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Two Tier Secured State of the Art EVM Design

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Abstract: Voting is a process in which citizens choose a leader in all candidates from a list by casting their vote to their desired candidate. On the Election Day, people who have citizenship of India and whose age is above 18 years, they can vote without going to their home constituency. Objective of Aadhar based Election voting system in public elections that would allow people to vote electronically, from their current city. In this paper, we propose biometric database that is a fingerprint. Hence our proposed voting system would provide high security and it will increase voting percentage also. The data stored in the Aadhar card act main criteria for authentication and confirmation in this system. And fingerprint provides security through biometrics. At the time of voting, the fingerprint information stored in the Aadhar card is take as the reference and used for authentication. Therefore the proposed system will be successful in preventing bogus voting that is the voting of an illegal citizens.
Keywords: Aadhar, Biometric, Electronic Voting Machine, Fingerprint and voting system.

I. INTRODUCTION

India is a Democratic country every citizen above 18 years of age is eligible to elect their leaders. When a person attends the age of 18 has the constructional right to voluntarily enrol 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 is not ready to travel such a distance. To avail constructional voting right to every citizen, Aadhaar and Web based Voting System using Fingerprint Recognition Technique is the best solution.

Nowadays 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. 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, eservices and information security it is necessary to ensure that data, communications or documents (electronic or physical) are enough secure and privacy enabled. Advances in cryptographic techniques allow pretty good privacy on e-voting systems. 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 project aims to build an electronic voting machine using finger print recognition module. This project is used to maintain High level biometric security. The voter details are stored in database in server. Before entering the premises that person should insert the finger on to reader, the finger print scanner will read the image of finger of persons. After reading the details the microcontroller sends these details to the library and checks for the details, if he is valid person, he will be allowed to vote. In this project we can overcome the problem prevalent in the existing system, such as proxy votes, missing identity, security, high cost and even presiding can view the result even before it is announced. The modified system consists of Fingerprint module one of the main component, microcontroller based control unit, keyboard interface, LCD to display the details of voters and party, an external memory to store the all the details of voting carried out. Ballot buttons will be provided for the candidate to cast their vote to their respective candidates. We are providing four ballot buttons in our project.

II. LITERATURE REVIEW

India is one of the world's largest democracies with a community of 1.1 billion; India has an electorate of 714 million persons over 828 thousand polling stations, 1.37 million voting machines and 5.5 million polling officials cover 543 parliamentary constituencies. Past experience of electoral process enforced us to focus on the use of latest technology in E-voting process. The current voting mechanism has many security problems, and it is very difficult to prove even simple security aspects about them. A voting system that can be demonstrated correct has many considerations.

Authentication of Voters, Security of voting process, Securing voted data are the main challenge of e-voting. This is the reason why designing a secure e-voting system is very important. In many proposals, the security of the system relies mainly on the black box voting machine. But security of data, privacy of the voters and the accuracy of the vote are also main aspects that have to be taken into consideration while building secure e-voting system. In this project the authenticating voters and polling data security aspects for e-voting systems was discussed. It ensures that vote casting cannot be altered by unauthorized person. The voter authentication in online e-voting process can be done by formal registration through administrators and by entering One time password. In Offline e-voting process authentication can be done using Iris recognization, finger vein sensing which enables the electronic ballot reset for allowing voters to cast their votes. Also the voted data and voters details can be sent to the nearby Database Administration unit in a timely manner using GSM System with cryptography technique. From the paper "Biometrics using Electronic Voting System with Embedded Security "volume 2, issue 3.

The idea is to reduce fake votes and illegal voting in election process. To improve security in current election process, two level of authentication is implemented, one is through RFID based Aadhaar card and other is through biometric traits, since it is very unique identity of individual. From the paper "AADHAR BASED ELECTRONIC VOTING SYSTEM AND PROVIDING AUTHENTICATION ON INTERNET OF THINGS "volume 4, issue 4, april 2017. Face recognition system by using Principal Component Analysis (PCA).This technique is used for authentication process and to provide secured voting system. PCA is a statistical approach used for reducing the number of variables in face recognition. In PCA, every image in the training set is represented as a linear combination of weighted eigenvectors called eigenfaces. These eigenvectors are obtained from covariance matrix of a training image set. The weights are found out after selecting a set of most relevant Eigenfaces. Recognition is performed by projecting a test image onto the subspace spanned by the eigenfaces and then classification is done by measuring minimum Euclidean distance. We can adopt these for the extended security purpose of the voting system. From the paper "Face Recognition Using Principal Component Analysis Method" volume 1, issue 9.

Voting is most pivotal process of democratic society through which people determine its government. Governments around the world ssare increasingly considering the replacement of traditional paper based voting schemes with electronic voting system.In this paper they have described the design, construction and operation of a digital voting machine using a micro controller profoundly. From the paper "A preview on Microcontroller Based Electronic voting machine "volume 3, no 2.

III.   PROPOSED SYSTEM

The Proposed System has the following steps to follow

Enrollment of the voter should be done and data is stored in database.

1) *Step 1:* Go to any polling booth nearby residing area.
2) *Step 2:* Verification of the eligible voter is done.
3) *Step 3:* Voter authentication is done using fingerprint biometric module.
4) *Step 4:* For extended security purpose of the voting system face recognition method can be adopted.
5) *Step 5:* If the scanned fingerprint matches with the stored database it displays the constituency details, then the person can choose the candidate from the list of candidate and is allowed to caste his/her vote. Then the vote is successfully registered.
6) *Step 6:* If the fingerprint does not match with the stored database, the person is not allowed to vote.

After the completion of voting process, the number of votes casted for a particular party is calculated and the result is declared according to the percentage of votes gained.
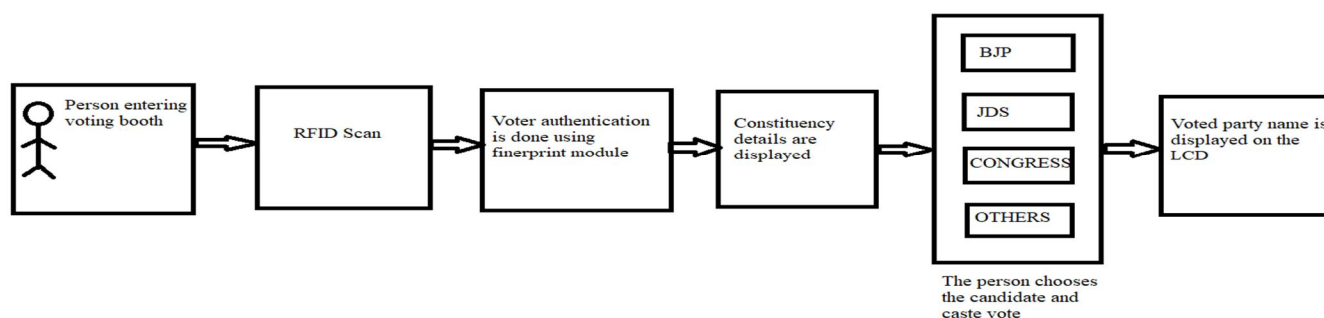

Fig 8: Block diagram of the procedure of the proposed model.

The Proposed System fulfills the following requirements:

a) People can vote without going to their respective home constituency on the Election Day, the people can cast their vote from their current location.

b) Illegal voting can be totally removed because we are using Fingerprint Recognition technique. (a biometric property which is unique to each individual). For extended security purpose of the voting system, Face recognition technique can be adopted.

c) In real time application to implement the proposed model, Aadhar card can be used since it has all the necessary details that is required for the voting system and aadhar card is one such ID card that is owned by every citizen of India.

d) Aadhar database permits only to those who are eligible to vote and it ensures that a person should cast their vote only once.

e) The major advantage of the proposed voting system is that we can increase voting percentage, ss that is every citizen of India staying in any location other than their home constituency get a chance to cast their vote. This will bring effective result in choosing a leader.

f) It saves the travelling time and money of the individuals (voter) and quick results can be obtained by implementing the proposed system.
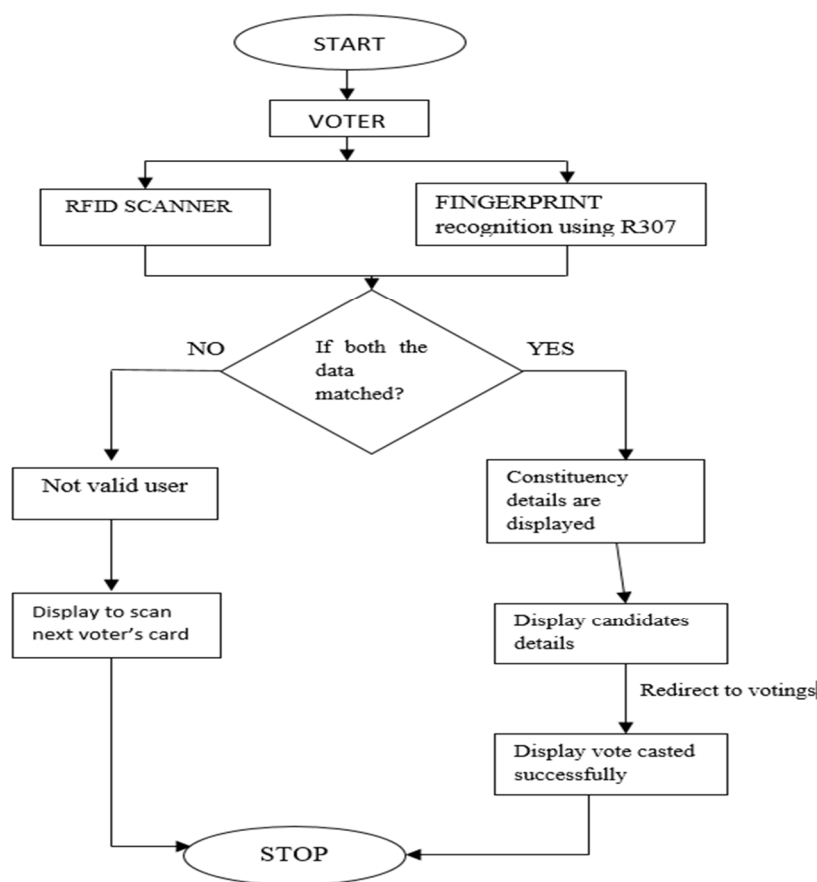

Fig 2: Flow Diagram of Proposed system

A. Description of flow diagram

One of the major factors to be taken care of in a voting process is authentication and authorization of voters. Many conditions need to be checked to ensure these factors. Major conditions include:

1) Check authenticity of voter.

2) Authorize legitimate voters to vote.

3) Avoid double vote casting by any individual.

Checking if all these conditions manually is a very complicated and exhausting task with many chances of human error. To voting system with finger print based authentication. avoid this we here propose a fingerprint based voting system project. We use a

fingerprint module interfaced with ARM controller and an LCD screen in this system. The fingerprint module is used to sense fingerprints and provide to ARM controller for further processing. The system has list of eligible voters in it, the voting system tallies the recognized finger print against the ones stored in database. If match is found that person is allowed to vote. In this project, we are using four switches for four different candidates. We can increase the number of candidate but for better understanding we have limited it to four. When a voter press any of four button then respecting voting value will increment by one each time in the respective constituency. Once a vote is casted by that person, he/she cannot vote again and if the person try to do so, it displays a message "Not a valid user". This avoids double vote casting. Thus our system provides for a fully automated.

IV. RESULT

In this project, voters data such as constituency details, unique ID and biometric details are stored in the database.

When the voter arrives at booth for voting purpose, authentication of the voter is done using finger print module R307.

If the stored and displayed data matches with each other, the voter is considered for voting, otherwise the person is not considered for voting. The information base is made utilizing visual essential studio which is provided with the Aadhar card subtle of the voter. At the time of voting when the candidate keep the fingerprint the image is compared with the reference image stored in the aadhar. On the off chance that the unique mark is perceived then the voter is permitted to vote.

V. CONCLUSION

This system provides best solutions to problems related to the Indian voting system. This system helps to increase voting percentage. In our voting process authentication can be done using fingerprint recognition to cast voter's votes, it ensures that vote casting cannot be altered by an unauthorized person. It requires Computer, Fingerprint scanner, and electricity.

Also the proposed method provides the voter to vote from any region with in India to the residential Constituency from the nearest voting booth with a secure voting process without neglecting to vote. The proposed method is to develop secured voting system based on finger print recognition which tried to overcome all the drawbacks that occurs in traditional or current voting system. This system of voting has many strong features like correctness, verifiability, convenience etc. The Proposed system provides two phase of authentication. First is through RFID and second is Fingerprint recognition. In real time application no voter can vote twice because the voter's fingerprint patterns linked to their Aadhar card. So that any use tries to vote twice with some other person's aadhar card, it is not possible due to the fact that the respective fingerprint patterns stored in data storage will not be matched with the voter trying to vote with some other persons's aadhar card.

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