Mobile Voting System

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***Abstract*—The mobile voting system is an application that provides a new technique of casting votes using mobile phones. There are many types of manual and electronic voting systems currently in use. Manual voting systems such as paper ballot are primitive and inconvenient in this technological era. Electronic voting systems were introduced with advanced technologies but have several drawbacks such as complicated usage requiring special equipment and training. The mobile voting application will bring the voting system to every user's mobile handset. It provides an efficient, convenient and secure mechanism for voters to register, log in and cast their vote. Elections can be conducted using this application without excessive planning or man power. The entire voting process will be encrypted to ensure security and no evidence of who has voted for whom will be present. Authenticity of the voters will also be determined using unique voter IDs and passwords.**

***Index Terms*—Android, Candidate, Election, Mobile, Voting System**

I. INTRODUCTION

"Vote" means to choose from a list, to determine or to elect. Electronic voting systems[1] translate the manual process of conducting elections using techniques like paper ballot into a more effective software system. By implementing the same using the mobile platform, additional convenience and portability is introduced. The voting process is simplified with a clear, unambiguous User Interface and an easy method for voter registration and log in. Unlike existing electronic voting systems that require the voters to assemble at a location or are complicated to use and need training or special equipment, a mobile application only requires a mobile phone with the Android Operating System.

In the mobile voting system, to prove the authenticity of the voters, their unique voter IDs must be inserted. These IDs, if registered through the appropriate channels previously, will be present in a database. If the same ID is found in the database, unique usernames and passwords are given to the voters. A voter can use them to log in and cast a vote after which he is automatically logged out. The tally of votes is calculated and can be viewed by the admin. To preserve anonymity, nobody can see which voter has voted for which candidate.

II. LITERATURE SURVEY

Voting applications are required to make the process of choosing a representative easy and quick. OVS (Online Voting System; Fig.2) is the latest, most innovative technology being used to conduct elections. In OVS, voters cast their votes on the internet. It has many advantages like portability, higher speed, mobility and reusability. A mobile application is preferred as it can be easily utilized since Smartphones are widely used.

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Traditional voting systems like Paper ballot and Electronic Voting Systems (Fig.1) have several disadvantages.

Voting systems as such are time consuming and inconvenient as all the voters must be present in a location at a time.

An excess of manpower is required for the operation to be accomplished.

The calculation of results might not be accurate since it is carried out manually.

Online voting systems exist for large scale use, like government elections which are not flexible or effective for general use.

Innovating new and better voting systems is a field of great interest as elections are an integral part of a democracy and our community. Lorrie Cranor**Error! Reference source not found.** has addressed the existing problems in every type of apparatus used for voting, but no recommendation has been made for one technology to be used over the others. The vastness of problems being faced while trying to design and put forth completely secure voting systems is discussed by Peter Neumann. Although rigorous encryption in the electronic voting systems provide a mightier security than methods used in the past, they present a whole new array of vulnerabilities which can be exploited. Insight on this dilemma has been presented by Anderson C[5].

Fig.1: Electronic Voting System

Fig.2: Online Voting System

III. REQUIREMENTS SPECIFICATION

Functional Requirements:

The primary requirement of the Mobile Voting System is to provide a secure mechanism for Online Voting at a small, diverse scale.

Non-Functional Requirements:

1. Ease of use: The User Interface must be easy to navigate, understand and use.
2. Availability: The application must be available for use as and when required.
3. Accuracy: Result computation is automatic and must reduce errors caused by manual calculations.
4. Flexibility: The candidate and voter databases must be easy to populate such that different organizations and institutions can use the application to conduct elections.
5. Mobility: Mobile voting application must have greater usability and convenience for portable mobile devices as compared to other electronic voting systems.
6. Privacy: A voting application must ensure privacy and anonymity of the votes being cast.

Hardware Requirements:

Any basic computer available with minimum configuration: Operating System- Windows XP, Intel Core 2 Duo Processor 1.8 GHz, 1GB RAM, 100 GB HDD, Any Smartphone running on Android Operating System, ver4.1 and above.

Software Requirements:

Language-Java and Android, Java Development Kit, Android SDK and ADT Plugin, IDE- Eclipse, SQL Front, Database- MySQL, WebService- SOAP or RESTFUL, Server- Apache Tomcat

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IV. ARCHITECTURE

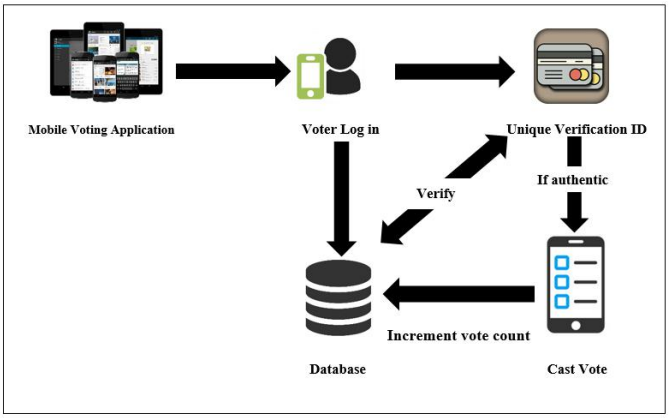

Fig.3: System Architecture

The Mobile Voting System's user interface will have two log in pages- voter log in and admin log in. If the voter has been previously registered by the admin, in addition to his unique verification ID, which can be his voter ID, Aadhar card etc., he will also be allocated a user ID and password. This information will be stored in the VOTER table of the database**Error! Reference source not found.** for every registered voter. During log in, the voter must enter said user ID and password. This will be cross checked with the database[Error! Reference source not found.] and if matched, the voter can cast his vote.

The admin will have a separate user ID and password which is stored in the ADMIN table. Using this, he can log in to the application with administrator privileges. This unlocks special functionalities only accessible by the admin like registering new voters, obtaining results and listing all voters.

The CANDIDATE table will contain the names of all eligible candidates and the total number of votes for each candidate. The number of votes will be incremented when a user votes for that candidate.

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V. IMPLEMENTATION

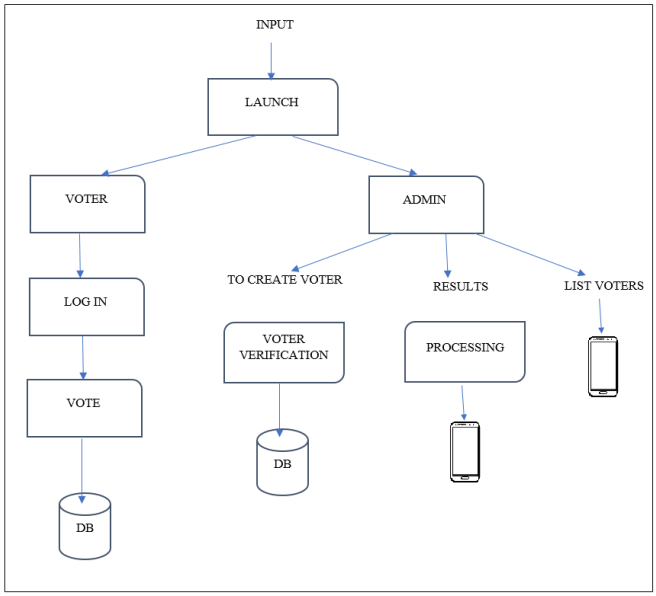

Fig.4: System Implementation

The mobile voting system primarily consists of two layouts: The Voter log in and Admin log in.

Administrator:

The administrator can log in using a preexisting username and password. Logging into the application as the administrator unlocks certain functionalities which can be selected to proceed. The admin functionalities are explained below.

1. For creating a voter: When this option is selected, the application asks the admin to enter voter details i.e. Name and Verification ID. The name must at least be 5 characters in length. If the fields are filled appropriately, the voter is registered in the database and the application window displays the generated Voter ID and password. This information is also stored in the database to facilitate log in.

2. For viewing the results: When this option is selected, the list of candidates and the total number of votes received by each is displayed. The admin can view this to determine the candidate with the highest votes. The mapping of voters to candidates is not visible even to the admin to allow complete privacy. None of the users except the admin can view these results.

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3. For listing the voters: The admin must hold a record of all registered voters in a database. This information will be displayed on the selection of this option. Voter data including name, verification ID, user ID and password will appear for every registered voter on the screen.

Voter:

The voter must first be registered by the admin. Once the registration is complete, the voter can log in using the automatically generated user ID and password. Once logged in, a list of candidates will be present on the screen. The voter must select one of them to vote for. Once a vote is cast, a confirmation dialog appears to ensure that the selection was purposeful. Finally, the vote is accepted and the tally for that candidate is incremented in the database. Then the voter is automatically logged out.

The voter module consists of the login and voting process. These are utilized by the end users who only take part in the election but have no responsibility in the organizational or development level.

The features of this module include:

1. Log in is successful only if the user is previously registered by the admin.
2. User ID and password must be given by the admin beforehand.
3. For the generation of User ID and password, the below mentioned algorithm is used.
4. Once the voter logs in, he can select a single candidate to proceed.
5. A confirmation dialog will appear at this point. If the voter proceeds, the vote is counted and he is automatically logged out.

VI. RESULTS

The Mobile Voting System aims to develop an accurate, user-friendly application that simplifies the voting process. A system which can automate the process of selection of representatives and provide easier processing of votes can be a quick way of attaining to all needs of the organization. The Mobile Voting System is flexible and can be customized for any group of users. The limitations of the existing system are addressed and overcome.

VII. FUTURE ENHANCEMENTS

The mobile voting system can be reconfigured as per the user's requirements. Organizations that might implement this system can be of a large variety with discrete priorities. Mainly, groups with greater concerns about security can implement sturdier encryption algorithms to collect the votes and calculate results. For large organizations with geographically dispersed branches, centralized servers and cloud storage can be utilized. Newer releases of Smartphones have fingerprint scanners built into them which can be a resource for voter authentication. Other biometrics like retina scan can be integrated with the system by making the appropriate hardware and software additions. Facial recognition software can be used for the same reason. There is a large scope for customization and enhancement of aspects of the system to meet specific needs.

VIII. CONCLUSION

The main aspect behind developing a mobile system for voting is to provide an easy to use means of conducting elections for various types of groups and organizations. Vote counting is also made easy by the application since it is just a matter of querying the database. A good application that can prevent system failures on a widely-used platform can gain acceptance among the potential users. A mobile voting system will be an inexpensive and less time-consuming alternative to existing electronic voting systems.

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