The Role of Technology in Election management with example from five Democracies

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Abstract

With the introduction of technology, complex electoral management processes can be made simpler and easier to organize. Advances in technology can thus speed processes up and reduce the workload involved in election management. In many countries today, technology is seen by the electoral management body (EMB) also as a means of minimizing the potentials for errors, and not just a tool for problem solving. For this reason therefore, many democracies around the world, with Nigeria not left out, have adopted various forms of electoral technologies in the conduct of their elections and this has drastically reduced electoral malfeasance. Despite the peculiar challenges that come with the use of technologies, countries continue to make use of it in the management of election mainly because of the essential role it plays which includes the reduction of stress as well as assuring credibility and transparency etc.

Keywords: Technology, Elections, Election Management, transparency, Electoral Integrity.

Introduction

Election is the process of actualizing representative democracy. It is a means of peaceful change in leadership by the people, serving as a formal decision-making process by which the population chooses an individual to hold public office. Through this means, the sovereignty of the people's mandate is enthroned. Apart from being free and fair, transparency is a vital feature of any election. An absence of these, question the validity of the outcome. Hence, the quest by various democracies to improve the quality of their elections.

In today's global world, technology (ICT) has taken the centre stage as virtually nothing can be organized and executed with greater success rate without its application. In fact, this has motivated its use in the electoral process of many countries around the world as a means to redeem and retain electoral integrity. Technology has shown efficiency and reliability in achieving viable, credible and free election compared to the traditional (manual) way of voting. In every electoral democracy, secure voting remains the cornerstone. In the 21st century, a

plethora of voting technologies, ranging from voting machines to results transmission systems, have become an inherent part of elections in many parts of 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. In some cases, these technologies have reduced electoral fraud and increased the accuracy of election results. This is because they (technologies) create an enabling environment for results to be made available to the public earlier and in a more detailed form. This thereby increases the credibility of those elections.

It is safe to conclude that the ultimate purpose of adopting voting and counting technology is to make the election management more efficient, more accurate and swifter, and to increase integrity and trust in the process. Several conditions that often arise that compel electoral authorities to adopt election technology include the following: (i) an over-complicated election system; (ii) excessive numbers of candidates; (iii) lack of access for voters in remote areas; (iv) a voting method that is non-inclusive of people with disabilities; and (v) a complex vote recapitulation process with the latter requiring the Election Management Body (EMB) to hire a lot of temporary staff, which resultantly increases the risk of manipulation. Technology is often considered a veritable tool to resolving these problems as well as improving the electoral process generally (Njoku, Amaefule, Nwandu & Jibiri, 2018). Although some argue that the adoption of these technologies has, in some electoral systems, had the opposite effects stemming from an increasing number of electoral disputes, less transparent and less accepted election results, the undermining of trust, greater electoral violence to an overall weakening of electoral integrity. These negative outcomes, however regrettable, nevertheless serve as valuable lessons for the future.

In recent times, electronic technology has played very salient roles in elections. According to an Ace Project publication (n.d), several types of electronic technology have been infused into the electoral process by electoral administrators. When technology is adopted in an election management system (EMS), the electoral process can invariably be carried out by electronic digital (computer) equipment. This requires less human involvement or intervention. In a fully electronic electoral management system, the entire electoral process – voter, party and candidate registration; verification of candidate support signatures; ballot production; electoral logistics; voter identification; voting in polling stations or remotely; vote counting; results transmission;

and presentation of preliminary and final results of data – can all be performed by electronic and digital equipment and with very limited human intervention. Although currently, only a few countries have achieved this holistic level of automation of election administration. However, many EMBs usually make use of a combination of both the manual processes and electronic technology into a suitable hybrid system, which is influenced by a wide range of factors, and may arguably be considered unique in any given country (International IDEA, (2014).

Making the Case for why most Countries Adopt Technology in Elections

Various governments might use ICT (technology) in their electoral processes for different reasons. According to some scholars (Remmert, 2004, Carter & Be´langer, 2012 & Boulus-Rodje, 2012), it has been advanced that the introduction of ICT is a necessary step in the fight against declining turnout, while in other cases, the need to improve the integrity of the voting process is the impetus for the introduction of ICT. In Brazil for instance, an electronic voter registration system was created to prevent voters from registering in more than one local registry (Avgerou, 2013). To improve the accuracy of voters' register and prevent fraud, some countries adopt the biometric voter registration (Haley & Zubrinich, 2015). Additionally, the speedy delivery of results is also a reason to introduce, for example, electronic counting of ballots. Finally but important is the fact that, electoral technology has helped to improve the accessibility of the electoral process. According to Gilbert, McMillian, Rouse, Williams, Rogers, McClendon & Cross, (2010), this also serves as one of the reasons why countries have towed the line of adopting various forms of technology in their elections. Considering the important role which technology plays in elections, newer democracies alike are increasingly showing interest in towing the line of others whose electoral processes are seen to have improved through the adoption of electoral technology. To advance the use of technology in elections, various donor agencies such as the United Nations Development Programme (UNDP), the European Union (EU), and the International Foundation for Electoral Systems (IFES) have been powerful agenda setters behind the modernization of voter registration (Evrensel, 2010).

In Nigeria for instance, one of the fundamental challenges truncating elections in Nigeria is election rigging – the manipulation of results to favor a particular political party. But with the introduction of the Smart Card Reader (SCR), this reduced election rigging to the barest minimum. In a way, the SCR helps in curtailing the efforts of mischief makers to rig elections.

This is because the device does not only serve for the accreditation of voters alone but also for reconciling and making sure that an equilibrium is reached between the total number of votes cast and the total number of accredited voters (Olaoye, 2007). According to Sahara Reporters (2015), the deployment of the SCR technology led to the total collapse of the plans of electoral mischief makers, hence the deployment of excessive use of violence like was seen predominantly in Rivers and Akwa Ibom states.

Typologies and Main Features of Elections Technology

Electoral technology can actually be adopted by EMBs to manage virtually all aspects of the electoral process. The various types and their main characteristics include the following (see Table 1 below)

Table 1: Types of Elections Technology and their Main Features.

S/N	Types	Main Features
1	Voter Registration Systems	The Voter Registration Systems are for the purpose of building and maintaining a voter register with personal details of all eligible voters in electronic format, in some cases also, biometric information such as photographs or finger print scans. Voter registration data in electronic format can be used in many ways (e.g. data cross-checks, duplicate detection, issuing voter identification documents, targeting voter information, planning and electoral logistics, producing voter lists for polling stations and obtaining demographic information about the electorate).
2	Voter Identification Systems	This is for checking the eligibility of each voter at the polling station level by comparing his or her personal details to a database of all eligible voters.
3	Party and Candidate Registration Systems	This type of election technology is used for tracking the registration status of all political subjects for an election, checking any required support signatures and providing the data in appropriate formats for designing ballot papers

		and tally sheets, configuring voting machines, etc.
4	Observer Registration and Accreditation Systems	Mainly for tracking the accreditation process for citizens and international observers and issuing their identification documents.
5	Districting and Boundary Delimitation Systems	It uses geographical information systems to delimit political boundaries and distribute polling stations and catchment areas.
6	Electronic Voting and Vote-Counting Systems,	Various systems ranging from machine counting of paper ballots to voting machines used in polling stations and internet voting systems; these speed up the counting process and reduces human interference in the vote counting process.
7	Result Tabulation and Transmission Systems	This system serves for processing electronically captured turnout and results data, greatly speeding up related procedures and avoiding as well as detecting human error through automation and data cross-checks.
8	Results Publishing Systems	For presenting and visualizing election results in various formats including maps, charts, detailed results databases and overviews.
9	Voter Information Systems	This is used to provide voters and other electoral stakeholders with detailed data about electoral process. Such systems include polling station locators allowing voters to easily find their polling station, legal databases of regulations, information about parties and candidates running for election, databases allowing access to detailed election results and statistics, and continuously updated calendars with key events and deadlines.

It is important to note that the services of all of the above electoral technological features can be best rendered from the use of simple mobile phones to private satellite links, from standard

productivity and collaboration systems to specialized biometric databases, and from private intranet systems to public websites and social media channels.

The Case of Nigeria: Between Manual or Electronic Voting?

Electronic voting, being one of the technologies used in elections (e-voting) is arguably the most difficult upgrade as this technology involves the core of the entire electoral process: the casting and counting of votes. E-voting greatly reduces direct human control and influence in the electoral process, and provides an opportunity to solve some old electoral problems. Although, some people are of the view that it also introduces a whole range of new concerns which are capable of triggering more criticism and opposition than any other technological application in elections.

Nonetheless, many people have advocated and continue to advocate the need for Nigeria to join the league of countries who have adopted e-voting in her election management as this will accommodate, among other things, diaspora voting and guarantee more transparency in our electoral process. Apart from this, there is a debate surrounding the sustainability of the country's present voting regime. Since the return to democracy in 1999, many reforms and innovations have been introduced to modernize or address perceived inadequacies in the administration of elections in Nigeria. This has led to the adoption of several technologies and methods of voter registration and elections. These technologies consist of transition in the use of typewriters to Direct Capture Machine (DCM), Electronic Voters' Register (EVR), Smart Card Reader (SCR), and E-Collation. In 2003, the country achieved a milestone with the introduction of Optical Magnetic Recognition (OMR), in order to improve the conduct of elections. Despite series of technological innovations in voter registration over the years, the actual voting process has remained manual and analogue.

One of the implications from the foregoing is that, on each Election Day, polling stations open for accreditation and voting from morning till afternoon. A process which is normally characterized by long queues, overcrowding and creates room for irregularities such as stuffing of ballot boxes, manipulation of results and vote buying.

It is needless therefore to say that the current voting process in Nigeria is inadequate. The inadequacies partly account for the progressive low voter turnouts in general elections since

1999. It will be recalled that before the 2019 General Elections, the National Assembly passed an Amendment to the 2010 Electoral Act which provides for electronic voting, but was not assented to by the President despite public outcry. Following the outcomes of the 2019 general elections, there has been a renewed call for the amendment of the Electoral Act 2010, specifically to accommodate electronic voting due to widespread fraud and irregularities that characterized recent elections.

As stated earlier, technology has played a very crucial role in election management in Nigeria, as its adoption has seen to the drastic reduction of electoral frauds such as ballot stuffing and snatching, rigging etc. However, according to Njoku, e'tal (2018) it has been confronted with myriads of challenges such as; first is the problem of personnel handling the electronic devices. The use of electronic technology in voting is marred by the problem of inadequate number of personnel to handle the gadgets. Even where adequate personnel are present, the available gadgets are fewer than the number of voters at the polling units. In some cases, most of the personnel deployed especially to rural areas to handle these gadgets are not properly trained to effectively operate them. They lack the expertise required to operate the gadgets and this can lead to manipulation of votes. Second, due to the remote nature of some parts of the rural areas where elections are held, thugs are hired to snatch or destroy the e-voting facilities meant for elections, which largely impacts negatively on the success of the election. The result of this is rigging, voters' apathy and loss of interest in participating in election because fear of being harassed or intimidated by thugs. Third, there is generally the problem of unstable power supply in the country. Meanwhile, the ICT facilities and electronic devices need constant power to operate efficiently.

Table 2: 5 Selected Democracies that have adopted forms of Technology in their Elections

Indonesia	The use of election technology in Indonesia is not novel. Since 1999, Indonesia has been using electronic technology to tabulate the election result at national level. There has been large-scale use of technology in electoral processes since the 2004 elections. Although up until the national elections in 2019, Indonesia had never used e-voting, other election technology had become integral to almost every stage of election management. In general, the main purpose of implementing election technology in Indonesia has been to

	increase transparency and accountability in the electoral process, and in turn to increase public trust and legitimacy in the election result.
Brazil	In Brazil, the largest nation in South America, currently, all votes are cast by electronic voting machines. The Brazilian Supreme Electoral Court authorized the use of Electronic voting technology in the 1996 Brazilian municipal elections. In 2000, the Brazilian government had converted to fully electronic voting and deployed over 400,000 kiosk-style machines in elections that year. Voters in Brazil use an electronic voting device that, for each office, displays the choices and prompts the voter for his or her vote. The voting machines feature an integrated screen and keyboard. To vote for a candidate, voters only need to press on the keyboard the number designated for a particular candidate. The candidate's picture then appears on the screen. Voters can confirm, reject, choose another candidate or start the selection process again. The Brazilian electronic voting technology is unusual in that the voting machine itself tallies the votes once voting finishes, producing both digital and printed reports of the number of votes given to each candidate. 12,000 machines used to produce a paper ballot that the voter could peruse and deposit in a box for recount. These paper-trail machines were successfully used during the election (Sarah, Kristen, Michael, Dan, Kyle, Daniel, & Ted, 2008).
India	In India, although voting machines have been in use since 2002 but it was first piloted in 1982 while the first remote internet voting was experienced in 2011. India is world's largest democracy with a population of more than 1 billion people. It has more than 668 million registered voters and covers 543 parliamentary constituencies which requires more than one million Electronic Voting Machines (EVMs). The balloting unit requires voters to press the button next to the candidate's name and symbol and the control unit records the vote. A light next to the button glows, and a short beep sound follows indicating the vote has been cast. The polling officer then presses a switch to clear the machine for the next voter.
Belgium	In Belgium Electronic voting was approved by law in 1994, and was widely

	used in the 1999 and 2000 general and municipal elections. In the general elections of May 18, 2003, 3.2 million Belgian citizens were able to vote electronically. Belgium applies similar approach as Ireland's in that it does not modify the voting process, but rather replaces the ballot paper with a machine at the polling station, and then uses an electronic counting system to tally the results.
Australia	In Australia EVM started in a close election in 1998. The Australian Capital Territory (ACT) is one of eight states and territories in Australia. Members of the ACT Legislative Assembly are elected using a proportional representation electoral system known as the Hare-Clark system. Hare-Clark is a variant of the single transferable vote method used in Ireland. Electors vote by showing preferences for individual candidates. To be elected, a candidate needs to receive a quota of votes. Each elector has a single vote, which can be transferred from candidate to candidate according to the preferences shown until all the vacancies are filled. In the ACT, the HareClark system is used to elect 17 members from 3 multi-member electorates. The electorates of Brindabella and Ginninderra each elect 5 members, and the electorate of Molonglo elects 7 members. A close election in 1998 in the ACT found numerous problems in the state's hand-counting system, when two candidates were separated by only three or four votes. After recounting, officials discovered that out of 80,000 ballots, they had made about 100 mistakes. Ultimately, the ACT Electoral Commission adopted a new system known as eVACS, or Electronic Voting and Counting System. The system was created by a company called "Softwar Improvements to run on Linux, which is a widely used, freely available open-source operating system. The eVACS-based voting terminal consists of a PC and offers ballots in 12 languages, including Serbian and Farsi. The system includes English audio for vision-impaired and illiterate voters. The voter swipes a bar code over a reader that resets the machine for a new vote and calls up a ballot. The eVACS- based voting system find problems, such as difficult-to-use barcode readers and minor delays in displaying results on and after election night, it was well

	received by voters.

Conclusion and Recommendations

Today, ICT is a widespread, common phenomenon, so technology-based electoral procedures seem almost inevitable. Although there is palpable fear that the recent spreading of technology in elections may endanger democracy, claiming that one cannot trust a fully electronic voting system (Jefferson, e'tal 2004 and Rubin, 2006). According to them, the questionable validity of numerous ballots during the United States presidential elections in 2000 due to hanging chads exemplifies why voting technology should be abandoned in favor of hand-counted paper ballots (Saltman, 2006). Notwithstanding, one of the significant benefits of technology in election is the possibility for increased efficiency. Technology in election allays the fears of voters and instill the confidence that they can submit their votes, and be reasonably sure that their votes will count. However, the paper recommends the following;

a. That Nigeria may consider advancing her technological use during elections by introducing, through legislation, e-voting as well as electronic transmission of results;
b. That the electoral Act amendment currently before the National Assemble can be taken advantage of to introduce recommendation (a) above;
c. For technology efficiency in elections, INEC should develop relevant training modules for its staff on the appropriate use of Card Readers in order to reduce some of the human errors encountered during elections; and
d. Should recommendation (b) above be provided for, there will be need for INEC in collaboration will political parties and civil society organization should embark on mass sensitization of electorate on how to go about e-voting.

References

Olaoye, E.O. (2004). Vote-buying and election rigging in Nigerian politics. In Femi Omotoso (Ed), Readings in Political Behaviour, Ibadan, John Home of Printers Ltd.

Sahara Reporters, (2015). www.saharareporters.com/majorviolence-in-rivers.

Njoku, O. D., Amaefule, I. A., Nwandu, C. I. & Jibiri, E. J. (2018). Application of ICT and Electronic Technology in Election Management: Challenges in Rural Areas in South-Eastern Nigeria. *International Journal of Advanced Engineering, Management and Science (IJAEMS)*. Vol-4, Issue-5, Pp. 360 – 365. Retrieved from (PDF) Application of ICT and Electronic Technology in Election Management: Challenges in Rural Areas in South-Eastern Nigeria (researchgate.net)

Ace Project (n.d). Electronic Technology. Retrieved from ACE Electoral Knowledge Network (aceproject.org).

International IDEA, (2014). Electoral Management Design (Revised Edition). Retrieved from electoral-management-design-2014.pdf (idea.int)

Remmert, M. (2004). Towards European Standards on Electronic Voting. In: Prosser, A. and Krimmer, R. (Eds.), Electronic Voting in Europe: Technology, Law, Politics and Society. Bonn: Gesellschaft fur Informatik. pp. 13–16.

Carter, L., & Be´langer, F. (2012). Internet Voting and Political Participation: An Empirical Comparison of Technological and Political Factors. ACM SIGMIS Database 43(3): 26–46

Boulus-Rodje, N. (2012). Mapping the Literature: Socio-Cultural, Organizational and Technological Dimensions of E-Voting Technologies. In: 5th International Conference on Electronic Voting 2012.

Avgerou, C. (2013). Explaining Trust in IT-Mediated Elections: A Case Study of E-Voting in Brazil. *Journal of the Association for Information Systems*. Vol. 14(8), Pp. 420–451.

Haley, N. & Zubrinich, K. (2015). Is Biometric Voter Registration the Way Forward for Melanesia? SSGM In: Brief 2015/26. Canberra: Australian National University.

Audit of AEC'S electronics voting machine for blind and vision impaired voters being a Technical Report by Australian Electoral Commission, 23 August 2007.

Gilbert, J.E., McMillian, Y., Rouse, K., Williams, P., Rogers, G., McClendon, J. & Cross, E.V. (2010). Universal Access in E-Voting for the Blind. *Universal Access in the Information Society*. Vol. 9(4). Pp. 357–365.

Evrensel, A. (2010). Voter Registration in Africa: A Comparative Analysis. Johannesburg: Electoral Institute for the Sustainability of Democracy in Africa (EISA).

Sarah, P. E., Kristen, K. G., Michael, D. B., Dan, S. W., Kyle, D., Daniel, S. & Ted, T. (2008). Electronic Voting Machines versus Traditional Methods: Improved Preference, Similar Performance, in the Proceedings of Measuring, Business, and Voting, Florence, Italy.

Jefferson, K., David, A., Avriel, R., Barbara, S. & Wagner, D. (2004). A Security Analysis of the Secure Electronic Registration and Voting Experiment (SERVE). Retrieved from http://www.servesecurityreport. org/paper.pdf - Bing

Rubin, A. (2006). Brave New Ballot: The Battle to Safeguard Democracy in the Age of Electronic Voting. New York: Morgan Road Books.