

Electronic Voting Machine Using Biometric and Aadhaar Card Authentication

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Abstract: The present voting system in India is a time consuming process and not so secured. Our project proposes and implements a simple and secured method of polling vote using Aadhaar information. Over a period of time there have been many improvisations in the field of voting which aim at increasing the flexibility, reliability, security, scalability and less time consumption to announce the results. In this system the user has to use his finger print to poll the vote. The fingerprints and Aadhaar database are used for the candidature verification, which will be stored in the computer through which the further process is carried out. The voter need not carry his/her voter ID to the polling booth. A finger print module is used for accessing fingerprints. Once the user gives the finger print it will be compared with the existing data and if it is a genuine user it will be verified else the user is barred from voting and also if a user attempts to vote for the second time it will not be allowed. Once the voting process is finished the authoritative officer accesses the results immediately using a unique PIN provided to him.

Keywords: Electronic Voting Machine, Biometric, Aadhaar Card.

1. Introduction

India is considered as world's biggest majority rule governments with the network of around 1 billion. Voting hypothesis started formally in the 18th century and recommendations for the voting framework are been made from that point onward. The Present voting instrument has numerous security issues. Over a significant-time span involvement of the constituent process authorized to center around the utilization of most recent advancements in e-voting process [1]. The improvement of the voting framework can be in the field of extra security in the verification process. The headway in the present voting framework can be made utilizing biometrics. Biometric is the unique identity that contains palm print, iris, finger print etc. [2]. Nowadays it is compulsory for every citizen in our country to have an Aadhaar which is embedded with the finger print mark and the iris. In this paper, Arduino and unique finger impression sensor are utilized to store the pictures of our finger impression in a database [3]. At the time of voting the voter can place his or her unique mark, in the event that it matches with beforehand put away one of a database then he/she will continue for voting. When a wrong person attempts

to vote at the time of voting the buzzer in the system starts buzz. The framework prevents the wrong person from voting.

When a person attends the age of 18 has the constructional right to voluntarily enroll for voter ID given by the Indian Election Commission (IEC). Voter ID is only used for electing purpose once in 5 years or on occurrence and voter card will not provide any government facility like Aadhaar, Citizens miss out to enroll for voter card and even after getting the voter card during the election time the voter may miss out the voting due to voter may neglect voting because voter is living in some other region which is far from his resident and voter ready to travel such a distance [4]. To avail constructional voting right to every citizen, Aadhaar and web-based voting system using Fingerprint Recognition Technique is the best solution. Now a days with the rise in population the need for checking the validity of the voters has become a problem. As the modern communications and Internet, today are almost accessible electronically, the computer technology users, brings the increasing need for electronic services and their security. Usages of new technology in the voting process improve the elections in natural. This new technology refers to electronic voting systems where the election data is recorded, stored and processed primarily as digital information [5]. In the past, usually, information security was used mostly in military and government institutions. But, now need for this type of security is growing in everyday usage. In computing, e-services and information security it is necessary to ensure that data, communications or documents (electronic or physical) are enough secure and privacy enabled. Security is a heart of e-voting process. Therefore, the necessity of designing a secure e-voting system is very important. Usually, mechanisms that ensure the security and privacy of an election can be time-consuming. Expensive for election administrators, and inconvenient for voters.

This paper examines policy regarding the electronic Approaches and developments towards electronic data storage and transmission. Finger print devices for voting machines and different existing identity documents are mentioned and enforced during this project [6]. The user needs to show the voter ID card whenever at the booth to poll his vote. This is

often a time-consuming method because the person needs to check the voter ID card with the list he has, make sure it as an authorized card and then enable the person to poll his vote. Thus, to avoid this type of issues, Aadhaar based voting machine is designed where the individuals no ought to carry his ID which contains his entire details. The person at the polling booth should place the finger on the module. This Finger print reader reads the details from the tag. This information is passed to the controlling unit for the verification [7]. The controller reads DATA from the reader and compares this data with the already existing data. If the data matches with the already existing information, the person is allowed to poll his vote. If not, a message is displayed on the monitor and therefore the person is not allowed to poll their vote. If a person attempts to vote multiple times the system displays error and the user is barred from voting [8]. The input given to the system is stored in the memory, which is obtained only by the authorized user who has a unique password with which the stored data is accessed, and the results are announced immediately after the voting process is finished.

2. Existing system

In the recent years, voting equipment which were widely adopted may be divided into four types.

A. Paper-based voting

The voter gets a blank ballot and use a pen or a marker to indicate he want to vote for which candidate. Hand counted ballots is a time and labor consuming process, but it is easy to manufacture paper ballots and the ballots can be retained for verifying, this type is still the most common way to vote.

B. Lever voting machine

Lever machine is peculiar equipment, and each lever is assigned for a corresponding candidate. The voter pulls the lever to poll for his favorite candidate. This kind of voting machine can count up the ballots automatically. Because its interface is not user-friendly enough, giving some training to voters is necessary.

C. Direct recording electronic voting machine

This type, which is abbreviated to DRE, integrates with keyboard, touch screen, or buttons for the voter press to poll some of them lay in voting records and counting the votes is very quickly. But the other DRE without keep voting records are doubted about its accuracy.

D. Punch card

The voter uses metallic hole-punch to punch a hole on the blank ballot. It can count votes automatically, but if the voter preformation is incomplete, the result is probably determined wrongfully.

3. Proposed system

With the aim of conducting democratic elections, we

proposed the system to endeavor to improve the easy usage of voting machine with fingerprint and Aadhaar card authentication using database. All the voters must reach the polling booths allotted to them. In the polling the voter should select his respective ward and place his finger on the sensor for verification. If it is a genuine user then he is proceed to next step in which the name of the parties are displayed to vote. If the user selects the wrong ward other than the one allotted to them, then their finger print is not verified and they cannot vote. Also if a user tries to vote more than one time the system pops out an error message and they are not allowed to vote. In this way one after the other all the voters can utilize their Right to Vote in a simple, secured and fastest way. After the voting process is completed the election officer enters their unique password to see the results. Since the whole process is carried out by the system it doesn't take much time for counting the votes and announce the results. Since we are using the data from Aadhar there is no chance discrepancy in the data available and rigging, cheating can be avoided resulting in safe voting process.

4. Objectives and methodology

Objective-1: To Match each person's fingerprint using fingerprint scanner for authentication.

- In the fig. 1 the module finger print sensor is connects with microcontroller and Finger prints of the voter is already stored in the finger print module.
- In real time it stored in server.
- Once voter placed finger on the scanner.
- It will scan and controller matches with stored one and gives authentication.



Fig. 1. Fingerprint Scanner

Objective-2: To Identify voter constituency using Aadhar Authentication using RFID.

- In the fig. 2 to identify the constituency the Aadhar number stored in the RFID card.
- RFID reader is connected to controller, When the ID received from reader then controller matches with Aadhaar.
- RFID reader and Wi-Fi module will gets initialize.



Fig. 2. Aadhaar card Scanner

Objective-3: To display corresponding elector on the LCD and Acknowledge the casted vote by alerting sound using buzzer.

- Once controller receives the information provided by Aadhar ID.
- It will match the database and display corresponding constituency representing candidates on LCD as shown in fig. 3.
- Voter can select and cast his vote to the candidate displayed on LCD using switch as shown in fig. 4.
- As soon as voter cast his vote the alerting sound will be given by buzzer and vote is casted message will be sent as Acknowledgment.

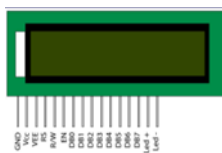


Fig. 3. LCD Display



Fig. 4. Voting using switches

Objective-4: To update every vote to cloud and show the results in webpage using wi-fi Module.

- Esp8266 Wi-Fi module is used to send data to Amazon cloud.
- Wi-Fi module as shown in fig. 5, is connected with microcontroller, after every vote is pressed, controller will send particular vote to the Amazon web service.
- In the cloud all the vote count will be stored.

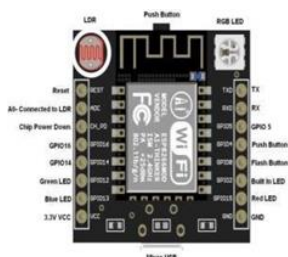


Fig. 5. Wi-Fi Module

5. Applications and advantages applications

1. EVM system can also be used in ATM machines where security prospectus is very high.
2. Used in The Mobile Voting System and in this system aims to develop an accurate, user- friendly application that simplifies the voting process.
3. It can also be used in school, colleges and offices for attendance and for BULK CHECK- IN in companies.

4. E-Verification of driving License through Aadhar database, this effectively verifies the driving license.
5. The automatic ration distribution involved RFID as well as GSM technology to distribute food materials.

A. Advantages

1. The cost of implementation and maintenance is less and easy to manage with less demand on man- power.
2. Preserves voting secrecy, no scope for invalid votes, as dual security checks are there, Firstly the Fingerprint validation then the Aadhaar card verification, both the criteria's are met without any big issues.
3. Facilitates quick and accurate counting –possible to declare results instantaneously.
4. As the whole data of the fingerprints of people is available, it can be used for identifying thieves, culprits i.e. it'll be more helpful for police dept. for investigation.
5. Illegal practice like rigging in elections can be eliminated completely.

6. RESULT

If not, the verification is passed the elector will not be permitted for polling. After the checking is enabled the political member's symbols are visible to the elector in the device electronic voting system.

After polling the keys will be deactivate for certain period until the other elector is permitted to poll and greets with text (“thank you”).

After this process all the polled votes are calculated and transmitted to the database of Indian election commission and the result will be displayed on particular period timing. So, the result will be announced quicker than the Conventional method.

7. Conclusion

Electronic voting systems have many advantages over the traditional way of voting. Some of these advantages are lesser cost, faster tabulation of results, improved accessibility, greater accuracy, and lower risk of human and mechanical errors. It is very difficult to design ideal e- voting system which can allow security and privacy on the high level with no compromise.

And also introduction about EVM and its variation, Issues and Aadhaar card based EVM. Our efforts to understand electronic voting systems leave us optimistic, concerned. The EVM system has to be further studied and innovated to reach all level of community, so that the voter confidence will increase. This paper review wide range of biometric and Aadhaar based voting system. In some project's RFID is used, but it will become costly. Hence, using of Aadhaar card provided by UIDAI with QR code present in it is good instead of using RFID cards. Our future work is based on online centralised Aadhaar database, Aadhaar card, fingerprint module and inbuilt GUI. We are working to make voting process online instead of offline mode, and storing the voting data to secured

online server. Results can be displayed by admin after entering user id and password.

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