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Deployment of GSM phones Assisted Registration for Voting in Nigeria

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Abstract: ***In democratic societies, voting is an important tool in collecting and reflecting people's opinions. In Nigeria and most of the developing countries, electoral processes proceeding democratic governance is characterized with high rate of fraudulent practices and irregularities. This research work therefore, in a quest to give a solution to these problems, has developed a Mobile-based GSM Phones Assisted Registration and voting system (MGARVS) for Elections in Nigeria. The system is designed using Iterative and Incremental development methodology. The software was developed using Java Server Package (JSP), JavaScript, Java Bean, HTML, Java Servlet and MySQL as the database. On the part of the users of the application, a GSM phone with internet enabled is required to effectively carryout the voting. Finally, from the research instrument used, it has clearly shown that with this Model, will increase voters' participation, reduce cost of conducting elections, and eradicate the monster of ballot box snatching and electoral violence.***

I. BACKGROUND OF STUDY

Voting is a critical feature of any democratic process and is a vital expression of the people's power (Reddy and Raghavan, 2009) in which the methods vary from traditional voting systems to electronic voting systems (Ofori-Dwumfuo and Paatey, 2011). Traditional voting systems include voice vote, the use of stones/balls, and also paper-based system (Carback III, 2010). Nigeria still uses the old method of paper-based voting system up till today with its numerous challenges despite the incorporation of semi-electronic voting in 2015 election (Omolaye et al., 2015).

The method of voting using ballot paper consumes time and can lead to many problems (Ekong and Ekong, 2010) and (Aker *et al*., 2011), including: voters not able to vote due to long queues; intolerable percentage of a very high lost, stolen, or miscounted ballot papers; very large number of invalid or unclear ballot papers, inadequate preparations to accommodation for disable persons; climatic conditions might as well make voters feel reluctant to walk long distances to polling booths to perform their civic rights by way of voting; harassment/intimidation of prospective would be voters by party Agents.

According to (Ekong and Ekong, 2010) time and resources incur by human through old voting method can be saved by simplified procedures of electoral process using ICT. Automating an election process by total submission and relying on state-of-the-art in ICT technologies, can tremendously mitigate many of the factors that would destroy or hamper a healthy progress of a given election process. For automated e-Voting processes to be fully accepted by citizenry, several issues must be addressed and resolved in terms of authentication/validation, security, robustness, performance and correctness (Omolaye, et al., 2015).

In today society, movement has become one of the most vital ICT pattern, affecting all views of modern life (Kumar and Ravikanth, 2009). As result of such technological breakthrough by world of ICT, using a system of mobile service will provide complex and more sophisticated service. Mobile phones exhibit some unique characteristics that distinguish them from the online medium (Little and Duncan, 2011). These ubiquitous devices are portable, affordable and in wide-spread use today, with about a third of the world's population having at least one.

This phenomenon offers instant connection from different resources anywhere all around the globe to entertainment, information family and friends. The execution of successful elections is the foundation of political stability and the definite way to establish democracy in the polity. The application of an effective voting system is the rudimentary ingredient for the conduct of a credible, fair and acceptable election. Since independence in 1960, Nigeria has grappled, without success, with the ways and means of ensuring the conduct of credible and acceptable elections. It is in view of the above that the researcher deems it fit to embark on, "A Model of MGARVS for Nigeria", with the hope that this research work, when fully implemented will increase the effectiveness of the voting process, reduce cost and time, increase security, increase turn-out and accessibility of Information on voting system in Nigeria.

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II. HISTORICAL BACKGROUND

As technology has moved forward in several dimensions of our lives, the exponential growth in the usage of mechanics and electronics has also emerged (Omolaye, 2014). Literature also suggests that improvements in voting systems started as early as in 1890s with the invention of the Herman Hollerith punch card machinery for the US census (Caarls, 2010). The Paper-Based Process involves a rigorous one because the process of validation before voter's ID will be issued involves a lot of paper work, appropriate training and time used to get the polling unit/station arranged according to specification (Yekini et al, 2012). With all these steps, groups and procedures that are involved, the process can prove to be tedious, error prone and costly (Omolaye et al, 2015). The Electronic voting encompasses both electronic means of casting votes and counting of votes which can include punched cards, optical scan voting systems and specialized voting kiosk, transmission of ballots via telephones, private computer networks or the internet (Omolaye et al, 2015). The Direct Recording Electronic Voting System (DRE) is not left out because the machine records votes by means of a ballot display provided with mechanical or electro-optical components that can be activated by the voter - typically buttons or a touch screen (Kohno, 2004). Public network DRE voting system will involve Internet voting systems have been used tested and used privately in many modern nations and also widely and publicly in some countries such as United States, the UK, Switzerland and Estonia. Smart Card Voting (Token) is played a vital role which has to do with the use of the smart cards and kiosk there was a significant leap in voting technology, as persons were able to vote within their own comfort zone or that was the intension. The need for the various human security bodies was eliminated. This system however, has flaws on security aspect and voters could vote multiple times (Omolaye et al., 2015). From all indications, since year 2005 and up to date, a number of researchers have proposed beautiful and novel ideas for achieving higher assurance of election integrity without stress and coercion

A. Justification of the proposed Model

In Nigeria for example, about 2,538,246 votes were invalid during the 2003 presidential election, thus summing up to 6.04% of overall votes. The invalid votes in 2015 general election was not able to account for due to the fraudulent activities of the edition. This is significant and substantial facts, hence a MGARVS is preferred to the traditional manual process. It is becoming obvious that the whole voting process in many undeveloped nations leads to civil unrest, thus to solve this problem in this nations and Nigeria in particular, there is a need to put in place a credible MGARVS.

B. Proposed Model

According to the principle of the three-layer architecture, the model architecture which was employed is shown in Fig. 1

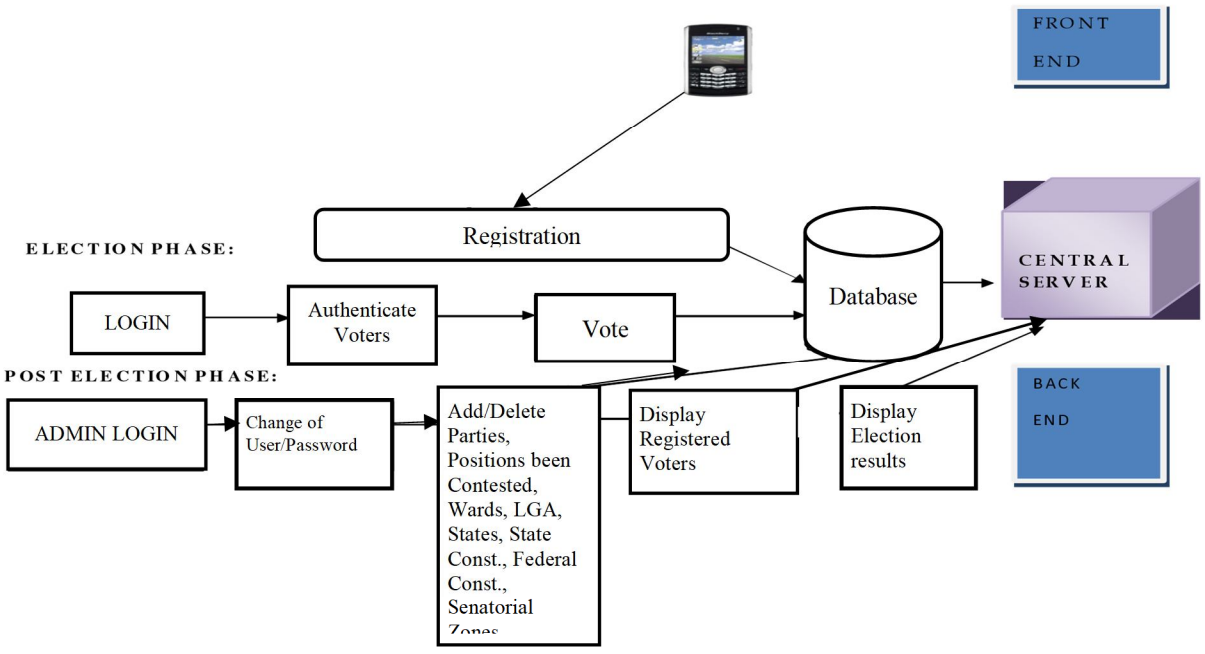


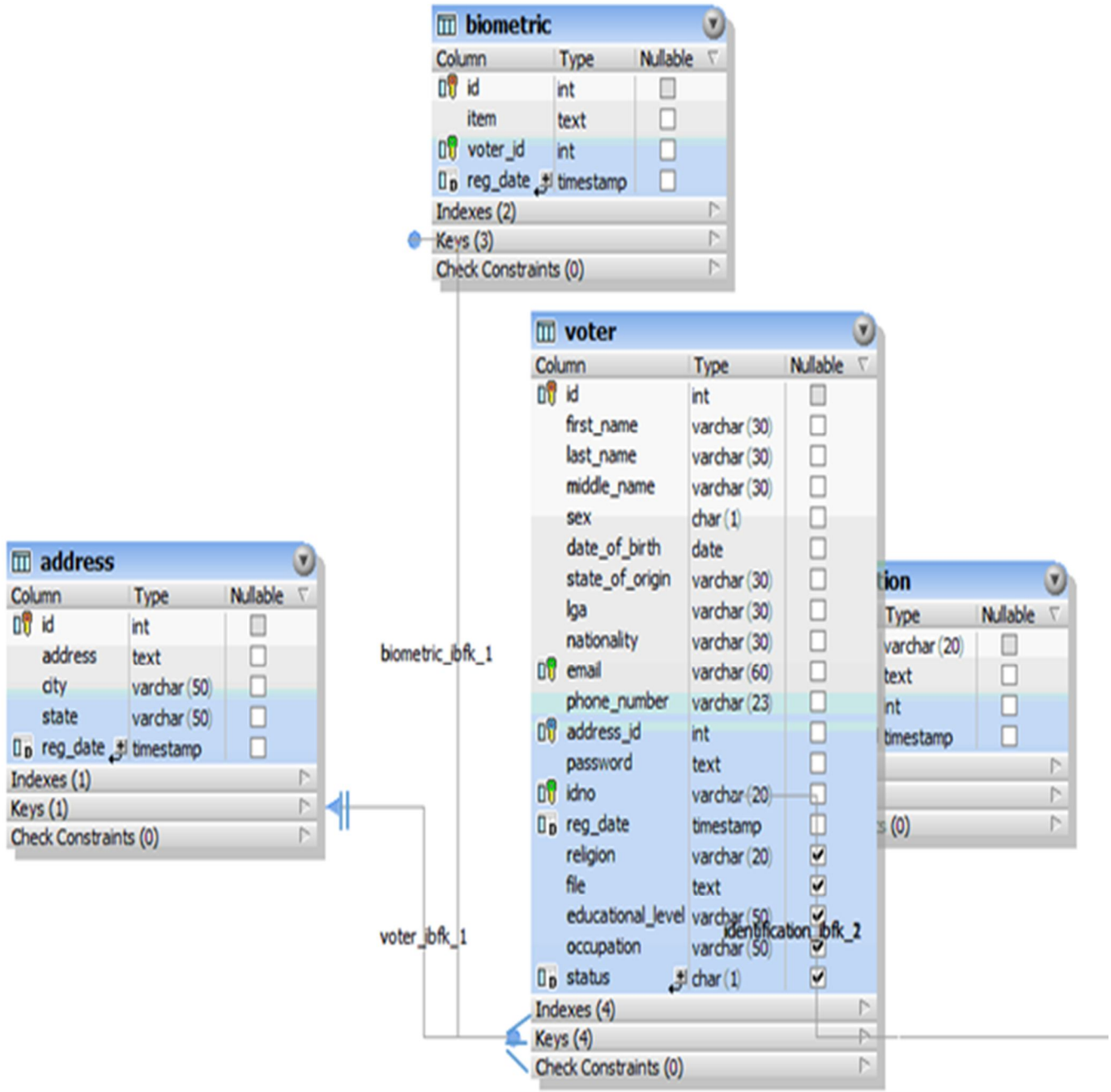
Figure 1: Model Diagram of GSM phones Assisted Registration and voting system for Nigeria.

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C. Data Modeling

A data model describes the flow of data through the different procedures in an organization. It represents the logical organization of data in the system without specifying how the data are generated, stored, or manipulated. This helps the researcher to place more emphasis on the business without being confused by technical details. The logical data model is later transformed to physical data model that reflects exactly how the data in database will be stored. Entity relationship diagramming (ERD), a graphics drawing techniques established by Peter Chen (Chen, 1976) illustrates data components of a business system is used to model the data in the new system. It uses three basic elements and they are entity, attributes and relationship. The Model of MGARVS for Nigeria Entity Relationship Diagram is represented in Fig. 2.



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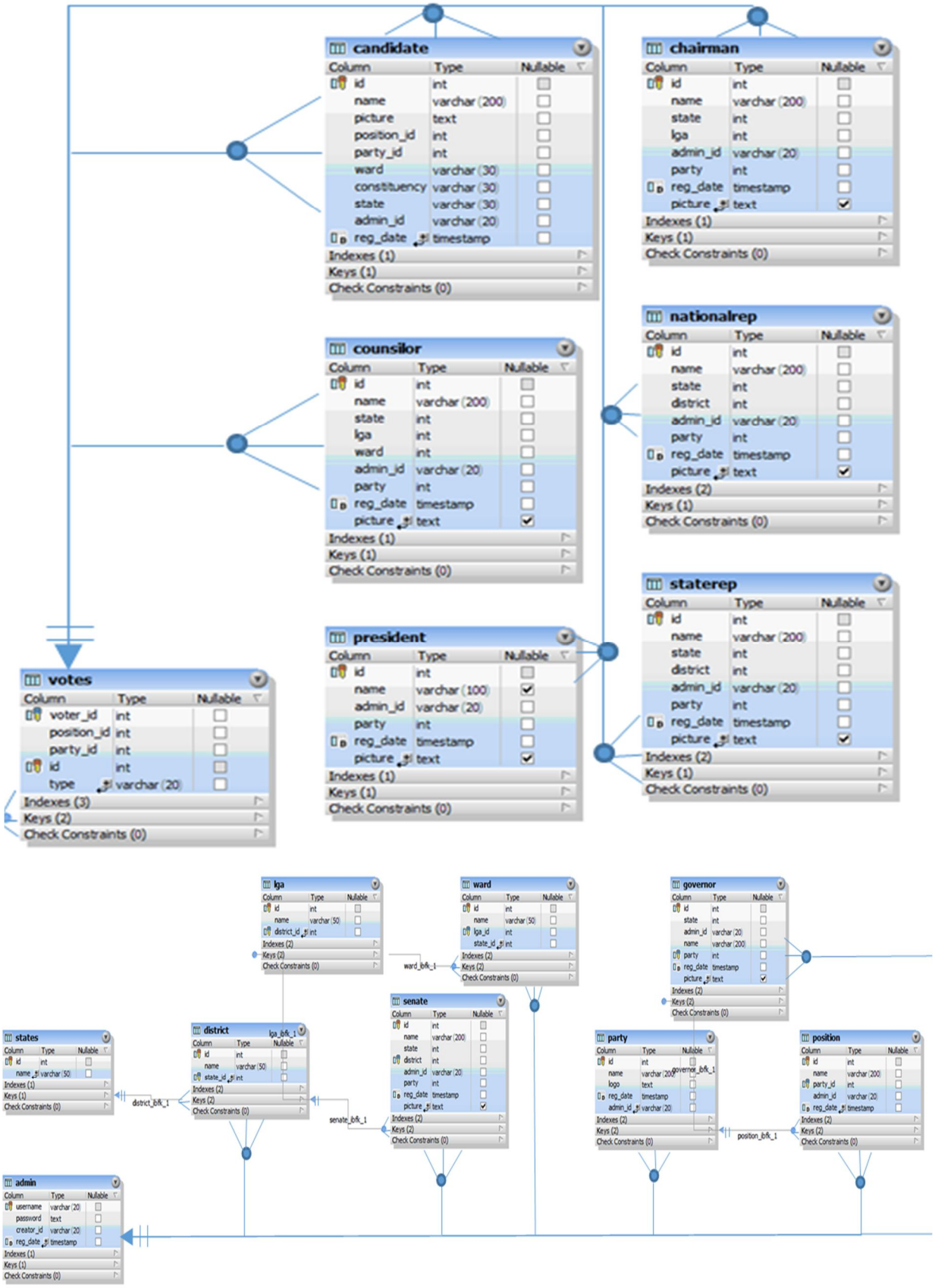


Figure 2: Entity Relationship Diagram for a Model of GSM Phones Assisted Registration and Voting System for Nigeria

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D. Program Logic

In general, the detailed steps are shown in the program flowcharts.

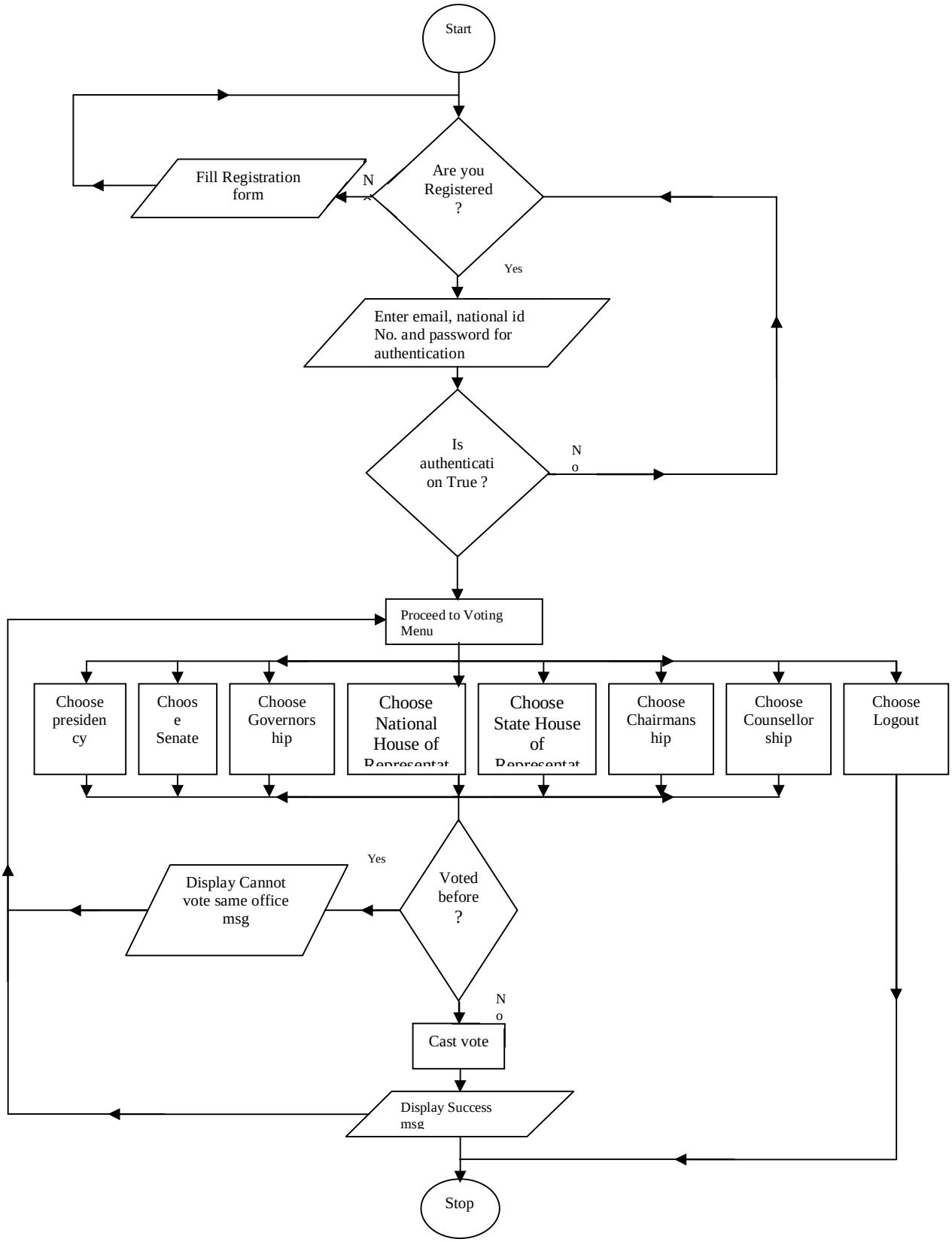


Figure 4: Program Flowchart

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III. CONCLUSION AND RECOMMENDATIONS

MGARVS has been designed and implemented for use in Nigeria. The initial requirement and design specification for this paper has being met coupled with the development of GSM Registration and voting system. The result of the research was very useful in the voters' Registration and voting software design to suite the Nigeria system and biometric authentication to eliminate sharp practices If implemented, Nigerians can registered and vote for any candidate of their choice irrespective of their location and result of vote cast is known instantly without delay. This tends to eliminate challenges such as voter suppression, voting not count, election rigging, snatching of ballot boxes and ballot papers, results being prevaricated and to cap it all the litigation after the election. All these challenges summed up to irregularity and instability in electoral process which tends to make the people to lose confidence in the electoral system of Nigeria.

A. Recommendations

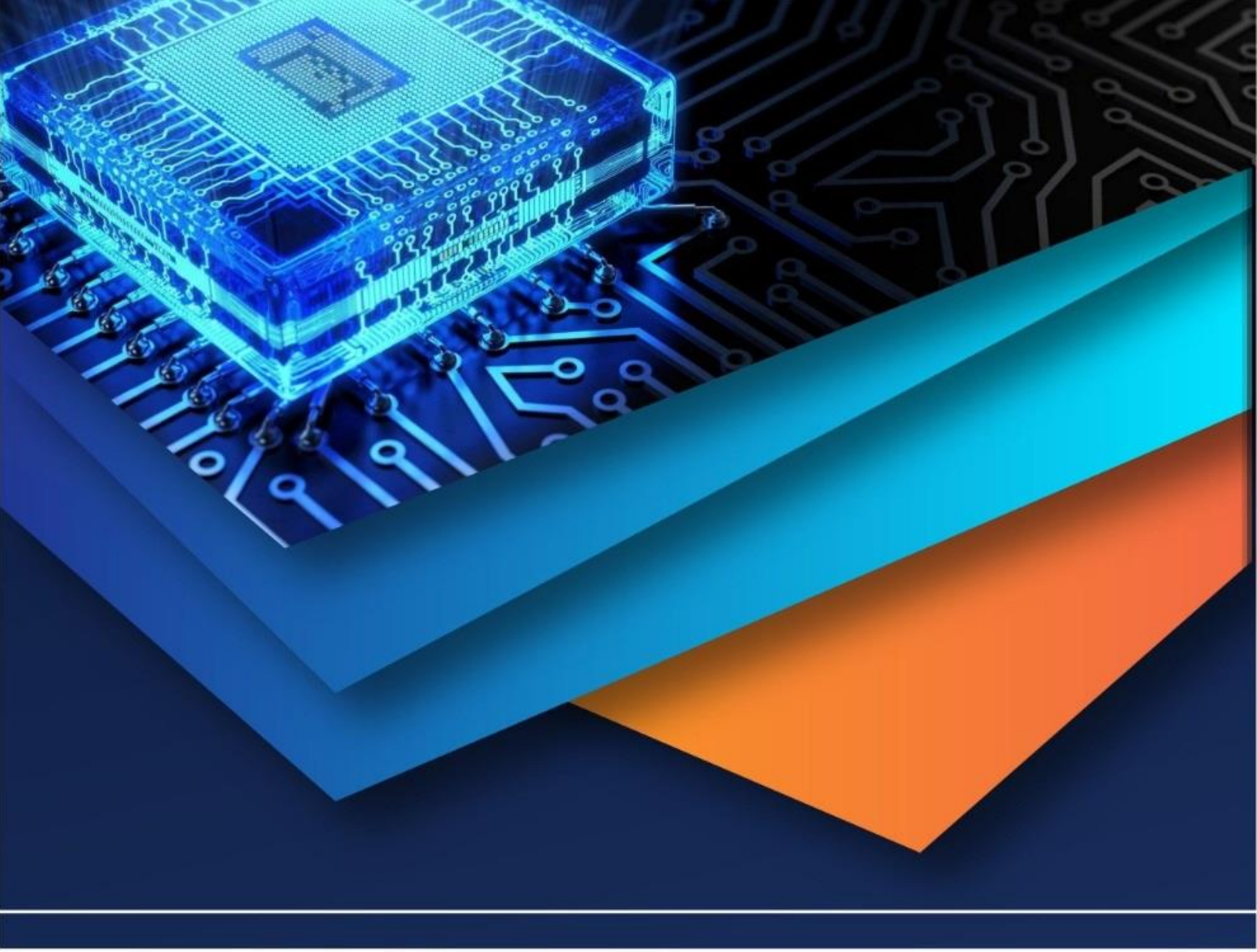
The following are some of the recommendation being made by the researchers for efficient operation of this system in Nigeria and further improvement for future researchers.

1) The credibility of system relies squarely on the administrator of electoral body.
2) There should be massive orientation on how to use the application.
3) There should be an effective connectivity and data recovery framework and free internet for citizenry during election period to motivate voters.
4) Enough bandwidth to cater for the large population of voters should be provided by telecommunication providers to facilitate the speed or rate of Registration and the voting.

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