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Electronic Elections in Nigeria: A Necessity

Promise Aaron[1]
LLB, BL, LLM, PhD candidate,
Lecturer, School of Law and Security Studies,
Babcock University,
aaronp@babcock.edu.ng

Toluwalase Toyosi Ajibade[2]

LLB, BL, LLM, PhD, ACIArb (UK),
Lecturer, School of Law and Security Studies,
Babcock University

Josephine Adejoke Adebayo[3]
LLB, BL, LLM, ACIArb (UK),
Lecturer, School of Law and Security Studies,
Babcock University,
adebayoj@babcock.edu.ng

Damilola Hephzibah Abidoye[4]
LLB, BL, LLM, Lecturer,
School of Law and Security Studies,
Babcock University,
abidoyed@babcock.edu.ng

Miller Nzenwata[5]
LLB, BL, Assistant Lecturer,
School of Law and Security Studies,
Babcock University,

Abstract

This paper provides a brief overview of the electoral process in Nigeria, including the legal framework that governs the electoral process. It then examines the benefits of electronic elections, including enhanced transparency, increased voter participation, time and resource savings, improved accessibility, and accuracy. The paper explores the challenges associated with the implementation of electronic elections in Nigeria and solutions were proffer.

The adopted doctrinal, historiographical and comparative approach. The paper suggests that Nigeria can learn from the experiences of other countries that have successfully implemented electronic elections, including Estonia, Brazil, and India. Furthermore, the paper argues that the benefits of electronic elections far outweigh the challenges, and that electronic elections are a necessity for Nigeria to promote democratic governance, accountability, and socio-economic development.

The paper concluded that electronic elections are a necessity for Nigeria. The legal framework that governs the electoral process in Nigeria should amended to include full implementation of electronic elections for secure, accurate, and verifiable electoral systems. Also, various challenges hindering the implementation of electronic elections in Nigeria should be tackled. Therefore, it is crucial that Nigeria explore the use of electronic elections to promote

democratic governance, accountability, and socio-economic development.

Keywords: Electronic elections, EVM, Technology, INEC, BVAS

Background

Technology has reshaped the activities of man. New approaches are being explored for improving life. Technology has impacted rapidly all facets of human existence, from health to agriculture to power, and other critical aspects of human existence have witnessed the impact of technology, including the manner in which humans elect their representatives into government. Democratic societies are built on the principles of elections and the opinions of citizens expressed through the ballot.[1] In order to reduce "physical baggage," electoral bodies around the world are coming up with innovative means to manage and improve the quality of the electoral process and endear citizens to the outcome of the electoral process. Human elements are substituted for machines for efficiency and accuracy. The use of ballot papers and polling booths in the electoral process is jettisoned to be replaced by an electronic medium.[2]

Electronic elections refer to the use of technology to carry out all the processes involved in voting, from voter registration to vote counting.[3] Thus, electronic elections is the involvement of Information and Communication Technology in the form of computer-mediated voting in which voters make their selections with the aid of a computer, where the recording, casting or counting of votes in political elections and referendums. It is the movement from the use of ballot papers and manual counting, countries have moved to adopt electronic systems that facilitate the process of voting.[4]

There are varieties of elections voting systems which can be categorized into three main types: optical scanning, touch screen, and internet voting.

i. Optical scanning systems involve the use of paper ballots, which are marked by voters using a pen or pencil. After voting, the ballot is scanned using an optical

[1]Toba Paul Ayeni and Adebimpe Omolayo Esan, "The Impact of ICT in the Conduct of Elections in Nigeria" (2018) 06 American Journal of Computer Science and Information Technology <http://dx.doi.org/10.21767/2349-3917.100014>. accessed March 6, 2023

[2] Ayo Charles, Oni Aderonke and Gberevbie "Challenges and Prospects of e-Elections in Nigeria" In European Conference on Digital Government Daniel, *93* (Academic Conferences International Limited 2014).

[3] Mbanefo Samson O., & Duruji Moses M, 'E-Voting and Democratic Consolidation in Nigeria: Lessons from the 2019 General Elections' (2020) African Journal of Political Science and International Relations, 14(1), 1-12

[4] Asiimwe, Evarist N., & Ruhinda Maurice J, 'Towards Electronic Voting in Africa: A Review of the Literature' (2020) Journal of Information Technology Impact, 10(1), 37-52.

scanner, which reads and records the vote. This system is widely used in the United States and other countries that use paper ballots.[5]

ii. Touch screen systems involve the use of electronic screens, which are used to mark votes. Voters select their preferred candidates by touching the screen. This system is commonly used in countries such as Brazil, India, and Venezuela.[6]

iii. Internet voting involves the use of online platforms to cast votes. Voters can access the platform using a computer or mobile device, and cast their votes remotely. This system is relatively new and is currently being tested in countries such as Estonia and Switzerland.[7]

History of Electronic Voting

Electronic voting has a rich history that dates back to the early 20th century. One of the earliest recorded instances of electronic voting was in the United States during the 1892 presidential elections, where an electrical device was used to register votes. However, it was not until the 1960s that electronic voting started gaining popularity, with the advent of the first computerized voting machines.[8] These machines used punch cards to record votes, which were then counted electronically. Since then, various types of electronic voting systems have been developed, including optical scanning, touch screen, and internet voting.

In Nigeria, electronic voting was first introduced in 2011, when the Independent National Electoral Commission (INEC) conducted a pilot project in the Federal Capital Territory. The project was deemed a success, and electronic voting was subsequently adopted for the 2015 general elections.[9] As a precursor to the 2015 general elections, the Electoral Act was amended empowering INEC deployed a card reader system, which was a form of electronic voting. The card reader system was used to authenticate voters and prevent multiple voting. The system was largely successful, although there were some reports of malfunctioning card readers and

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[5]Ted Selker, 'Old Voting Technologies: Problems and Improvements' (2015) <https://static.scientificamerican.com/sciam/assets/media/pdf/selker.pdf> accessed 28 May 2021.

[6] P Daniel, K Rajasekhar and T Phani Siva Sankar, 'Touch Screen Based Electronic Voting System' (2012) <https://www.ijert.org/research/touch-screen-based-electronic-voting-system-IJERTV1IS7371.pdf> accessed 22 March 2023.

[7]Charles Ayo, 'E-Voting Implementation in Nigeria: The Success Factors' (2012) <http://eprints.covenantuniversity.edu.ng/873/1/E-Voting%20Implementation%20In%20Nigeria.pdf> accessed 22 March 2023.

[8] Lichtenstein, Sarah & Verhulst, Stefaan, 'Electoral integrity in the age of digital democracy' (Ashgate Publishing, Ltd. 2015)

[9] Okwori, Emmanuel A., & Adejo, Egbunu P, 'Electronic voting system and electoral democracy in Nigeria' (2015) International Journal of Humanities and Social Science Invention, 4(5), 34-39.

other technical challenges.[10] The card reader machine was further used in the 2019 general elections.

The first deployment of the full component of electronic voting machines was in Kaduna State, a sub unit of the Nigerian Federation. The Kaduna State Electoral Law was amended in 2018 empowering the Kaduna State Independent Election Commission (KAD-SIECOM) to make use of electronic voting machines for the conduct of the Local Government Council elections in the 23 Local Government Council in Kaduna State.[11]

In preparation to the 2023 general elections, the Electoral Act 2022 was passed into law, paving the way for the Independent National Electoral Commission for the deployment of digital technology in the management of election system in Nigeria.[12] INEC introduced the Bimodal Voter Accreditation System (BVAS) and the Election Result Viewing Portal (IReV) for the conduct of the elections. The BVAS device is for the identification and accreditation of the voters' fingerprints and facial recognition before voting, while the IReV is an online portal for the uploading and transmission of polling units results directly from the various polling units across the federation.[13]

Although some detractors claim that the technology is susceptible to hacking and manipulation, thereby corrupting the entire electoral system,[14] and may not be appropriate for Nigeria's diverse and frequently rural communities. Others have expressed doubts regarding the expense and viability of deploying electronic voting on a nationwide level, particularly in light of Nigeria's limited infrastructure and resources. Notwithstanding these challenges, the Nigerian government and INEC have continued to push for the expansion of electronic voting, citing the need for greater transparency, efficiency, and accuracy in the electoral process.

Benefits of Electronic Voting

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[10] Nwosu, Ihuoma E., & Charles-Ogan, Gloria, 'The deployment of technology in the Nigerian electoral process: A review of the 2015 general elections (2016) Nigerian Journal of Technological Research, 11(1), 1-11.

[11] EMPTECH, 'Nigeria's First Ever Electronic Voting Election Introduced in Kaduna State - Case Studies' (*www.emperortech.com*2018) <https://www.emperortech.com/case-studies/Electronic-Voting/Nigeria%E2%80%99s-first-ever-Electronic-Voting-Election-introduced-in-Kaduna-State.html> accessed 23 March 2023.

[12] Sambo, Zeenat O, 'Technology, E-Voting and Credible Elections in Nigeria' (*Premium Times Nigeria*29 April 2022) <https://www.premiumtimesng.com/opinion/526697-technology-e-voting-and-credible-elections-ine-nigeria-by-zeenat-o-sambo.html>.

[13] The Guardian Editorial Board, 'BVAS, INEC and Electoral Integrity' (*The Guardian Nigeria News - Nigeria and World News*24 November 2022) <https://guardian.ng/opinion/bvas-inec-and-electoral-integrity/> accessed 23 March 2023.

[14] Nic Cheeseman, Gabrielle Lynch and Justin Willis, 'Digital Dilemmas: The Unintended Consequences of Election Technology' (2018) 25 Democratization 1397.

In spite of challenges of electronic elections in Nigeria, there are numerous benefits over traditional voting systems. One of the main advantages is that it facilitates the process of voting, making it faster, more efficient, and more accurate. Electronic voting systems can process a large number of votes in a short time, reducing the time taken to count votes. This helps to reduce instances of election fraud and errors, as the system is more accurate than manual counting. Additionally, electronic voting systems can help to reduce the cost of elections, as they require fewer resources than traditional voting systems.

Legal Framework for the conduct of Election in Nigeria

Since the return of Constitutional democracy in 1999, the electoral framework for the conduct of elections in Nigeria are as follows: Electoral Act, 2001, Electoral Act, 2002, Electoral Act, 2006, Electoral Act, 2010 and the Electoral Act, 2020. The Electoral Act, 2022 is the extent electoral framework, repealing the Electoral Act, 2010, which regulated the conduct of Federal, State and Area Council elections and for related matters. The Constitution of the Federal Republic of Nigeria (1999 as amended)[15] and the Electoral Act, 2020, established a body corporate, the Independent National Electoral Commission (INEC).[16] The functions of INEC is to conduct voter and civil education, promote knowledge of sound democratic election processes and conduct any referendum required to be conducted pursuant to the provision of the 1999 Constitution or any other law or Act of the National Assembly.[17] The Electoral Act, 2022 (as amended) and the Independent National Electoral Commission Regulations and Guidelines for the conduct of Elections[18] guides the agency in its functions and conduct of elections in to various elective position in Nigeria.

Voting under the Electoral Act, 2020 (as amended), is manual by the issuance of ballot papers to eligible voters having been accredited by the Presiding Officer at the various voting point in the constituency where the name of the eligible voter resides. The Electoral Act, 2020 did not make provision for the use of Electronic voting machine.[19] Voting is by open secret ballot.[20] The Presiding Officer being satisfied that the name of the voter is on the register issue the ballot papers to the eligible voter.[21] A person intending to vote shall be verified as the person on the Register of Voters by the use of the Smart Card Reader (SCR) or any other technological device prescribed

[15] Constitution of the Federal Republic of Nigeria 1999 (as amended), s 153.
[16] Electoral Act, 2010 (as amended), s 1.
[17] ibid s 2.
[18] The extent Regulations and Guidelines for the conduct of Elections is the 12th of January 2019 which supersedes all other Regulations and/or Guidelines on the conduct of Elections issued by the Commission which remains in force until the replacement by new regulations or amendment.
[19] Electoral Act, s 49.
[20] Ibid, s 50.
[21] ibid, s 50 (3)

by INEC for the purpose accreditation.[22] The accreditation process comprises of the reading of the Permanent Voter's Card (PVC) and authentication of voter's fingerprint using the SCR.[23]

From the above, it is conclusive to state that by the provisions of the Electoral Act and the Regulations and Guidelines for Election 2019 accreditation of voters is done through verification of the voter by checking the Register of Voters and the reading of the Permanent Voter's Card (PVC) with the Smart Card Reader (SCR). Upon satisfaction that the Voter is on the Register and Verification of the Permanent Voter's Card, the Presiding Officer issue ballot papers to the prospective Voter who then voting in an open secret ballot in the public view[24]. Thus, Electronic Voting is alien to the Nigerian electoral space. Also collations and transmission of election results by the provisions of the Electoral Act is to done manually from the polling units to National collation center.[25]

Importance of elections in Nigeria

Elections are a critical part of democratic governance, and they provide citizens with the opportunity to choose their leaders and hold them accountable. Nigeria, Africa's most populous country, is no exception to the importance of elections. Elections are an essential part of Nigeria's political system and play a significant role in determining the country's future direction.[26]

i. Democratic Governance

One of the most important reasons why elections are essential in Nigeria is that they promote democratic governance. Elections provide an avenue for citizens to participate in the governance of their country by choosing their leaders through free and fair processes. Through the power of their vote, citizens have the ability to hold their leaders accountable for their actions and decisions.[27] Moreover, elections provide a platform for a peaceful transition of power, which is essential for democratic governance. In Nigeria's history, there have been instances of military coups and authoritarian rule that have undermined democratic governance. However, since the

[22] Ibid, s 47 (2)
[23] Regulation 10 (a) and (d) Regulation and Guidelines for the conduct of Elections, 2019.
[24] Electoral Act, s 50 (2) & 62
[25] Sections 63, 65, 73 and 74, Electoral Act, (as amended)
[26] Asaju, Kabiru, "Democracy and Electioneering in Nigeria: The 2019 General Election." In The Palgrave Handbook of Democracy in Africa (Palgrave Macmillan, 2021) pp. 477-495
[27] Nwokolo, Ezech. N., & Onu, Peter. N 'Elections and Democratic Governance in Nigeria: The Journey So Far' (2020) International Journal of Innovative Research and Advanced Studies, 7(7), 27-35.

return to civilian rule in 1999, elections have been a crucial tool in consolidating democratic governance in Nigeria.[28]

ii. Accountability

Elections provide citizens with the opportunity to hold their leaders accountable for their actions and decisions. Elected officials are required to deliver on their campaign promises and work towards the betterment of the people they represent. If they fail to do so, citizens have the power to vote them out of office during the next election cycle.[29] Moreover, elections provide an avenue for citizens to voice their concerns and grievances. By participating in the electoral process, citizens have the opportunity to express their views on issues affecting their lives, such as access to basic services, security, and economic opportunities. Elected officials are then obligated to take these concerns seriously and address them in their policies and programs.[30]

iii. Socio-Economic Development

Elections are also important in promoting socio-economic development in Nigeria. Elected officials have the power to make decisions that affect the lives of citizens, including decisions on economic policies, infrastructure development, and social programs. By electing leaders who have the best interests of the people at heart, citizens can ensure that their needs and priorities are reflected in government policies and programs.[31]

Moreover, elections provide an avenue for marginalized groups to participate in the political process and advocate for their rights. Women, youth, and minority groups have historically been underrepresented in Nigerian politics, but elections provide them with the opportunity to participate and make their voices heard. By electing leaders who are committed to promoting inclusive and equitable development, these groups can be assured that their concerns will be addressed.[32]

Need for Electronic Elections in Nigeria

Problems with traditional elections in Nigeria

Elections are a vital part of democracy, and they play a crucial role in ensuring that the government is accountable to the people. In Nigeria, traditional elections have

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[28] (n 15)

[29] Farrell, David M, 'Democracy and elections' (2004) Political Studies Review, 2(2), 135-148.<doi: 10.1111/j.1478-9299.2004.00010.x> accessed on 23 March 23, 2023

[30] Somin, Ilya, 'Democracy and political ignorance: Why smaller government is smarter' (Stanford University Press, 2013)

[31] Ojo, Emmanuel O., & Oyediran, Olawale G 'Political decentralization, elections and poverty alleviation in Nigeria' (2012) African Development Review, 24(3), 225-236 <doi: 10.1111/j.1467-8268.2012.00318.x> accessed March 23, 2023

[32] Omotoso, Kehinde 'The role of civil society in Nigeria's democratization process' (2011) Journal of Sustainable Development in Africa, 13(4), 131-143

been used to elect leaders for many years. However, the electoral process has been marred by several challenges, which have contributed to electoral malpractices, voter apathy, and a lack of confidence in the electoral process.[33]

a. Electoral Violence

Electoral violence involves any form of violence or threat of violence during an election campaign, on election day, or after the announcement of results. Electoral violence in Nigeria has been fueled by a lack of political will to address the underlying causes of violence, such as poverty, unemployment, and inequality.[34] Political actors have also been known to use violence as a means of intimidating opponents, manipulating election results, and gaining political power. This has led to a culture of impunity, where perpetrators of electoral violence are rarely held accountable for their actions.[35]

b. Voter Intimidation

Voter intimidation involves any attempt to prevent voters from exercising their right to vote freely and fairly. This can include physical intimidation, threats of violence, and the use of armed gangs to intimidate voters.[36] Voter intimidation is often used as a means of suppressing the votes of opposition supporters, and it has been a common feature of elections in Nigeria. This has contributed to voter apathy and a lack of confidence in the electoral process, as many citizens feel that their vote does not count.[37]

c. Electoral Fraud

Electoral fraud involves any attempt to manipulate the electoral process to influence the outcome of an election. This can include ballot stuffing, multiple voting, vote buying, and the manipulation of election results.[38] Electoral fraud is often perpetrated by political actors who seek to gain political power by any means necessary. The lack of transparency and accountability in the electoral process has made it easy for

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[33] Onapajo, Hakeem, & Uzochukwu, Eammneul C 'The Nigerian 2015 General Elections: The 4th Republic's Most Competitive and Peaceful Electoral Process?' (2018) Africa Development, 43(4), 97-114.
[34] Obi, Chuka, Omenma, Ifeanyi E., & Abubakar, Aliyu 'Electoral violence and security management in Nigeria: Emerging trends, challenges and prospects' (2021) Journal of Policing, Intelligence and Counter Terrorism, 16(2), 250-262.
[35] Oluwasegun, Adeyinka F., 'Electoral Violence and the 2019 General Elections in Nigeria: A Critical Analysis' (2020) Journal of Pan African Studies, 13(2), 173-189
[36] Gbemre, Christopher A., & Ite, Ufuoma E., 'Election violence, security agencies and the Nigerian experience' (2018) Journal of Social Sciences and Humanities, 4(4), 30-40.
[37] Ite, Uche E., & Orji, Chibuzo A., 'Voter Intimidation and Electoral Violence in Nigeria: A Study of the 2019 General Elections. Journal of Politics and Society, 1(1), 27-44.
[38] Hassan, Mohammed M., & Yikpotimi, Ibiye A., 'Mitigating electoral fraud through technology adoption in Nigeria' (2019) Journal of Internet and Information Systems, 10(1), 15-27.

political actors to manipulate election results, leading to a lack of confidence in the electoral process among citizens.[39]

d. Lack of Transparency and Accountability

The electoral process in Nigeria has often been shrouded in secrecy, with limited access to information and a lack of transparency in the conduct of elections. This has made it difficult for citizens to hold political actors accountable for their actions, leading to a lack of confidence in the electoral process. The absence of independent and impartial electoral institutions has also contributed to a lack of accountability in the electoral process.[40]

2.0.1 Advantages of electronic elections in Nigeria

Electronic elections have become increasingly popular in many countries as a means of conducting transparent, efficient, and credible elections. Nigeria is one of the countries that attempting to adopted electronic voting as a means of improving its electoral process. The efforts towards the adoption of electronic voting in Nigeria has been met with both positive and negative reactions. However, there are numerous advantages associated with electronic elections in Nigeria.[41]

a. Enhances transparency and credibility

The use of electronic systems in voter registration, voting, and vote counting ensures that the process is efficient, reliable, and free of human errors. The electronic systems provide an accurate and verifiable record of votes cast, thereby reducing the likelihood of fraud and manipulation. This increases the confidence of voters in the electoral process and enhances the credibility of election outcomes.[42]

b. Increases voter participation

The traditional voting process in Nigeria involves long queues, which often discourage voters from participating in the electoral process. Electronic voting systems, on the other hand, offer a more convenient and efficient way of casting votes, thereby

[39] Okolie-Osemene, Omonigho, 'The State of Electoral Fraud in Nigeria: The Role of Civil Society Organizations in Combating Electoral Violence' In Kazeem O. Kuforiji & Comfort U. Agbese (Eds.), *Social and Economic Issues in Nigeria* (Springer, 2018) 233

[40] Oladele, Raphael T, 'Electoral transparency, credibility and good governance in Nigeria: An assessment of the 2015 presidential election' (2019) Journal of Research in Humanities and Social Science, 7(5), 30-39.

[41] Idris, Alhaji. S., 'Exploring the Viability of Electronic Voting Systems in Nigeria: An Empirical Study of Nigerian Youths' Perception' (2020) Journal of Business and Management, 22(4), 61-72.

[42] Onwubiko, Chidiebere E., Chiemeke, Prosper C., & Okereke, Obinna A., 'The Prospects and Challenges of Electronic Voting in Nigeria's Electoral Process' (2019) International Journal of Innovative Science and Research Technology, 4(7), 63-74.

encouraging more voters to participate in the electoral process. This leads to a more representative and legitimate electoral outcome.[43]

c. Saves time and resources

Electronic voting saves time and resources compared to traditional voting systems. The use of electronic systems in voter registration, voting, and vote counting reduces the need for manual labor, thereby reducing the time and cost associated with the electoral process. Electronic systems also reduce the likelihood of errors, thereby reducing the need for costly re-counts or re-runs.[44]

d. Improves accessibility

Electronic voting systems can be designed to cater to the needs of different categories of voters, including the elderly, the disabled, and illiterate voters. For instance, electronic systems can be equipped with audio and visual aids to guide illiterate voters through the voting process. This makes the voting process more accessible to all voters, thereby promoting inclusivity and enhancing the legitimacy of the electoral outcome.[45]

e. Improves accuracy

Election results are highly accurate when using electronic voting technologies. The possibility of errors connected with manual vote counting is decreased when electronic techniques are used. Real-time vote counting is another feature offered by electronic systems, allowing for the prompt release of election results. This encourages accountability and transparency in the electoral process, which raises the credibility of the outcome.[46]

Some countries with successful electronic elections

The use of electronic voting technologies by numerous nations to increase the effectiveness and legitimacy of their electoral processes has gained momentum on a worldwide scale. Electronic voting methods improve transparency and security, allow for faster and more accurate vote counting, and do away with the inaccuracies that come with human counting.[47]

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[43] (n 30)

[44] Oladosu, Jelilat. B., & Samuel, Adeyemi O., 'Electronic Voting System and Democratic Stability in Nigeria' (2021) International Journal of Recent Technology and Engineering (IJRTE), 10(5), 3575-3579.

[45] Bello, Tijani & Ayegboyin, Damilola T., 'Electronic voting and electoral integrity in Nigeria' (2021) Journal of Political Science and Leadership Research, 2(2), 72-82.

[46] Oke, Adeola O & Adeniran, Joshua O., 'Electronic Voting System and Electoral Credibility in Nigeria: An Assessment of the 2019 General Election' (2020) Journal of Politics and Law, 13(3), 137-147.

[47] Suri, Shivali & Hall, Timothy E., 'Emerging trends in election technology'(2017) Journal of Electronic Resources in Medical Libraries, 14(2), 47-53.

1. Estonia

Estonia is widely recognized as a leader in electronic voting systems. The country introduced e-voting in 2005, and since then, it has conducted six parliamentary elections and several local elections using this technology. Estonia has a secure and reliable electronic voting system, which allows voters to cast their ballots remotely over the internet. The country's legal framework on electronic voting ensures that the system is secure, transparent, and verifiable.[48]

E-voting has been made easier by Estonia's enactment of an extensive legal and regulatory framework. Since its adoption in 1999, the Identity Documents Act has included specific provisions for digital identity cards, including mobile ID. The Digital Signatures Act, which governs the use and supply of certification and time-stamping services, was adopted in 2000. The main state database holding data on all Estonian citizens and residents, the Population Register, is governed by the Population Register Act and the Personal Data Protection Act.[49]

E-voting system in Estonia is based on public-key cryptography, and it allows voters to cast their votes securely and anonymously from anywhere in the world.

2. Brazil

Brazil was one of the first countries to adopt electronic voting systems in 1996, and since then, it has held several successful electronic elections, including presidential elections. Brazil's electronic voting system is one of the most advanced in the world, featuring biometric identification and electronic vote counting. The system has been lauded for its transparency and efficiency, and it has significantly reduced the incidence of electoral fraud.[50]

The introduction of E-voting in Brazil was motivated by economic and fraud-prevention factors. A multi-year approach for the gradual introduction of e-voting was adopted and included the following steps:

a) Voter and civic information including usability and feasibility studies starting in 1986
b) Capacity building within the Electoral Management Body (EMB), and digitalization of the result aggregation

[48] Põder, Kristjan & Merilo, Erkki 'Legal Framework for E-Voting in Estonia' (2020) European Journal of Law and Technology, 11(1), 1-19.
[49] Piret, Ehin, Mihkel., Solvak., Jan Willemson & Priit Vinkel 'Internet Voting in Estonia 2005–2019: Evidence from Eleven Elections' (2022) 39 Government Information Quarterly 101718 <https://www.sciencedirect.com/science/article/pii/S0740624X2200051X> accessed 26 March 2023.
[50] Selbach-S Ilha, Guilherme & Vieira, Jorge 'The Brazilian electronic voting system: legal framework, technical features, and public acceptance' (2018) Journal of Information Technology & Politics, 15(1), 54-68.

c) Development of hard- and software, involving local technical expertise
d) Testing of equipment in the Brazilian environment
e) EMB's final decision on the type of machine fitting the Brazilian context best
f) Quality control and testing in various environments
g) Authorization of e-voting in 1996 local and municipal elections
h) Post-election review and subsequent quality overhaul
i) Full e-voting roll-out in the 2002 general elections

A hacking competition was organized in 2009 to create additional confidence in the technology. Over the years, citizens and stakeholders gained enough trust in the system for the paper trail that was initially included to be deemed redundant and scrapped after technical problems associated with the printers. While systems without paper trails are often disputed, the Brazilian case exemplifies what can be achieved with successful trust, capacity and consensus building over many years and several electoral cycles.

3. India

India is another country that has adopted electronic voting systems, and it has been using them since 1982. The system features a touch-screen interface, and it has been used in several national and state-level elections. The Indian electronic voting system has been lauded for its reliability, transparency, and security.

Two distinct features of the Indian Voting Machines are the low price, significantly lower than that of most other systems, and a relatively simple technology. The Indian system provides no paper trail, a fact that is widely accepted, given the absolute trust institutionally granted to the EMB. However, the simplicity of the system created controversy around alleged security problems in 2010 and led to the Indian EMB considering the introduction of paper trails in 2011. The Supreme Court of India in 2011 directed the Election Commission to include a paper trail as well to help confirm the reliable operation of Electronic Voting Machines (EVM). The Election Commission developed EVMs with Voter-Verified Paper Audit Trail (VVPAT) system between 2012 and 2013. The system was tried on a pilot basis in the 2014 Indian general election. EVMs and accompanying VVPAT are now used in every assembly and general election in India.

Challenges of Implementing Electronic Elections in Nigeria

Technical challenges

a. Infrastructure: The country's internet connectivity is poor, and the power supply is unreliable. These two factors are essential for the successful implementation of electronic voting systems. Without reliable power supply

and internet connectivity, electronic voting systems may not function effectively.[51]

b. Cybersecurity: Electronic voting systems are vulnerable to cyber-attacks, which could compromise the integrity of the election. The Nigerian government needs to invest in cybersecurity measures that will protect the electronic voting systems from cyber-attacks.[52]

c. Funding: Implementing electronic voting systems requires a significant financial investment. The Nigerian government needs to provide adequate funding to ensure that the electronic voting systems are secure, reliable, and accessible.

d. Voter Education: Another technical challenge of implementing electronic voting in Nigeria is the need for voter education. Many Nigerians may not be familiar with the technology used in electronic voting systems. Voter education programs should be put in place to ensure that voters are adequately informed on how to use the electronic voting systems.[53]

e. Technical Expertise: The implementation of electronic voting systems requires technical expertise. Nigeria may not have the necessary technical expertise to implement electronic voting systems. Therefore, the government needs to invest in the training and development of technical experts who will oversee the implementation of electronic voting systems.

Funding challenges

The implementation of electronic voting systems in Nigeria requires significant financial investment. The high costs of acquiring and maintaining electronic voting machines, as well as the necessary infrastructure and software, are significant challenges that must be addressed.[54]

One of the main funding challenges of implementing electronic elections in Nigeria is the high cost of acquiring and maintaining electronic voting machines. Electronic voting machines are relatively expensive compared to traditional paper-based voting systems. The cost of acquiring electronic voting machines can be prohibitive, especially for developing countries like Nigeria. In addition, the maintenance and

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[51] Adigun, Muyiwa O., Ojokoh, Amos B., & Agbele, Kayode K, 'E-voting implementation challenges in Nigeria: An assessment of INEC's preparedness for the 2015 general elections' (2014) International Journal of Computer Applications, 91(4), 1-6 <doi: 10.5120/15944-4503> accessed 25 March 2023.

[52] (n 49)

[53] Adepoju, Adewale O., & Joseph Adedayo F, 'The prospects and challenges of electronic voting in Nigeria: a critical analysis' (2019) Journal of Political Sciences & Public Affairs, 7(3), 424< doi: 10.4172/2332-0761.1000424> accessed March 25, 2023

[54] Oguntimehin, Fatai, & Adegoke, Femi, 'The feasibility of electronic voting system in Nigeria' (2016) International Journal of Scientific and Research Publications, 6(4), 493-500.

upgrade costs of electronic voting machines can also be high, making it challenging for developing countries to adopt electronic voting systems.[55]

The cost of infrastructure development is another challenge inhibiting the implementation of electronic elections in Nigeria. Electronic voting requires adequate infrastructure, including power supply, internet connectivity, and data storage facilities. Providing such infrastructure is a significant financial investment, especially in rural areas where infrastructure is lacking.[56] Furthermore, the training of election officials and voters on the use of electronic voting machines is an essential aspect of electronic elections. The cost of training election officials and voters on the use of electronic voting machines can also be a significant challenge. The training of election officials and voters requires significant resources and time, making it challenging for developing countries like Nigeria to adopt electronic voting systems.[57]

The cost of cybersecurity presents another financial obstacle to holding computerized polls in Nigeria. Electronic voting machines are susceptible to malware, phishing, and other cybersecurity assaults. Significant investment in cybersecurity measures, including software upgrades, firewalls, and intrusion detection systems, is necessary to ensure the security of electronic voting systems.[58] The high cost of electronic voting systems and the necessary infrastructure, training, and cybersecurity measures can be a significant challenge for developing countries like Nigeria. Without adequate funding, the implementation of electronic voting systems in Nigeria may not be feasible.[59]

Security challenges

The use of electronic voting systems in Nigeria has been touted as a means to address some of the challenges associated with traditional paper-based voting. Electronic voting systems have the potential to increase the speed, accuracy, and transparency of the electoral process, as well as improve voter turnout. However, the implementation of electronic voting systems in Nigeria is not without its challenges, particularly in the area of security.[60]

When putting electronic voting systems in place, security is a key factor. Electronic voting system security refers to the safeguards put in place to guard against illegal access, tampering, or manipulation of the system. Election results can be

[55] ibid
[56] (n 51)
[57] Ali, Abubarka. M, 'E-voting adoption in Nigeria: prospects and challenges' (2021) Journal of Cybersecurity Research, 6(1), 1-11 <doi: 10.22042/isecure.2021.267305.618> accessed March 25, 2023
[58] ibid
[59] (n 51)
[60] (n 48)

manipulated, voter data can be compromised, and public trust in the electoral process can all suffer as a result of security flaws in electronic voting systems.[61]

The potential for cyberattacks is one of the main security issues with conducting electronic polls in Nigeria. Hacking, phishing, and virus attacks are just a few examples of the various ways that cyberattacks can appear. Anyone, including individuals, criminal groups, and even foreign governments, is capable of carrying out these attacks. Cyberattacks have the potential to taint the electoral process's fairness, erode the public's confidence in it, and give rise to claims of electoral fraud.[62]

The possibility of insider attacks is another security challenge for electronic elections in Nigeria. Insider threats describe the potential for people who have been granted permission to use the electronic voting system to misuse their rights in order to benefit themselves. Election officials, technical workers, even political parties or candidates themselves, might pose an insider threat. Insider dangers can jeopardize the voting system's security and result in the tampering of election results.[63]

The potential for technological issues during Nigeria's computerized polls is a third security risk. Electronic voting systems are sophisticated technological devices that need regular upkeep and assistance. Hardware malfunctions, software bugs, and connectivity problems are examples of technical problems. Technical issues can cause delays, confusion, and claims of election fraud while jeopardizing the accuracy and integrity of the voting process.[64]

Solutions to Challenges

1. Collaboration with technology companies

Collaboration with technology companies offers several benefits that can address the challenges of electronic elections in Nigeria. Firstly, technology companies can provide technical expertise and resources to support the deployment and maintenance of electronic voting systems in Nigeria. This will help address the technical challenges associated with electronic voting, such as the lack of adequate infrastructure and skilled personnel.[65]

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61 (n 54)
62 ibid
63 Onu, Christian C., & Onu, Ifeanyi V, 'Electronic voting and the Nigerian electoral process: Prospects and challenges' (2019) Journal of Research in National Development, 17(1), 319-327 <https://www.ajol.info/index.php/jorind/article/view/189315> accessed March 25, 2023
64 Ezenwoke, Anayo N, 'The feasibility of electronic voting system in Nigeria: A review of its prospects and challenges' (2021) European Journal of Computer Science and Information Technology, 9(1), 9-17 <https://www.researchgate.net/publication/350788085_Feasibility_of_Electronic_Voting_System_in_Nigeria_A_Review_of_its_Prospects_and_Challenges> accessed March 25, 2023
65 (n 61)

Secondly, technology companies can provide alternative sources of funding for the deployment and maintenance of electronic voting systems. This will help address the funding challenges associated with electronic voting in Nigeria. Additionally, technology companies can provide innovative solutions that reduce the cost of electronic voting systems while maintaining their integrity.[66]

Thirdly, technology companies can provide solutions to mitigate the security risks associated with electronic voting. Cybersecurity companies can provide secure electronic voting systems that use encryption and other security measures to protect against cyber threats. Additionally, technology companies can provide real-time monitoring of electronic voting systems to detect and respond to cybersecurity threats.[67]

Moreover, technology companies can collaborate with the Nigerian government to develop customized electronic voting systems that meet the specific needs of the Nigerian electoral process. This will help address the challenges associated with the customization of electronic voting systems to suit local conditions.[68]

2. Increase in government funding

The government has a responsibility to ensure that the electoral process is free, fair, and credible, and this includes providing adequate funding for the process. The government should prioritize the funding of the electoral process, particularly in the allocation of the national budget.[69] In 2019, the budgetary allocation for INEC was N45.5 billion, which was less than the N55 billion allocated in 2018. This lack of adequate funding for the electoral process hampers the efforts to improve the electoral process and implement electronic voting systems.[70]

Furthermore, the government can explore other sources of funding, such as public-private partnerships, foreign aid, and corporate social responsibility. Public-private partnerships can provide resources and expertise that can complement government funding. Foreign aid can also be a significant source of funding, as some international organizations and countries are willing to support the electoral process in developing countries. Corporate social responsibility can also be explored, with private

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[66] Ogunseye, Oluwagbemi O., & Oluwadare, Olumide J, 'Electronic voting system: Challenges and prospects in Nigeria' (2018) Journal of Emerging Trends in Computing and Information Sciences, 9(12), 545-551.

[67] (n 60)

[68] THISDAYLIVE, 'NCS: Collaboration with Stakeholders Will Promote Tech-Based Voting Systems' (*www.thisdaylive.com* 2022) <https://www.thisdaylive.com/index.php/2022/09/29/ncs-collaboration-with-stakeholders-will-promote-tech-based-voting-systems/> accessed 25 March 2023.

[69] Olutayo, Adegbite O., & Akinwale, Oluwakemi P, 'Financing Elections in Nigeria: Prospects and Challenges' (2020) Journal of Law, Policy and Globalization, 97, 126-133.

[70] Okechukwu, Iwuozor A., & Orji, Felicia E, 'An Appraisal of Electronic Voting System as a Panacea for Free and Fair Election in Nigeria' (2020) Global Journal of Political Science and Administration, 8(3), 12-23.

organizations contributing to the funding of the electoral process as part of their corporate social responsibility activities.[71]

Moreover, the government can explore innovative funding models, such as crowdfunding and block chain-based fundraising. Crowdfunding involves raising small amounts of money from a large number of people through online platforms. This model has been successful in raising funds for various social causes and can be adapted to fund the electoral process in Nigeria. Block chain-based fundraising involves the use of block chain technology to create a transparent and secure fundraising platform. This model can provide an avenue for citizens to contribute to the funding of the electoral process while ensuring transparency and accountability.

3. Implementation of security measures

The implementation of electronic elections in Nigeria has been hindered by various security challenges, including cybersecurity threats, physical threats, and insider threats. These security challenges pose a significant threat to the integrity of the electoral process, and it is crucial that measures are put in place to mitigate them.

a. Cybersecurity measures

Cybersecurity threats are one of the most significant security challenges facing electronic elections in Nigeria. These threats include hacking, phishing, malware attacks, and denial-of-service (DoS) attacks. These attacks can compromise the integrity of the electoral process by manipulating election results, stealing voter information, and disrupting the electoral process. To mitigate these threats, Nigeria can implement various cybersecurity measures, including:

i. Network segmentation: This involves separating the electoral network from other networks to prevent unauthorized access to the electoral system.

ii. Encryption: This involves encrypting all data transmitted between devices in the electoral system to prevent interception and manipulation.

iii. Two-factor authentication: This involves requiring users to provide two forms of identification before accessing the electoral system, such as a password and a fingerprint.

iv. Regular system updates: This involves updating the electoral system regularly with the latest security patches and software updates to address vulnerabilities and bugs.

4. Physical security measures

[71] Adeniji, Adeolu A., & Soriyan, Hassan A, 'Electronic Voting System: A Panacea to Electoral Challenges in Nigeria' (2021) Journal of Politics and Society, 1(1), 32-45.

Physical threats are another significant security challenge facing electronic elections in Nigeria. These threats include theft, vandalism, and physical attacks on electoral infrastructure and personnel. To mitigate these threats, Nigeria can implement various physical security measures, including:

i. Restricting access to electoral infrastructure: This involves limiting access to electoral infrastructure to authorized personnel only and implementing physical security measures such as surveillance cameras and access control systems.

ii. Transport security: This involves securing the transportation of electoral materials from the storage facility to the polling station.

iii. Ballot box security: This involves securing the ballot boxes at the polling station and during transportation to the vote counting center.

5. Insider threat mitigation measures

Insider threats are a significant security challenge facing electronic elections in Nigeria. These threats include the manipulation of election results by insiders, such as electoral officials and political party agents. To mitigate these threats, Nigeria can implement various insider threat mitigation measures, including:

i. Background checks: This involves conducting background checks on all electoral officials and political party agents to ensure that they have no criminal history or conflicts of interest.

ii. Training: This involves providing training to electoral officials and political party agents on their roles and responsibilities and the consequences of electoral malpractice.

iii. Monitoring: This involves monitoring the activities of electoral officials and political party agents during the electoral process to detect any suspicious activity.

iv. Audit trails: This involves implementing audit trails in the electoral system to track all changes made to the system and detect any unauthorized access.

Conclusion

Electronic elections are a necessity in Nigeria to ensure credible, transparent, and inclusive democratic governance. The traditional system of manual voting has been marred by various challenges such as voter suppression, electoral fraud, and violence. Electronic elections offer a solution to these challenges by providing a more secure, efficient, and accessible voting system. However, implementing electronic elections in Nigeria has not been without challenges, such as technical, funding, and security challenges. Nonetheless, these challenges can be overcome through collaboration with

technology companies, increased government funding, and implementation of security measures.

Electronic voting has been successfully implemented in various countries, such as Estonia, Brazil, and India, demonstrating the potential for its success in Nigeria. The legal framework governing elections in Nigeria is not developed accommodate electronic elections. Electronic voting in Nigeria has the potential to increase voter participation, reduce electoral fraud, and increase transparency and credibility in the electoral process.

The Nigeria political landscape has the potentials for a successful implementation of electronic elections. However, there are hindrances for the implementation of electronic voting in Nigeria varying from various technical challenges such as inadequate infrastructure, lack of technical expertise, and power supply challenges. To overcome these challenges, Nigeria can collaborate with technology companies to provide the necessary technical support and expertise, and invest in building the necessary infrastructure and power supply.

Another challenge facing electronic voting in Nigeria is inadequate funding. To ensure the successful implementation of electronic voting, the Nigerian government needs to increase its funding for the Independent National Electoral Commission (INEC) to enable it to acquire the necessary technology and infrastructure to support electronic voting. Nigeria can also explore alternative funding models, such as public-private partnerships, to finance the implementation of electronic voting.

The security of electronic voting in Nigeria is also a significant concern. The country is faced with various security challenges such as cybersecurity threats, physical threats, and insider threats. To mitigate these challenges, Nigeria can implement various security measures such as cybersecurity measures, physical security measures, and insider threat mitigation measures. These measures can help ensure that electronic elections are secure, transparent, and credible.

In conclusion, electronic elections are a necessity in Nigeria to promote democratic governance, accountability, and socio-economic development. The implementation of electronic voting systems can be challenging, particularly in developing countries such as Nigeria, but with the right strategies, these challenges can be overcome. Nigeria can learn from successful implementation of electronic voting systems in other countries, and collaborate with technology companies, increase government funding, and implement security measures to ensure the success of electronic voting. Ultimately, electronic voting can help Nigeria achieve free, fair, and credible elections and promote democratic governance, accountability, and socio-economic development.