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The Design of Electoral Booth Monitor System

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Abstract: Social media such as Twitter, Facebook, whatsApp, YouTube etc provide new ways to encourage citizen to be involved in political and economic affairs of their nation where elections and electoral campaigns have a central role. This paper seeks to present the design and test implementation results of the software developed to monitor and report election results in Nigeria. The methodology used in development of the software is the Object Oriented approach. The system was designed using UML Use Case diagram. Java Programming Language was used to develop the electoral booth monitor system with Java Server pages (JSP) as the front end technology while Enterprise JavaBean business logic was used for the coding. The backend was developed using MYSQL relational database. The system test implementation results shows that accuracy and timely results can be obtained from elections if results are allowed from multiple sources for evaluation and this particularly will reduces the extent of election results falsification.
Keywords: Election Software, INEC, Voting, Social media, Information
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I. Introduction

Online Reporting is a new state-of-the-art electronic platform to revolutionize reporting under Multilateral Environment. In Nigeria, the Independent National Election Commission (INEC) has allowed organization both private and nongovernmental to observe elections as this is an important and fundamental way of ensuring free and fair elections as well as been seen meeting internationally accepted standards. However, because of the multilateral and topological nature of the country it becomes difficult for observers to cover and effectively observe the electoral process. Usually after results are announced at the polling unit, the presiding officer fills the result sheet after which he/she is escorted by armed security men to the collation center where the result sheet is submitted. The system of conducting and announcing election results in Nigeria has the following pitfalls:

1. Usually the presiding officer leaves the original result sheet from the voting centres at the mercy of the collation officer at the collation centre thereby creating avenues for results falsification and manipulations.
2. There is no other way/means to follow up on the proceedings of election results other than what the collation officers announces to the public which in most cases, are falsified results.
3. Due to the large number of electorates and the high level of insurgency in some part of the country, it becomes difficult for observers and journalist to effectively cover every polling unit making the results from such centres highly unreliable.

One way to reduce these pitfalls is to make all electorates become observers and reporters of the elections. That is, any concerned and capable electorate can report the progress of election in their various polling units (PU). This conceived concept will be crucial to election success and it will discourage election result rigging to a greater extent as results will be available for multiple sources for comparison and evaluation.

This research work therefore takes advantage of the social media to develop a booth monitor which is an online election reporting platform for Nigerian electoral system. The social media such as Facebook, Twitter, Whatsapp etc. remains an unofficial mode of reporting elections even though they have been partially and unofficially serving the purpose. The main focus of this paper therefore is to develop a software that will enable members of the public to take advantage of social media and their phones to report, monitor and contribute their quota to making elections results free and fair.

II. Related Works

For citizens to make well-informed decisions in an election there must be a free media. But the media must be more than free. It must be reliable. It must be trusted. It must have opportunity to form independent and diverse views. Unfortunately, there are places where journalism is compromised by governments or powerful interest and some places are completely out of reach due to insurgency and difficult terrain. Reference [7], observed that nowadays, social media are ubiquitous, offering many opportunities for people to share and access information, to create and distribute content, and to interact with more traditional media. For news organizations the social web has become an important platform for distributing content, as well as a space where reporting and newsgathering takes place.

According to [8] the primary responsibility for monitoring the election rests locally with the political parties. They are more than observers. The party agents represent the first line in defense of Nigeria's electoral democracy. If the parties are unable, or unwilling, to shoulder this burden responsibly, they only have themselves to blame when things go awry.

There are, however, gaps in election observation: civil societies, for instance, no longer have sufficient institutional capacity especially financially to monitor the media therefore it becomes difficult for these organizations to fund herself.

Reference [9] in their research attempted to use social media to measure public opinion.They considered the scenario where scholars have attempted to use social media data to predict election results. Other studies such as ([3], [5], [10], [12]-[13]) exist that have considered elections, media, freedom of the press and media and their relationship.

Reference [4] surveyed the impact of social media on election system. In their research, social media platforms, such as Twitter, Facebook and YouTube provided new ways to encourage citizen get involved in political life, where elections and electoral campaigns have a central role. Reference [2] provided definition for social media as "a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0 and that allow the creation and exchange of user-generated content."

Reference [1] asserted that mass communication is one of the inevitable allies of political parties. Most of the parties and their leaders exploited the mass communication tools very effectively. Even, most of the political parties and leaders have won seats in the government with the help of effective media and communication strategies. Most of the political parties and politicians have been using the mass communication tools for a long period. With the outbreak of new technologies, election candidates are looking for new ways to reach out to their followers and prospective voters. INEC should also look out for new ways of improving the Nigerian Electoral System, perhaps.

The research by [6] showed that certain isolated factors can at times lead monitoring organizations to approach elections with a highly positive "pre-election stance." Thus it reveals that the notion of "neutral" election observers is a myth. For both practitioners and scholars, it is important to understand monitors' predispositions. This analysis does not lead to easy conclusions, however. The issue is complicated, and the policy implications deserve greater discussion.

One possible recommendation is that monitoring organizations should avoid making overall assessments of the quality of elections. But this is probably unrealistic, as their mandate is, after all, to evaluate elections. Another approach is to encourage several organizations to monitor the same election—the hope being that, among the various organizations present, at least some will be willing to highlight any fraud. As mentioned earlier, the issue of funding remains the biggest challenge here.

The role of journalists is particularly crucial during the election process. In an often fragile context, and with a mind to conflict prevention, journalists must depend on their professional skills. They must commit to delivering thorough, verified, and unbiased information, pulled from a number of diverse sources, to their listeners or readers. At the same time, they must refrain from publishing information that encourages divisions or antagonistic discussions, which are likely to incite violence or jeopardize social cohesion. You can agree with us that, the same information that will incites violence when convey by conventional journalism will be conveyed peacefully over digital media.

The best way to try to limit problems (in elections) is to provide as much training for journalists and resources for public information and awareness as is possible [14].

According to [11] the portrayal of elections in Africa by the Western mainstream media include its focus on crisis, disaster, war, famine and its oversimplification of social organization and ethnicity. Conversely, the local African journalism remains a disappointment for many Africans because they were hoping to have, with the increase in media outlets, quality journalism that could provide detailed coverage of the news that affects their lives. They want the media to cover the important topics that will affect their country's economic and political development, but in many cases, it is an illusion.

Of course, there are legitimate reasons for the poor performance of African journalism such as the difficult conditions under which African journalists work and these factors have naturally affected their efficiency for example; poor salary scheme, poorly trained professionals and being subjected to working under both political and economic pressure. Many African journalists suffer from the devaluing of their profession, which has left them vulnerable and isolated.

Conducting elections in Nigeria presents many challenges, considering the large size of the electorate, the limited infrastructure, low literacy levels, and an environment that is characterized as violent and corruption. There are also complex ethnic, religious and geographical divides. Journalism and the media, even election observers have submitted to these limitations. But to further strengthen the media/observers above these limitations, we present an online monitoring system under the capture "Booth Monitor" where all able electorates can carry out a self-reporting activity to save the system from total collapse.

III.   Methodology

This research uses the Object Oriented methodology in its design and implementation of the Booth Monitor system. Object-oriented development is a method to develop software by building self- contained modules or objects that can be easily replaced, modified, and reused.

The block diagram in Figure 1 shows the conceptual model that defines the structure, and views of a system.

**Figure 1: Booth Monitor Block Structure**
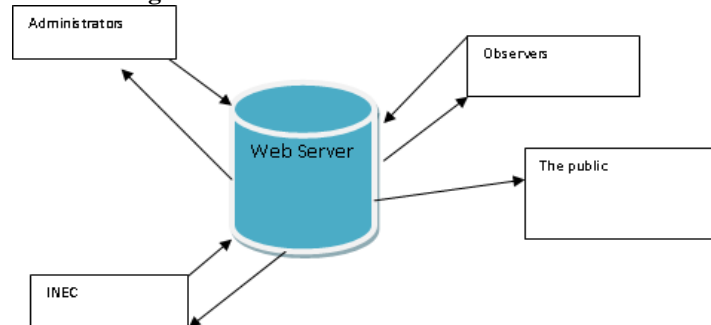
The block structure shown in Fig. 1 contains the following modules and their functions:

- **Administrator (Admin)**: An administrative user sets up the database. He carries out functions such as registering the States, Local Government, Wards and Polling stations. He also manages all users.
- **INEC**: INEC will register their accredited observers in their respective polling units and upload the codes of all electorates in their respective polling units
- **Electorates**: all concern and capable electorates register themselves on the system in their respective polling units using their pre-uploaded codes.
- **Observers**: both INEC accredited observers and registered electorates will be able to report the result of their polling units and also follow up on what's happening in other polling units.

A.   Use Case Diagram of the System

This is a representation of a user's interaction with the system that shows the relationship between the user and the different use cases or list of steps in which the user is involved.

Figure 2: Booth Monitor Use Case Diagram
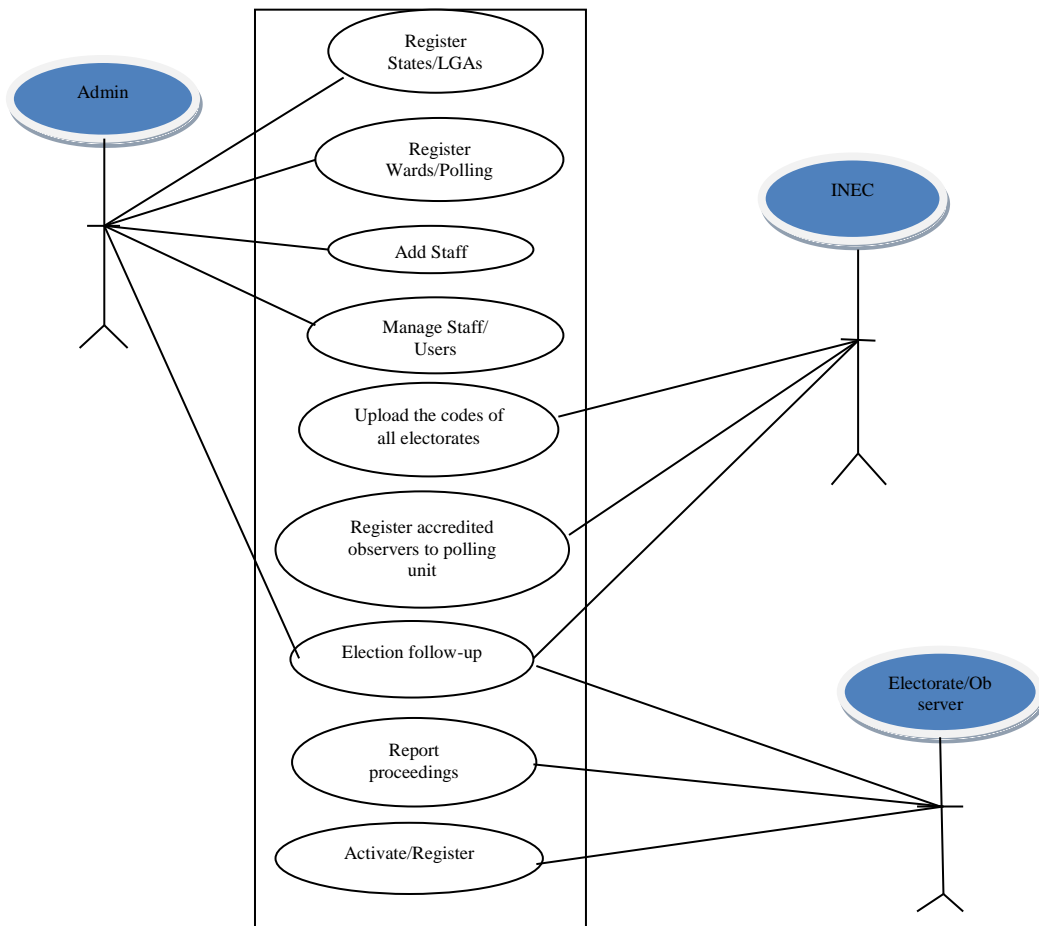
B.   Hardware and Software requirements for the Design and Use of Booth Monitor

The minimum hardware required to use the system are:
   i.   Hard disk of 500 Giga bytes
   ii.   System memory (RAM) of 4 Giga byte

The minimum software requirements required to use thesystem are:
   i.   Microsoft Windows XP (Home and Professional Editions), Windows 7 & 8
   ii.   MySQL Database
   iii.   Browser e.g. Mozilla Firefox, Safari, chrome, Flock etc.
   iv.   Web Server e.g. JBOSS Server

IV.   Results And Discussion

The system so designed can be deployed and used for mobile and smart phones. Every voter is expected to install the software and learn the interfaces before the election. The system must register the user as observer in a particular polling unit before the election. The process is easy because all valid voters have a registered polling unit to cast their vote. Therefore such polling unit can also be used as the unit where the election will be monitored. A user can only report election results or vote cast in their given polling unit of accreditation by the system. The details of such reporters are thus verifiable. The results from the system test run are presented and discussed.

Figure 3: Secured login page
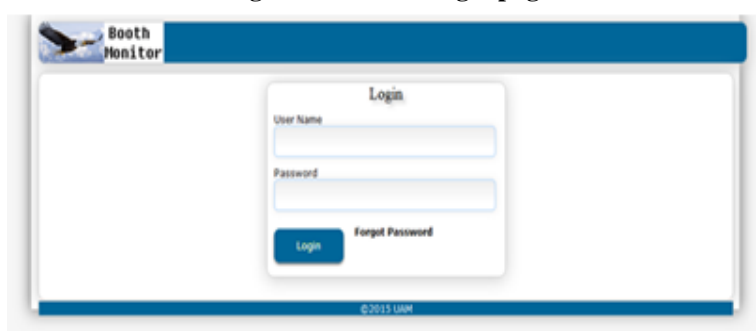
This is the secured login interface (see fig. 3) where users log onto the system (**booth monitor**). Like every other secured system, each registered user has a password and a user name which he/she uses to login.

Figure 4: Dashboard menu

As soon as a user successfully logged in to the system, the system presents him/her with a dashboard of options (see fig. 4).The user simply selects the appropriate option depending on what operation is to be carried out.

Figure 5: The option to reporting an election
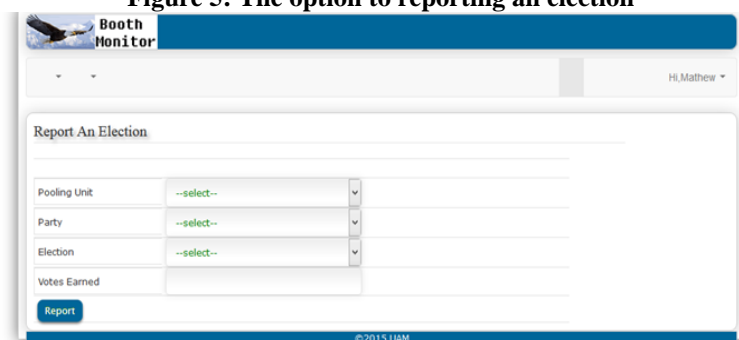
At this stage a user can report a particular election in his/her pooling unit as it is shown in Fig 5, the user is expected to key in the votes earned by each political party in a given election.

Figure 6: The view of Election Result

As it is seen from Fig.6 above, every user has the privilege to view election proceedings in form of votes earned by various parties in a given elections regardless of their pooling unit (PU)

V. Conclusion

The world is experiencing an information age revolution that is fundamentally transforming the way in which human activities are carried out. Governments are now building mainframe computer that runs e-government portals for service delivery and various schools and organizations now deliver services over the internet. Our world is now a global village which makes it easier for Booth Monitor to function effectively. The importance of reporting election results over the internet in a Multilateral Environment as Nigeria cannot be over emphasized, even as it has been mentioned earlier "this will help curtail election misconduct mostly at the collations centres" by strengthening the statistical evidence of elections proceedings thereby, constraining the collation officers not to deviate from the true results. Most often journalist/electoral observers are constrained in discharging their duties due to the large number of electorates; however INEC could increase the number of observer but funding remains a challenge to INEC as an independent body and the high level of insurgency in some parts of the country. We believe that if electorates are provided with a tool (such as Booth Monitor) that will enable them to reports their observations, the electoral process in Nigeria will be better captured and, most importantly, the same information from which decisions are made will be made available to the public thereby further preserving the integrity of the electoral process.

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