

Original paper

Digitalization of Election Management System in Nigeria: A Contemporary Appraisal of Independent National Electoral Commission (INEC)

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ABSTRACT: Over time, conducting of free and fair elections in Nigeria has seemed like a mirage, but cutting-edge digital technologies like biometric voter registration, smart card readers, digitized voter cards, optical mark recognition, electronic result transmission, etc., promise an improved election management system as a precondition for following best practices around the world. This paper briefly examines all the components of Nigeria's election administration system in the context of digitization and emerging technology. A qualitative research method was adopted i.e. the authors focused heavily on the use of secondary data but also collected primary data to a small extent to validate the available literature in this regard i.e. 150 questionnaires were filled by voters in selected south-western states of the country. The study recommends that people should be more receptive to new technologies and that the Nigerian government should be more open and adaptive to international best practices in election administration by systematically adopting full digitization and technology in this regard.

Keywords: Democracy, Election, Management, Technology

INTRODUCTION

Nigeria, whose history started at her political independence in 1960 has witnessed many random elections, though, none had been hitch-free, as it is the nature of politics. The conduct of credible elections with sufficient electoral integrity and wider acceptability has been a lingering challenge in the country. Indeed, virtually all elections conducted in Nigeria have been problematic and lacking in electoral integrity due to persistence of election fraud, rigging, manipulation of results, thurgery /electoral violence, etc. which occur at different stages of the electoral process, and each of which was made possible because of the manual conduct of elections in the country. With the looming disillusionment in the polity as 2023 general elections approach, Nigeria needs to replace crude system of election management she is used to with a range of hybrid regimes that accommodate the idealized liberal democracy.

One core area of legitimizing elections is the issue of credibility and fairness, for any democratic election to possess these characteristics, there has to be a standing institution to adjudicate and meddle between or among the competing parties. The prerequisite of representative democracies is a process of elections that is competitive but fair. This is the role of electoral institutions which determine how elections are fought, how the act of voting, generation of results in the election of political representatives and the determination of which political leader (in a presidential system), or party or set of parties (in a parliamentary system), is to form the executive leadership for the next few years (Carter and Farrell, 2009). The importance of electoral umpires is very significant if the tenet of democracy would be upheld whereas their job is very sensitive and evolving in the contemporary time.

A comparative examination of elections across the globe brings to knowledge the overwhelming emerging technologies used to either simplify the electoral process or nullify any form of electoral fraud cum corruption. Diverse innovations in this regards had precipitated developed and even developing countries to digitalize all the paraphernalia of their electoral systems and this, over time, has improved their political culture as well as the citizens' sense of patriotism hence, development. One of such bodies to manage, in a fair manner and maintain sanity in Nigeria's elections, is 'Independent National Electoral Commission' (henceforth- INEC) This is an election management body providing the over-arching structure within which the electoral process occurs, though, there has been a low level of adoption of digitalization in its operations, especially, in 2019 general elections and subsequent minor ones across the polity and this tide is still infinitesimal today. This paper focuses on the core area of democratic regimes i.e elections and most especially, innovative aspects of election management which involves engagement of technologies and digitalization of INEC's equipment and procedures to enhance performance and to make the electoral process to be result-oriented so one can begin to experience fair outcomes in results of elections. To achieve this, the author segmented the paper into seven sections. The first is to explore the significance of the study by looking at why study of this nature aptly captured and reordered the narratives on Nigeria's election procedures. Second is the conceptual framework which addressed the major concepts employed in the paper. These concepts are however essential to understanding major construct of knowledge that the paper stands for. Third is the theory most relevant to election upgrade in a social and complex system like Nigeria. The theory employed by the writer served the role of a mirror to properly view the context of elections as well as its process. Fourth is the review of relevant texts and literature in order to verify and aggregate the thoughts and opinions of other writers on elections and election technologies. The writer then looked at Nigeria's Election Managers and Administrators in order bring to limelight the nexus connecting INEC and other election management bodies in Nigeria. Also, electoral design and management adopted in Nigeria's democratic regime was critically analyzed to unravel the nitty-gritty of operationalization of elections and this led to process of adoption of various shades of election technologies in Nigeria since 2011. The paper therefore supplied succinct recommendations to help other developing nations in digitalizing their elections towards political development.

Imperativeness of the study

"In the buildup to 2019 Nigeria's general elections, Presidential and National Assembly elections were held simultaneously. But there were more votes cast in the

presidential elections than the National Assembly figures. The total number of registered voters announced before the election and the figures announced by the electoral commission during the collation in 30 of the 36 states were inconsistent" (Aiyede, 2019).

Following the painful experiences of irregularities and associated violence in Nigeria's previous elections, particularly the 2019 election, it is critical to implement a variety of election technologies, including biometric voter registration and a result transmission system (RTS) or electronic recapitulation (e-recap). Neo-liberal researchers agree that no matter the level of integrity of the election administrators and that of institutions in any polity, without adoption of voting technology and or digitalization, there cannot be a tolerable level of acceptance in fairness for any election result. With the implementation of technology, complex electoral management and administration processes can be made simpler and easier to organize. Advances in technology can thus speed processes up and reduce the workload of electoral managers. (Pratama and Salabi, 2019). Voting (election) is a cornerstone of electoral democracy and in the 21st century a plethora of voting technologies, from voting machines to results transmission systems have become an inherent part of elections all over the world. Although initially criticized, these technologies have increasingly demonstrated that they can comply with the high standards set by election administrators and other stakeholders. This study is aimed at unraveling the importance of engaging emerging technologies cum digitalization in Nigeria's electoral system. It is also aimed at, having a developing country like Nigeria as the context, x-raying the needed technologies relevant to INEC's operationalization.

Conceptual framework

For the sake of clarity in understanding some concepts, due diligence is done to major concepts in this section. They are as follows;

Election

Elections allow the general public to choose leaders directly or indirectly and express preferred way on how they are governed. Elections represent the highest level of democracy where citizens choose their leaders and representatives to rule them (Shuaibu et al., 2017).

Election management

This is the overall objectives and principles of organizing a state election using those components of a voting system that, control and maintain election databases, performs election and setup functions of personnel, formats and design ballot boxes, acquires and tabulate

results, consolidates the aggregated election results, produce report and maintains its audit trails.

Election management system

This involves the hardware and software applications used to configure, program, and report election results from one or more voting units or centres, including the ballot and the election reporting subsystem. The election management system may provide utilities for other election administration tasks, including maintaining equipment inventories, estimating ballot printing needs, and maintaining information on voter service and polling centers, manpower planning for electioneering administration as well funding of diversified activities towards a successful operation.

Digitization

This is the process of changing from analog to digital form, also known as digital enablement. Said another way, digitization takes an analog process and changes it to a digital form without any different-in-kind changes to the process itself. For instance, INEC's documentation and sensitive materials being transposed digitally without changing their superficial significance is appropriate in this regards.

Digitalization

This deals with information processing, or how digitized data can be used to improve workflows through automating existing processes. Digital transformation is all about leveraging knowledge and integrating it in all business areas to enhance engagement and creating new values (Longe, 2022).

Technology

This is the application of scientific knowledge for practical purposes, especially in industry. It can also be "advances in computer technology" It is the sum of techniques, skills, methods, and processes used in the production of goods or services or in the accomplishment of objectives, such as scientific investigation. Because technology is applicable to a wide range of knowledge, I will focus on voting or election technology and management in this paper. The significance of technology in this context cannot be overstated, since it is a process of applying technical ideas to complex electoral management and administration. Voting exercise can be made simpler and easier to organize through technology. Advances in technology can thus speed processes up and reduce the workload of electoral managers. In many countries, technology is built in accordance with their electoral

needs and seen by the Electoral Management Body (EMB) as necessary for ease of process. Also, it is a means of minimizing the potentials for errors in compilations cum collation of votes cast, or as a tool in election-related problem solving methods. Some of available election technologies are the following: Electronic Voters Register (EVR) used at the inception of electoral process, either wholly or partially in certain electoral stages. Secondly, Continuous Voters Register Locator (CVRL) technology as used during the voting and vote counting at polling units and vote recapitulation stages. Another aspect of election technology is 'E-voting'. This is a process of building a real-time voting portal where eligible voters can vote from home, office etc. regardless of distance and speed which allows for counting of votes alongside other votes cast at physical polling units. (Arulogun, 2019). International IDEA defines e-voting as a system of recording, casting and counting votes in a political vote or election that uses IT and this is Internet voting (also online voting) (International IDEA 2011:p6).

Democracy

There have been many definitions on the concept of democracy. It is a system of government by the whole population or all the eligible members of a state, typically through elected representatives. According to Merriam Webster, dictionary, it is a government in which the supreme power is vested in the people and exercised by them directly or indirectly through a system of representation usually involving periodically held free election. The 16th president of United States, Abraham Lincoln defined democracy as "government of the people by the people and for the people". Meanwhile, there are forms of democracy; direct democracy, representative democracy, presidential democracy, parliamentary democracy and authoritarian democracy. Nations only adopt whichever suit them depending on their best ideology.

Theoretical foundation

This study is anchored on the theory of Electoral System Design. According to Andrew Reynolds Ben Reilly and Andrew Ellis (2008), the choice of electoral system design is one of the most important institutional decisions for any democracy to survive. To them, in almost all cases, the choice of a particular electoral system has a profound effect on the future political life of the country concerned. More so, electoral systems, once chosen, often remain fairly constant as political interests solidify around and respond to the incentives presented by them. In the context of digitization of election materials and the entire process however, these theorists advocate for a wholesome inclusiveness of the electoral design based

on modern technology in order to consolidate the system and enhance integrity in our electioneering process so as to activate credibility in any election result and instill reassurance in the electorates.

Literature review

This section reviewed perspectives of scholars, academics and practitioners with regards to elections, digitalization of democratic election, norms, voting and other election-related technologies. 'Elections form a vital component of democracy and they differentiate a democratic form of government from a non-democratic one. Therefore 'elections serve to elect representatives and to confer upon them authority in the form of a democratic mandate' (Richards, 2004). The issues surrounding election management are overwhelming and challenging that no singular political system can assume hitch-free election even with full digitalization and technology.

Although initially criticized, these technologies have increasingly demonstrated that they can comply with the high standards set by election administrators and other stakeholders. In some cases, these technologies have reduced electoral fraud and increased the accuracy of election results. Results can be made available to the public earlier and in more detail, thereby increasing the credibility of those elections. The globalized world has borrowed a leaf of evolving technology to address the challenge of integrity in elections hence, it has been observed that digitalization of INEC' operations will correct the anomalies in our elections in this contemporary time. Technology is regarded as a technical instrument to attain certain electoral goals such as efficiency and effectiveness, as well as to ensure a high-quality process and integrity of results (Pratama, and Salabi, 2019).

However, against the position of Pratama and salabi, Nigeria's 'Electoral Acts' (2019 and 2022 amended) still lack merits in terms of ensuring the much needed election integrity due to non-adoption of needed technologies to aid Nigeria's elections. The electoral process is already tech-driven. Thanks to innovations by INEC in the last election in 2015, technologies like the card reader has helped to reduce the level of voting fraud and general malpractice on election days (Abubakar 2019).

This observation was apt sequel to events surrounding 2015 general election and its administration. However, the role of technology has gone beyond how the election managers in Nigeria (INEC) used it then. Technology is now playing a key role in influencing voting decisions and patterns in several other ways.

"It shall remain INEC's intention to keep deepening the credibility of the electoral process by improving on all planning, management, implementation and support

processes through the deployment of appropriate technology"... Yakubu, (2019).

This submission by the INEC chairman gave a rising hope to Nigerian electorates, even as we were hoping for improved electioneering process in 2023. The author therefore intended to view other scholastic views in the eye of Yakubu's position which is in tan-dem to full digitalization and adoption of emerging technologies in Nigeria's elections. In Nigeria, the use of Electronic Voters' Register (EVR) was introduced in 2010 for the preparation of 2011 general election. This technology captures the names of eligible voters, eliminates duplication and minimizes discrepancies in the electoral process. In this technology, electronic voter register (EVR) is embedded into a notebook laptop cased with other components such as printer, camera for capturing voter picture, a finger print scanner, card readers that connects the components together, a movable battery that powered the gadgets, and external backup devices. The electronic voting machine developed by the Nigeria Communication Satellite (NIGCOMSAT) was another device developed with a view of improving the electoral process.

"What INEC did is called a technological convergence.

It reveals the expediency of technology in election management in Nigerian polity and stressed the commission's hope of upgrade in technological know-how (Okoye, 2021).

Due to large scale frauds in our previous elections, the academia and the entire political elites are clamoring for employment of modern technologies to better the lot of our elections hence, e-voting. Similar to definition supplied above, e-voting is defined as an election that involves using an electronic device for the purpose of casting votes without physically appearing at the polling booth. With an e-voting system, the voting process is done electronically with ease from the registration, casting and counting of votes (Adeleke et al., 2013). E-voting is often seen as a tool for advancing democracy, building trust in electoral management, adding credibility to election results and increasing the overall efficiency of the electoral process (IDEA, 2011). Adoption of these technologies have in some electoral systems had the opposite effects: an increasing number of electoral disputes, less transparent and less accepted election results, the undermining of trust, greater electoral violence and an overall weakening of electoral integrity (Carter and Farrell, 2009). This submission shows that whatever is good and useful may as well have its negative side especially when it has to do with adoption of technology. It has even been discovered in some quarters that some election management bodies (EMBs) are afraid to employ this technologies in order to perpetuate corruptive 'Business as Usual' operations.

Nigeria's election managers and administrators

Nigeria is one of the very few countries in the world with more than one election management bodies. Broadly speaking, the country has the Independent National Electoral Commission (INEC) and the State Independent Electoral Commission (SIEC). Both are creations of the Nigerian Constitution. INEC was created by Section 153 (f) of 1999 Constitution as one of the 14 federal executive bodies while SIEC was established by Section 197 as one of the three state executive bodies. While INEC conducts elections into the offices of the president, governors, Senate, House of Representatives, state Houses of Assembly and the six Area Councils of the Federal Capital Territory, SIEC conducts elections into the positions of chairman and councilors of the 768 Local Government Councils. Each of the 36 states in Nigeria has its own State Independent Electoral Commission (SIEC). Therefore, technically speaking, Nigeria can be said to have, not two, but 37 electoral management bodies conducting different levels of elections in the country even though, the central and main election management body is INEC.

Electoral design and management

The world of electoral systems is crowded and complex, becoming more so all the time. The range of variations among the different electoral systems makes life quite difficult for the analyst seeking to produce an acceptable typology. (Carter and Farrell, 2009). Management of a country's election involves a whole lot of complexities which are broken down in the electoral guidelines of such system. Scholars in the field of democratic elections come to a point of convergence on number of critical issues of integrity and fairness, let alone violence at the poll, which need to be urgently addressed. For instance, the electoral materials designed and purchased by the electoral management body must protect the integrity of the system and image of respective country. Secondly, the internal management and operational procedures should include built-in mechanisms to identify integrity risks, assess the risk involved and ensure that the proper persons or oversight agencies are contacted, and that immediate corrective action is taken. The electoral management body needs to ensure it also has a system to receive and address outside complaints made by the political parties, observers or oversight agencies. This is an important factor to ensure not only integrity in the system but also to promote accountability of its administrators and participants. The electoral body should ordinarily have an all-encompassing electoral policy which, to a large extent, must be anchored on 'Electoral Laws and Guidelines' governing the conduct of elections in the country. Whereas, the conduct of credible election is the defining characteristic of democracy and a means of according legitimacy to governments all over

the world. Thus, the legitimacy of an election depends, in large part, on the actual and perceived integrity of the electoral process. By design, the electoral process in Nigeria has been spelt out in the 'Electoral Act 2022' which clearly defines the mandate of INEC as a commission managing the processes. The Electoral Act '2022 Amended' therefore is a review of 'No 6' of 2010, 2015 and 2018 Electoral Acts which then identifies the following; categories of personnel for election duties as well as various stakeholders in the electoral process and their functions, conditions for selection of types and dates of elections and modalities for designing and printing of election materials. It also defines the polling units and collation centres while spelling out those eligible at elections and criteria for appointment of polling officials and the methods of voting applicable in diverse cases. The legal framework for election management makes all inclusive provisions for the paraphernalia of elections by conduct of poll in open secret ballot form starting from voter's registration, continuous registration, election of national officers and area council election. Nonetheless, the *modus operandi* of election results transmission, including procedures for election petition tribunals and litigation up to the court of appeal are not left out of the electoral design (Table 1). The Electoral Act (2022 amended) however gives a whole paragraph (part iv: Procedure at Election-sub 41: 'ballot boxes and voting devices') to accent election procedures which, among other things, accommodates the deployment of necessary technologies and devices, such that can increase the credibility and legitimacy of Nigeria's elections.

"The Commission shall provide suitable boxes, electronic voting machine or any other voting device for the conduct of elections" (Clause 43 Subsection 1).

The Table 1 is a reflection of sequential and systematic adoption of technology in the operations of Nigerian election management system. It also replicates the technological procedures adopted by INEC for 2019 general election. There was still a long way to go in terms of use of hybrid technologies for voting and counting of votes cast and this characterized what was experienced in the just concluded general election of 2023.

2023 Elections Technology (BVA and IReV)

There is a vast dichotomy between 2019 elections and that of 2023 in that INEC's operation was more digitalized as more advanced technologies were deployed for the general elections especially the gubernatorial. Subsequently, Bi-modal Voters Accreditation System (BVA) and the earlier smart card readers are vaccines against vote-rigging (Figure 1). I therefore think that in no distance future, our electoral system will be one of the most credible, free and fair in the entire world

Table 1: INEC digital platforms and elections technologies.

Tech's Name	Year of adoption	Function
Biometric Direct Data Capture Machine (BDDCM)	2010	For production of Electronic Voters Register (EVR) to reduce fraud and multiple registration
Electronic Voters' Register (EVR)	2010	It captures the names of eligible voters, eliminates duplication and minimizes discrepancies in the electoral process
Smart Card Readers (SCR)	2015, 2019	To authenticate prospective voter's identity and reduce multiple voting
Continuous Voters Register Locator (CVRL)	2021	Embedded in the new INEC's portal to enable online registrants to locate the nearest registration centre or the one close to them to complete their registration.
INEC Voter Enrolment Device (IVED),	2021	This is new technology to replace BDDCM. It is adaptable to internet cable module which is operates on an Android tablet technology.
Building and testing the online registration Portal	2021	To facilitate easy and quick self registration of voters to reduce congestion at registration centres.
Bimodal or Biometrics Voter Accreditation System (BVAS)	2022	BVAS is new system that will combine fingerprint, facial biometrics and other profiling for identity verification of voters. It was designed to undermine filling incident forms.
INEC Result Viewing platform (IReV)	2023	This is an encrypted domain server or portal which enabled Nigerian electorates to view polling unit results in real-time as voting ends on each election day.

Source: The Author's survey /Open Access, 2022



Figure 1. Bimodal Voter Accreditation System (BVAS).

(Okechukwu, 2023). This assertion was corroborated by Osita (2023; 2) when he posits that the only remedy to perennial haphazard elections in Nigeria is the recourse to technology. "BIVAS Technology is Vaccine to Vote Rigging in Nigerian" state. The Bimodal Voter Accreditation System (BIVAS) and Result Viewing Electronic Platform are the latest technological approaches introduced into the electoral space. The one verifies fingerprints, checks voter's eligibility by authenticating facial features to eradicate voting by proxy

while the other serves as a visual platform where results of every polling units can be seen and monitored in real time. This device and the new wave of emerging technology are gradually making electoral malpractices cum rigging impossible any longer and thereby enhancing the confidence of the electorates in the process. While BVAS offers an advancement in election technology that improves electoral integrity, the INEC Results Viewing (IReV) portal and electronic transmission of election result have become a masterstroke that

promote transparency in the results collation process while preventing malpractices during the physical transmission of results from polling units to collation centres (Olasupo, 2022). This gives the necessary leverage to the populace to access election results from the comfort of their homes thereby, encouraging openness in the system.

This Bimodal Voter Accreditation System as major tool for 2023 general election was subjected to credibility test as it was used for November, 2021 gubernatorial elections in Anambra, June 2022 in Ekiti and July 2022 in Osun states long before the 2023 elections and its performance and the level of resource-support given to those elections were remarkable. Also, Independent National Electoral Commission introduced the INEC Result Viewing Portal (IReV) in 2020 during the Edo State governorship election, an online platform designed to promote transparency in the electoral process; it allows for easy dissemination of polling unit results, making the electoral process more transparent and accountable to citizens. The portal also provides accessibility for the general public to access and view officials' activities and actions.

Lastly, Election Result Analysis Dashboard ERAD is another tool developed by a civil society organization, Yiaga Africa. The ERAD allows for the real-time aggregation and analysis of polling unit results uploaded to the IReV. This helps to increase transparency and credibility in the election process, as it eliminated the need for voters to endlessly wait for results to be announced on traditional media. Hence, it provided them with the results as soon as they were available. The dashboard can also help to identify and address any potential issues or discrepancies in the results which can help to increase the overall integrity of the election and detect electoral malpractices. Whereas, the landmark difference in the 2023 general elections is due to the impact made by the use of Bimodal Voter Accreditation System (BVAS), it allowed for a faster and more accurate accreditation process, reducing the potential for human error and fraud in the whole exercise. On the legal framework of Nigeria's election management, the constitution of the Federal Republic of Nigeria has given INEC the exclusive right, power and mandate to organize, undertake and supervise elections that are captured within the confines of the constitution. (Okoye, 2022)

Similarly, the image maker of the electoral management concern, (INEC), Festus Okoye, further asserts, "we are accountable to the people of this country and the people have accepted the BVAS as a game changer in our electoral process. BVAS is domiciled within the confines of the Electoral Act of 2022 and we do not have any fear whatsoever in relations to the validity and legality of BVAS and other technological and electronic devices we are using for elections".

BVAS, as a machine shown above is a mobile device

that allows and runs various election-related applications. It works like mobile phones. It is a system that allows for voter authentication using fingerprint and facial recognition technology. The BVAS comprises of software and hardware components which can be used to scan and electronically transmit PU/RA/LGA/ State election results to the INEC Result Viewing (IReV). The hardware component includes the handy physical device as seen in the (Table 2). According to INEC Manual for Election Officials (2023), the software component of BVAS runs on Android Operating System (OS) after installation of relevant software for the various functions it is designed to perform.

Overall Functions of BVAS

- a) It is used during accreditation, to verify a voter's PVC by entering the last six digits of the VIN, or Scanning the Barcode on the PVC or using the last name of the voter or Scanning the QR code on the voter register.
- b) Authenticate the bearer of the card as the legitimate owner of the PVC by either fingerprint or facial matching.
- c) Scan and upload Polling Unit (PU) Result sheet 'Form EC8A' which will be visible on the IReV portal immediately.
- d) Scan and upload 'Form EC40G'(PU) into IReV portal where election did not hold or is cancelled.
- e) It also stores number of accredited voters for future reference.

INEC result viewing portal

This platform was designed and launched in July, 2020 and "it was intended that this innovation will improve the transparency in election result management and therefore further consolidate public confidence in the electoral process" (Okoye, 2020). This aspect of digitization of election results was long overdue for a developing country like Nigeria as it has been adopted by other countries earlier on.

Overall Functions of IReV

- a). IReV enables Nigerians to view polling unit results in real-time as each day's voting ends.
- b). the portal also allows members of the public to create personal accounts to gain access to polling units' results uploaded on the platform as PDF files.

Primary Data Analysis

The researcher distributed one hundred and fifty (150) questionnaires to actual voters in three stratified states in the Southwest geopolitical zone of Nigeria i.e. fifty (50) questionnaires were allocated to each of Oyo, Ogun and Ekiti States. The respondents' responses table below

Table 2. Features of BVAS Technology as adopted by INEC for 3023 General Elections.

Features	Functions
Front Camera	To capture the face of INEC official handling a sensitive material.
Fingerprint scanner	For capturing of voter's fingerprints
Touch screen	The glass screen is calibrated to allow for ease of operation.
Rear Camera	To make facial capture of voter during voters accreditation.
Power button	To simply power on and off.
Microphone	To enhance audio recording.
Volume up/down button	To increase or decrease volume of audio evidence in case of any eventuality
LED Flash	In case the atmosphere is dark or environment not well lit, it serves to brighten photographs taken.
USB Type A port	To import or export files using conventional USB cord type.
USB Type C port	To import or export files using special USB cord.
Device Speaker	Here, the sound is aired.
Sim Card & SD Card slots and Device Battery enclosed within the back cover	For insertion of sim card and memory cards.

Source: INEC Manual for Election Officials (2023).

Table 3: Collated Results of Responses on INEC's Style of Election Management.

Questions	Responses				
	A	SA	D	SD	Total
The 2023 Elections were better managed by INEC than previous ones.	60	30	30	30	150
Based on your experience, the gubernatorial election was near perfect.	72	27	24	27	150
Mainstreaming the BIVAS and IReV into the election process is a welcome development.	90	42	12	06	150
BIVAS and other Technologies reduced rigging and other electoral malpractices.	66	51	27	06	150
INEC's style of Election Management motivated you to vote	72	51	12	15	150
Use of BIVAS in our Election made a lot of difference.	66	54	12	18	150
The Presidential and gubernatorial election patterns are not fair enough	27	18	75	30	150
INEC should discontinue BIVAS, IReV and Electronic Transmission of Results, etc.	39	12	63	36	150

Author's field work, 2023

suffices. The (Table 3) with the following characteristics; Agreed- A, Strongly Agreed- SA, Disagreed- D and Strongly Disagreed- SD was used to test one hundred and fifty respondents from three states mentioned above in a compressed format. The main questions tested in line with the research focus were aggregated below in tables and frequencies. Table 4 shows the percentages and ratio of responses as regards electorates' opinions about the management trend of 2023 general elections in Nigeria. The author aggregated the responsorial profiling into two broad categories for easy analysis; hence, 'TA' (Total Agreed) is a combination of those that agreed as well as those that strongly agreed. Also, 'TD' (Total Disagreed) is a combination of those that disagreed and those that strongly disagreed from (Table 3).

Meanwhile, 60 percent agreed to 2023 general election being better managed by INEC over and above previous elections in Nigeria while a minority of 40 percent disagreed. A total of 66 percent agreed that the gubernatorial election, which was particularly conducted using BVAS, was a near perfect election but 34 percent disagreed alinitio. A whopping 88 percent of the respondents support the Nigerian government to allow for technological-driven elections by mainstreaming IReV, BVAS etc. permanently while only 12 percent disagreed to this position. Also, 78 percent admitted that BVAS and other election-related technologies reduced rigging and other electoral irregularities in the just concluded elections while 22 percent disagreed. Another 80 percent

agreed to BVAS making a lot of difference in our election and only 20 percent disagreed to this crucial position. Finally, 34 percent of the respondents agreed to a question deliberately inverted to the fact that INEC should discontinue BVAS and other technologies recently adopted while 66 percent disagreed. This means, to a large extent, majority of 66 percent of the respondents disagreed with the idea (Table 5). The (Figure 2) is a histogram showing number of technologies adopted for each election year since 2011 and their frequencies. The above chart (Figure 3) is a linear graph showing corresponding values of the histogram chart above (Figure 2) in order to differently express the field survey on (Table 4).

Explanation of tables and charts

The charts above were a vivid display of trends of technology employed by INEC since 2011 as the author decided to ignore 2007 data in this regards because it was only a computer laptops and minor software applications used by the electoral manager, (INEC) for that year's elections as seen in analytical matrix table above (Table 4).

2011 General elections

The chart shows that dependency on mere computer use at elections declined to insignificant 95% rate, 'Biometric

Table 4: Aggregated respondent’s data.

Questions	TA	%	TD	%	T
The 2023 Elections were better managed by INEC than previous ones.	90	60	60	40	100
Based on your experience, the gubernatorial election was near perfect.	99	66	51	34	100
Mainstreaming the BIVAS and IReV into the election process is a welcome development.	132	88	18	12	100
BIVAS and other Technologies reduced rigging and other electoral malpractices	117	78	33	22	100
Use of BIVAS in our Election made a lot of difference.	120	80	30	20	100
INEC should discontinue BIVAS, IReV and Electronic Transmission of Results, etc.	51	34	99	66	100

Author's Field work, 2023

Table 5: Matrix analytical table.

Election Year	LAPTOP	BDDCM	EVR	CVRL	SCR	BVAS	IReV
2007	100	00	00	00	00	00	00
2011	95	90	100	85	00	00	00
2015	60	70	100	100	60	00	00
2019	15	30	100	80	100	30	00
2023	00	00	00	80	00	42	100

Author's Field Survey, 2023

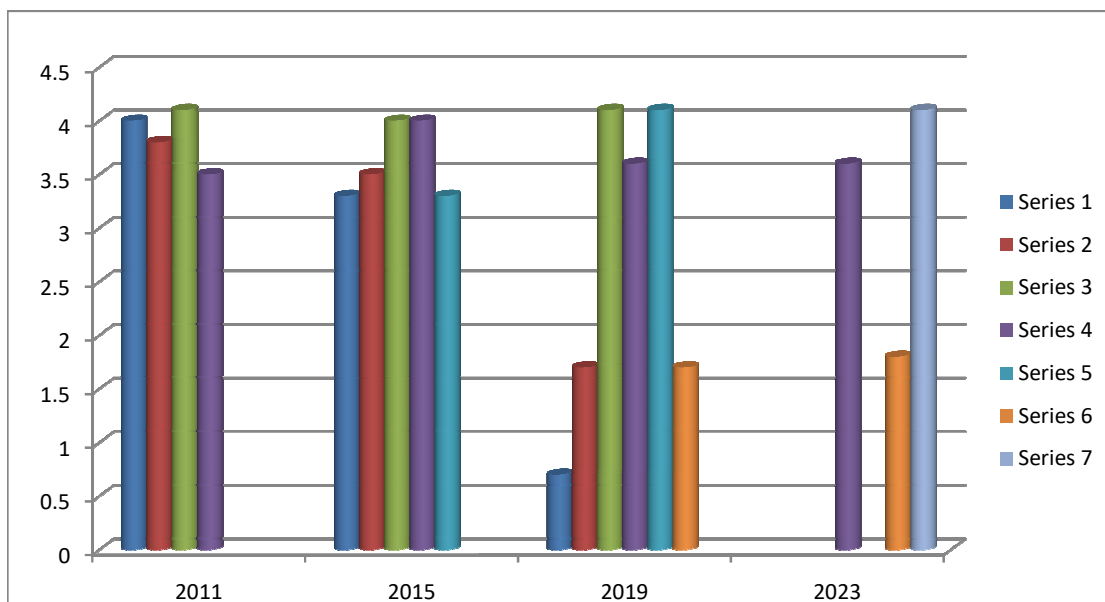


Figure 2: A Comparison chart on previous and latest elections based on technology adopted.

Direct Data Capture Machine’ (BDDCM) declined to 90%, ‘Electoral Voters Register’ (EVR) adoption gave 100% effectiveness in that year’s general elections being it was a newly adopted device while, the ‘Continuous Voters Register Locator’ (CVRL) had 85% effective usefulness in the elections.

2015 General elections

Unlike 2011 elections that witnessed four types of technologies, the 2015 general elections employed five as the technology of ‘Smart Card Reader’ was newly

introduced. The use of computer reduced to 60% while that of BDDCM came to 70%. The use of EVR and CVRL was still in full operations thereby giving 100% while the Smart Card Reader gained about 60% adoption rate.(as it was first tested in some run-off and rerun elections in some states).

2019 General elections

The use of computers on elections fields came to all time low (15%), BDDCM came to 30% on the table while Electoral Voters Register use remained 100%. There was

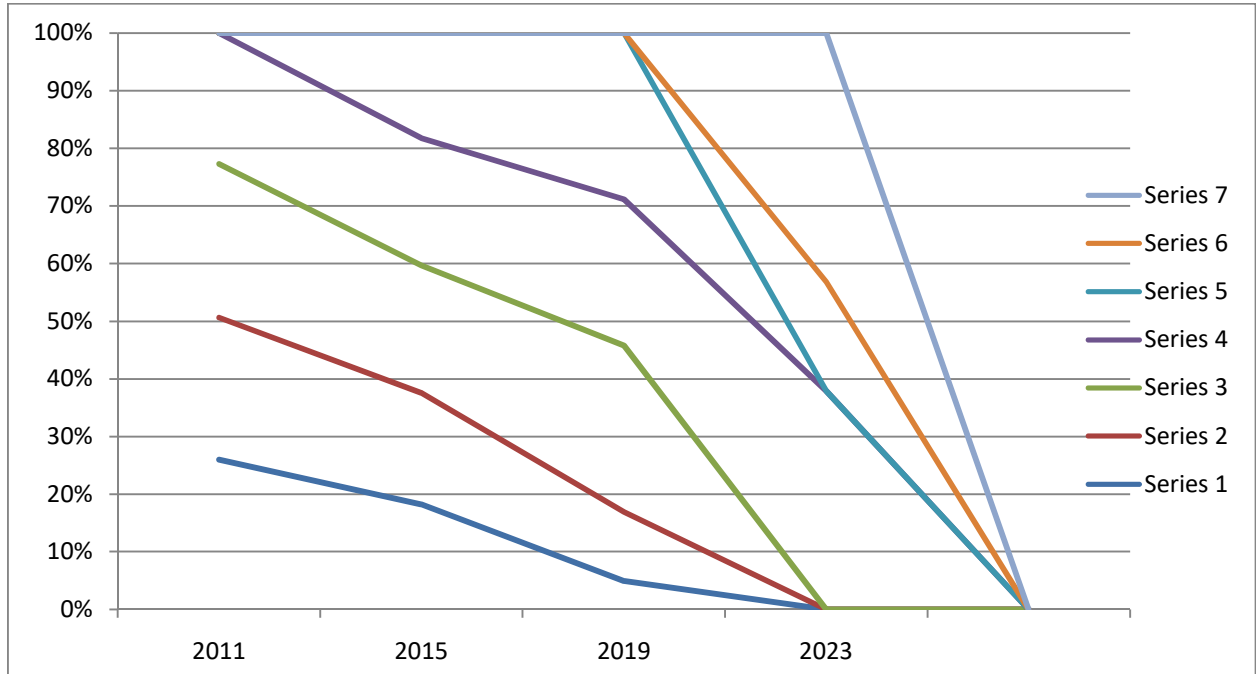


Figure 3: A Comparison Chart on Previous and Latest Elections based on Technology adopted.

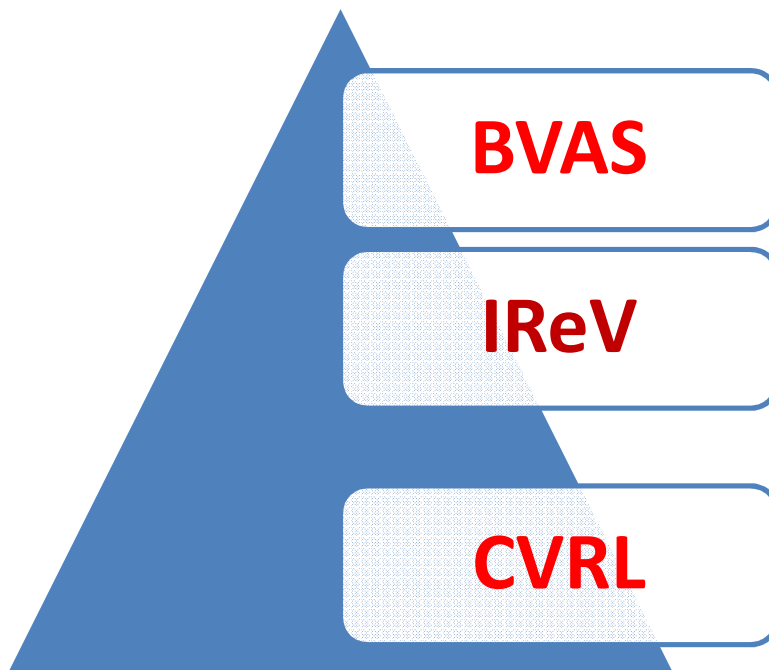


Figure 4: Pyramid of Nigerian 2023 Election Technology

a decline in the use of CVRL to 80% while the Smart Card Reader scaled up to 100% use from 60% it was in 2015. The new technology called Bimodal or Biometrics

Voter Accreditation System (BVAS) was tested alongside IReV for efficiency in some states' elections after the 2019 general elections. BVAS gave 30% relevance to all

such states' election as witnessed on 10th September, 2021 when it was first deployed for the Isoko South Constituency 1 bye-election in Delta State, Other instances where BVAS was used or field-tested are Anambra, Ekiti and Osun states gubernatorial elections of 13th November, 2021, 18th June and 16th July, 2022 respectively while IReV gave approximately over 90% efficiency and relevance to those elections. For instance, result statistics of Osun state shows that a total of 3763 results (100%) were submitted on IReV portal on state gubernatorial election day out of 3763 voters' results expected (InecPublicV2 (inecelectionresults.ng))

2023 General elections

"What happened on the 25th of February was that INEC observed that the results of the presidential election were not being viewed as expected, INEC, suspecting cyberattack, withheld the uploading of the results in order to preserve the integrity of the data" Okoye (2023)

The just concluded 2023 general elections saw Nigerians adapting to the technology of BVAS in full force which gave a relative effectiveness of 42% in the gubernatorial and States Houses of Representatives elections of 18th March, 2023 though experienced minor challenge during the Presidential, Federal House of Representatives and House of Senate elections of 25th February, 2023 due to technical hitch but the election Result Portal (IReV) functioned optimally (100%) during and after the two elections. The author's field survey shows that Continuous 'Voters Registration' which enabled any form of change a prospective voter might desire (of location/residence or loss of PVC) contributed up to 80% of the election success rate. However, the charts exhibit corresponding values of the information on the matrix table which also shows that BVAS, CVRL and IReV are the only technology used for the 2023 elections, whereas, huge difference was made. The analytical pyramid above (Figure 4) is a pictorial summary of available digital (technology) platforms found relevant and deployed for 2023 general elections by Independent National Electoral Commission which are somewhat a mixture of old (CVRL) and new platforms (IReV and BVAS). The background pyramid itself represents the political space (Nigeria) in which Bimodal Voter Accreditation System (BVAS), INEC Result Viewing (IReV) and Continuous Voters Register Locator (CVRL) have their effects.

Results of the study

This study on election management and attendant technologies has unraveled the following;

1. Revolutionizing INEC' operations from analogue to digital as well as digitalizing election process have positively charged the political space to the effect that

politicians are catching the wind of change that it is no longer business as usual.

2. Trend of new election management system has greatly reduced and would likely eliminate rigging and other irregularities in our election process completely in the future as voters can no longer vote without proper electronic profiling at the polling unit whereas election results of all units and centres are uploaded on the IReV as soon as they are cast hence, no room for manipulations.

3. There is reduction now in voters apathy which was rampant at 2019 elections because, voters now have trust and confidence in the election process.

4. The average politician is now aware that failure to execute his election promises and or party manifestos would rob him a second term due to loss of popularity among the electorates. Whereas, the aspirants are now sure that the votes of the voters would count. This portends a new Nigeria with infrastructural development.

5. Also, with these technologies in place, cases involving vote buying is naturally addressed with deterrence in accreditation of a proxy voter with someone else's PVC.

Concluding remarks

This study has revealed the importance of technology to the legitimacy of elections. It has also x-rayed the need for digitization and digitalization of the entire election process to facilitate speedy outcomes and coverage of oversight functions of Election Managers-INEC. The adoption of digital technology had a profound impact on 2023 general elections in Nigeria. First, the Independent National Electoral Commission's Continuous Voters Registration initiative was able to identify approximately 2.7 million double registrations using technology in voters' registration and also simplifying the voters' registration procedure with the use of biometrics and digital data, easing the process for eligible prospective voters to register and to vote. (Folorunsho, 2023) Secondly, attempt made by a group of people to manipulate result portal was foiled due to adequate and prior training given to INEC staffers in preparation for the elections which made the election managers not to upload the presidential results as soon as it was cast

"...our failure to upload the results was due to technical glitches and not any form of sabotage or cyber attack" Mahmood Yakubu (2023).

It is therefore imperative to understand that engagement of these technologies would go a long way in securing lives and properties of both the election managers as well as that of the electorates, aside saving time and energy.

Recommendation

The following are recommendations based on the findings:

The study has brought so many idiosyncrasies of democratic elections to the fore and there is a long way to go in Nigeria elections if we would be classified as a developed nation in governance and politics. Therefore, the following are few recommendations supplied by the author:

1. We need to upgrade our election management system to accommodate 'Electronic Voting' (e-voting) and e-transmission of results not yet deployed as they are quite different from functions of IReV. It should be noted that e-transmission of result is an instantaneous action of viewing or watching each polling result sheet as it is being computed ever before being uploaded on our already deployed IReV.
2. In a bid to eliminate cases of inconclusiveness of elections, the Commission should review the guidelines and regulations of elections to enable them accommodate more digitalization cum technology and to enhance the country's image in the international scene hence, review of 'Electoral Act'. There is no such thing like, the country cannot afford competitiveness up to global best practice in election management.
3. The Independent National Electoral Commission (INEC) should introduce 'Out of Country Voting' (diaspora franchise) into its electoral process to avoid disenfranchisement of qualified Nigerians abroad. But the Out of Country Voting should be predicated on; the creation of a database for Nigerians in diaspora; provision of a legal framework for that purpose including its logistics through legislation, designing eligibility criteria, conduct of pilot schemes for necessary technology and the acquisition of necessary platforms and gadgets for its implementation.
4. The internal management and operational procedures should include built-in mechanisms to identify integrity risks, assess the risk involved, and ensure that the proper persons or oversight agencies are contacted, and that immediate corrective action is taken. The electoral management body, INEC, needs to ensure it also has a system to receive and address outside complaints made by the political parties, observers or oversight agencies.
5. To make INEC staff proficient in the use of modern technology deployed, they should be trained and certified on all electoral devices. In the meantime ICT technical staff should be trained and updated to all trends of modern day elections.
6. The election manager needs to co-opt alternative transport system (for instance, Jets) to make election materials arrive on time in many remote and flashpoint areas. It has been noted that in some cases, they needed to use animals like donkeys, human porters, boats to access some of these difficult areas especially riverine areas.
7. Also, alternative power sources for all electoral devices such as Power-Banks, Solar Panels, Inverters

etc should be provided for the Commission as backups.

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