Volume 7, Issue 3, March 2017 ISSN: 2277 128X
International Journal of Advanced Research in Computer Science and Software Engineering
Research Paper
Available online at: www.ijarcsse.com

A Framework for the Adoption of Electronic Voting System in Nigeria

Aishatu Shuaibu[1], Abubakar Mohammed[2], Arthur Ume[3]
[1]Centre for Distance Learning Modibbo Adama University of Technology, Yola, Nigeria
[2, 3]Department of Information Technology, Modibbo Adama University of Technology Yola, Nigeria

DOI: 10.23956/ijarcsse/V7I3/01310

Abstract: ***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. The integrity of the election process is fundamental to the integrity of democracy [5]. The election system must sufficiently be robust to withstand a variety of fraudulent behaviors and must be transparent and comprehensive for voters and candidates to accept results of elections [19]. The objective of the paper is present an implementable model consisting of use case and activity diagrams that can be used to implement e-voting system in developing countries using Nigeria as case study. Despite the partly e-voting system implementation in Nigeria, some challenges were encountered in the voting process such as slow application response, high rate of biometric rejection during capturing and poor picture quality of the voters. The study was undertaken with a view to improve the voting system by highlighting the key processes and interactive tools involves during e-voting; hardware options and Information and Communication Technologies (ICTs) required for the e-voting system. The paper is a model design that uses Unified Modeling Language (UML) techniques for the design approach. Two (2) components of UML were specifically used to present the models. Microsoft Visio is used for designing the models. The design models are capable of handling electronic voter registration, verification, casting, collation, counting and presentation of results. The paper recommends that governments and electoral bodies should improve computer literacy rate among citizens due to technophobia that exists within them, security standard and integrity of the system should be properly maintained by electoral bodies in order to have more confidence and independent of the system, and further research can be conducted towards implementation of the designed models.***

Keyword: Framework, E-voting System, Unified Modeling Language, Information & Communication Technology

I. INTRODUCTION

Voting system (manual or computerized) must be understandable and usable by the entire voting population regardless of stage, weakness, or disability. The system must be resistant to prevent wide range of attacks which include ballot filling by voters and incorrect tallying by insiders. In the third World countries particularly the African continent, the use of electronic voting is at its infancy; this is as a result of technological backwardness and other social and economic problems of underdevelopment. Electronic voting system is underway in South Africa; and in Nigeria the use of e-voting is presently being advocated both by the experts and the non-experts with a view of reducing electoral fraud and corruption associated with the electoral processes [1][2].

History has shown that most elections in Nigeria were manipulated in order to influence outcome. There have been reported cases of delay in delivering election materials to the polling units as well as alteration of results on transit to the collation centers. In fact, results have been reported to be written without elections been held. This has been attributed to poor and bad electoral system. It has also been reported that other factors that contribute to the problems of election in Nigeria include the confusion about the registration process, inability to get to a registration point, inadequate ballots papers, lack of proper identity documents, inadequate staff, and political intimidation [1]. Long queues, inadequate privacy, fear of intimidation, victimization and security are also challenges in Nigeria's electoral process.

Some of the problems associated with the existing voting system in Nigeria from 2015 election are: there is a high rate of rejection of fingerprints during the capture of biometric recognitions process which in most cases attributed to low quality of finger print scanner. Poor picture quality resulting to inadequate biometric verification was also a problem. The design objective is to design models of an electronic voting system that would help reduce mistakes, election fraud, and to facilitate free and fair election in Nigeria. The designed models will show how the system would interact with its users.

Models are various processes or stages that are being selected for the development of a project or system depending on the requirements and goals of the system. Several tools may be used to create software models; typical among them is Unified Modeling Language (UML). The use of models for different software design has been reported by several researchers [3][4][5][6].

Use Cases (UCs) are a convenient way of representing the functional requirements of e-voting system, since each of them may be assessed without knowing the detail of subsystem containing it. Therefore, Use Case can break the system up into a collection of Use Cases with low interrelation among them, which allows the requirements traceability. In addition, it is a convenient tool for the users when they must validate the system, allowing each actor to verify the UCs in which they take part without the need of knowing more details about the system [6].

II. LITERATURE REVIEW

A. Electronic Voting System

Voting forms an important part of democracy, in every country. For democracy to be sustainable, the voter's participation is the key consideration [1]. The function of the electoral system is to implement elections in such a way that voters and election administration have understanding of how elections should be operated [7]. Therefore, e-voting is one of the most credible voting systems that make election results acceptable to the public.

E-voting is defined as an election that involves using an electronic device for the purpose of casting votes. With an e-voting system the voting process is done electronically with ease from the registration, casting and counting of votes [3]. 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 [8]. E-voting provides benefit of ease especially for disabled voters. This is because of the software-base and indirect characters of electronic voting system which assist in casting votes. Provision is made for disabled voters such as voice recognition for the sight impaired and more than one biometric feature to be used for the deaf like finger print and iris recognition [9].

DRE voting machines which collect and tabulate votes in a single machine were used by voters in all elections in Brazil and India, and also on a large scale in Venezuela and the United States. It has also been used on a large scale in Netherlands but had been decommissioned after public concerns [10].

B. Types of Electronic Voting System

There are three types of e-voting systems as identified by Electoral Council of Australia and New Zealand [11]. These are:

1. ***Kiosk voting***: Access to the relevant web page is made available only at "internet kiosk" sites under the control of the EMB (Electoral Management Board). The EMB maintains a relatively high degree of control not only of the hardware used by the voters, but also of the environment in which votes are casts.
2. ***Mobile internet voting***: Such access is made available away from such sites, but using systems managed and delivered by the EMB. For example, electoral visitors or mobile polling teams could visit voters in their homes or localities, taking with them portable devices with internet connections which the voters could use to vote.
3. ***Remote internet voting***: In this system, voters access web page for voting using any computer or device capable of being connected to the World Wide Web. The EMB have only limited control of the hardware used by the voter, and little or no control over the environment in which the vote casts.

Other scholars [12] have identified other ways to group types of e-voting systems similar to those reported by Electoral Council of Australia and New Zealand above. This lead to the identification of another three types of e-voting which includes:

1. ***Polling station e-voting*:** Here voters cast their votes electronically on an electronic machine within the polling booth.
2. ***Kiosk e-voting:*** where voters cast their votes at pre-selected stations through terminals like ATM
3. ***Remote e-voting*:** where voters cast their votes anywhere, and anytime, there is Internet access.

The Similarities between the types of e-voting is that both have Kiosk e-voting with access to internet or web page. There is also Remote e-voting system where Voters cast their votes anywhere, anytime and with any device as long as there exists internet connectivity.

New South Wales Electoral Commission (NSWEC) identified two broad categories of electronic voting systems, namely: Direct Recording and Enumeration (DRE) systems, and Remote Electronic Voting (REV) Systems [13].

1. ***DRE Voting Systems:*** The DRE systems incorporate electronic voting devices which are installed at polling places, pre-poll or other designated locations. In this system voting infrastructure are installed at the voting locations prior to the commencement of voting.
2. ***REV Systems:*** The REV systems enable the voter to access the voting system at any location having access to either a telephone or a web browser on an Internet connected computer.

Therefore, based on these two types of e-voting system, the REV system has advantages over the DRE system. This is because, the REV system uses communications infrastructure and devices already available to the voter, namely a telephone or computer, while the DRE have difficult logistical challenge for polling places. The DRE system requires the NSWEC to roll-out, install, configure and test voting devices and their associated equipment prior to the voting time.

The DRE system is an electronic implementation in which there is no ballot, the choices are visible to the voters in front of the machine and voter directly enters choices into electronic storage with the use of a touch screen, push buttons or similar devices [14]. Therefore, DRE systems completely eliminate paper ballots from the voting process. One

advantage of DRE is that, the voter is given a PIN, a smartcard, or some other token that allows him/her to approach a voting terminal, enter the token, and then vote for candidates of choice [15].

C. Electronic Voters' Register in Nigeria

In Nigeria, the use of electronic voters' register 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.

The most recent approach in Nigeria was the introduction of Biometric Direct Data Capturing Machine (BDDCM). In registration of voters' in 2010 in preparation for the 2011 general elections, the BDDCM assisted drastically in reducing fraud and incident of multiple registrations [2]. The use of computer and management information system encouraged greater use of information technology (IT) in most forms of service delivery and means of transformation of any process, including electoral process in Nigeria.

The EVR system is not completely error free. Independent National Electoral Commission (INEC) originally planned to capture eligible voters on to the electoral roll by a computerized system called Direct Data Capture (DDC), but this was not achieved due to inadequate supply of DDC machine. The system was apparently preferred to the 2003 system of Optical Mark Recognition (OMR) system as it has the capacity to pick voter's biodata, picture, thumbprint and issue the voter ID right on the sport [16]. However, the problem started when INEC discovered that only a few people were getting registered due to inadequate supply of the DDC equipment and the few deployed frequently broke down without hope of repair. INEC abandoned the DDC system for a more pragmatic manual registration [2]. INEC reported that Optical Mark Reader (OMR) which was used during the 2007 registration is an incorporated technology that register and computerize voters' roll was adopted. The result was an Electronic Voters Register (EVR) with a high percentage of voter dislocation due to errors in shading the OMR forms [17].

As part of the modernization process, INEC took inventory and spatially located the agency's 120,000 polling locations scattered around the country. These locations and their attributes were linked to the EVR [18]. The current Open Ballot System (OBS) has not given the desired result intended. Rigging has been the common problem that is facing the general electoral system; these and many other problem recorded are as follows: ballot paper hijack, incorrect thumb print rendering the vote void, lack of voters' security confidentiality, delay of electoral materials resorting a large queue, hence discouraging the voters interest in the voting process, inaccuracy in counting and collation of the electorate votes.

Although the current system has mitigated some of the election malpractices as described above, and was able to provide some level of democratic dividend to about thirty to forty percent (30%-40%) but yet to meet up with the international standard for the provision of viable, successful and generally accepted electoral system for democracy. Therefore, this model if properly implemented will improve the existing voting system and ease the electioneering processes for both electoral body and the citizens.

III. METHODOLOGY

The UML models are used to represent the electoral processes, ease understanding and provide the exact snapshots of the procedures involved in e-voting system. The use of UML is an essential requirement. Use Cases, and Activity diagrams are types of UML used for the models design of e-voting system. The choice of UML is because of its unified standard of modeling language and it is also programming-language independent. Use Cases are used to show the view of system or module behavior initiated by proposed system actors outside the system. The Use Cases illustrate the functionality or capability of e-voting system in Nigeria. The Activity Diagrams helps to describe the flow control of the e-voting system.

IV. RESULTS AND DISCUSSIONS

The results are arranged based on the five processes of e-voting system.

A. Presentation of Modeling the Processes of E-Voting System using Use Cases and Activity Diagrams

The models designed are divided into five processes of e-voting system. Activity Diagrams and Use Case Diagrams were used for the design of the processes. A detailed or elaborated Use Case was used for better understanding of the models. The following processes were involved in e-voting system:

1. Registration
2. Verification and Authentication
3. Casting
4. Collation and Counting
5. Presentation of Results.

1. Registration Process of e-voting system

Interactive tools, hardware and ICTs (Information and Communication Technologies) involved in registration process involves scanners, cameras, computer systems, online access, and printers. The models are divided into offline

and online systems. The model of the offline system is represented with Use Case diagram in Fig 1 and Detailed Use Case model description elaborating the interaction of the system actors with the system. While the online model which uses internet, mobile or virtual private network (VPN) systems is depicted using activity diagram in Fig 2.

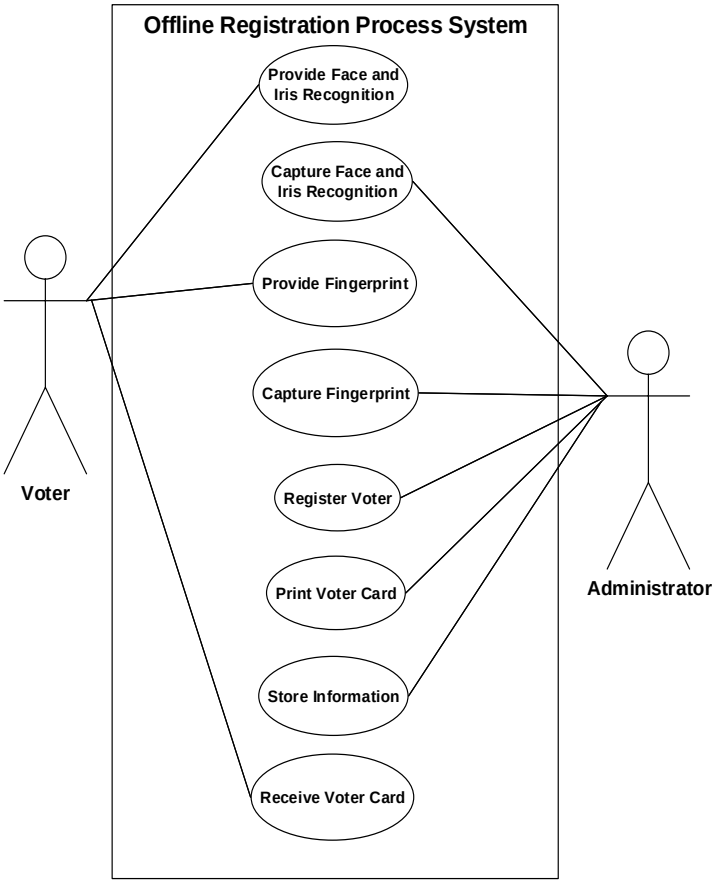

Fig 1: Use Case diagram of computer offline system for registration process of e-voting system.

Therefore, the use case diagram is broken into an elaborate means to provide detailed description of the actors involves in the system for offline registration process. This is presented below:

Unique identifier and name of Use Case: UC 1 Provide face and Iris recognition.
Initiator: Voter
Goal: Voter provides his/her face and Iris recognition for biometric identification.
Pre-condition: The voter intends to register for election
Post-condition: The voter gives his/her identity for the registration
Main success scenario:

1. The voter's face is available for registration as an identity
2. The voter's Iris is provided for registration as an identity
3. The voter's name, age, state, gender, and status are provided for the registration

Unique identifier and name of Use Case: UC2 Capture face and Iris recognition
Initiator: Administrator
Goal: administrator captures the face and Iris recognition for voter registration
Pre-condition: the administrator has the style in which the face and Iris recognition will be captured
Post-condition: The administrator snapped a photo of the voter for his/her recognition
Main success scenario:

1. The administrator switched-on the camera
2. The administrator press the snap button to snap the face and Iris recognition for registration
3. The face and Iris recognition is displayed on the camera screen
4. The face and Iris recognition is stored automatically on the camera

Unique identifier and name of Use Case: UC3 Provide fingerprint
Initiator: Voter
Goal: Voter provide his/her fingerprint for biometric identification of registration
Pre-condition: The voter is intended to be register for election.
Post-condition: The voter gives his/her fingerprint identity for registration

Main success scenario:

1. The fingerprint is available for identification
2. Additional Biometric Identification is provided

Unique identifier and Name of Use Case: UC4 Capture fingerprint
Initiator: Administrator

Goal: Administrator captures the fingerprint for voter biometric identification and registration

Pre-condition: The administrator has format for capturing the voter fingerprint for registration
Post-condition: The administrator scanned the voter's fingerprint for registration

Main success scenario:

1. The administrator switched-on the scanner
2. The administrator clicks on the scan to capture the fingerprint
3. The fingerprint is displayed on a screen
4. The system automatically picks the next voter

Unique identifier and Name of Use Case: UC5 Register voter
Initiator: Administrator

Goal: Administrator register voter to have a unique identity for casting vote
Pre-condition: The administrator has the detail of the voter he/she wants to register
Post-condition: The administrator registered voter for election

Main success scenario:

1. The administrator gets the face and Iris recognition of a voter
2. The administrator gets the fingerprint recognition
3. The administrator gets the name, age, status, gender and state for voter registration
4. The administrator register the voter
5. The information of a voter for registration is displayed

Unique identifier and Name of Use Case: UC6 Print voter card
Initiator: Administrator

Goal: Administrator print voter card

Pre-condition: The administrator has already registered the voter

Post-condition: The voter should have voter card that have a unique identity for election

Main success scenario:

1. The administrator connects the printer to the system
2. The administrator sets the option for print
3. The complete detail of the voter is displayed on the screen
4. The administrator send the voter information to printer
5. The printer prints the voter card

Unique identifier and Name of Use Case: UC7 Store information
Initiator: Administrator

Goal: Administrator stores voter registration information on a system or any storage device
Pre-condition: The administrator has finished voter registration
Post-condition: The administrator saves voter registration information for election

Main success scenario:

1. The administrator connects a storage device to a system
2. The administrator copies voter information to a storage device
3. The administrator saves information on the system and on the storage device
4. The administrator safely removes the storage device from the system

Unique identifier and Name of Use Case: UC8 Receive voter card
Initiator: Voter

Goal: Voter receives a registered voter card for election
Pre-condition: Voter is already registered for election
Post-condition: Voter collects a registered voter card

Main success scenario:

1. The voter receives voter card
2. System keeps record of voter registration
3. Voter has machinery for election

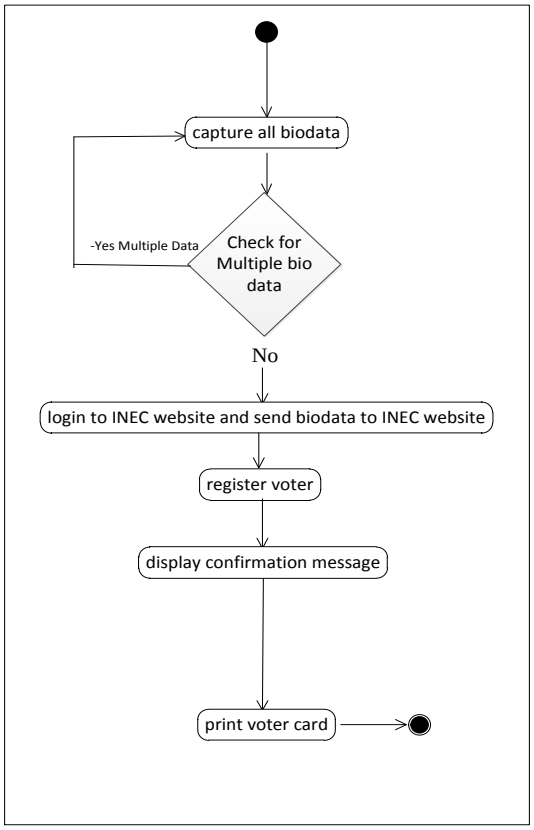

Fig 2: Activity diagram of online (Internet, Mobile and VPN) system for registration process of e-voting system.

B. Verification and Authentication process of e-voting system

Interactive tools, hardware and ICTs involved in Verification and authentication process are finger Print Scanner, Iris Camera or Iris Recognition Machine (i.e. Smart Iris Capture device), human face recognition using camera (Smart Human Face Recognition device), computer system, Database application, and Smart Card Reader. The design models of the Verification and authentication process is based on Smart Card Reader and is presented using Use Case diagram in Fig 3.

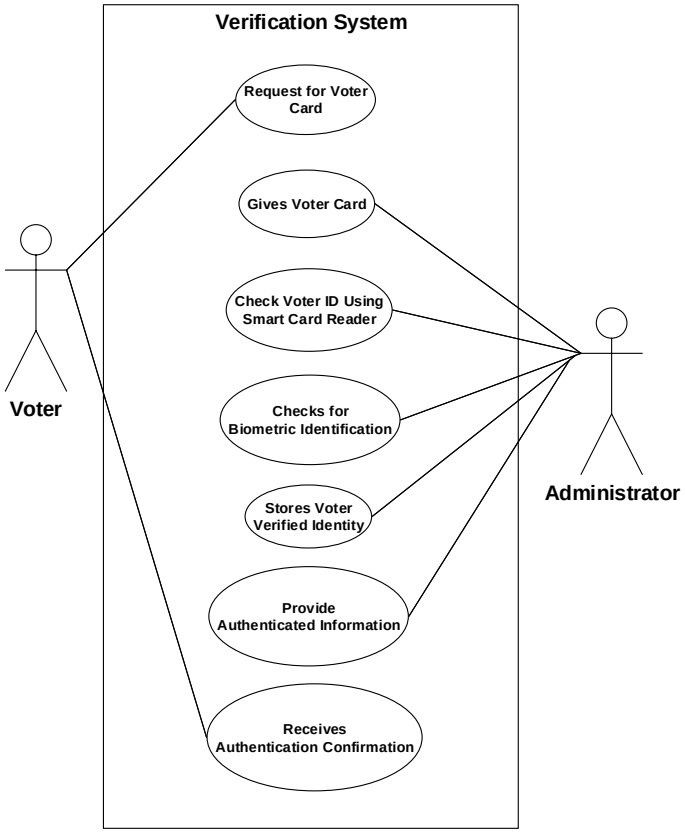

Fig 3: Use Case diagram of smart card reader for verification and authentication process of e-voting system.

Therefore, the use case diagram is broken into an elaborate means to provide detailed description of the actors involves in the system for offline registration process. This is presented below:

Unique identifier and Name of Use Case: UC 1 Request for voter card

Initiator: Administrator

Goal: Administrator requests for voter card for verification

Pre-condition: The administrator has in mind the voter card might be valid

Post-condition: The administrator collects the voter card

Main success scenario:

1. The administrator requests for the voter card
2. The administrator collects voter card
3. The administrator looks through the card to be verified

Unique identifier and Name of Use Case: UC 2 Give voter card

Initiator: Voter

Goal: Voter gives his/her voting card for verification

Pre-condition: The voter wants his/her voting card to be verified for election

Post-condition: The voter forward his/her voting card to administrator for verification.

Main success scenario:

1. The voter gives his/her voting card to the administrator

Unique identifier and Name of Use Case: UC 3 Check voter card using smart card reader

Initiator: Administrator

Goal: Administrator checks voter card using smart card reader for verification

Pre-condition: Administrator will insert voter's card into smart card reader for verification

Post-condition: The administrator verified voter card using smart card reader.

Main success scenario:

1. The administrator insert voter card into the slot of the smart card reader
2. The system (smart card reader) displayed the information about the voter
3. The administrator presses the verification button on the machine
4. The system displayed the confirmation message
5. The administrator presses the eject button

Unique identifier and Name of Use Case: UC4 Store voter verified identity

Initiator: Administrator

Goal: Administrator stores voter's verified identity.

Pre-condition: The administrator has in mind to keep verified identity of voter.

Post-condition: The administrator stores verified voter's identity.

Main success scenario:

1. The administrator connects a storage device to a system.
2. The administrator copies voter verified identity to the storage device.
3. The administrator saves verified identity on the storage device and on the smart card machine.
4. Administrator safely removes the storage device from the system.

Unique identifier and Name of Use Case: UC5 Receive authentic information.

Initiator: Voter

Goal: Voter receives authentic information from the smart card reader to clear him for election.

Pre-condition: Voter has it in mind that he/she has a valid voter card.

Post-condition: The voter collects an identity to show that he/she has been cleared for election.

Main success scenario:

1. System displays an option.
2. Voter selects from the options to bring out authentication message/procedures.
3. Voter receives authenticated information from the system.
4. The verified identity shows an evidence of his/her qualification to vote.

C. Casting Process of e-voting system

Interactive tools, hardware and ICTs involved in casting process are Touch Screen Voting Machine or DRE System, Mobile Phones and smart phones, Computer System with Database access and Database Management System, and internet facility. The model is divided into two parts consisting online system that uses internet, mobile and VPN.

This is presented in Fig 4. The second part is DRE Voting System and is represented in Fig 5.

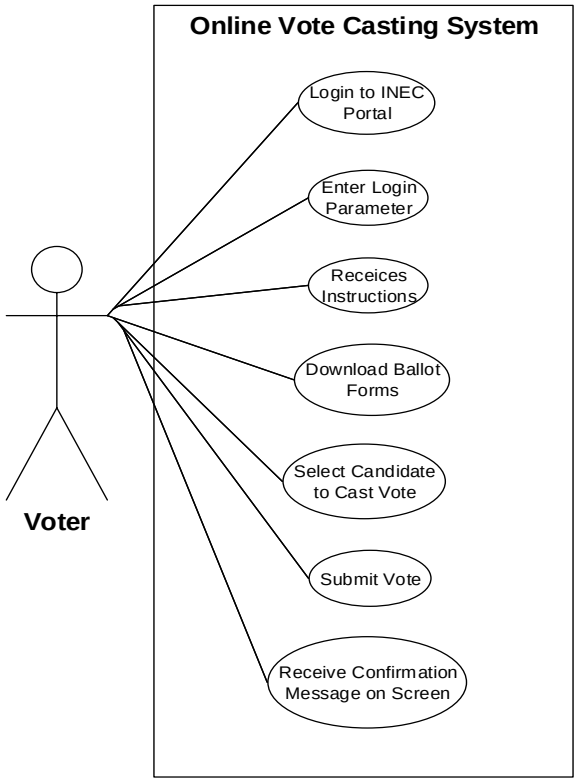

Fig 4: Use Case diagram of online (Internet, Mobile and VPN) system for casting process of e-voting system.;

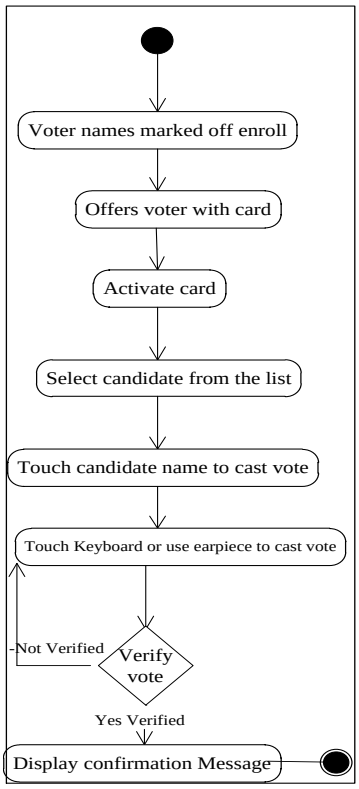

Fig 5: Activity diagram of DRE system for casting process of e-voting system.

D. Collation and Counting process of e-voting system

Interactive tools, hardware and ICTs involved in Collation and Counting process are computer System and storage devices such as CD plate, external hard disk and flash. The model is divided into two parts consisting fully automated system and semi-automated system. The fully automated system is depicted in the activity diagram in Fig 6, while the semi-automated system is represented by use case diagram in Fig 7.

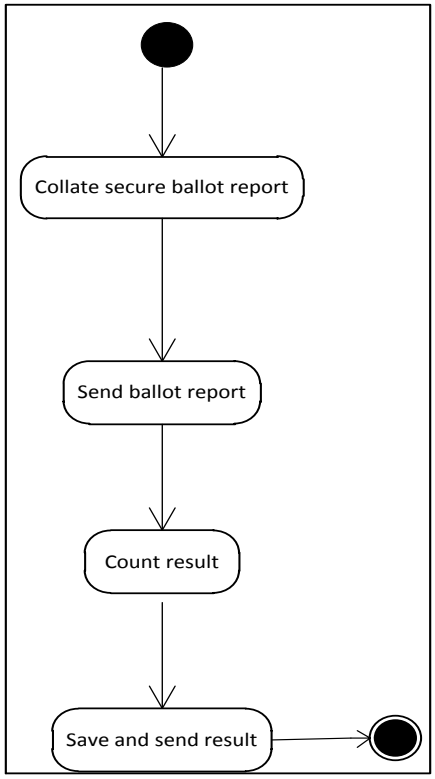

Fig 6: Activity diagram of the computer system (Fully Automated) for collating and counting process of e-voting ystem.;

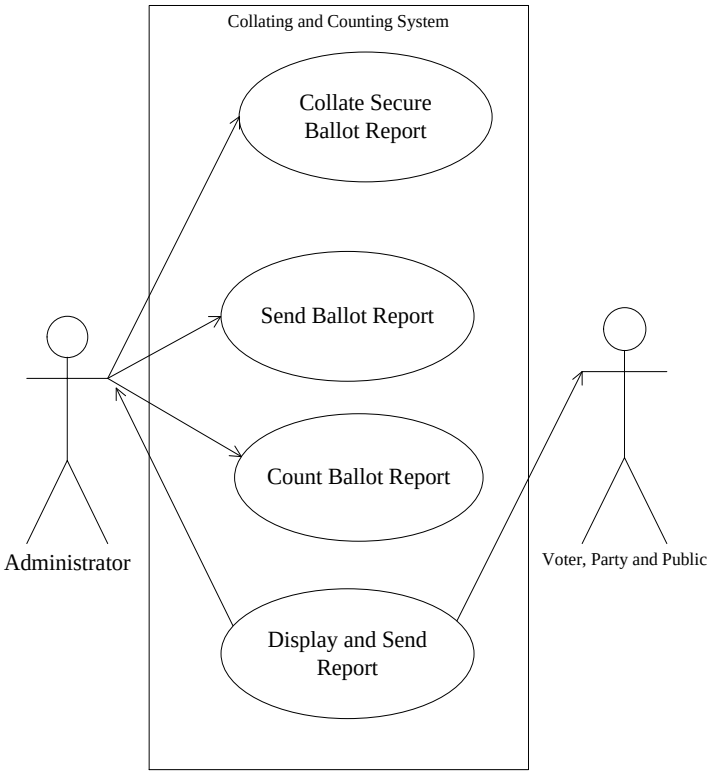

Fig 7: Use Case diagram of Semi-Automated system for collating and counting process of e-voting system.

E. Presentation of result process of e-voting system

Interactive tools, hardware and ICTs involved in presentation of result process are broadcasting system such as radio and television stations, internet facilities mobile and smart phones or devices. The model is divided into two parts consisting of contemporary media and conventional media. The contemporary media is depicted in the activity diagram in Fig 8, while the conventional media is presented by use case diagram in Fig 9.

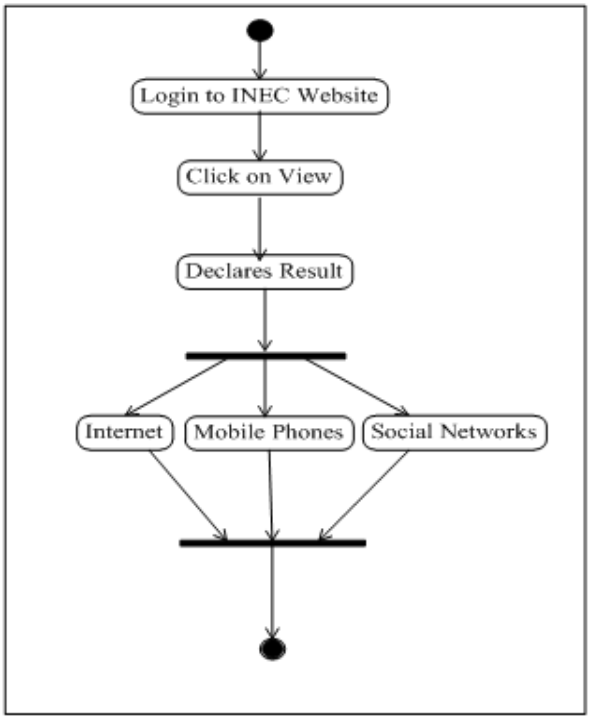

Fig 8: Activity diagram of contemporary media system for result presentation process of e-voting system

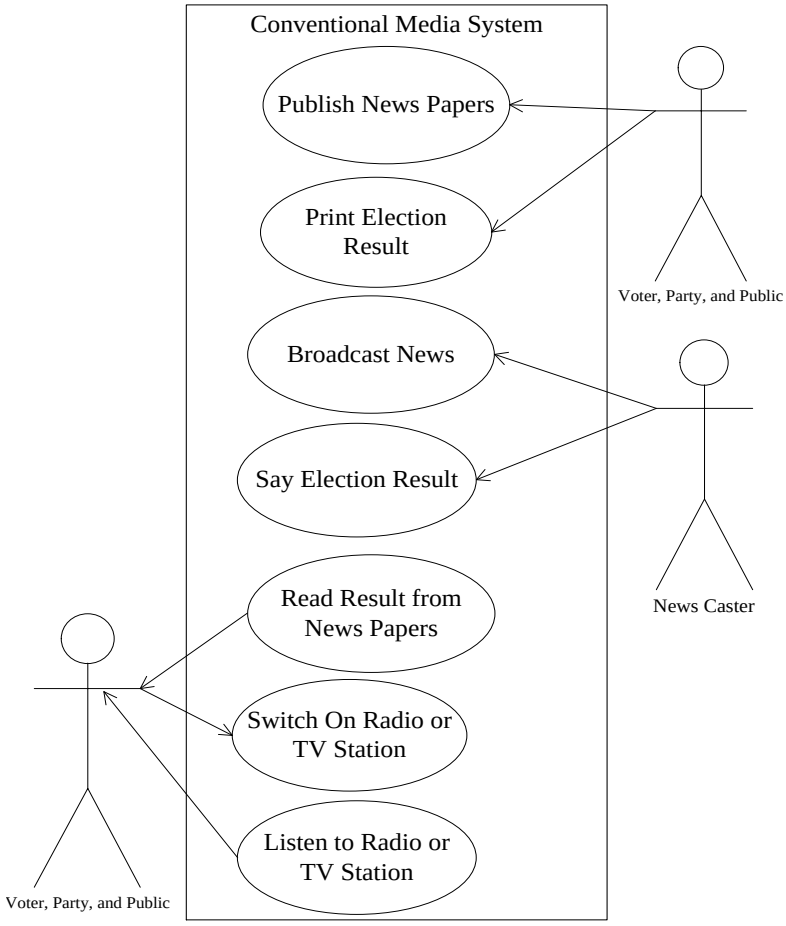

Fig 9: Use Case diagram of conventional media system for result presentation process of e-voting system.

V. CONCLUSION AND RECOMMENDATIONS

Elections are always characterized with a lot of irregularities especially in the developing countries. Politicians uses thugs to snatch ballot boxes and sometimes intimidate both aspirants and electorates before and during the election process. The models for e-voting system offers alternative to the earlier manual voting system as practiced in most developing countries if properly implemented. In Nigeria, the e-voting models design will improve the recently used smart card reader in 2015 general election. The models if implemented will therefore ease processes such as registration, verification, vote casting, collation, counting, and presentation of results.

The study therefore makes the following recommendations:

1. Governments and electoral bodies in developing countries should improve computer literacy rate among citizens due to technophobia that exists within them.
2. The security standard and integrity of the system should be properly maintained by electoral bodies in order to have more confidence and independent of the system.
3. Further research can be conducted towards implementation of the designed models.

ACKNOWLEDGMENT

Aishatu Shuaibu: I wish to acknowledge the contribution of my husband Prof. Abdullahi Muhammad Saddiq, my late father Alh. Shuaibu Jagab and my mother Hajiya Aishatu Shuaibu for their prayers, patience, understanding, support and encouragement. I also wish to appreciate my academic mentors; Prof. Arthur Ume, Dr. A. S. Bashir, Dr. H.G. Muazu for counseling, careful scrutiny, constructive critique and shaping my academic talent to its current status. I acknowledge and appreciate the contributions of my colleague Abubakar Mohammed for his assistance in research. Thank you all.

Abubakar Mohammed: I appreciate my parents and my beloved wife for supporting me with prayers. I also acknowledge Dr. Sanjeev Kumar for taking part of this research paper as well as guiding me in other research work. Finally, I appreciate Prof. S.K. Das, Prof. A.M. Saddiq, Prof. Arthur Ume, Prof. Abraham Okolo, Dr. A.S. Bashir and Dr. H.G. Muazu for their support and words of encouragements towards research work, thank you all.

Arthur Ume: I appreciate the management of Modibbo Adama University of Technology Yola for supporting and encouraging staff to embark on research activities. My deepest acknowledgement goes to the Head of Information Technology Department Dr. A.S. Bashir for carrying his staff along in both teaching and research work. I finally appreciate my wife and my children for being with me all this while.

REFERENCES

[1] Masuku, N. (1994). Transforming Election Management. *South Africa Journal of Independent Electoral Commission:* 7(8), 23-30

[2] Aranuwa, F. O. and Oriola, O. (2012). Improved Electoral Fraud Prevention Mechanism for Efficient and Credible Elections in Nigeria. *African Journal of Computing and ICT* 5(6), 70-77

[3] Adeleke, A. R., Kayode, A. S., Rasheed, J.G., and Idowu, O. D. (2013). Modeling and Evaluation of E-Voting System for a Sustainable Credible Election. *International Journal of Applied Information Systems,* 5(3), 8-14.

[4] Malkawi, M., Khasawneh, M., and Al-Jarrah, O. (2009). Modeling and Simulation of a Robust e-Voting System**.** *Journal of Communications of the IBIMA. 8, 198-206*

[5] Nu'man, A. (2012). A Framework for Adopting E-Voting in Jordan. *Electronic Journal of e-Government.* 10(2), 133-146.

[6] Pesado, P. M., Feierherd, G. E., and Pasini, A. C. (2005). Requirement specifications for electronic voting systems. *Journal of Computer Science and Technology (JCS&T)* 5(4), pp312-319.

[7] De-ville, J. & Steytler, N. (1999). Voting in 1999 choosing an electoral system Butteworths

[8] IDEA (2011). *Introducing Electronic Voting: Essential Considerations*. Stockholm: Bulls Graphics, Sweden Publishers.

[9] Rivest, R.L. (2012). Laboratory for computer science Massachusctts Institute of Technology. Cambridge, rivest@mit.edu.

[10] Bellis, M. (2013). The history of Electronic Voting Machines and Related Voting Technology. Retrieved from http://www.//votingmachines.procon.org/view.timeline.php?timeline ID=00002 on 23rd December, 2013

[11] Electoral Council of Australia and New Zealand (2013). Internet Voting Australian Election System. Retrieved from http://www.election.wa.gov.au/sites/./internet voting_a us.pdf. On 10TH February, 2014

[12] Ayo, C.**,** Adebiyi, A. A., and Sofoluwe, A. B. (2008). (Eds.) E-Voting Implementation in Nigeria: The Success Factors. Curbing Political Violence in Nigeria: The Role of Security Profession

[13] New South Wales Electoral Commission (2010). *Report on the Feasibility of Providing ivote Remote Electronic Voting System.* Retrieved from http://www. election.nsw .gov .au/data/ assests /pdf_file/00 On 26th March, 2014.

[14] United State Election Assistance Commission (2006). What Are Electronic Voting Machines. http://www.votingmahines.procon.org On 2nd December, 2013.

[15] Chaum, D. (2004). Secret-ballotreceipts: Truevoter-verifiableelections. *IEEE Security and Privacy*, 2(1):38– 47.

[16] Awopeju, A. (2011). Election Rigging and the Problems of Electoral Act in Nigeria. *Afro Asian Journal of Social Sciences* 2(2.4), 1-17

[17] INEC (2009). Continuous Voter Registration Guide. Retrieved from http://www. inecnigeria.org/wp_content/continuous_voter_registration_guide.pdf accessed on 5th April, 2014.

[18] Kuye, C. O., Coker J. O., Ogundeinde I. A. and Coker C.A. (2013). Design and Analysis of Electronic Voting System in Nigeria. *International Archive of Applied Sciences and Technology (IAAST)* 4(2), 15-20

[19] Kohno, T., Stubblefield, A., Rubin, A.D., & Wallach, D.S. (2004). Analysis of an Electronic Voting System. *IEEE Symposium on security and Privacy, IEEE Computer Society Press, May, 2004.*

