-world obligations, such as property transfers, which are unlikely to be recognized by existing legal frameworks unless validated by explicit statutes or regulatory mechanisms. For a contract to be enforced, an intention of the parties to create legal relations has to be established. This intention has traditionally been established through the context of the agreement- commercial or social.⁴⁷

However, such deeds being used in decentralized finance (DeFi) or virtual property transactions in the Metaverse may have different implications on intent. Although some argue that smart contracts by virtue of automatic execution imply legal enforcement, others indicate that participation in blockchain transactions may not qualify as legal enforceability, especially in programming errors or unforeseen

⁴² Hung Duy Le, Vu Tuan Truong, and Long Bao Le, "Blockchain-Empowered Metaverse: Decentralized Crowdsourcing and Marketplace for Trading Machine Learning Data and Models," *IEEE Access* (2024).

⁴³ Mohtasin Golam et al., "Meta-Learning: A Digital Learning Management Framework Using Blockchain for Metaverses," *IEEE Access* (2024).

⁴⁴ Yongjun Ren et al., "HCNCT: A Cross-Chain Interaction Scheme for the Blockchain-Based Metaverse," *ACM Transactions on Multimedia Computing, Communications and Applications* 20, no. 7 (2024): 1–23.

⁴⁵ Ibid

⁴⁶ Ibid

⁴⁷ Keke Gai et al., "Blockchain-Based Multisignature Lock for UAC in Metaverse," *IEEE Transactions on Computational Social Systems* 10, no. 5 (2022): 2201–2213.

events. Courts may consider related documents like terms of service or off-chain agreements to determine parties' intent, thus entrenching smart contract obligations in a broader contractual framework.⁴⁸

To obligate and enforce a contract, it has to be evident that the parties intended to create legal relationships. Traditionally, courts establish this evidence based on the surrounding context of the agreement-whether commercial or social.⁴⁹ While smart contracts may do this in the context of decentralized finance (DeFi) or virtual property transactions in the Metaverse, some ambiguity may arise concerning the implication of intent. For instance, it is argued that intelligent contracts imply a legal binding commitment just by their automated execution; however, transaction in blockchain does not really have to imply legal enforceability, especially where programming errors or accidents occur.⁵⁰ To ascertain the parties' intent, therefore, courts may also look into the accompanying documents, like terms of service or off-chain agreements; in this case, smart contract obligations would then be nurtured within a more general contractual framework. Though smart contracts seem to promise so much in terms of fast-tracking transactions in the Metaverse, a variety of enforcement challenges exist.⁵¹

First, jurisdictional issues arise because blockchain networks are decentralized, allowing parties to find themselves in different legal jurisdictions with respect to the smart contracts by which they have jointly bound themselves. Second, another potential enforcement issue stems from the very nature of smart contracts: the immutable manner in which executed code is treated as being irreversible appears to present a legitimate question as to whether ordinary remedies such as rescission and specific performance can really be brought to bear upon a smart contract's execution.⁵² Courts will likely find that, when confronted with issues of fraud, misrepresentation, or duress, an equitable approach to modify or void the intended purpose of a smart contract can be impossible. Therefore, in order to guarantee that smart contract enforcement adheres to contract law principles, legal systems would have to adapt and integrate new forms of dispute resolution, including arbitrations building upon blockchain resources, or hybrid regulatory systems.⁵³

In many regards, smart contracts in the Metaverse conform to traditional contract law principles; however, this necessitates some reinterpretation of older legal doctrines due to their digital execution.⁵⁴ While offer and acceptance may be expressed via automated means, concerns over informed consent arise. Blockchain execution generally satisfies consideration, but its acceptance or recognition within

⁴⁸ Yuntao Wang, Zhou Su, and Miao Yan, "Social Metaverse: Challenges and Solutions," *IEEE Internet of Things Magazine* 6, no. 3 (2023): 144–150.

⁴⁹ Abir El Azzaoui and JaeSoo Kim, "QNFT: A Post-Quantum Non-Fungible Tokens for Secure Metaverse Environment," *Journal of Information Processing Systems* 20, no. 2 (2024): 273–283.

⁵⁰ Winston Ma and Ken Huang, *Blockchain and Web3: Building the Cryptocurrency, Privacy, and Security Foundations of the Metaverse* (Hoboken, NJ: John Wiley & Sons, 2022).

⁵¹ Ibid

⁵² Ibid

⁵³ Ibid

⁵⁴ Ouns Bouachir et al., "AI-Based Blockchain for the Metaverse: Approaches and Challenges," in *Proceedings of the 2022 Fourth International Conference on Blockchain Computing and Applications (BCCA)* (2022): 231–236.

legal dispute resolution remains a developing area of law.⁵⁵ Courts may look at surrounding circumstances when deducing the intention of the parties to create legal relations, yet the decentralized and self-enforcing nature of smart contracts makes it difficult to enforce these contracts.⁵⁶ As the Metaverse develops, the legal framework also needs to respond to the challenges affronted by smart contracts, taking in regulatory monitoring, technological safeguards, and alternative dispute resolution mechanisms to achieve contractual equity and legal certitude.

3.3. Smart Contract in the Metaverse Operation in Nigeria and Uganda

A smart contract, as an automated computer program that efficiently executes the terms of a contract without the involvement of third parties, presents a novel approach to business relationships and interactions for countries like Uganda and Nigeria, where technology penetration, unfamiliarity with the concept, and the transnational transactional nature of the metaverse are significant.⁵⁷ Due to the potential exchange of money, delivery of services, unlocking of content protected by digital rights, or other forms of data deployment, the acceptability and establishment of legal frameworks that can guide its recognition have been slow to develop or is nonexistent. It is important to note that, despite the nomenclature and buzz around it, smart contracts are not legally binding contracts. Their primary function is to execute business programs that perform various tasks, processes, or transactions inputted in them to respond to a given set of conditions. In other words, legal steps must be taken to connect this execution to legally binding agreements between parties.

However, exponents of smart contracts argue that, due to their openness, transparency, and rigidity, the legal system plays little or no role in enforcing such transactions, as there can be no legal disputes over the terms of the agreement.⁵⁸ This is understandable as each party to the contract has from the beginning agreed to be bound by the automatic execution of the contract as defined by the governing code, and once the contract is entered into, there is no longer a need to trust the other party or modify the contract.⁵⁹ The emergence of the metaverse and its integration with smart contracts presents a paradigm shift in the digital landscape, creating unique legal and regulatory challenges, especially in the context of Nigeria and Uganda where the concept is still in its infancy.

For example, in Nigeria, the operation of smart contracts in the metaverse within the legal and regulatory framework has fundamental implications for parties⁶⁰. While such contracts are recognized as a decentralized and distributed

⁵⁵ Ibid

⁵⁶ Ibid

⁵⁷ Aidonojie Paul Atagamen, A. Oyemwen Odojor, O. Oluwaseye Ikubanni, A. Adeniyi Oyebade, Adeniyi Oyedeji, and Nosa Okuoghae, "The Challenges and Impact of Technological Advancement to the Legal Profession in Nigeria Given the Covid-19 Pandemic," *KIU Journal of Humanities* 6, no. 4 (2022): 5–19.

⁵⁸ Aidonojie Paul Atagamen, O. Oluwaseye Ikubanni, Nosa Okoughae, and Adeniyi Ayoedeji, "The Challenges and Relevance of Technology in Administration of Justice and Human Security in Nigeria: Amidst the Covid-19 Pandemic," *Cogito Multidisciplinary Journal* 13, no. 3 (2021): 149–170.

⁵⁹ Adaralegbe Babatunde, "E-Business and Matters Arising from Some Commercial Law Perspective," accessed April 24, 2024, <https://www.babalakinandco.com/.../e-business>.

⁶⁰ Aidonojie Paul Atagamen, Odojor A. Oyemwen, and Oladele O. Odetokun, "An Empirical Study of the Relevance and Legal Challenges of an E-Contract of Agreement in Nigeria," *Cogito Multidisciplinary Research Journal* 12, no. 3 (2020): 181.

ledger that records and verifies the authenticity of digital assets,⁶¹ and the Nigerian government acknowledges the potential of blockchain technology to create new transaction channels for the development of the digital economy, the regulatory landscape surrounding blockchain and distributed ledger technology (DLT) is still in the early stages of development.⁶²

Therefore, while the government acknowledges the potential of blockchain technology in revolutionizing commerce, there is a need for a comprehensive and robust regulatory framework to ensure its effective operation. The lack of substantive regulation of smart contract operations in the Metaverse in Nigeria creates considerable legal uncertainty, especially regarding contract enforceability, consumer protection, and fraud prevention.⁶³ In Nigeria, though there is progress in the regulation of digital assets, with institutions like the Securities and Exchange Commission (SEC) issuing guidelines regarding digital currencies and blockchain technology; however, there are no clear provisions in the law for the recognition of smart contracts. This creates uncertainty in their enforceability under Nigerian contract law, which has traditionally placed a requirement for clear elements of offer, acceptance, and common consent. In Uganda, the legal system and practices primarily operating under an establish law that provides for express recognition of smart contracts.

However, the operation and regulation of smart contracts in Uganda can be said to have come a long way.⁶⁴ Because of its interconnection with blockchain technology and cryptocurrency, the Bank of Uganda had as of 2017 issued a press release warning of the use of "One Coin Digital Money" for transactions thereby prompting the need for clarification of the status of cryptocurrency and blockchain technology in Uganda's emerging fin-tech economy. Presently, the regulatory framework for smart contracts in the metaverse technology in Uganda like in Nigeria is not determinable. Though there are laws touching on several aspects of electronic transactions and commerce that may impact smart contract transactions, there is a need for definitiveness to avoid misinterpretations and misapplications of the laws which could have enormous implications for contracting parties.⁶⁵

One of the pertinent case studies highlighting some of the challenges in Uganda is the shutting down of Dunamiscoins, a blockchain-based Ponzi scheme that took advantage of the legal gaps to prey on investors. It offered high returns on cryptocurrency transactions and went down, causing some financial loss to many Ugandans. Such case scenarios demonstrate the possible dangers of an unregulated

⁶¹ Adegite E. Odetukun, *Business Law for Accounting Technicians Scheme West Africa (ATSWA)*, ed. ABWA Publishers (Abuja, Nigeria: 2009); *Cheshire and Fifoot's Law of Contract*, 10th ed. (England: Butterworth & Co. Publishers Ltd., 1981).

⁶² Aidonojie Paul Atagamen, Odojor A. Oyemwen, O. Oluwaseye Ikubanni, A. Adeniyi Oyebade, Adeniyi Oyedeji, and Nosa Okuoghae, "The Challenges and Impact of Technological Advancement to the Legal Profession in Nigeria Given the Covid-19 Pandemic," *KIU Journal of Humanities* 6, no. 4 (2020): 5–19.

⁶³ Ankur Gupta, Surbhi Gupta, and Saurabh Sharma, "A Digital Twin Framework for Smart Contract-Based DeFi Applications in the Metaverse: Towards Interoperability, Service Scaleup & Resilience," *Next Generation Computing and Information Systems* (2024): 88–94.

⁶⁴ Adaolu T. Obafemi, Ayoola T. John, and Akinkoye E. Yemi, "Electronic Payment System in Nigeria: Implementation, Constraints and Solutions," *Journal of Management and Society* 1, no. 2 (2011): 56–62.

⁶⁵ Ibid

space for digital transactions, where, if left ungoverned, smart contracts can easily be used as tools for fraudulent activities. Smart contracts, unlike legal contracts, do not offer express legal remedies in courts; they are executed on the networks of Ethereum, losing their ability to be undone forever. The few alerts put out by the Financial Intelligence Authority of Uganda and the Bank of Uganda on risks tied to digital assets give little consolation; there are still no enforcements of any regulatory regime for smart contracts operating in this Metaverse, exposing both investors and users to the same caliber of dangers. This case confirms how lack of regulation facilitates evil-minded people to exploit gaps in almost every emerging digital economy.

Consequently, it is worth stating that the operation of smart contracts in the metaverse within Nigeria's current legal and regulatory framework necessitates navigating the evolving regulatory environment, adhering to existing laws and regulations, and anticipating the formulation of a more encompassing regulatory framework just like the Uganda system.

3.4. Benefits of Smart Contracts in the Metaverse

Smart contracts are viable in performing commercial transactions and as a result, they come with some benefits part of which are:

- a. It allows for automated execution of agreement;
- b. It reduces ambiguities in interpretations;
- c. It creates decentralization without the need for an intermediary for enforcement such as legal personnel and the court;
- d. It is cost efficiency;
- e. It reduces counterparty risk because once the contract is encoded as agreed it cannot be tampered with by any of the parties;⁶⁶
- f. It reduces reneging risks, a party cannot single-handedly repudiate the contract once the contract is encoded, and when it is time for execution, it can be automatically done;
- g. It promotes transparency between the parties involved;
- h. It allows for a global reach without jurisdictional or geographical limitations.⁶⁷

3.5. Validity and Enforcement of Smart Contract in Metaverse Operation in Nigeria

Though the metaverse concept is gradually creeping into Nigerian terrain, however, Nigeria is yet to come up with laws that will guide the metaverse operations generally. However, there are certain provisions under some Nigerian laws that their interpretations could be applicable and relate to metaverse activities. These laws are briefly examined as follows;

The Nigerian Data Protection Regulation (NDPA) Act was enacted in 2023, to provide for protection and regulation of data information. Section 3 (3) of the

⁶⁶ Funmilola Olatundun Olatoye et al., "Blockchain in Asset Management: An Extensive Review of Opportunities and Challenges," *International Journal of Science and Research* 11 (2024): 2111–2121.

⁶⁷ Andrew Ebekozen, "Smart Contract Applications in the Built Environment: How Prepared Are Nigerian Construction Stakeholders?" *Frontiers of Engineering Management* 11 (2024): 50–61.

NDPA⁶⁸ is the primary law regulating data protection in Nigeria.⁶⁹ The act makes strict guidelines that regulate data of persons resident in Nigeria and Nigerian citizens outside Nigeria. The draft Data Protection Act applies to the Metaverse, the act ensures that users' rights are protected and companies that operate metaverse (digital) platforms and other parties must adhere to various standards before handling personal data belonging to users, this is a requirement provided under section 28 of NDPA⁷⁰ to include identifying and documentary the lawful basis for processing data. The NDPA is a law regulating data generally and smart contracts are data-based deals with facts and figures, it is logical to conclude that metaverse transactions are regulated by NDPA 2023 (Amended).

Similarly, another regulatory law that regulates digital activities is the Cybercrimes Prohibition and Prevention) Act (CPPA) 2015. Section 21(1)⁷¹ of the CPPA, metaverse platforms are required to keep all traffic data and subscribe information as may be directed by the relevant authority for 5 years, this is because metaverse also brings about cybercrimes regarding financial fraud, identity theft, security breaches etc. The Act sets up a regulatory system where the Attorney General may seek assistance from any Agency or authority of a Foreign State for a collaborative investigation to be done to detect, prevent, or respond to the prosecution of any data offense created under the Act. This means any person who operates a computer system or a network whether public or private must as a matter of urgency notify the national computer emergency in case there is an incidence of a data breach.⁷²

Also, the Nigerian Communications Commission Act⁷³ 2003 provides for the monitoring of digital transactions is the Nigeria Communication Commission (NCC) established under the Nigerian Communications Commission Act. Section 31 of the Act provides that anyone who intends to operate a communication system or facility or to provide communications service must have been authorized and licensed by the NCC or have been exempted from such requirements. This section ensures that digital transactions obtain permission first before operating and this includes metaverse contracts once metaverse operations meet the requirement of the law, their operation becomes valid and enforced. Section 147 of NCCA 2003 provides that the Commission may determine that a licensee or class of licensee shall implement the capability to allow authorized interception of communications and such determination may specify the technical requirements for authorized interception capability. Also, section 148(2) of the Act says, If the Commission takes possession of any network facilities, service, or customer equipment under subsection (1) of this section, the person licensed under this Act about the facilities, service or equipment shall be paid reasonable compensation which shall be determined by the Commission after allowing the licensee to be heard on the matter.

⁶⁸ *Cybercrimes (Prohibition and Prevention) Act (CPPA)*, 2015.

⁶⁹ Adejoh V. Adetunde, "Role of E-Commerce in the Economic Development of Nigeria (Konga a Case Study)," *Texila International Journal of Management* 4, no. 1 (2018): 1-5.

⁷⁰ Ibid

⁷¹ Ibid

⁷² Adriyoosu D. Adebayo, *An Examination of the Legal Regulations and Taxation of Telecommunications and Electronic Commerce in Nigeria* (Ph.D. thesis, University of Ilorin, Nigeria, 2012), 1-345.

⁷³ *Nigerian Communications Commission Act*, 2003.

Another legal framework that regulates digital transactions of which smart contracts are one of them is the Nigerian Data Protection Regulation Act.⁷⁴ It is the principal data privacy law in Nigeria, with the main mandate of safeguarding the citizens of Nigeria both at home and in the diaspora⁷⁵ in line with international best practices.⁷⁶ Section 31(5) NDPRA⁷⁷ designates the data freedom and data rights of the subjects as fundamental human rights and seeks to protect these rights through technological and organizational measures. The above law protects the citizens of Nigeria and assures them of protecting their data. This also shows that whatever transaction done by a Nigerian citizen using his data is valid and it is enforceable under Nigerian law.⁷⁸ It is our view that a smart contract falls within the digital transaction which makes it valid and enforceable. The Advertising Regulatory Council of Nigeria Act⁷⁹ establishes the legal framework for advertising and marketing communications in the industry to ensure that citizens of Nigeria are exposed to preapproved content. The regulatory body as established by the act is the Advertising Regulatory Council of Nigeria (ARCON) which is saddled with the responsibility of making policies on all activities involving advertising, advertisements, and marketing communications in the country. In December 2023, the ARCON directed that from January 2023 all advertising,⁸⁰ advertisement, and marketing communications materials meant for the Nigeria market are expected to achieve a minimum of 75% cumulative local content from the above one can deduce that the ARCON Act validates digital transactions of which metaverse contracts fall within the online advertisement and therefore makes it enforceable in the eye of the law.

Furthermore, it must be noted that the National Information Technology Development Agency Act⁸¹ (NITDA), is another relevant legal framework that could be relevant in regulating and providing for contracts in Nigeria. The Act establishes its agency which is under the supervision of the Federal Ministry of Communications and Digital Economy. The Act is the forerunner of the digital economy in the country, this Act has shown through its guidelines, frameworks, and regulations to facilitate this economy. All the legal frameworks and regulations are channeled towards the effective and smooth operation of online business which includes smart contracts in Nigeria that make any transaction within the air space valid and enforceable.⁸² It must also be noted that, because the Nigerian digital economy has finally come to stay, this is a clear fact that companies rendering digital services have registered

⁷⁴ *Nigerian Data Protection Regulation Act*, 2023.

⁷⁵ Ibid

⁷⁶ Aboye P. Cosmos and Rick Ezejiofor, "The Impact of E-Taxation on Revenue Generation in Enugu, Nigeria," *International Journal of Advanced Research* 2, no. 2 (2024): 449–458.

⁷⁷ Ibid

⁷⁸ Rick Duxbury, *Contract Law*, 8th ed. (London: Sweet & Maxwell, 2009); Catherine Elliott and Frances Quinn, *Contract Law*, 8th ed. (England: Pearson Education Limited, 2011); Laurence Koffman and Elizabeth MacDonald, *The Law of Contract*, 7th ed. (New York: Oxford University Press, 2010).

⁷⁹ *Advertising Regulatory Council of Nigeria Act*, 2022.

⁸⁰ Ibid

⁸¹ *National Information Technology Development Agency Act (NITDA)*, 2007.

⁸² Jane P. Mallor et al., *Business Law and the Regulatory Environment*, 11th ed. (Boston: Irwin/McGraw-Hill, 2001); Richard Stone, *Principles of Contract Law*, 3rd ed. (London: Cavendish Publishing Limited, 1997).

their attendance in Nigeria tremendously, for that reason the Financial Act 2021⁸³ provides for taxation of digital service companies in the country. It also provide for the amendment of laws relating to financial and digital activities

Concerning the above, it suffices to state that, the above legal framework did not specifically provide and regulate smart contract activities as in the case of contractual agreement within the digital metaverse. In this regard, there are still challenges in enforcement of smart contracts in Nigeria. Metaverse contracts in Nigeria still require specific legal frameworks for their validity and enforcement to be guaranteed.

3.6. Validity and Enforcement of Smart Contract in Metaverse Operation in Uganda

Uganda is an African country regarded as one of the countries with a well-structured legal system and laws that regulate its territory. This is concerning the fact that several laws including laws that regulate contracts of agreement in documented and digital platforms have been enacted. Some of these laws include the Electronic Transactions Act,⁸⁴ Contract Act,⁸⁵ and Electronic Signature Act.⁸⁶ In this regard, it will be relevant to consider these laws to ascertain the extent they concern the validity and enforcement of smart contracts in the metaverse.

It must be noted that the primary law that regulates a contract of agreement in Uganda is the Contract Act⁸⁷ which was enacted in 2010. In this regard, most of the common law principles concerning the regulation of contracts have been codified in the laws of Uganda regulating contracts of agreement.⁸⁸ Sections 3 to 9 of the Act stipulate that a contract is formed if there is a valid offer, acceptance, and consideration. However, one striking part of the Uganda Contract Act is as stipulated in section 10(2) of the Act which stipulates that a contract is said to be formed if it is written or in oral form. Section 10(5) and (6) of the Act also stipulate that a contract of agreement whose consideration exceeds a currency point of twenty-five and a contract of indemnity must be in writing. However, section 10(3) of the Act seems to relax and lay to rest the issue of electronic contract transactions. This is concerning the fact that section 10(3) of the Act stipulates that a data message in digital or electronic form that relates to a contract of agreement will be deemed to be in writing.

In this regard, it suffices to state that though the Uganda Contract Act is not a primary law regulating digital contract of agreement, however, it also recognizes the fact that when a contract is negotiated in the digital platform it is also regarded as valid.

The Electronic Transaction Act was enacted in 2011, the introductory part of the Act stipulates that, the act is aimed at providing for the use, security, facilitation, and regulation of digital or online transaction and electronic communications.

⁸³ *Financial Act*, 2021.

⁸⁴ *Electronic Transaction Act*, no. 8 of 2011.

⁸⁵ *Contract Act*, 2010.

⁸⁶ *Electronic Signature Act*, no. 7 of 2011.

⁸⁷ *Contract Act*, no. 7 of 2010.

⁸⁸ Adeniyi S. Ismail and Babalola Adesunloro, "Electronic Taxation and Tax Evasion in Nigeria: A Study of Lagos State," *Journal of Academic Research in Economics* 9, no. 1 (2017): 45-59.

However, section 4 of is consider more elaborate on the aim of the Electronic Transaction Act. The said section provide that the object of this Act is to provide a regulatory framework as concern the following.

- a. To facilitate and enhance digital transactions;
- b. To eliminate any form legal encumbrance concerning digital transactions;
- c. To ensure there is neutrality concerning applying the law to digital or electronic transaction
- d. To secure public confidence on the legality of electronic or digital transaction
- e. To ensure that digital transaction in Uganda is in conformity with international standard and best practices
- f. Fostering social and economic prosperity

Furthermore, it suffices to state that, section 14 of the Electronic Transaction Act⁸⁹ laid the foundation of the formal validity and enforcement of digital transactions or smart contracts of agreement within the metaverse. The said section tends to provide that a contract of agreement will not be denied its legal validity, effect, and enforcement on the basis that such contract is wholly or partly contracted or executed within a digital or electronic platform. Section 14(2) of the act⁹⁰ further stipulates that a contract of agreement or transaction through a digital or electronic means is concluded or said to be valid and enforceable if the person making the offer has received an acceptance through an electronic means or digital platform.⁹¹ Furthermore, section 5 of the act further stipulates that information or communication will not be denied legal validity, effect, and enforcement on the basis that part of it or wholly is in the form of a data message. In this regard, section 7 was of the view that Where a law requires and provides that information is required to be presented or retained in its original content, the requirement is said to be fulfilled if such form or content is in the data message. Provided that the integrity, veracity, and reliability of the information at the time when it was first generated in its final form as a data message is guaranteed. Furthermore, the information is capable of being produced or displayed to the individual to whom it is to be presented.

However, there are instances where a party may require the assistance of digital technologies to aid in executing or contracting a transaction through a digital platform. In this regard, section 13(1) of the Act stipulates that, in an automated or digital transaction, a contract may be formed where an electronic agent performs an action required by law to form a contract or a contract may be formed by a party to the transaction using an electronic agent to enter into the contract. In this regard, section 13(2) further stipulates that a party using an electronic agent to enter into a contract shall, be bound by the terms of the contract irrespective of whether the party reviewed the actions of the electronic agent or the terms of the contract. Also, section 8 of the Act, it stipulates that in legal proceedings, the rules of evidence shall

⁸⁹ *Electronic Transaction Act*

⁹⁰ *Ibid*

⁹¹ J. Edem Adoh, "Taxing the Informal Economy in Nigeria: Issues, Challenges and Opportunities," *International Journal of Business and Social Science* 6, no. 10 (2015): 53.

not be applied to deny the admissibility of a data message or an electronic or digital record, on the following grounds:

- a. That it is constituted by a data message or a digital record
- b. If it is the best evidence that the person adducing the evidence could reasonably be expected to obtain
- c. Merely on the ground that it is not in its original form.

Furthermore, it was the provision of section 28 that finally sealed it up by stipulating that no provision or clause in an agreement shall exclude or oust the rights of any party as it concerns transactions in any digital platform. It further provides that the provision of any such clause in any agreement will be regarded as void.

Furthermore, it must be noted that the global environment has advanced to the extent that most smart contracts of agreement or negotiation in digital platforms are often executed or sealed with the electronic signature of the parties. In this regard, in some countries, an electronic signature is yet to be legally recognized as having the same effect as an imprint of a signature on a hardcopy document. However, some other countries such as Uganda have taken the step in enacting the Electronic Signature Act⁹². The introductory part of the Act stipulates that the Electronic Transaction Act is enacted to provide for the regulation of electronic signatures. Furthermore, section 4 of the Act⁹³ stipulates that where is required by law that a person should sign a document, the requirement will be deemed fulfilled if the signature is in digital signature form. In this regard, section 4(3) of the Act⁹⁴ sets out the conditions that a digital signature must satisfy to be reliable as follows

- a. The signature must be linked to the creator and no other person
- b. That the creation of the signature was under the control of the person deemed to be the owner of the signature
- c. There is no alteration to the digital or electronic signature

In this regard, having fulfilled the above condition, section 16 of the Act stipulates that a document that is digitally signed will assume and be regarded as a document that is written. Section 3 of the Act⁹⁵ further provides that a method of digital signature that meets the requirement of the law, shall not be refused legal effect or excluded. Section 17 of the act⁹⁶ is also to the effect that a digitally signed document will be regarded as an original document that is valid and can be enforced in a court of law. However, section 15 of the Act⁹⁷ stipulates that an individual may reject and refuse to rely on a digital signature if the signature is considered forged. The recipient of such data message where the digital signature is contained is required to communicate his/her rejection of the digital signature to the creator of the signature and state the grounds upon which it was rejected. In this regard, by

⁹² *Electronic Signature Act 7, 2011*

⁹³ *Ibid*

⁹⁴ *Ibid*

⁹⁵ *Ibid*

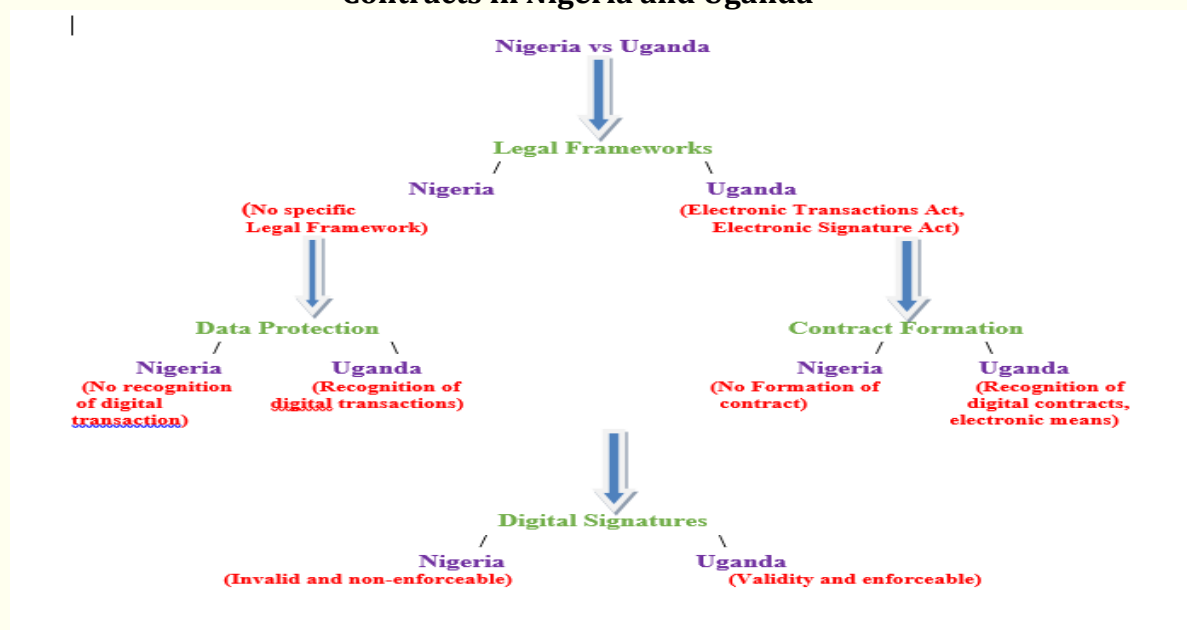
⁹⁶ *Ibid*

⁹⁷ *Ibid*

section 12 of the Act,⁹⁸ a digital signature may not be enforced or relied on by a court if it is proved to be forged or altered.

In essence, it suffices to state that the above provision of the electronic digital signatory law has laid to rest issues that may arise as it concerns the authenticity, originality, and reliability of digital signature on a smart contract within the trending digital metaverse concept. In this regard, the Statute of Fraud and the Contract Act of Uganda that requires a contract of agreement or transaction to be physically signed by the party involved has been resolved with the enactment of the digital signature law of Uganda. Concerning this, a smart contract in the digital metaverse deemed to be digitally signed by the parties involved is considered valid and enforceable.

Diagrammatical Flow of the Difference between Legal Regulation of Smart Contracts in Nigeria and Uganda



Sources: From primary sources, design by authors of the study

3.7. Challenges Concerning Validity and Enforcement of Smart Contracts in Nigeria Metaverse

Implementation of smart contracts for the Nigerian operations of the Metaverse is seriously challenged by major regulatory loopholes, particularly the lack of specific enactment governing them.⁹⁹ They fail to recognize that entire self-executing agreements could form legally bargaining instruments; contract laws in Nigeria mostly rely on principles based on the Contract Law Act and common law. Traditional enforcement mechanisms of contracts essentially resort to some form of human interpretation and judicial oversight to ascertain whether a certain contract has been performed or not, in stark contrast with the wholly automated and

⁹⁸ Ibid

⁹⁹ Pronaya Bhattacharya et al., "Towards Future Internet: The Metaverse Perspective for Diverse Industrial Applications," *Mathematics* 11, no. 4 (2023): 941.

immutable character of smart contracts.¹⁰⁰ The absence of statutory support means that such eventualities may not fall within the jurisdiction of already existing legal frameworks, which creates a wider legal uncertainty for businesses and individuals involved in Metaverse transactions.¹⁰¹ The absence of defined legal provisions does much to deter institutional uptake and investment in blockchain-based digital commerce in Nigeria. The other big issue, for example, is for Nigeria to adopt international best practices such as the UNCITRAL Model Law on Electronic Commerce which has created the legal framework under which electronic transactions, including smart contracts, are recognized.¹⁰²

Best practices include some sovereign countries with built blockchain legal frameworks like Singapore and the EU, which have taken portions of this model law to enhance the digital agreements' legality. However, Nigeria's approach is fragmented and has no full digital asset or smart contract legislation.¹⁰³ Largely, this gap makes it difficult for cross-border Metaverse transactions for Nigerian businesses, as international partners tend to shy away from entering into transaction modalities with an uncertain legal environment. Without harmonizing its regulations with global standards, Nigeria might lag in the much-accelerating digital economy.

Barriers to effective operation of smart contracts even include related technical and jurisdictional problems in Nigeria's metaverse space. The key issue is automated contract execution without a renegotiation mechanism in place.¹⁰⁴ Unlike ordinary contracts which allow parties to change terms by consent, smart contracts execute under pre-defined conditions without human intervention; therefore, they prove inflexible to adverse outcomes when unforeseen occurrences such as force majeure or fraud occur. So, if, for example, a buyer in a virtual property deal subsequently finds out that there was fraudulent misrepresentation, he or she may not have a legal way to reverse the situation if the smart contract has executed the transfer of title. This inflexibility may discourage users from adopting smart contract-based transactions in Nigeria due to the absence of regulatory bubbles. Jurisdictional conflicts in disputes based on Metaverse make it even more complicated for smart contracts to come into practice.

The Metaverse is about doing business in decentralized environments across borders, hence disallowing the identification of the appropriate legal system for applying the contract cited in the above case. A smart contract executed between a Nigerian and an international party may well refer to blockchain protocols rather than Nigerian law, leaving local courts unequipped for interference. This problem

¹⁰⁰ Ahmad Zainudin et al., "Blockchain-Inspired Collaborative Cyber-Attacks Detection for Securing Metaverse," *IEEE Internet of Things Journal* 11, no. 10 (2024): 18221–18236.

¹⁰¹ Ahmad Musamih et al., "Enhancing Claustrophobia Exposure Therapy: A Blockchain and NFT-Enabled Metaverse Approach," *Computers in Human Behavior* 160 (2024): 108364.

¹⁰² Xiaorui Zhang, "Blockchain Technology-Based Metaverse Development Application," in *Proceedings of the 2023 IEEE 6th Information Technology, Networking, Electronic and Automation Control Conference (ITNEC)*, vol. 6, 1521–1524, 2023.

¹⁰³ Paul P. Momtaz, "Some Very Simple Economics of Web3 and the Metaverse," *FinTech* 1, no. 3 (2022): 225–234.

¹⁰⁴ Hongzhou Chen et al., "Web3 Metaverse: State-of-the-Art and Vision," *ACM Transactions on Multimedia Computing, Communications and Applications* 20, no. 4 (2023): 1–42.

was brought to light in the case of *Binance vs. Nigerian Government*,¹⁰⁵ which resulted from jurisdictional complications involved in enforcement of regulatory compliance based on trading and transactions with cryptocurrencies. Apart from that, even the absence of a specific regulatory backbone for smart contracts aggravates these problems and denies any legal recourse to the parties involved in case of any breach of contract.¹⁰⁶

The concerns of data privacy, as well as the accountability of data breaches, will serve as major barriers to the overall integration of smart contracts into Nigeria's Metaverse operations. The existing Acts within the country that address the issue of data protection do not adequately provide for how personal data will be treated under decentralized and blockchain environments in the Nigeria Data Protection Act (NDPA) 2023.¹⁰⁷ Entering transactions on the Metaverse lays bare very sensitive pieces of information such as financial and digital identity, including the possibility of using these by malicious third parties. The permanent nature in which blockchain transactions are made spares scant chances for remedial actions against infractions due to security breaches, which in turn translates into risks, especially concerning consumer protection.¹⁰⁸ This means that without concrete legal safeguards, the inadequacy that smart contract transactions leave as a consequence of unclear regulatory oversight may expose Nigerian users to possible financial fraud, identity theft, and unauthorized use of data.¹⁰⁹ Besides, AI-driven smart contracts open up a whole new realm of legal challenges. Autonomous execution of self-modifying smart contracts based on sensory inputs implicates liability and accountability concerns. An AI actuated contract may decide wrongly: say, by misallocating digital assets or executing unauthorized transactions. Currently, Nigeria has no legal instruments on which to ground the determination of responsibility much less remedies.¹¹⁰ This gap is a compelling reason to push for the regulatory intervention that would create a regime for the regulation of AI-manufactured smart contracts, ensuring that users have civil legal remedies when contracts fail by automation.¹¹¹ There must be a general legal framework that caters for the distinctiveness of smart contracts as they would be applied in a global context and which provides mechanisms for dispute resolution, consumer protection, and cybersecurity to be developed by Nigerian regulators in this regard.

¹⁰⁵ Vinden Wylde et al., "Post-COVID-19 Metaverse Cybersecurity and Data Privacy: Present and Future Challenges," in *Data Protection in a Post-Pandemic Society: Laws, Regulations, Best Practices and Recent Solutions*, 1–48, 2023.

¹⁰⁶ Abdelkader Mohamed Sghaier Derbali, *Blockchain Applications for Smart Contract Technologies* (Hershey, PA: IGI Global, 2024).

¹⁰⁷ Ibrar Yaqoob et al., "Metaverse Applications in Smart Cities: Enabling Technologies, Opportunities, Challenges, and Future Directions," *Internet of Things* 23 (2023): 100884.

¹⁰⁸ Tae-Gyu Lee, "A Test Method for the Convergence of the Metaverse and Blockchain," in *Proceedings of the 2024 26th International Conference on Advanced Communications Technology (ICACT)*, 321–326, 2024.

¹⁰⁹ Yijing Lin et al., "Blockchain-Based Efficient and Trustworthy AIGC Services in Metaverse," *IEEE Transactions on Services Computing*, 2024.

¹¹⁰ Ibid

¹¹¹ Ibid

4. Conclusion

Smart contracts in the metaverse are viewed as a way of improving contractual relationships between parties with the help of technology without an intermediary. However, for effective regulation and enforcement of smart contracts in the metaverse, it must conform to the principle of contracts in line with the laws operating in a particular jurisdiction for it to be valid and legally enforceable. This study identifies the significant legal gaps in Nigeria regarding the validity and enforcement of smart contracts in the metaverse. By drawing comparison with Uganda, this research emphasizes the necessity for a dedicated regulatory framework that recognises the evolving nature of digital contracts. It is recommended that Nigeria adopt legislative measures similar to Uganda's Electronic Transactions Act and Contract Act to provide legal certainty for smart contract enforcement. Furthermore, policymakers should prioritize collaboration with international legal frameworks to ensure that Nigeria's metaverse regulations align with global best practices.

Concerning the above, the following are therefore recommended as follows:

- a. Nigeria should enact specific legislation recognize smart contracts as legally binding
- b. Establish a regulatory body to oversee blockchain-based contractual transactions
- c. Promote public awareness and training programs on the legal implications of smart contracts
- d. Encourage cooperation with international organisations to harmonize regulations

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