**A WEB-BASED E-VOTING APPLICATION FOR THE COMPUTER SCIENCE DEPARTMENT**

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**1.1 BACKGROUND OF THE STUDY**

The use of online voting has been explored for many years due to its potential advantages over traditional paper-based voting. Web-based e-voting applications have emerged as a potential solution for increasing voter participation, reducing the cost of elections, reducing the risks of fraud, and providing a more secure and efficient voting process.

The background of web-based e-voting applications is rooted in the development of new technologies and the need to provide a secure and reliable way to cast and count ballots. The use of the Internet and the development of cryptography have enabled the development of secure and reliable web-based e-voting systems. In addition, the development of authentication mechanisms, such as digital signatures, has further helped to secure the voting process.

The use of web-based e-voting applications has been explored in numerous research projects, including the development of e-voting systems for various elections around the world, such as the Estonian i-voting system and the Indian e-voting system. Additionally, the use of web-based e-voting applications has been explored by companies, such as Microsoft and IBM, which have developed their own e-voting systems. These systems have been tested in various elections and have demonstrated their potential in increasing voter participation and providing a secure and efficient voting process.

A web-based e-voting application is a type of software that allows users to cast their votes electronically over the internet. This type of application is commonly used in elections, polls, and other situations where it is necessary to collect and tabulate votes from a large number of people. E-voting applications are designed to be secure, convenient, and accessible, and they offer several advantages over traditional methods of voting. For example, e-voting applications can save time and money, reduce the risk of errors or fraud, and make it easier for people to cast their votes from any location with an internet connection. However, e-voting systems also raise concerns about security, privacy, and the integrity of the voting process.

**1.2 STATEMENT OF THE PROBLEM**

computer science election commission often involves a lot of manual labor, such as printing and distributing ballots, collecting and counting votes, and verifying the accuracy of the results. This can be time-consuming and expensive, and it may not be able to accommodate large numbers of voters. It is also prone to errors and potential fraud. For example, votes may be miscounted, or there may be discrepancies in the results. This can lead to disputes and challenges to the legitimacy of the election. The current voting systems may also pose barriers to certain groups of voters, such as people with disabilities or those who lives far from the school axis. This can undermine the integrity and credibility of the election

**1.3 AIM AND OBJECTIVES**

The project is aimed at designing a working web-based E-voting application for the computer science department at Kaduna polytechnic.

**OBJECTIVES**

The objectives of this research work are as follows:

1. In the front-end development, HTML and CSS will be employed to create an interactive UI and UX as well as Django which is a Python web framework will be employed in developing the back end.
2. Series of vital testing will be carried out in ensuring the efficacy of the research work.
3. In storing and retrieving location data; MySQL, an open-source relational database, will be used as the database technology.
4. The student data set will be extracted from the department based on some criteria ensuring that only the right set of people can vote.

**2.1 LITERATURE REVIEW**

**A Survey on Web Based Application of Secure Online Voting System**

Shanthi S., Ilakkiyavani R., & Amsaveni P. (2018). Data Mining is an analysis tool which is used to extract various knowledge from the vast amount of data with security for the effective decision making. Online voting system uses data mining technique, to increase transparency at the highest level and to increase operational effectiveness to minimize piracy of data and also to have faster access for effective decision making with secure data. Since some years ago, different methods, such as the punch card systems or the secret ballot method have been held to carry on electoral processes, where people have to visit the booth to cast their votes in the existing system. Since then fast evolution of Information Technology, voting systems have emerged, which allow a voter to be part of an automated process that can only be possible through Voting Systems. The proposed system is online and hence even people who live out of their home town can also vote. Increasing the voting percentage is the major goal. The main objective of proposed system is to provide, a quick and efficient retrieval of information.

**E-Voting system using Blockchain technology**

Indapwar, A. (2020). Nowadays, normal voting using EVM (Electronic voting machine) which stores the votes of each voter in a centralized database. And after researching many different e-voting applications, most of the application used centralized data storage as the database. As, these centralized databases stores the complete data at a single location and is easy hackable and can be tampered with. Hence, due to this the data can be inconsistent while voting count and will not provide us with the correct result. Hence, using blockchain technology, we create a decentralized application where the tampering of data becomes almost impossible as Blockchain uses the decentralized algorithm for the data storage where the data is stored at a single location. The main objective of E-voting system using blockchain is to create a e-voting system underneath using a blockchain technology. This system is just like a normal voting system, of which same process is conducted on e-voting which used to be conducted on the normal paper-based voting with the use of mobile, web browser for the voting purpose by the voters. Therefore, this paper will give a review of blockchain technology and how this technology will be used in E-voting system.

**The Implementation of Electronic Voting System for Student Representation Council using reCAPTCHA**

Salleh, A. A. K., Kadir, H. A., Ahmad, A., & Yusof, M. A. M. (2021). The electronic voting system (E-voting System) is a web-based application that enables voters to record safe and confidential votes electronically. This research aims to develop an E-Voting System by exploiting the 'reCAPTCHA' security component for a private international college. The Waterfall Model is deemed the most suitable to be used after data was gathered prior to developing the system and it is also considered simple to be employed. The functional testing was conducted with thirty students and results revealed that 63% of the respondents are in agreement that the traditional voting system should be supplanted with electronic voting system, especially to cut down the time in the voting process. Ultimately, the system developed demonstrated that it efficient, reliable and displayed transparency in the E-voting System.

**3.1 PROPOSAL METHODOLOGY**

This kind of in-depth examination is part of the research strategy, which aims to learn new facts or details about the current system. The department and the internet were used as primary sources of data for this investigation.

**3.1.1 INTERVIEW**

The main objective of using interviews as a method of data collection is to obtain information in a thorough and rigorous way. Based on the questions the researcher provided, the researcher met with the departmental project coordinators and acquired reliable information.

**3.1.2 DIRECT OBSERVATION**

This method allows varied degrees of control over the context in which they are used, and the meticulous inspection highlighted the obvious shortcomings in the current system. It was utilized to gather information/data for this study by looking at how student locate places manually.

**3.2 CHOICE OF PROGRAMMING LANGUAGE**

This research work will be a web-based application and will be implemented on a relational database system (SQLite). HTML (hypertext markup language), CSS (cascading style sheet), and JavaScript will be employed in the frontend while Django(python) will be employed for the backend programming. The above are the modern languages used in implementing this system.

**REFERENCES**

Indapwar, A. (2020). E-Voting system using Blockchain technology. *International Journal of Advanced Trends in Computer Science and Engineering, 9*(3), 2775–2779. <https://doi.org/10.30534/ijatcse/2020/45932020>

Salleh, A. A. K., Kadir, H. A., Ahmad, A., & Yusof, M. A. M. (2021). “The Implementation of Electronic Voting System for Student Representation Council using reCAPTCHA.” *In IOP Conference Series: Materials Science and Engineering (Vol. 1062). IOP Publishing* Ltd. <https://doi.org/10.1088/1757-899X/1062/1/012043>

Shanthi S., Ilakkiyavani R., & Amsaveni P. (2018). “A Survey on Web Based Application of Secure Online Voting System”. I*nternational Journal of Trend in Scientific Research and Development, 2*(3), 1546–1551. https://doi.org/10.31142/ijtsrd11483