

Biometric Voting System

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Abstract: The word “vote” means to choose from a list, to elect or to determine. The main goal of voting (in a scenario involving the citizens of a given country) is to come up with leaders of the people’s choice. The project is mainly aimed at providing a secured and user-friendly Biometric Voting System. The problem of voting is still critical in terms of safety and security. The proposed voting system with biometric authentication is an electronic voting system which seeks to make use of the uniqueness of the minutiae of the human fingerprint to further enhance the level of trust and confidentiality of the voters in the system as well as making the actual process as universally accessible as possible which would be achieved through the deployment on the Internet. It is expected to solve the critical issues faced due to elections. For the voter registration and authentication processes which are performed on the desktop module, the voter is expected to have his or her fingerprints captured and the minutiae extracted that is stored on the database. This is done to prevent the occurrence of multiple registrations or identity. Thus, during the authentication period, voters are expected to undergo a matching verification of their fingerprint samples against the values stored in the database which is identified through the use of a unique voter identification number assigned during registration. Voters can thus proceed to the online module of the project to cast their votes through any internet – connected device using the voter identification number, security answer keyed in during the registration process as well as a token key that was generated automatically for each voter per election on the online module. The token is sent by the administrator to each voter through his or her associated email. Worthy to note is that though voting is now done ubiquitously, it must be carried out during the stipulated period as contained in the email message sent to the voters. Conclusively, Online Voting System with biometric authentication project, has been able to deliver an electronic voting system that solves all the highlighted challenges of the traditional system of conducting elections, offering voters a trusted and credible means of exercising their franchise with great ease. It is therefore recommended to be deployed fully in subsequent elections.

Keywords: Voting

I. INTRODUCTION

E-voting (Electronic Voting) as a term encompasses a broad range of voting systems that apply electronic elements in one or more steps of the electoral cycle. There are many levels to e-voting in broad sense which could be e-collation, e-verification, internet voting, remote online voting etc. Following the definition of a system as anything that takes an input and gives an output, an e-voting system is any system that can offer both electronic and online voting. It could also incorporate e-registration, e-verification, e-collation, remote online voting and real-time result display. An E-voting system (EVS) generally comprises the following for it to work efficiently:

E-voting system serves to reduce the cumulative costs of running elections and increase voters participation in election system as it offers voters an easy and convenient way to vote and most importantly, it is a panacea to the issue of long distances covered by voters to a specific destination for their votes to be counted, and also it combats the issues of ballot box snatching which is rampant in the conventional election process in India.

- An interactive voting user interface on an electronic device which provides a friendly environment for voters to authenticate and cast their votes, it also serves as a means of collection of the individual votes and storing them in the local and central database.
- An administrative dashboard for voter’s registration, details update and elections coordination and monitoring.
- A database management system for the storage of election, voting and voters data.
- A result display interface.

A great technological improvement is observed in election process mostly in the areas of result collation and transmission. Though the Independent National Electoral Commission (INEC) has not fully implemented the use of technologies for collation due to lack of legal framework. But, most elections around the world use ICT in elections to some degree, at least to summarize and aggregate the votes. This electronic adaptation is the result of a long period of evolution during which not only the procedures but also the technological means for casting votes changed considerably.

II. DESCRIPTION OF THE PROBLEM

2.1 Biometric Voting System

This voting system makes use of a biometric feature (fingerprint) to authenticate users of the system. Fingerprint recognition hardware is integrated with the system so as to solve the problem of the existing system. The new system operates in an identification mode and performs the following:

- Captures fingerprints, extracts the features and stores it in the database.
- Verifies the identity of the voter at login time by comparing the fingerprint that has been pre-stored in the database with the fingerprint being supplied at login.
- Provides an interface for the user to cast votes if a match is found.
- Provides an interface for viewing the results of the election.

2.2 Problem Statement

The present voting system applicable in India is inefficient as the voters registration process is slow, the manual collection of results takes time and gives room for result manipulation, also the inaccessible nature of election venues which includes the long distances to be covered by voters to their registered location increases voters apathy towards the election process, and finally the issues of ballot snatching and damage also the other election violence and issues associated with the traditional voting all defiles the purpose of voting in election process.

III. METHODOLOGY

The methodology of choice is Rapid Application Development (RAD); this is because the objectives of RAD include high speed, high quality and lowered cost. RAD emphasizes the use of special techniques and computer tools to speed up analysis, design and implementation phases. Tools include Computer Assisted Software Engineering (CASE) tools, Joint Application Design (JAD) and fourth generation programming languages. All of which are inline and essential to the proposed system. The RAD methodology goes through the following phases:

Phase 1:

Requirements planning: refers to a review of the areas immediately associated with the proposed system.

Areas associated with the proposed system include:

- Mode of user voting
- Mode of voter authentication
- Mode of data collection and verification
- Mode of data communication

Phase 2:

User Design: This stage would use various software modelling tools to illustrate the system's data and processes and to build a visual representation of critical system components. Also, the programming tools chosen to implement the proposed system were stated. A key milestone of this proposed system is to make it a much user friendly and easy to use.

IV. LITERATURE REVIEW

A literature survey or a literature review during a project report is that section that suggests the numerous analyses and studies made in the discipline of your interest and consequently the outcomes already published, thinking of the varied parameters of the project and additionally the extent of the project. A literature survey is the maximum substantial step in any reasonable study. Before beginning development, we need to test the preceding papers of our area in which we're

operating and the idea of the look at what we're capable of expecting or generate the downside and start operating with the reference of preceding papers. During this phase, we briefly evaluate the associated work on the Biometric Voting System.

1. In this paper, the writer attempted to discover the ability of biometric which can additionally increase the number of voters thereby in-corporating the problem of visiting the physical location for the purpose of voting. This system also can be audited through reducing the malfunction to trace the number of votes as the data gets stored in the database, thus making the system absolutely fair.
2. In this paper, they considered the firebase database that allow maintaining crystal clear records of the data.
3. This paper discusses the use of firebase for tracking data. When any elections are conducted, most often it seems to be fake and one of the main causes is corruption and the forcing of great politicians. So, if biometric is introduced here, it becomes easy to reduce the fake votes as every individual possess unique biometric i.e. fingerprint and at the same time it becomes easier to track the data stored where it is being utilised. This technology can also be utilised in the government sector and can have a major impact on the growth of a society.
4. This system as mentioned makes use of the firebase technology helps to take care of each and every vote and action performed by the user thus helps to save the information in a very transparent way. Using this system a transparent elections can be performed by providing a complete secure, authentication and reliable system of casting and tracking of votes.
5. In this paper, the system does verification at the every single stage till it reaches the page where the user is asked to select to party or community which they want to vote. It provides us with fingerprint authentication along with this it provides face detection which captures the individuals face and detects no face found if the face is not clear. The proposed framework thus helps in tackling all misinterpreted data and provides a secure voting system. This system will assist in limiting the time that the individual face when they need to go to the actual place of vote.
6. In this paper, this system provides a decentralized application that provides functionalities of casting vote online. A transparent vote can be done as there would be no third-party interference.

V. EXISTING & PROPOSED SYSTEM

The Existing System:

The problems of the existing system include the following:

1. The biggest challenge with the technology is that no matter how much data it records but a single virus can destroy the entire data storage.
2. The highly humid area and those areas which receive frequent rainfall are not suitable for casting votes using electronic machines.
3. Fake display units could be installed in the electronic voting machines which would show manipulated numbers but originally fake votes could be generated from the back-end.
4. Electronic Voting Machines can be tampered during its manufacturing and in such case, it does not even require any hacker or malware to manipulate the actual voting.

The Proposed System:

The new system makes use of a biometric feature (fingerprint) to authenticate users of the system. Fingerprint recognition hardware is integrated with the system so has to solve the problem of the existing system.

The new system operates in an identification mode and performs the following:

1. Captures fingerprints, extracts the features and stores it in the database.
2. Verifies the identity of the voter at login time by comparing the fingerprint that has been pre stored in the database with the fingerprint being supplied at login.
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VI. SYSTEM DESIGN AND FLOW

The Biometric Voting System's architectural design is a diagram that defines the relationship between major structural elements of the software, the design patterns that can be used to achieve the requirements defined for the system and the constraints that affect the way in which architectural design patterns can be applied.

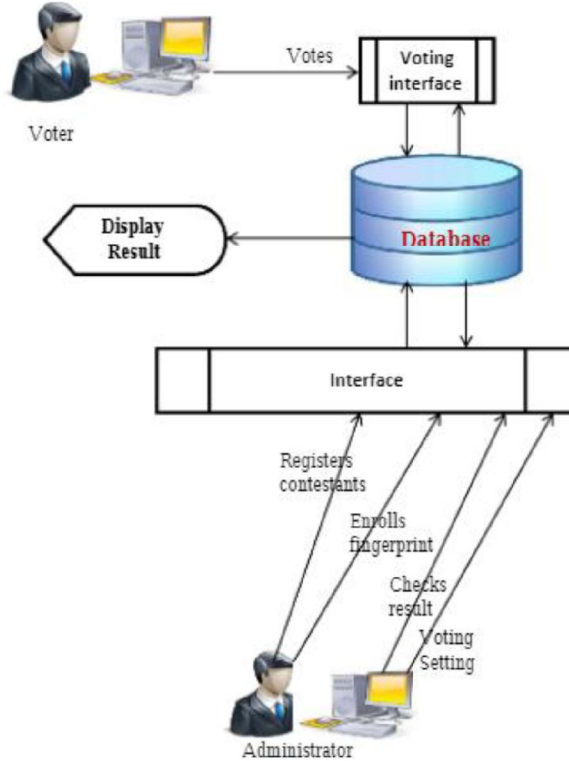
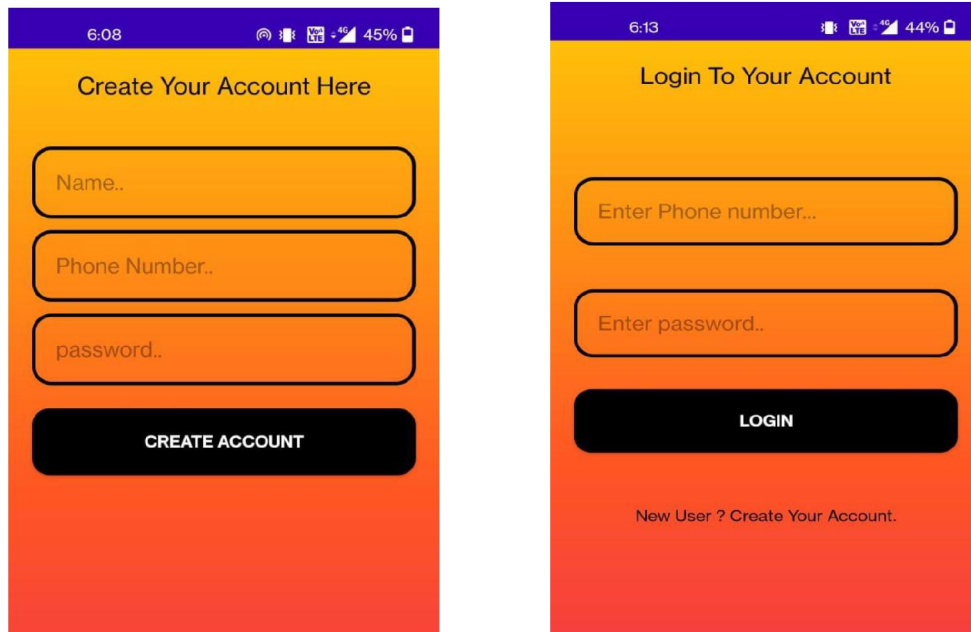
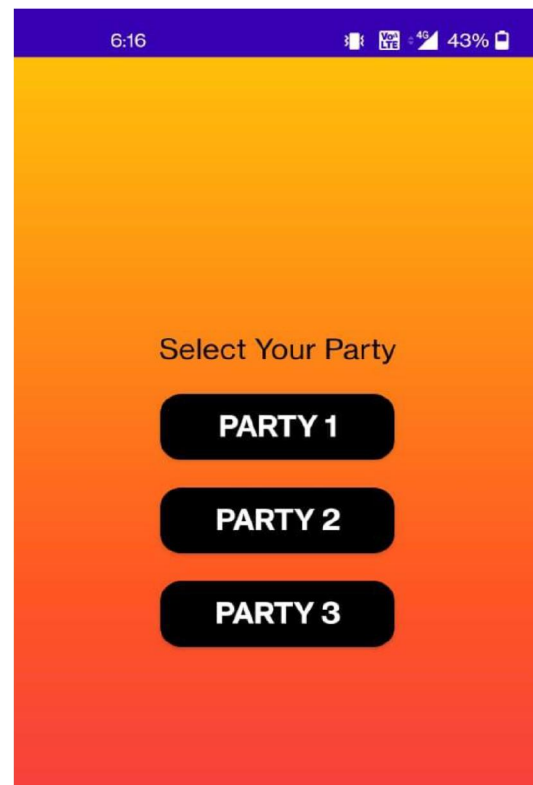
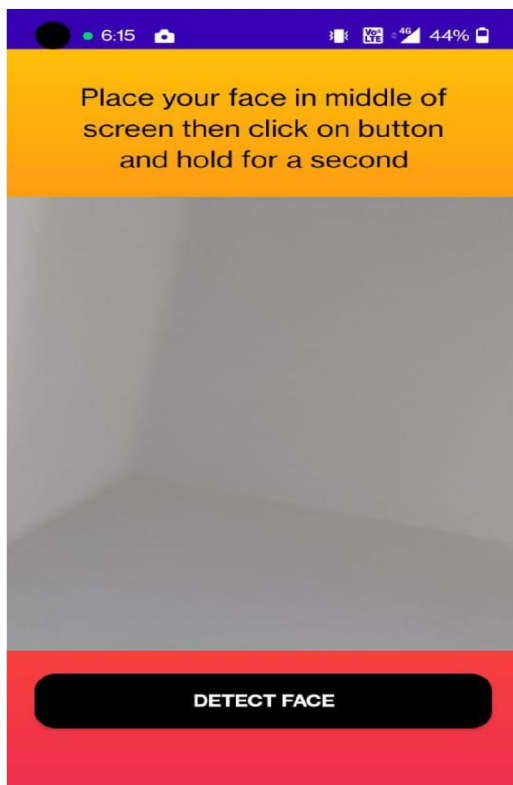
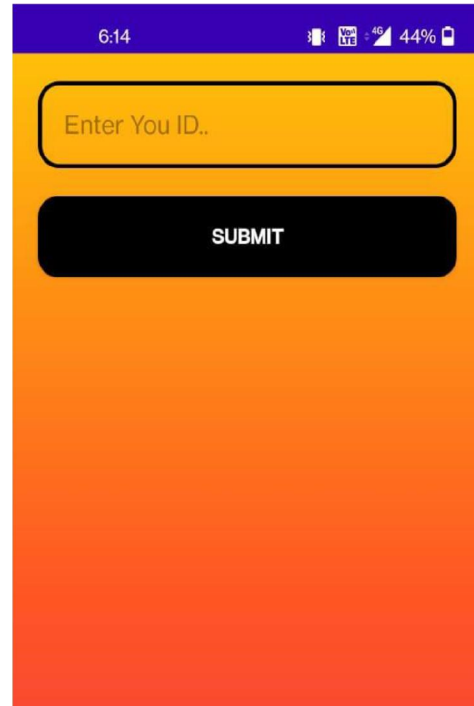
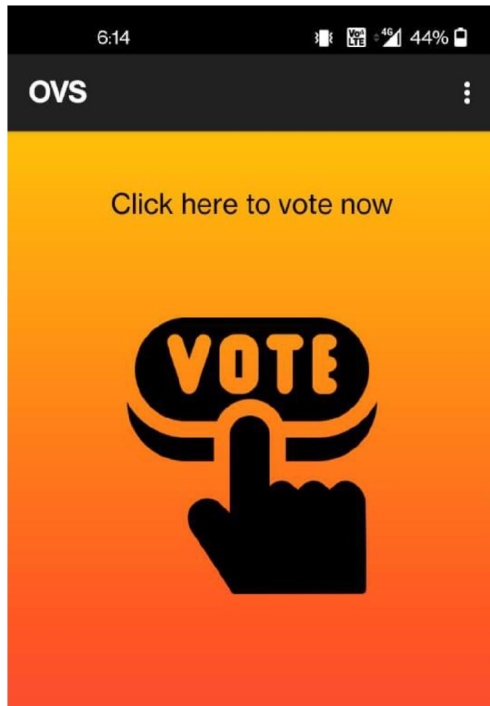
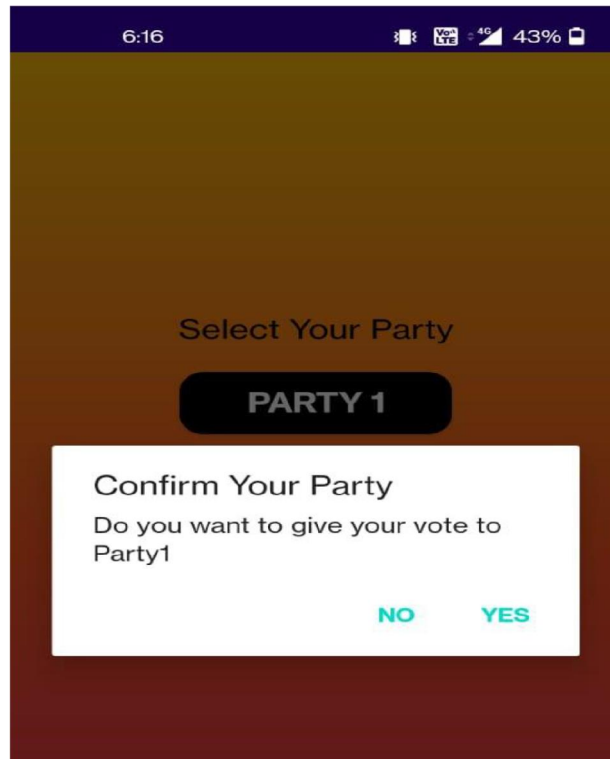


Figure 1: System Architecture for the BVS System

VII. PROJECT IMPLEMENTATION







VIII. ADVANTAGES & DISADVANTAGES

8.1 Advantages

- Increased Security - Provide a convenient and low-cost additional tier of security
- Reduce fraud by employing hard-to-forge technologies and materials
- Eliminate problems caused by lost IDs or forgotten passwords by using physiological attributes.
- Prevent unauthorized use of lost, stolen or "borrowed" ID cards
- Offer significant cost savings in long run
- Greater Accuracy, Faster Tabulation of Result
- Make it possible, automatically, to know WHO did WHAT, WHERE and WHEN!

IX. CONCLUSION & FUTURE WORK

9.1 Conclusion

The biometric voting system was implemented to solve the proximity bottlenecks, unnecessary time delays with very secure and accurate recording of votes. This project was designed to implement a system that will be used for election process. The integration of biometric authentication within the system will provide an efficient way to cast votes, free of fraud, and make the system more trustable, economic and fast as well as enabling the voters to cast their votes from any location as a result of the online voting module which can be accessed from any device with internet connectivity. The use of fingerprint 75 recognition deepens the process of ensuring that the voting mantra – one man, one vote – is fully enforced.

It is seen that the system is fault tolerant at all end points (registration, voting platform and the server). The voting device can last for more than 6 hours which is very sufficient for a quick system like ours. This system will provide boundless voter participation in remote areas with very little or no cost on the voter greatly reducing apathy. Further improvements can be done on the system to increase the credibility of the votes and further reduce proximity issues.

9.2 Future Scope

- Further improvement of the prototype device could be done at the later development by using fingerprint modules for every party so that it is more secure.
- People with no hands won't be able to cast votes following this procedure. So in future we plan to extend our biometric identification system to a multi-biometric system by integrating facial recognition, retinal scan and iris scan system to our model.

ACKNOWLEDGEMENTS

The completion of our project brings with it a sense of satisfaction, but it is never complete without those people who made it possible and whose constant support has crowned our efforts with success. One cannot even imagine our completion of the project without guidance and neither can we succeed without acknowledging it. It is a great pleasure that we acknowledge the enormous assistance and excellent co-operation to us by the respected personalities.

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