Using Blockchain Technology to Curb Voter Fraud in Nigeria

Prospects and Challenges

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Abstract

Blockchain is gradually changing the way in which data is stored, accessed and processed. Could this help Nigeria to achieve free, fair and credible elections? This study discusses how blockchain technology could be used in that country's electoral processes – specifically, how it could prevent electoral fraud by providing a secure and transparent way of storing and accessing voting data. It reviews existing literature on the subject, and analyses current and potential applications of blockchain technology in ensuring electoral integrity. The study does not focus on the computational aspects of blockchain, but on its potential to curb electoral fraud in Nigeria. It also discusses the potential benefits and challenges of implementing blockchain technology in electoral systems in Nigeria, examines the various policy considerations and potential solutions, provides actionable recommendations, and suggests areas where blockchain could be effectively integrated into Nigeria's current electoral system.

Introduction

'A lack of transparency has plagued many elections around the world, but particularly in some African countries, where large sections of the electorate are often suspicious that incumbent parties or ethnic loyalties have been responsible for the manipulation of the results in favour of one candidate or another. These suspicions remain even when there is little evidence of manipulation. A more transparent system could help restore trust' (Kazeem, 2018).

This suggests that many Africans mistrust their electoral systems. A recent study of the feasibility of integrating blockchain into electoral systems in Africa found that the centralisation of elections are a key reason why voting processes can be manipulated, and suggested that decentralisation could be the answer to this problem (Alam et al., 2020).

The demand for and use of voting technology have increased due to the prevalence of electoral anomalies in many transitional democracies, particularly in Africa, in order to detect and curtail electoral fraud (Nwangwu et al., 2019).

Although officials of Nigeria's Independent National Electoral Commission (INEC) and pro-democracy activists have generally acknowledged that digital technology has helped to

achieve free, fair, and credible elections in Nigeria (Nwangwu et al., 2019), the integration of blockchain with electoral systems is just beginning to receive attention in the literature.

Blockchain technology has the potential to improve electoral integrity in Nigeria by providing a secure and transparent way to conduct elections. It uses a distributed ledger to record and verify transactions, making it difficult to tamper with or manipulate the data (Wright & De Filippi, 2015). It can therefore help to prevent electoral fraud, such as ballot stuffing and voter intimidation, and increase public confidence in the electoral process. A brief discussion of blockchain terms such as transactions, provenance, immutability and finality will help to position blockchain technology in the context of preserving electoral integrity.

In blockchain, a transaction invokes the predetermined rules for a contract. Votes cast, election outcomes, and birth dates are some examples of transactions that can take place in voting systems supported by blockchain technology (Pratt et al., 2019, cited in Ikuero et al., 2021).

Since the origin of blocks (transactions) and their current owner can be determined by all blockchain network users, past transactions can be evaluated, and their provenance established. In the case of an election, everyone in the network could check that their votes were tallied (Herian, 2020).

A security feature known as immutability ensures that once a transaction has been recorded in the blockchain, it cannot be altered in any way. In this case, it prevents the forging of records and the falsification of votes (Pathak et al., 2021), which has been a frequent complaint in past Nigerian elections (Sandner, 2019; Oladayo, 2021).

Once a transaction or block has been entered into the ledger, it cannot be changed or modified. Every single transaction must be unanimously accepted and verified by all participants across the blockchain network. As a result, the capacity of blockchain to achieve finality could assure the safety of transactions within it (Niranjanamurthy et al., 2019).

One of the key benefits of blockchain technology is its ability to provide secure and transparent record-keeping. This can be particularly useful in areas such as voting, where the integrity of the electoral process is vital. Since the start of the Fourth Republic in 1999, Nigeria has been plagued by electoral fraud and irregularities, leading to widespread public mistrust in the electoral process (Afrobarometer, 2022). However, this is not the exclusive preserve of the Fourth Republic, and earlier elections also recorded varying levels of voting fraud (Casimir, Omeh & Ike, 2013).

An overview of Nigeria's electoral systems

INEC is responsible for organising elections in Nigeria. It was established by the Nigerian Constitution in 1998, following the end of military rule. The commission is independent, and its mandate is to conduct free, fair and transparent elections at all levels of government, from the presidency to local councils. This includes registering voters, issuing voter cards, organising elections, counting votes, and announcing results. INEC is also responsible for overseeing political parties and ensuring compliance with electoral laws.

Since its inception, INEC has organised numerous high-profile elections, including the presidential elections of 1999, 2003, 2007, 2011, 2015 and 2019. In addition, the commission has organised numerous state and local elections (gubernatorial and parliamentary).

INEC has faced various challenges, including logistical difficulties, security threats, and allegations of bias. Despite these, the commission has generally been considered to have improved the fairness and credibility of Nigeria's electoral process and has generally been seen as a credible and impartial body that has played a crucial role in consolidating Nigeria's transition to democracy (Bassey, 2022). It is a key institution in the country's electoral process, and a vital part of Nigeria's democratic system.

Nigeria primarily uses the Paper Voting System (PVS) for casting votes. This system was used before the advent of the Fourth Republic in 1999 after the transfer of power from the military to civilian rule. PVS in Nigeria has evolved from the Modified Open Ballot System to the Re-modified Open Secret Ballot System, Verification and Accreditation Systems (VAS), helped by Electronics Card Readers (ECR) (Ikuero et al., 2021) and most recently, the Bi-Modal Voter Accreditation System (BVAS) although some scholars have argued that the Nigerian's voting system is still prone to irregularities (Ajayi, 2006).

The problems that bedevil Nigeria's electoral system can be broadly categorised as follows: accurate voter registration; free, fair and credible elections at every voting centre; and the timely announcement of results that accurately reflect the will of the people (Ugwuede, 2018).

One of Nigeria's key challenges in preventing electoral fraud is the lack of transparency and trust in the voting process, and challenges of rigging are not peculiar to Nigeria alone; other African countries also have a history of election rigging, ballot stuffing, and other forms of fraud, which undermine the legitimacy of the electoral process. Blockchain technology offers a potential solution to this problem by providing a secure and immutable voting data record beyond officials' reach and manipulation. In recent years, several African countries have explored the use of blockchain for electoral purposes.

Selected cases studies

During the presidential elections in Sierra Leone on 7 March 2018, blockchain technology was deployed for the first time. The election results for the West District were recorded on a blockchain developed by Agora, a Swiss company certified as an official foreign observer. The results were recorded on an immutable blockchain ledger, which allowed Agora to announce the result much earlier than a human count would have allowed. This safeguarded the election data against tampering, and ensured that it could be independently confirmed. This makes Sierra Leone the first country on record to include blockchain technology in its electoral process. However, blockchain was not adopted nationwide, but only in a pilot phase in the West District (Agora, 2018).

In another first in Africa, The blockchain developer community of the University of Jos in Central Nigeria developed a blockchain application for departmental elections that took place on 16 January 2020 (Anusionwu, 2020).

Integrating blockchain into the existing electoral structure in Nigeria

A voter register is a vital part of any election, as it is used to identify eligible voters and prevent fraud. In Nigeria, as elsewhere, an accurate register is always a recurring issue. Most recently, in the build-up to the 2023 elections in Nigeria, INEC opened up the Preliminary National Register of Voters for the general public to scrutinise, and there were several reports

of under-age voters, deceased Nigerians, as well as non-Nigerians being found on the list (Ufuoma, 2022).

Ensuring a reliable voter register using blockchain would involve several key steps. First, a secure platform would need to be created using blockchain technology. This platform would store and manage the voter register and could be accessed by authorised individuals such as election officials and voters.

Next, the voter register should be populated with accurate and up-to-date information about eligible voters. This could be done in various ways, such as importing data from existing voter databases or requiring individuals to register in person at designated polling stations.

Once the voter register has been populated, it would need to be maintained in a secure and transparent way. This could be achieved by using cryptographic techniques to ensure the integrity of the register and prevent tampering. Any changes to the register, such as the additions or deletions of voters, would need to be recorded on the blockchain and made visible to authorised individuals.

Additionally, measures would need to be put in place to ensure the security and privacy of voter information. This could include using encryption to protect personal data, as well as implementing strict access controls to prevent unauthorised individuals from accessing the voter register.

Overall, ensuring a reliable voter register using blockchain would require the creation of a secure and transparent platform, the maintenance of accurate and up-to-date voter information, and the implementation of measures to protect the security and privacy of voter data.

Prospects

Besides preventing electoral fraud, blockchain technology could also help to make the electoral process more efficient and accessible. By using a distributed ledger, voters coulld cast their ballots electronically without needing paper ballots or polling stations. This can make it easier for citizens -- particularly those who live in remote or difficult-to-reach areas -- to participate in elections. It can also reduce the cost and logistical challenges of conducting elections, making the process more efficient and cost-effective.

One of the key benefits of using blockchain is its ability to provide a tamper-evident record of the electoral process. Because each transaction on the blockchain is recorded and verified by multiple nodes, it would be virtually impossible to alter the voting data without being detected. This would provide a high level of trust and confidence in the electoral process, as stakeholders would be able to verify the accuracy of the voting data independently.

Additionally, using blockchain for voting would enable real-time reporting and monitoring of the election results. Because the data is stored on a distributed ledger, it would be immediately available to all stakeholders, allowing them to track the progress of the election in real time. This could help prevent incidents of electoral fraud, such as ballot stuffing, by providing early warning and enabling timely intervention. In Nigerian elections, it sometimes takes days or even weeks before the results are announced, and there are recorded cases of the alteration of result sheets before announcements. An immutable system would effectively end issues like this.

As part of its commitment to improving the integrity of elections in Nigeria, INEC has implemented biometric voter verification to prevent multiple voting, and deployed security personnel at polling stations to prevent violence and intimidation. However, the latter has not been very successful because they are not neutral, but sometimes facilitate electoral malpractices themselves. These existing measures and the use of blockchain technology can help create a more secure and transparent electoral process in Nigeria, and solidify the principle of one person, one vote.

One of the causes of post-electoral violence in Nigeria is the real or imagined manipulation of the electoral processes, and therefore the results. The basis of anger is usually an electoral process that is not free, fair or credible (Tunmibi & Olatokun, 2022). Therefore, implementing blockchain technology will help ease fears about the credibility and reliability of the process, thus reducing the incidences of post-electoral violence.

Another good spin-off would be the reduction of legal disputes about the credibility of elections, and if all the contestants ere to be assured that the elections are credible and truly reflect the will of the people, they will have fewer incentives to challenge results at the election tribunals.

Challenges

Despite the potential benefits of blockchain technology, there are also some challenges and limitations to consider. One major challenge is the need for strong institutional support and political will. For blockchain to be effective, it must be integrated into the existing electoral infrastructure and processes, which requires the support of governments and election authorities. Politicians may not always be eager to adopt new technologies by electoral management boards, especially when this does not serve their best interests. For example, in Nigeria, when the BVAS was introduced in 2022, several politicians voiced their opposition (see Ajayi, 2022; Oloja, 2022).

There are also concerns about the scalability and sustainability of blockchain systems, and the potential for their misuse. Additionally, there are policy considerations around privacy, cybersecurity, and the regulation of blockchain-based systems. This could be a particular challenge in African countries, where infrastructure and technological capabilities may be limited. Additionally, there are concerns about the sustainability of blockchain systems, as the network of nodes require a lot of energy to maintain.

Another challenge is the need for technical expertise and infrastructure. Blockchain technology can be complex, and requires specialised skills and knowledge to implement and manage. Moreover, it requires robust digital infrastructure, including reliable internet connectivity and secure servers, to support the transmission and storage of data.

Because the technology is decentralised and largely unregulated, another challenge is the potential for the misuse of blockchain technology in the electoral process. Malicious actors could exploit it to manipulate the voting data or disrupt the network, and this could undermine the integrity of the electoral process and compromise the trust of stakeholders.

Given that some 38 per cent of Nigerians are illiterate (Onyedinefu, 2022), the apparent complexity of the process and issues of internet connectivity poses challenges of accessibility.

Despite these challenges, blockchain could improve the integrity and efficiency of the electoral process. It could help prevent electoral fraud and increase public trust in elections by providing a secure and transparent way to conduct elections. As such, it represents a promising technology for enhancing electoral integrity in Nigeria and delivering free, fair and credible elections.

Recommendations

To address these challenges and ensure the effective use of blockchain technology in preventing electoral fraud in Nigeria, the following steps are recommended:

• Conduct research and pilot projects to better understand the use of blockchain technology in electoral processes.
• Develop clear and consistent regulations around the use of blockchain technology, including measures to protect privacy and prevent misuse.
• Invest in infrastructure and capacity-building to support the implementation of blockchain-based systems for voting.
• Explore the use of cell phone messages to facilitate the process to cater for places with low or zero internet connectivity.
• Engage with stakeholders, including the public, election officials, and other government agencies to ensure that blockchain technology is developed and used in a transparent, accountable way that will benefit the Nigerian electorate.

Conclusion

Blockchain technology has the potential to reduce or even eliminate electoral fraud. Because of its decentralised and transparent nature, blockchain can provide a secure and tamper-proof platform for storing and verifying voter information and voting results. Additionally, using smart contracts can automate the verification and tallying process, reducing the potential for human error or manipulation. While there are challenges and risks associated with this approach, careful planning and implementation can help overcome these challenges and ensure that blockchain technology is used effectively in the electoral process. Blockchain can help to ensure that every vote by a Nigerian citizen is counted accurately, and therefore that the will of the people is accurately reflected in the results, thereby helping to consolidate democracy in Nigeria, and improve democratic governance.

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