Finger Print Based Electronic Voting Machine

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Abstract - *In India election commission initially used ballet voting method over a decade back electronic voting machines are introduced. The problem with these two methods is that they require so much of staff and it is time taking process for manually checking the eligibility of the voter at polling booths. Moreover it is to be considered as not environmental friendly because it requires lots of paper for printing ballet papers and Check lists of voters for different polling booths. There is client server based voting which works using internet, any problem with network connectivity can hamper the poll process. To avoid all these kind of problems and to perform the voting process at faster rate and smoothly, we are presenting a method which is based on the authentication of finger print and UID number from AADHAR database. This method of electronic voting mechanism helps to reduce the election process, voter's time; results can be announced in a very short period of time and increasing the reliability and security of the votes.*

***Key Words*—EVM's (Electronic Voting Machine), UID number, AADHAR database, Client-Server based Voting.**

1. INTRODUCTION

In earlier days for elections process different methods are implemented. They are: a) Ballet voting, b) Postal voting, c) Proxy voting and d) Internet voting. Most of these methods start with the first step verification of voter details and checking his/her identity proof.

In Ballot voting [5] after the verification of voter identity he/she will be given a ballot paper and allowed to cast their vote. The ballot paper is printed with all the candidates contesting for poll with party name and symbol of the party for which he/she is representing. The voter has to give their vote by marking on one of the columns using a stamp. One voter is allowed to mark one of the columns. If more than one mark found at the time of evaluating the ballet papers it will be considered as an invalid vote.

Postal voting [6] is used by people who are on election duty and attending other special duties. When any one of the person who is unable to attend voting process they will be given an application to give their vote through post. Proxy voting [7] is something in this the other person will give vote behalf of the person who is sick and unable to go to the polling booth. But there must be a mutual understanding between the one want to give their vote and the one who is going to do that on behalf of other person. To do proxy voting special permission is to be taken from respected concern officials in the voter's area. The person who is going to vote instead of the actual voter must be a trusted one by him.

Internet based voting [8] is not used in India because lack of awareness and less literacy. In this method voting will take place using a client-server based technique. The voters will log on to website to give their votes. Currently this method is using in corporate sector to for the election of chairperson.

The above discussed methods have their own limitations and difficulties in terms number of staff to conduct elections, lots of paper work, less voting percentage, inaccessibility to internet, time consuming, delay in announcing the result and error in counting the votes, to name a few.

We have proposed a method which will completely work without using internet. This method is based on fingerprint and UID authentication. The UID and fingerprint of the voters for a particular polling booth will be loaded in the database of the standalone system. At the time of voting process the voter finger print will be searched in the library after entering his/her UID number. The UID number and finger print images are taken from the AADHAR data, and after successful verification, the person is allowed to cast the vote.

2. Design Methodology

2.1 Designing

In this paper we proposed a new method which is based on the finger print and UID number verification. The system uses finger print and UID number for authentication of the voter. The UID number and finger prints of the voters will be taken from the AADHAR base. The election commission will load the data in different machines which are going to serve in respective areas as per the lists prepared for respective polling booths. It is the responsibility of the election commission to make sure that the voters data loaded will go to their respective areas at the time of elections.

Usually the election process starts by verifying the user's identity proof and then he/she will be allowed to cast their vote. The verification of user identity proof, that helps the voters to know that whether the particular voter can give their vote in that area or not. When this verification happens manually it will take too much time. If the voters data is correctly loaded in the system where the voter can cast their vote. The manual checking can be eliminated totally, as the system will verify authorized UID number and finger prints authentication before he/she is going to cast their vote. The

verification of voter hardly takes less than five seconds as the system is using a standalone database to verify the voter's data. For the verification and to cast their vote voter needs to input the UID number. The system will not proceed to finger print authentication and voting process unless the UID number is correct and which is found in the data base of that system. If not pertaining to that polling booth, the rejection is indicated on the LCD. Once the voter input the UID number and Finger print authentication is done the user can cast his/her vote. Once the voter has given the vote, UID number will be deleted from the data base. When the voter try to give multiple votes as the system will check for the UID in database it will not found as it is deleted when the voter cast his vote before. The voter cannot cast vote with other UID number because system will check for the matching of UID and finger print. The block diagram of the system is as shown below figure 1.

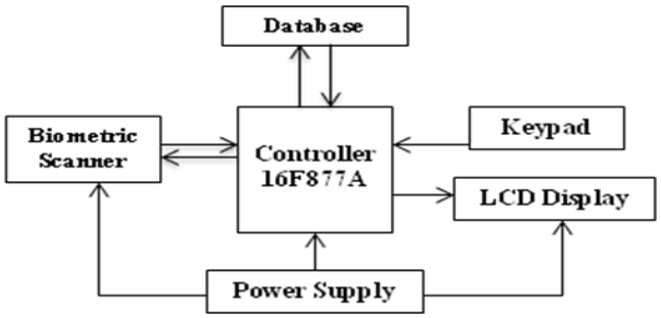

Fig - 1: Block Diagram of Finger print based Electronic voting machine.

2.2 Methodology:

The proposed method uses a finger print module named R305 which can scan and store finger prints up to few hundred and the same can be transferred to database if the storage for finger prints is not enough within the module. The module works with the concept of optical scanning with the wave length of light in the range 6897 to 25,000 nanometers.

The module can be able to do two different ways of searching 1:1 and 1:Ns searching by sending respective commands. The finger print module is interfaced with the microcontroller using USART communication. The commands and acknowledgement between the module and microcontroller works based on this communication. The system will undergo three different modes of operation. They are a) Enrolling mode, b) Authentication and voting mode and c) Result announcement mode.

a) Enrolling Mode: This mode is used to load database of the system with different voters UID numbers and finger prints. But this mode is only accessible by the election commission or the concerned officials only. The system will enter into this mode by following a particular procedure, with security codes and relevant authentications. While powering up the system if one presses and hold the enrolling key the machine will go into enrolling mode. Then one can load the data on to the system. Once the system is loaded with the data we can turn it off and send it to the respective polling stations. Proper care should be taken as the particular system can serve only the specified location.

b) Authentication and voting mode: There is no need of special procedure to enter into this mode so simply power up the system. After a welcome message displayed on the screen the system will go and wait for the voter to input the UID number. If the UID number match found in the database system will direct the voter to place his/her finger on the finger print module if not placed/improper voter will get notified by a message on the screen. If the finger print scan was successful and found in the database the authentication process is completed. And the system will ask the voter to give his/her vote. By pressing on of the dedicated keys of different candidates voting process will be competed. The status of the voting process will get display on the screen. The flow chart of the voting process is as shown below, in fig.2..

c) Result announcement mode: This mode is also used by the election commission to announce the result of a particular area. There no need of a special procedure to enter into this mode. Whenever the system is in voting mode and displaying the message "Enter UID number" by typing a password which is same length as the UID number. The number of votes received by different candidates will be displayed one by one. The result can be send to computer if required. If the user wants to see the result again by pressing the repeat the result will be displayed one by one again. By pressing the close button the system will enter in to the voting mode.

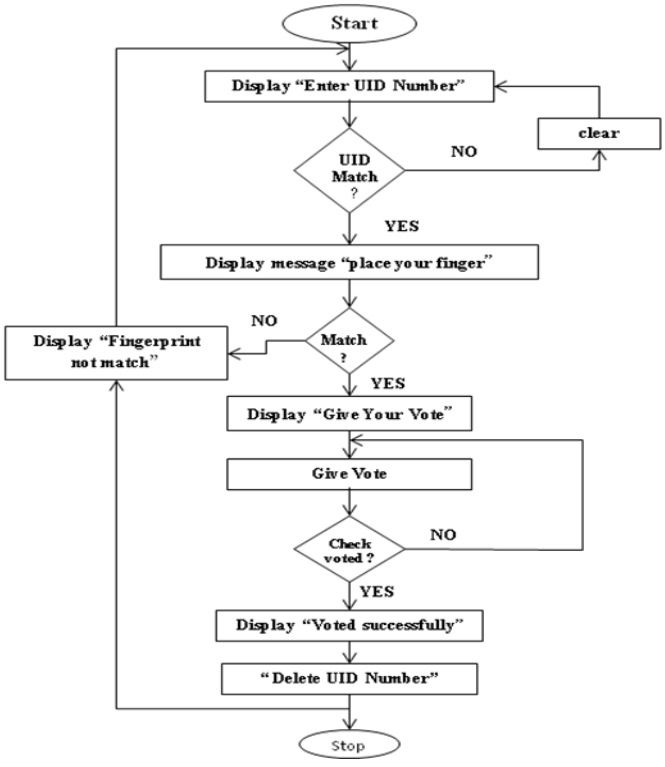

Fig - 2: Flow chart of Authentication and Voting process

3. Result and Analysis

In the proposed method, the data of the voters are taken from the AADHAR database. The list of voters who are going to cast their votes in different polling booths are prepared and loaded in the system. As per the lists prepared individual machine will be loaded with finger print and UID details. These individual machines are going to serve in their designated polling booths. The UID details for a particular polling booth are also loaded in computer to check that a particular voter eligible to vote in that area or not before voting process.

It was newly developed information which has all the information concerning the people. Fingerprint verification could also be an honest choice for in e-voting systems, where you can provide users adequate explanation and training, and where the system operates in a controlled environment. When the system is powered up it will be start with "Fingerprint Based Electronic Voting Machine" message on the LCD screen. The voting time is drastically reduced compared to existing methods. The voting time for a voter is reduced to 5 to 10 seconds as the system is able to perform authentication and voting process at the same time.

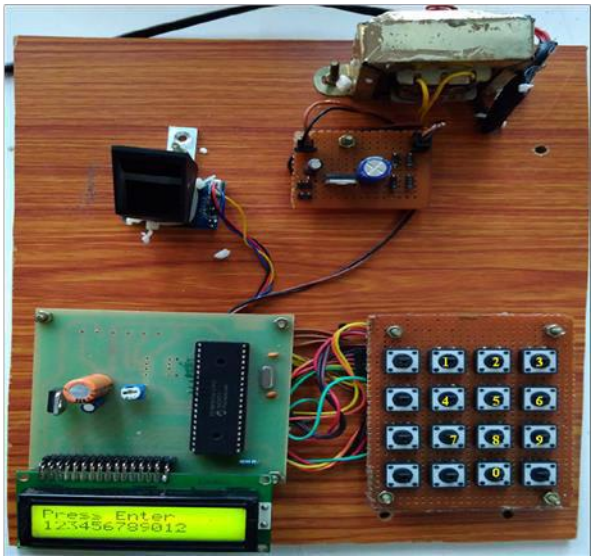

Fig - 3: Prototype of finger print based Electronic voting machine.

4. CONCLUSIONS

The overall review about Aadhar based electronic voting machine is that it provides full security authentication because finger print of one does not matches with other person. As it is a biometric way of checking the database of saved fingerprints. This is also a Time saving process with instant result announcing way of method which will hardly take less than a minute. The proposed method drastically reducing the voting time and saving money as it is using very less staff to conduct the voting. It is also an environmental friendly method that it is using lee number of papers. It is also reducing the voter's time as well as the government effort in conducting the result. The system is working completely without using any internet. So the system is protected from hacking. This makes the system best suited for conducting elections in rural areas.

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