2026 Volume: 02 Issue: 05 www.ijrpa.com ISSN 2456-9995 Review Article

International Journal Research Publication Analysis

Page: 01-12

USE OF BLOCKCHAIN TECHNOLOGY ON INTERNALLY GENERATED REVENUE FOR EBONYI STATE GOVERNMENT

***Onyibe, Ikechukwu Nwogbaga, Chukwuma Udeh**

Computer Science Department, Enugu State University of Science and Technology, Enugu, Nigeria.

Article Received: 29 March 2026
Article Revised: 19 April 2026
Published on: 09 May 2026

***Corresponding Author: Onyibe, Ikechukwu Nwogbaga**
Computer Science Department, Enugu State University of Science and Technology, Enugu, Nigeria.

DOI: https://doi-doi.org/101555/ijrpa.3527

ABSTRACT

Blockchain is a distributed ledger and one of the most promising, disruptive and revolutionary technology of today. decentralized systems are the backbone of cryptocurrencies and the technology behind these currencies are block chain. Crypto, a digital currency, which is an alternative form of payment created using encryption algorithms. A cryptocurrency is a digital currency designed to work through a computer network that is not reliant on any central authority, such as a government or bank, to uphold or maintain it, Bitcoin is block-chain but it actually consists of chain of consecutive blocks of transactions. Block chain is a decentralized, peer-to-peer (P2P) network and distributed in nature. Each and every participant of the network can control the network. Blochchain technology network consists of many computers connected together and the block cannot be altered without consensus of the whole network. Block can be considered as a container for the data. Blockchain is continuously growing chain of blocks which are interconnected and protected with the help of cryptographic functions also. Validating of new blocks is followed by a set of protocols and consensus from every participant of the network. The revenue records are kept basically in linear chain. Pointers and linked list data structures are used in blockchain for the block representation. Blocks are arranged in sequence. Block is a collection of data that stores the transaction details such as timestamp, link to the previous block which is generated by secure hash algorithm. Every block has contained two parts: block header and block body. This Research on Block chain tax payment system basically features organized, distributed and immutable authenticated system that ensure security, transparent, and reliable distributed ledger by having multiple network citizens and government views on transactions,

data storage and many other nodes distribution in internally generated revenue of Ebonyi state government, preventing alterations to past records immutability, and verify the identity of the payer. blockchain is widely considered a budding technology, meaning it is a rapidly developing, promising, and emerging technology with significant potential to disrupt industries by providing secure, transparent, and decentralized methods for recording and verifying transactions.

INTRODUCTION

Chapter One

Blockchain payment system which will improve the economy of the young state

1.1 Background of the study

Internally Generated Revenue (IGR) denotes the revenue that the state government generates within their respective areas of jurisdiction (Abiola & Ehigiamusoe, 2022). IGR for State governments has also been described as revenues that are derived within the state from various sources such as taxes (pay as you earn, direct assessment, capital gain taxes, fire services, waste management, business premises etc.) and motor vehicle license, among others (Adenugba & Chike, 2023). According to Asimiyu and Kizito (2024), economic development and sustainability of states in Nigeria depend on the ability of such states to generate revenue internally to supplement the revenue allocation from federation account. In other words, federal allocations are not sufficient to guarantee economic development of states, hence the emphasis on local generation of revenues to sustain its economic viability.

This Seminar specifically incorporate only the Business premises, fire service and waste management revenues in various commercial building in Ebonyi state into government, ensuring transparency, immutability and security in consideration to the fact that the very young state have control over their IGR and economic development is made possible and faster.

This would increase their IGR capable of absorbing increasing recurrent and capital expenditures of states by boosting IGR which is not only dependent on tax, but through technological blockchain.

This technology can provide guaranteed transparency, accuracy, and data security for not only IGR but all relevant parties. It allows authorized public users and controlled users to use its distributed ledgers, as well as to participate in transactions that can be approved by the parties involved. When a transaction has been completed, no party can change its transaction records. Blockchain technology allows peer to peer interactions to occur. Its characteristics,

such as autonomy, equality, and transparency, have the potential to detect both corruption and fraud. Apart from that, blockchain technology also provides benefits in terms of data veracity, data security, and data triangulation. Another advantage of blockchain technology is that its dimensions, i.e., decision rights, accountability, and incentives, are in line with the literature on good Information Technology (IT) governance. The most important blockchain features for supporting competitive performance are traceability and immutability. The challenges and barriers to adopting blockchain technology include issues of usability and security, legal issues, conflicts of values, and criticism of its political dimensions. The features and challenges of blockchain technology can also explain that there are some business models going to apply blockchain technology in the future. Several previous studies have shown that blockchain technology has been widely applied in various sectors, including both government and business sectors. The fields of accounting, finance, and auditing have benefited greatly from the presence of blockchain technology. In addition, blockchain technology can also be applied for effective and efficient tax administration, for example in the context of IGR. Blockchain technology provides a reliable ledger, meaning no party will be able to manipulate it because every transaction in the system will always be retained through the smart contract, and because it provides transparent records. These are the two reasons why this technology has shown promise for being applied to the IGR system in Ebonyi state. However, several matters need to be considered for the successful adoption of blockchain technology in IGR systems. Notably, there are at least four alternatives that can be considered and used by Ebonyi state governments in the utilization of electronic technology to develop IGR systems. These alternatives include developing regulations and legal products, creating databases and developing infrastructure as the main means of support in the implementation of electronic information and technology in the tax system, developing technical equipment, and developing database software used for efforts to increase the ability of tax authorities to carry out their tax obligations. Blockchain technology makes IGR taxable and charged in real time under the direct supervision of tax authorities. Automation compliance on blockchain technology enables the verification J. Open Innov. Technol. Mark. Complex. 2020, 6, 156 3 of 27 and automation of tax filing, which could significantly reduce the risk of tax avoidance, fraud, and evasion. Blockchain technology can transparently confirm, verify, and track e-Invoice. With strong transparency, this technology can also ensure that it will be difficult or even impossible for the parties involved in the chain of administration to commit fraud. However, despite its potential, blockchain technology is not

yet widely known by the public nor utilized by the previous government. Based on the discussion above, this study focused on the adoption of blockchain technology in the IGR system. Therefore, the purpose of this study is to analyze how blockchain technology models can be applied in the IGR system, particularly in E-invoicing, of business premises, waste management and fire services. There is currently not much research on the application of blockchain technology in the taxation sector. The utilization of new technology, namely blockchain tax payment system in the state internally generated revenue acceptance systems is relatively new and has not yet been implemented today. As studies regarding the implementation of blockchain in the system are few, this study is expected to provide an overview and are reference for other states that are planning to adopt blockchain technology to build their IGR systems. This research has academic and practical contributions. Reviewed from an academic angle, this research is expected to complement similar previous studies related to the development and utilization of new technologies for IGR systems i.e., blockchain tax payment system. As all countries are entering the era of the industrial revolution, blockchain technology is growing and gaining more attention, particularly in developing countries. This technology enhances the transparency, accuracy, and data security of IGR systems. The literature review in this study discusses the application of blockchain technology for both the government and taxation sectors but some of the references do not focus on providing an idea of how blockchain technology can be applied in IGR systems. Thus, the novelty of this research lies in the in-depth description of the application of blockchain technology in a VAT system, particularly in terms of e-Invoice issuance. We hope that this study will provide additional information as well as a reference for other researchers who desire to conduct research on similar topics in the future. In terms of practical contributions, this research can provide information and input to related parties, including the government and policymakers, i.e., the Board chairman of Ebonyi state internally generated revenue (EBIGR), the state revenue mobilization, allocation and Fiscal commission (RMAPC), the state ministry of digital economy, and the state ministry of budget and planning, which are directly related to the application of technology in the IGR system. We hope this research can be used as a reference and be considered by the government and stakeholders when making policies related to the application of blockchain technology in IGR systems in Ebonyi. This paper starts with an introduction that explains the background, purpose, and the academic and practical contributions of this research. Next, the theoretical review contains a literature review of relevant studies and the theoretical framework used in

this study. This is followed by the research methodology, which describes the qualitative research method used and the data collection through in-depth interviews. The next section presents the results and discussion, which addresses the application design of blockchain technology on the IGR system and the views of the government, academics, practitioners, and associations regarding the application of blockchain technology in IGR systems. The conclusions of the research are presented at the end of the article.

1.2 Statement of the Problem

Ebonyi State saw a significant trend of high internally generated revenue (IGR) growth, achieving the highest percentage increase in Nigeria in 2023 with a 148.2% rise, jumping from N12.42 billion in 2022 to N30.84 billion in 2023. However, a 2024 Debt Sustainability Analysis report from the Ebonyi State Government states that while other revenue items increased in 2023, the state's IGR witnessed a 33% reduction compared to 2022, creating a conflicting trend. This indicates a complex financial picture where the overall IGR figures presented in news may not align with the deeper financial data available from the state itself hence the need for blockchain technology in internally generated revenue. However, According to reports in late 2024, Ebonyi State recorded the highest annual growth in IGR among all Nigerian states in 2023, with a 148.2% increase, but was grossly mishandled by few individuals, hence the improved blockchain tax payment system will form a modern bedrock for an overhauled IGR in the state and improve efficiency, fairness, and security not only on government but taxpayers.

1.3 Aims and objectives of the study. Implementing a blockchain tax payment system **for** Internally Generated Revenue (IGR) in the state of Ebonyi will help modernize tax systems, ensuring transparency, efficiency, and reduced fraud and provide a transparent record of all transactions. Citizens and government officials can view real-time payment data, creating a culture of accountability and trust, ensuring all payment are permanently recorded and no room for immutability. blockchain transactions are tamper-proof, the risk of falsifying tax records, underreporting, or misappropriating funds is minimized to the barest. allowing for automatic auditing because every transaction can be traced and verified without human intervention. This makes it difficult for tax evaders to hide their income or evade taxes. Blockchain enables real-time processing and verification of tax payments, eliminating delays associated with traditional payment systems. Taxpayers don’t have to wait for manual processing or for payments to clear. By automating tax collection and payment systems, the need for intermediaries and paperwork is drastically reduced, speeding up tax collection and

improving the overall efficiency of the process. It will greatly reduce over reliance on traditional financial institutions (like banks) for payment processing, lowering transaction fees. By automating tax payment processes and reducing manual intervention (Task force People), governments can save on administrative costs and use those funds for other critical services. The Blockchain tax payment system will reduces the risk of data breaches thereby ensuring encryption of sensitive taxpayer data is securely stored and transmitted will integrate biometric authentication or digital IDs to ensure that taxpayers are who they say they are, further enhancing security and preventing identity fraud. Will deploy smart contracts, which are self-executing contracts with predefined rules, to automate tax payments. For instance, if a citizen's payment meets specific criteria, the smart contract can automatically execute the payment and send e-invoice. Will as well integrate with other government systems, ensuring that tax data is always accurate, up-to-date, and consistent across all platforms with transparent, immutable, and decentralized records, blockchain helps reduce the risk of corruption in the tax collection process. This builds greater trust among taxpayers, especially in regions where corruption is a problem. With greater transparency, citizens may feel more engaged in the tax process. They can see exactly where their money is going, which can lead to higher compliance and voluntary tax payments. Blockchain facilitates access to tax payment systems, even for people in rural or underdeveloped areas where traditional banking services are limited. People can use blockchain wallets or mobile phones to make payments without needing a bank account.

A decentralized blockchain system ensures that no single entity controls the entire tax system, which reduces the potential for abuse or manipulation. If a taxpayer works in different countries, blockchain could ensure that taxes paid in one jurisdiction are recognized by others, preventing double taxation and ensuring compliance with national tax laws. Blockchain offers the potential for continuous, real-time auditing. Tax authorities can audit transactions instantly, without waiting for end-of-year reconciliation. This would make audits quicker and less prone to errors. And in Blockchain system reports are generated automatically, making the entire process more efficient for both governments and taxpayers. This reduces administrative burdens and streamlines tax filing.

it is easy to steal cookie from a jar kept in a sequestered place than stealing a cookie from a jar kept in place governed by hundreds of people.

1.3 Research questions or hypotheses

Research Questions

1. Impact on Tax Compliance

RQ1: How does the implementation of a blockchain-based tax payment system affect tax compliance among businesses and individuals?

RQ2: Does the use of blockchain in tax payments lead to a reduction in tax evasion or avoidance compared to traditional systems?

Efficiency and Cost Reduction: To what extent does a blockchain-based tax payment system reduce transaction processing time and administrative costs for tax authorities?

RQ4: How does the blockchain-based system affect the overall efficiency of tax collection compared to conventional methods (e.g., manual processing or centralized databases)?
taxpayer behavior and government accountability?

2. Adoption and Technological Challenges

RQ3: What are the key barriers to the adoption of blockchain technology for tax payments in developing countries or less-developed regions?

RQ4: How does the adoption of blockchain technology in tax systems vary between developed and developing nations?

3. Integration with Other Systems

RQ5: How can blockchain technology be integrated with existing government financial systems to ensure smooth and secure tax payments?

RQ5: What role does blockchain play in integrating cross-border tax payments and reducing tax evasion in international trade?

4. Scalability and Sustainability

RQ15: What are the scalability challenges of blockchain-based tax systems in large populations or highly decentralized tax collection models?

RQ16: Is blockchain technology sustainable for long-term use in tax collection systems, particularly in terms of energy consumption (e.g., proof-of-work vs. proof-of-stake)?

Hypotheses

Hypothesis on Compliance

H1: The implementation of a blockchain-based tax payment system leads to a significant

increase in tax compliance rates. Among both businesses and individual taxpayers.

1. Hypothesis on Efficiency

H2: Blockchain technology will significantly reduce the time and costs associated with processing tax payments, especially in developing countries with less efficient infrastructure.

3. Hypothesis on Fraud Prevention

H3: Taxpayers using blockchain-based systems will experience lower levels of fraud or identity theft compared to traditional tax payment methods.

1.5 Significance of the study

The significance of studying a Blockchain-based system in Internally Generated Revenue (IGR) is multifaceted, as it touches upon various aspects of governance, tax administration, and economic development. The adoption of blockchain technology for IGR offers unique opportunities for efficiency, transparency, security**,** and accountability in the collection and management of tax revenues. Below are key points that underscore the significance of such a study:

1. Improved Tax Collection Efficiency

• **Optimizing Revenue Generation:** Blockchain has the potentialto streamline and automate tax payment systems. By reducing the need for intermediaries and manual processes, blockchain can make tax collection more efficient. This efficiency can lead to higher **tax revenue generation**, especially in areas with limited resources for tax administration.

Real-time Processing: Blockchain's ability to settle transactions in real time means that there's no lag in the verification and processing of payments. This could increase the speed and reliability of IGR collection, allowing for timely access to government funds.

Enhanced Transparency and Accountability

Public Transparency**:** A blockchain system allows real-time public visibility of all tax transactions. This transparency can help build trust between the government and taxpayers by showing exactly where the money goes. Citizens and businesses can verify their contributions and see how revenues are being utilized.

Reduced Corruption**:** Blockchain's immutability makes it difficult for data to be altered or tampered with. This can help reduce corruption in the tax collection process by eliminating opportunities for officials to manipulate records or divert funds.

2. Increased Tax Compliance

Tamper-proof Recordkeeping**,** The inability to alter or erase records on a blockchain ensures that once a tax payment is made, it is permanently recorded. This can **increase taxpayer compliance**, as taxpayers are aware that their records are visible and can't be manipulated.

Automated Reminders and Compliance Checks: Blockchain-based systems can integrate **smart contracts** to automatically send reminders to taxpayers about deadlines, ensuring timely tax payments and reducing the likelihood of non-compliance.

3. Cost Reduction for Government

Lower Administrative Costs: Traditional tax collection systems often rely on intermediaries (e.g., banks, tax collectors, auditors) and involve significant administrative overhead. By automating these processes with blockchain, governments can reduce costs associated with tax processing, auditing, and reporting.

Efficient Auditing**:** Blockchain's transparent and immutable nature enables automatic auditing**,** allowing tax authorities to conduct real-time audits. This reduces the need for extensive manual audits, saving both time and money.

Attracting Foreign Investment:

A transparent and efficient tax system can make a country or region more attractive to foreign investors. Blockchain can provide potential investors with confidence that taxes are being collected fairly and efficiently, with reduced risk of corruption.

Building Trust in Government

Fostering Citizen Trust**:** Blockchain's transparency and accountability can play a crucial role in building trust between governments and their citizens. Citizens are more likely to comply with tax laws if they see that funds are being used appropriately and that the system is transparent and fair.

Reducing the Information Asymmetry: Blockchain allows taxpayers to have access to detailed information about the tax process, improving citizen awareness of how taxes

are calculated, reported, and spent. This transparency helps bridge the information gap between government and taxpayers.

Adapting to the Digital Economy

As the global economy becomes increasingly digital, the need for blockchain-based systems for tax collection is even more pronounced. Many individuals and businesses now prefer digital payment methods. Blockchain provides a secure, efficient infrastructure for accepting digital payments for taxes.

Blockchain can be integrated with digital identity systems**,** enabling seamless verification and payment processes for taxpayers. This could lead to greater participation in the tax system by people who might otherwise be excluded from traditional banking or tax systems.

10. Innovative Governance Model

Decentralized Governmental Models**,** Blockchain enables a more decentralized approach to tax collection. This could open the door to more autonomous and efficient governance models**,** especially in regions where central authorities may not have the infrastructure or capacity to manage tax payments effectively.

Empowering Local Governments**:** Blockchain-based IGR systems can also empower local governments to collect taxes independently and efficiently. It can allow for localized tax systems, enhancing the ability of cities and regions to generate their own revenue without relying on central government allocations.'

Scope and limitations of the study:

This study is highly limited to only 3 area of taxation, they are revenue generation on Business premises on commercial houses, fire services on commercial houses and waste management fees for commercial houses and containers, income taxes other internally generated revenues were not included in this study.

Review of Related Literature

Tax administration is fundamentally concerned with recording, verifying, and enforcing monetary transactions between individuals, businesses, and governments. Scholars argue that blockchain's immutable ledger could mitigate information asymmetry between taxpayers and authorities by creating auditable and transparent transaction records (Yermack, 2017; Catalini

& Gans, 2016).

Smart contracts represent a particularly promising mechanism in tax contexts. They are self-executing agreements coded with predefined rules, which can be applied to automatically calculate and remit taxes at the point of transaction (Szabo, 1997; De Filippi & Wright, 2018). For instance, a value-added tax (VAT) could be withheld instantly when a sale occurs, thereby reducing opportunities for evasion. Theoretically, such mechanisms embed compliance directly into digital transactions.

Nevertheless, theoretical debates highlight important trade-offs between permissionless and permissioned blockchains. While public blockchains offer transparency, scalability issues and privacy risks limit their suitability for tax administration (Xu et al., 2019). Conversely, permissioned systems—where only authorized parties validate transactions—may better align with legal and institutional requirements of taxation, though they introduce new governance and interoperability challenges (OECD, 2020).

Research gap

Empirical work on blockchain in taxation remains nascent. Much of the literature consists of proof-of-concept designs, technical simulations, and pilot projects. For example, Pimentel and Boulianne (2020) discuss simulation studies showing how blockchain-enabled invoicing can prevent VAT carousel fraud by ensuring that each invoice is uniquely registered on a distributed ledger. Similarly, Chen and Bellavitis (2020) emphasize blockchain's role in enhancing transparency and reducing fraud in financial systems, although they caution that operational complexities limit immediate deployment in taxation.

Other Several gaps include:

1. **Lack of rigorous evaluations**: Few studies employ econometric or experimental designs to measure blockchain's actual effect on compliance or revenue outcomes.
2. **Comparative analysis**: Limited research directly compares blockchain-based systems with advanced centralized digital solutions, leaving the relative value proposition uncertain.
3. **Privacy-preserving technologies**: The literature calls for more work on integrating zero-knowledge proofs, encryption, and off-chain storage in tax contexts (Zhu & Hendrikse, 2021).
4. **Governance and legal frameworks**: Research is needed on institutional models that

allow smart contracts to remain flexible under changing tax laws.

CONCLUSION, SUMMARY AND RECOMMENDATION

The Technology of blockchain-based tax payment systems reflects both optimism and caution. On one hand, blockchain's capacity for transparency, automation, and fraud prevention aligns well with the core challenges of tax administration. On the other, substantial barriers—legal, technical, and institutional—complicate large-scale deployment. Empirical studies remain limited, and rigorous comparative evaluations are needed to determine whether blockchain genuinely outperforms advanced centralized systems.

Going forward, researchers are called to explore privacy-preserving architectures, legal adaptability of smart contracts, and the socio-technical dynamics of taxpayer adoption. Policymakers, meanwhile, must carefully balance innovation with regulatory safeguards. In sum, blockchain holds transformative potential for tax administration, but its success will depend on careful, evidence-based implementation rather than technology optimism alone.

REFERENCES

1. Alzahrani, S., & Daim, T. (2019). Blockchain frameworks for secure electronic health records and property registries. *Journal of Systems and Information Technology, 21*(2), 145–170.
2. Catalini, C., & Gans, J. (2016). Some simple economics of the blockchain. *MIT Sloan Research Paper No. 5191-16*.
3. Chen, Y., & Bellavitis, C. (2020).
4. Blockchain disruption and decentralized finance: The rise of decentralized business models.
5. *Journal of Business Venturing Insights, 13*(e00151).
6. Crosby, M., Pattanayak, P., Verma, S., & Kalyanaraman, V. (2016). Blockchain technology: Beyond bitcoin. *Applied Innovation Review, 2*, 6–19.
7. De Filippi, P., & Wright, A. (2018). *Blockchain and the law: The rule of code*. Harvard University Press.
8. Finck, M. (2018). Blockchain and the General Data Protection Regulation: Can distributed ledgers be squared with European data protection law? *European Law Journal, 24*(6), 442–463.
9. Nakamoto, S. (2008). Bitcoin: A peer-to-peer electronic cash system.
10. Pimentel, E., & Boulianne, E. (2020). Blockchain in accounting and auditing: A research synthesis. *International Journal of Accounting Information Systems, 37*(100455).