

SMART VOTING SYSTEM USING ANDROID

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ABSTRACT: The Smart Voting System is developed using Android application. The application involves voter's Aadhar ID and face image of each voter to promise their uniqueness in the system. This system reduces the manual work of election committee. Authenticates the voter to avoid the loitering or rigging and also makes the voting process ease. It ensures the vote casting cannot be altered by unauthorized person. The voter authentication in real time can be done by using UIDAI (Unique Identification Authority of India) data along with acquired data which is stored in the centralized database. The proposed dual authentication approach verifies the Aadhar ID as its first stage and then uses the face recognition as the second stage of authentication. This Smart Voting System also focuses on the security of the voters' data. This supports in increasing the vote percentage by making every citizen to register their vote though they are mobilized.

KEYWORDS: Face Recognition, Finger print, UIDAI, Authentication.

I. INTRODUCTION

From the start, there has been an increase in bribery and corruption in the Voting system. Now a day's mobile phones are widely used, it is possible the development of applications for worldwide popular participation by digital vote using mobiles. Smart Voting system is the application for Android Mobile Operating System Platform. It is application for voting (polling) purpose. Application is based on Client-Server Architecture. At server site, the proposed system stores a database globally. System is divided into three main parts: one is Server, second is (Registration Centre) and third is Android client (Voter). In Java client application, Voters can register their name, documents and face image for further Authentication. The system can have numbers of Android clients. Each Android client can view candidate information, information about different parties and can submit the vote and also can see newly updated status of election. Manual voting system has been deployed for many years in our country. However in many parts of our country people cannot attend the voting because of several reasons, sometimes people may not be in their own region and due to this fact they cannot do voting.

II. LITERATURE REVIEW

According to Swaroop Sridhar in The California Internet Voting Report on 2000 suggests a strategy of evolutionary rather than revolutionary change towards achieving the goal of providing voters with the opportunity to cast their ballots at any time from any place via the Internet. The report defines four distinct Internet voting models: Internet voting at voter's polling place, Internet voting at any polling place, Remote Internet voting from County computers or kiosks, Remote Internet voting from any Internet connection and the corresponding technical and design requirements that must be met when implementing any of the stages. It addresses the advantages, implementation and security issues of each of the four stages.

According to Mohammed Khasawneh et.al in IEEE Conference on 2008, an e-voting system for biometric security is providing a two-sided solution such as server and user side. After casting the vote system will generate hardcopy for voter and also generate unique number. This unique number and voter name and identification number is secured. All content are stored in special box; this box is secured box, this information is used for verifying the vote before stored in final database. This side copy is printed with unique barcode that can be easily readable automatically and scanned then randomly choose one copy, then this copy is tested; this two-sided process providing verification and correctness for the system.

According to Atiya Parveen et.al in International Journal of Computer Applications on 2013, a public network Direct-Recording Electronic voting system is an election system that uses electronic ballots and transmits vote data from the polling place to another location over a public Network. The Vote data may be transmitted as individual ballots as they are cast or periodically as batches of ballots throughout the Election Day or as one batch at the close of voting. This scheme includes Internet voting as well as telephone voting. Two methods are used in Public network DRE voting system: they are pre count or central count method. The central count method forms a table from multiple pre counts at a central location. The Internet voting can use remote locations (voting from any Internet capable computer) or can use traditional polling locations with voting booths consisting of Internet connected computers. Corporations and organizations can use Internet voting to elect officers and Board members and for other proxy elections.

According to Shridharan in Fourth International Conference on Computing, Communications and Networking Technologies on 2013, Implemented a three models such as, Authentication model, franchise excising model, distributed database and central server model. In authentication model voter with smart card and voter identification number and also gives the biometric information; this all information is used in future election voting process. After verification and validation voting interface means candidate name and sign are displayed, this is verified by vote casting database, and then votes are counted and declared the result. In this system

security and traceability also ensures to auditing the vote and voter information. In such a system, the correctness burden on the voting terminal's code is significantly less as voters can see and verify a physical object that describes their vote and are allowed to vote in terminal only after their identity is proved. The voters, who cast multiple votes during the process of voting is ensured to be prevented. Also to ensure the maintenance of authenticity, any biometric identification of the voters could be used for accessing the terminal to cast their vote and restricting them to cast again. The process of online voting could be deployed with three phases - the voter registration online vote capturing and the instant online counting and result declaration.

According to Himanshu Agarwal et.al in IEEE conference on 2013, Aadhar id based online voting system for Indian election is proposed for the first time in this paper. The proposed model has a greater security in the sense that voter high security password is confirmed before the vote is accepted in the main database of Election Commission of India.

In this model a person can also vote from outside of his/her allotted constituency or from his/her preferred location. In the proposed system the tallying of the votes will be done automatically, thus saving a huge time and enabling Election Commissioner of India to announce the result within a very short period. This system is much secure and efficient than the traditional voting system.

A unique Aadhar identity is the center point of our proposed model. It leads to the easier verification of both voters and candidates. This Aadhar Identity number is unique for every citizen or voter of India. This Aadhar Identity number has been introduced by government of India and this also recognizes the constituency of the voter. But the registration of the voter should be completed only after the verification of all documents by the field officer. The field officer also verifies Aadhar Identity Number from the main Aadhar card database. After completing verification, the registration of the voter should be complete and the voter will get auto generated e-mail which has all these information of the voter with the system generated password.

The Voter can use this password for login and he/she can also change the system generated old password. Voter can also set the verification keys to ensure security. There should be restriction to use only virtual/on screen keyboard to type password or to change password. Main purpose of using virtual/on screen keyboard is to stop capturing password, if voter changes his/her password from some public place.

Pashine, ninave et.al in International Journal of Engineering Trends and Technology on 2014, proposed an android platform for online voting system. This application provide diversion of long process also provide security to the voter and its voter comfort system voter no need to go polling booth easily vote for candidate in hometown itself. And also provide the option of gesture recognition but authentication is the problem of android platform. In this application which is partitioned into three panels on the basis of its users as follows: Admin Panel: This panel will be specifically used by members of election commission to administer all the electoral processes including registrations of candidates & voters; and monitor all other actions carried out by them. Candidate Panel: This panel will be specifically used by electoral candidates to interact with the election commission & voters which will help them to work efficiently not only before the election but also after the election if elected. Voter Panel: This panel will be specifically used by each individual voter who is eligible for casting his vote i. e. a person ageing 18 years or the above. These are the main users, for whom the application is developed.

According to Jambhulkar, Chakole et.al in International Journal of Computer Applications on January 2014, proposed a novel security for online voting system by using multiple encryption schemes. Provide security for cast vote when it is submitted from voting poll to voting server. Multiple encryptions to avoid DOS attack. Security provide submissive as well as active interloper. This system is to take a judgment of certain issues. This paper use cryptography concepts to take pros of digital signature. Encrypting the send forth vote to client server then send to voting server with the help of net.

After sending encrypted vote then server side decrypt the vote before counting. On server side decryption of that vote is done before counting. We require two keys for this purpose one for encryption on voter system, which should be publicly known and second key for decryption of encrypted vote before counting on voting server, this key must be private. So for this purpose we need a pair of asymmetric keys. To provide security from active intruder who can alter or tamper the casted vote when vote is transferring from voter to voting server, we are using digital signature. When a voter cast his/her vote after that he/she will digitally sign on that by using his/her own private digital signature, and send this to voting server, on voting server side that signature is checked by digital signature verifier of that voter which is publicly known. For this purpose each voter should have a private digital signature and a public digital signature verifier, for this we are using a pair of asymmetric keys for each registered voter.

According to S. V. Prasath et.al in International Journal of Advanced Research in Electronics and Communication Engineering on December 2014, the voting machine design proposed in this system is appropriate and highly secured. The simulation of the machine is working properly under normal conditions. Vote scan be casted by pressing the switches on the machine and infrared sensors have been used to track the voter entries. The count of the voter entries previously stored in the register is matched with the total votes casted to avoid any mistakes thus making the system more protected. After entering the valid password the result button will be pressed to view result.

According to S. Hashimi et.al in IEEE conference on December 2015, this system records votes by means of an electronic display provided with mechanical or electro-optical components that can be activated by the voter, that processes voter selections by means of a computer program, and that records that processed voting data in memory components. It produces a tabulation of the voting data that is stored in a removable memory component. The system may further provide a means for transmitting the processed vote data to a central location in individual or accumulated forms for consolidating and reporting results from precincts at a central location. DRE systems additionally can produce a paper ballot printout that can be verified by the voter before they cast their ballot.

According to Rajashree Raskar S et.al in international Journal on Recent and Innovation Trends on 2016 suggests Android E-Voting application on smart phone user gives voter facility to vote, an application with an interface for consultation to a dynamic web page that contains the buttons to send the votes. Admin can't see the voting results according to vote options. In this system initially the voters should have to provide their Aadhar number to authenticate themselves and establish their user-ids. This constraint is imposed to ensure that only the genuine person is allowed to vote in the elections. This system aims is to design and implement an electronic voting application for the Android platform that will enable people to vote securely from anywhere. The application as a whole is aimed at being compatible with devices from many manufacturers and running different versions of the operating system.

III.ISSUES AND CHALLENGES

The following issues and the challenges are encountered when implementing the proposed system. This is also the part of a research study. The explanatory research study provides the scope for the implementation of the proposed system, but these are the common issues that we encounter while doing the project. They are

- 1) Inadequate Information and Communication Technology Infrastructure within the government as well as across the nation.
- 2) Inadequate access to Information and Communication Technology by government officials, and by citizens.
- 3) Lack of awareness of government officials and citizens about Information and Communication Technology.
- 4) Non acceptability of Information and Communication Technology.
- 5) Inadequate human resource capacity.

IV. PROPOSED SYSTEM

The proposed system will be beneficial in number of ways. The voter verification will be done through face recognition. Only the verified voter can vote, hence dummy voting will be eliminated. A voter can vote only once. So, voting multiple times or dummy voting shall be prohibited. Moreover, being a smart device, there is no geographical and time constraint. The proposed system would limit the voting time period allowing the voters to vote within that time frame only. As there will be no crowd accumulation, there are no chances of violence. Being automated system, election in different slots need not be arranged. It can be organized on the same day all over the country. The voting result can be generated automatically and quickly.

This is a real time application for the election authority of government. The application provides real time updates to the election commission. This helps avoid loitering and the officers will be more attentive in their duties. The application greatly reduces paperwork since the data are stored as memory inside the central database. This also prevents loss of data. The admin login provides unique id and password for each authorities. This prevents the involvement of fake officers. The main scope of the project is to reduce duplicate of votes and cover 100 percent vote as much as possible.

The project also aims to the application that covers the people facing any disability to vote in person. The system should also address the security issues. It also brings awareness to people. This prevents rigging. It also maintains a record of all activities in the main central server. This prevents data loss and there is no need for unnecessary documents. It keeps daily updates on each officer and their actions and duties are monitored by the central department. Admin can only add candidate, voter details and restricted in other process. The project has a major impact on the election commission. It helps to monitor each candidate's results. Illegal votes are traced in Smart Voting System. Hence if this system is utilized the election would be truthful and free from rigging.

Smart Voting System also improves E-governance in developing countries. This project is future proof and hence by implementing this there will much better management can be done in the long run. It also helps in digitalizing the system. Then the system covers the people facing any disability to vote in person. The system should also address the security issues.

Central Server

The central server is a central management node where all the databases are stored and can be accessed from the application. The central server is the one which maintains all the data and the future records are also being recorded in this database. The data are accessible in full duplex mode i.e. the data are retrieved and stored 27 simultaneously in the server. The following figure 5.2 clearly explains about the central server and database server. In the database server, there are six databases that are required for the system.

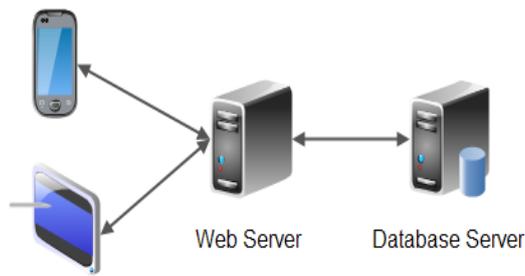


Figure 1 Central server

Admin Login

The admin login database keeps track of the user credentials of the admin personnel. The user credentials of the admin are auto generated by the admin’s election department. This prevents the unwanted credentials created by the hackers. The admin personnel’s credentials are created only after their details and their records are verified. Thus the admin login credentials are highly encrypted and are difficult to hack. This database is used when the admin personnel try to login into the application. The database can be updated as and when the admin personnel are records are verified. Admin login is created by using Firebase mail authentication.

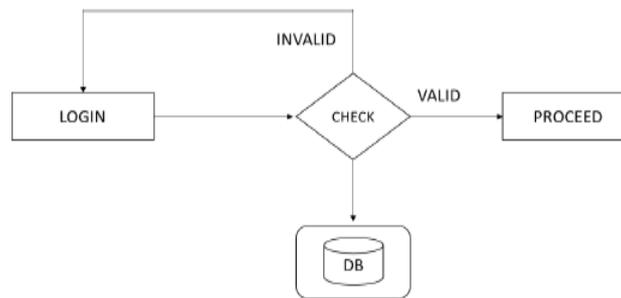


Figure 2 Admin Login Process

Voter Login

There is a dual authentication for voter’s login before vote casting.

Aadhar validation

Face detection

Aadhar validation

In the admin process all the persons details are updated with the Aadhar number. But the eligible voting persons Aadhar numbers are uploaded in the centralized database. Hence, the every Aadhar numbers are being validated through the centralized database.

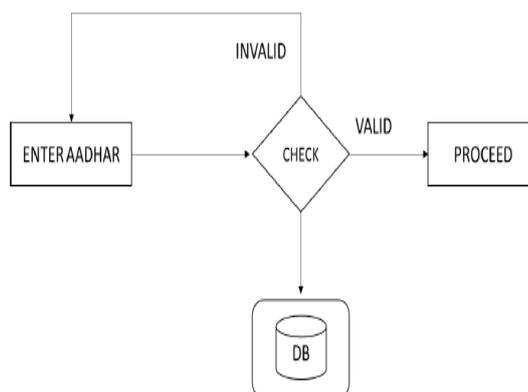


Figure 3 Validation of Aadhar

Face detection

The face samples are retrieved from Aadhar database by calling the Azure Face API. In the voter registering process users images are stored in the centralized database. Then the voter should login with face detection.

If the above dual authentication are successfully validated then the voter can login with anonymously by using **Firestore Authentication**.

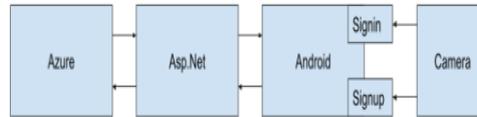


Figure 4 Face Recognition

UIDAI

Aadhar is a 12 digit unique-identity number issued to all Indian residents based on their biometric and demographic data. The data is collected by the Unique Identification Authority of India (UIDAI), a statutory authority established on 12 July 2016 by the Government of India, under the Ministry of Electronics and Information Technology, under the provisions of the Aadhar Act 2016. The UIDAI Database is the most important database in the project.

The system mainly involves the retrieval of the voter's details using a single component. The Aadhar is used as the main source for the retrieval of the voter's details. The Aadhar is main identity component used and the details can be retrieved just by using the unique Aadhar identification number which fetches the other details relating to the voter's Aadhar. The database is created using the Aadhar details and are stored in the firebase real time database server. The database may require higher bandwidth and it has to be handled properly. This method is implemented because this is the faster process.

Why Use Aadhar?

The Aadhar is used as the main database because it has all the details regarding the person's iris scanner, fingerprint and also their address and phone number. The Aadhar provides a unique identification number for all this details besides that fingerprint details are also present. This helps the person's details to be retrieved in multiple ways. Thus, the Aadhar is used as the component for retrieving the person's details.

Voters

A voter database is a database containing information on voters for the purpose of assisting a political party or an individual politician. This database includes contents of voter's Aadhar number, city, district, date of birth, gender and unique user identity.

Candidates

A candidate or nominee, is the prospective recipient of an award or honour, or a person seeking or being considered for some kind of position. "Nomination" is part of the process of selecting a candidate for either election to an office by a political party, or the bestowing of an honour or award. This person is called a "nominee", though nominee often is used interchangeably with "candidate". A presumptive nominee is a person or organization believes that the nomination is inevitable or likely. The candidate's database include candidate's Aadhar number, name, city, party logo and party name.

Vote Results

Voter's casting their votes by selecting the image in the vote dashboard image. The selected vote is being stored along with the unique id for the each party database. All the vote results are generated as the JSON format which will leads the polling accuracy.

ADVANTAGES OF PROPOSED SYSTEM

- 1) No paperwork needed.
- 2) Possibility for 100 percent voting.
- 3) Disabled people can vote.
- 4) Records are maintained online.
- 5) People can cast their vote in any location.

V.CONCLUSION

Thus by implementing this digital system, Paperless records can be maintained. This helps avoid data loss since documents are easier to lose compared to stored memory. The application creates awareness among people about the Smart Voting System. It also helps create awareness on the rules and the public reducing bribery and corruption. In this way, no illegal actions can be taken by the election officers against the rule breakers. The digitalizing of Smart Voting System is very vital for a developed India. Online work is becoming a trend for every possible work.

People turn to online services such as buying goods, doing online jobs, booking tickets, etc. The uses of online services are limitless. However, the Smart Voting Systems have many advantages over the traditional voting system. Some of these advantages are less

cost, faster generation results, easy accessibility, accuracy, and low risk of human and mechanical errors. It is very difficult to develop voting system which can allow security and privacy on the high level.

VI.FUTURE ENHANCEMENTS

Now a days, Information systems and Communication Technologies (ICT) are being integrated into different stages of electoral process globally and thus it is becoming essential to explore methods for secure electronic voting. Identification of appropriate technology and its extent to use for secure electronic voting is the prime concern in electoral process. Success of electronic voting depends on trust level and thus security issues need to be addressed. This Smart Voting System considered electronic voting mainly as security critical process. This thesis attempts to identify the different issues in electronic voting while focused mainly on security aspect to deploy a voting system in a secure manner satisfying expected assurance at technical and procedural levels. This system attempts to incorporate Fast and Accurate Biometric technique into the Smart Voting System to prevent an unauthorized person to vote. This work has many advantages over the traditional voting system like reduced polling time, less problems in electoral preparation, strong authentication mechanism, easy and accurate counting, flexibility to voter for vote cast irrespective of geographical location and quick publication of results. The proposed model and framework enhances the security issues into the electronic voting system with respect to eliminating bogus voting and vote repetition, less election expenditure, more transparency and fast results.

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