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Embedded based E-Voting System through Fingerprint and Aadhaar Card Verification

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Abstract:
Election has a great effect on the minds of people. It is one of the significant futures of our country INDIA. In order to have an impartial elections World is conducting experiments with different technology. Main objective is designing a voting system model where it supports impartial election. This paper deals with the design and development of a fingerprint voting system with AADHAAR card verification. The suggested fingerprint allows the user to scan his/her fingerprint, in order to check his/her eligibility by comparing his/her current fingerprint with one already stored in the AADHAAR card. Once the user complete the identification process, they will allowed to cast vote using friendly geographical user interface. The counting of vote will be immediately and that makes voting process efficient, fast, and secure. There by can reduce the proxies done in the election system or voting system and elect the right candidates as rulers.

Index terms: Finger Print Sensor, Arduino, LCD (16x2) display.

I. INTRODUCTION

In most of the countries, rulers were selected by their own peoples with different method voting system. But those voting systems were corrupted by rulers and officers. India requires secure and effective voting system in 21st century. This project aims to develop a voting system that provides security and a truthful election. Every citizen or voters of India has the right to express their own choices as vote to elect a rightful person As our ruler. Since the system is corrupted, a highly efficient voting process is required. To allow the exercise of this right, almost all voting systems include the following steps: voter identification and authentication, voting and recording of votes cast, vote counting, publication of election results. A Secured electronic voting machine using unique identification number i.e. AADHAR number has been developed. To provide additional security along with the AADHAR number biometric identification is used. At the time of voting in the elections, the voter authentication can be done through biometric pattern. If the biometric information of the voter matches the database of the AADHAR then the person is allowed to cast their vote.

II.SYSTEM

From 1948 onwards, India is conducting election process at a time interval of 5 years. The following methods are used for elect the majority representing person as our ruler.

- Paper ballot system
- Electronic voting machine
- Online voting

A. PAPER BALLOT VOTING

Paper Ballots were used in India before 1997 for conducting the public elections. Even though this method gives uninterrupted voting, Votes captured in ballots can be stored for a very short period as the ink used in voting my discharge or ballot paper may lose its quality. Proper care has to be taken in maintaining these ballots to protect them from humidity, sunlight and other factors, which affect the ballot papers. Once the ballot is corrupted, we cannot recover the original data. After the election process, it takes more time and effort for counting the votes manually by checking each ballot paper. Paper is an Inflammable material accidentally I may catch fire in case all record will be lost and cannot be recovered and hence government has to spend extra money for conducting re-elections. Bogus ballots can be made and in-numerous fake votes can be casted. Physically disabled peoples were facing difficulties in casting their votes, in those cases they need others help, but privacy while casting votes is vomited.

B. ELECTRONIC VOTING SYSTEM

India has an outdated method of conducting elections using Electronic Voting Machines, which is prone to fraud and it is tedious to handle the voting machines. EVMs which are used in India do not have any mechanism by which the voter can verify their identity before casting votes, due to which fake voters can cast numerous fake votes. EVMs can be tampered during manufacturing in such case it can manipulate the actual voting. After elections government has to maintain these **II**again a tedious process for government. Many countries namely Germany, Netherland, Italy, France have banned EVMs. Indian EVMs are manufactured in Japan but Japan is using ballet system.

C. ONLINE VOTING

Online voting system has merits than existing system but it has many demerits. It is difficult to ascertain the identity of the person casting vote. It is not always reliable. It is vulnerable to

hackers and malicious software programs. Since many proposed system are web based there are chances of illegal access of data. Hackers can steal the login credentials of voters and can cast illegal votes.

III. PROPOSED WORK

The proposed system is a secured e-voting system that uses Unique Identification Authority of India (UIDAI) or AADHAAR database as its backend. The system ensures authentication of an individual by matching fingerprints and eligibility is checked by calculating the age of the voter thus making the existing voting cards redundant.

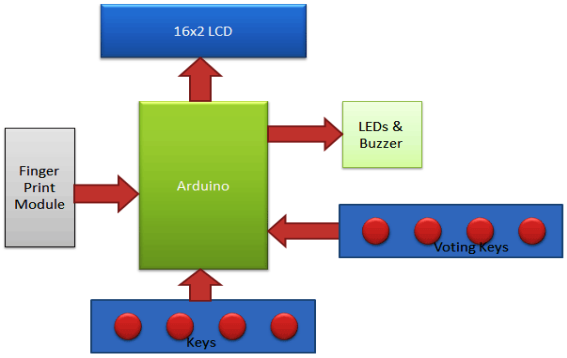

Figure.1. Block Diagram

The proposed system contains two databases. One is Central database and another is Local database of the polling booth. Central database called Central Identities Data Repository (CIDR) which forms the backbone of the system. It contains all the demographic and biometric data of every citizen of India. In order to reduce load on the central database there are local databases that will be located alongside the servers which will contain cached copies of data of the inhabitants that fall under its zone. These zones are decided on the basis of population density, area and other factors. All the local databases retrieve data from CIDR of only those people who come under its scope. This data is periodically updated and is stored in volatile form so that it can be erased if and when necessary such as during security attacks, natural calamities, maintenance works, etc. The local databases will retrieve only the data that is pertaining to the voting process and exclude all other irrelevant information. These databases will be used for generating statistics and results of the electoral process. These databases make it possible to allow voting from anywhere provided that the voter is within electoral circuits.

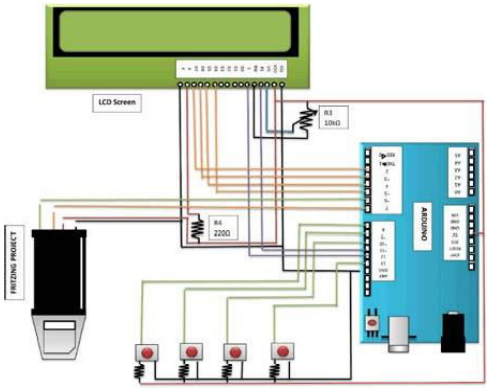

Figure.2. Circuit Diagram

A. AUTHENTICATION AND VERIFICATION OF THE VOTER

Authentication is the process of determining whether someone or something is, in fact, who or what it is declared to be. In order to authenticate a person we require them to have a valid Unique Identification (UID) number/ AADHAAR number. The number will be checked in the local database records first. If it is not found then it will search the central repository. It involves one-to-many match. If the person's number is not found in the central database then of course he/she will be avoid of taking part in the voting process. On the other hand if the number is present in the central database then the data of that person will be cached to the local database. This record is extracted from the local database and sent to authenticating servers for further processing.

IV. PREVENTING FRAUDULENT VOTING

The first and the foremost thing to ensure proper voting is by accurately authenticating every voter. It is necessary to identify that every person coming to vote is unique otherwise it will violate the very principle of voting. Any person would be voting on behalf of others. Fingerprint matching ensures the authentication that the system requires.

V. GENERATING REPORTS

Whenever a voter casts a vote in favor of the candidate of choice, the vote count of that candidate gets incremented in the local database. The votes from all the local databases are summed up to get the final figure that the candidate has received. Thus this system provides instantaneous results and prevents unnecessary use of manpower and wastage of time. Since this is an electronic system and uses digital data it has several advantages. Statistics can be generated from the obtained data for e.g. we could answer how many people have voted from a certain region, how many females voted, which age group voted the most, the highest turnouts, comparisons from previous years, etc. all that was not possible from traditional voting methods not even from EVMs. It would provide important insights into the election results and help improve the system even further.

Figure.3. Arduino Uno

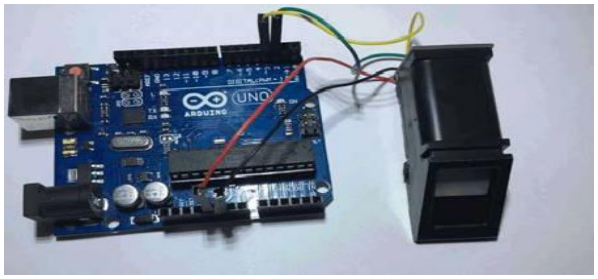

Figure.4. Fingerprint Module

Figure.5 LCD Display

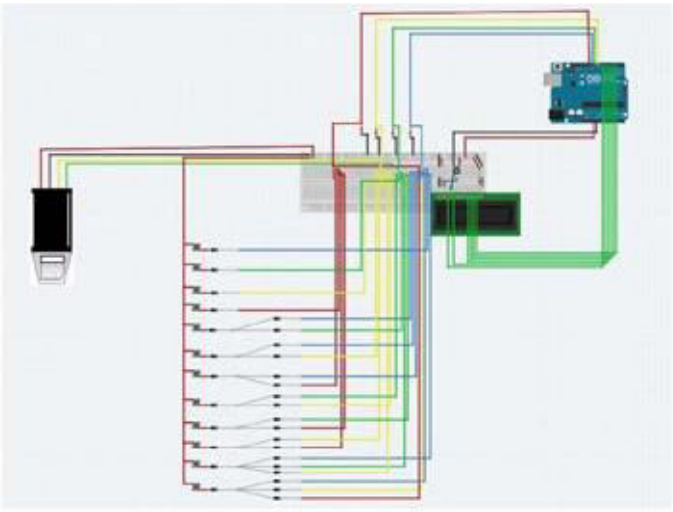

Figure.6. System Design Schematic Diagram

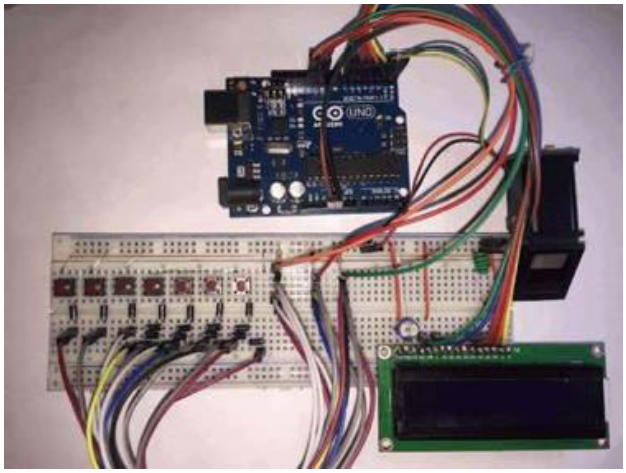

Figure.7.1 Beginning System

In this paper, the proposed 'Embedded based E-voting system through fingerprint and AADHAAR card verification' which is better and faster than previous systems. The new system prevents access to illegal voters, provides ease of use, transparency and maintains integrity of the voting process. It has provided chance to avoid invalid votes, It reduce the polling time, Easy to carrying to polling center from the polling box, Reduce the staff of voting center, It provide easy and accurate counting without any troubles, Provisioning of voting preventive measures.

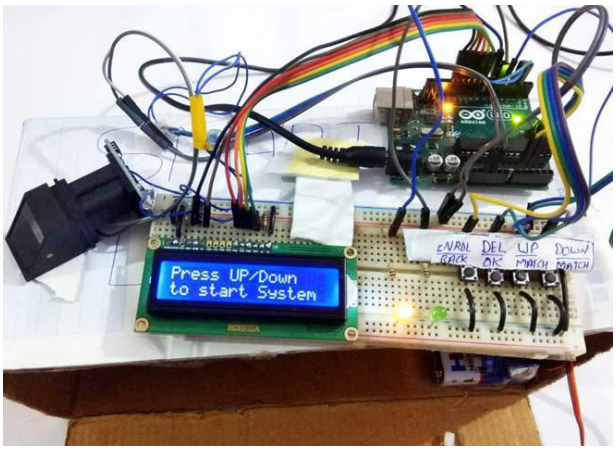

Figure.7.2 Complete System

This will surely ensure a safer voting method which is very much what is required for a healthy growth of a developing nation.

VII. CONCLUSION

The proposed voting system had many advantages over the traditional method of voting. This system affords additional security by allowing voter to vote only once by imparting unique identification along with biometric information. This system avoids fraudulent voting and illegal practices during the elections which is the key issue in the traditional voting system. This system provides transparency in the counting process. The advantages of this system are economic, faster tabulation of results, improved accessibility, greater accuracy, and lower risk of human and mechanical errors. Database consisting of the details like age, biometric of the people should be updated every time before election. Information about the casted vote can be sent to the voter through the messaging system.

VIII. REFERENCE

[1]. C. H. Jayalakshmi, S. Kalpana, **SECURED AND TRANSPARENT VOTING SYSTEM**, *IEEE Trans, Invention System and Control,* Volume no: 2, pp. 343-350, May 2018.

[2]. Vidhyasree, Dr. S. Vishwanandaraju, Dr. G. Madhavi, **DESISTING THE FRAUD INDIA'S VOTING PROCESS THROUGH MULTIMODAL BIOMETRIC**,*IEEE Trans, Advance Computing,* Volume no: 6, pp.448-491, Oct 2016.

[3]. Kavitha S. N, Shahila .K, Dr. Prasannakumar S. C, **BIOMETRIC SECURING VOTING SYSTEM WITH FINGERPRINT. FACE. AND IRIS VERIFICATION**,*IEEE Trans, Secured and Privacy,* Volume no: 5, pp.743-746, Sept 2018.

[4]. S.B. Khairnar, P.S. Naidu and R. Kharat, **SECURE AUTHENTICATION FOR ONLINE VOTING SYSTEM**, 2016 International Conference on Computing Communication Control and automation(ICCUBEA), Pune,pp,1-4.2018.

[5]. Bhuvanapriya R., RozilBanu S., Sivapriya P., and Kalaiselvi V.K.G. ***SMART VOTING***,2017 *2nd International Conference on Computing and Communication Technology (ICCCT)*, Chennai,pp.143-147. 2017.

[6]. N.H. Sulthan, F.A Barbhuiya and N. Sarma, **PAIR VOTING; A SECURE ONLINE VOTING SCHEME USING PAIRING-BASED CRYPTOGRAPHY & FUZZY EXTRACTOR**,*2015 IEEE International Conference on Advance Networks and Telecommunication System (ANTS), Kolkata*, pp,1-6. 2015.

[7]. S.Sridharan**IMPLEMENTATION OF AUTHENTICATE AND SECURE ONLINE VOTING SYSTEM**,*2013 Fourth International Conference on Computing, Communications andNetworking Technologies(ICCCNT),Tiruchengode*,pp.1-7. 2013.

[8]. H. Agarval and G.N.Pandey**ONLINE VOTING SYSTEM FOR INDIA BASED ON AADHAR ID**,2013,*Eleven International Conference on ICT and Knowledge Engineering Bangkok*,pp.1-4.2013.

[9]. L.Rura, B. Issac and M.K. Halder, **ONLINE VOTING VERIFICATION with CRYPTOGRAPHY and STEGANOGRAPHY APPROACHES**, Proceedings of 2011 *International Conference on Computer Science and Network Technology, Harbin*,pp.125-129. 2011

[10]. Vishal.VChinmay, R. Garg and P. Yaduv, **ONLINE VOTING SYSTEM LINKED WITH AADHAR**, 2016 3rd *International Conference on Computing for Sustain Global Development (INDIA com)*, New Delhi,pp 3239-3240. 2016.

[11]. AshwiniWalake, Prof. Ms, PallaviChavan, **EFFICIENT VOTING SYSTEM WITH SECRET SHARING BASED AUTHENTICATION***, (IJCSIT) International Journal of Computer Science and Technologies*, vol.6(1), pp.410-412. 2015.

[12]. S. Katiyur, K.R.Meka, F.A.Barbhuiya and S .Nandi, **ONLINE VOTING SYSTEM POWERED BY BIOMETRIC SECURITY STEGANOGRAPHY**, *Second International Conference on Emerging Application of Information Technology, Kolkata*,pp.288-291. 2011.

[13]. K.Kim, & D.Hong, **ELECTRONIC VOTING SYSTEM USING MOBILE TERMINAL**,*World Academy of Science, Engineering and Technology*,pp.33-37. 2009

[14]. SmithaKhairnar, ReenaKharanth, Survey on **SECURE ONLINE VOTING SYSTEM**, International Journal of Computer Applications(0975-8887).Volume 134-No 13,January 2016

[15]. B. Madan Mohan Reddy, D. Srihari, (April 2015), **RFID BASED BIOMETRIC VOTING MACHINE LINKED TO AADHAAR FOR SAFE AND SECURE VOTING**.

[16]. Anandaraj, S, Anish R, Devakumar P.V **SECURED ELECTRONIC VOTING MACHINE USING BIOMETRIC** IEEE Sponsored 2nd International Conference on Innovations in Information, Embedded and Communication systems (ICIIECS) 2015.

[17]. Devendra Vijay Naik ,**SMART WIRELESS AUTHENTICATING VOTING MACHINE**,this full-text paper was peer-reviewed and accepted to be presented at the IEEE ICCSP 2015 conference.

[18]. B.Madan Mohan Reddy, D. SrihariRFID**BASED BIOMETRIC VOTING MACHINE LINKED TO AADHAAR FOR SAFE AND SECURE VOTING**, International Journal of Science, Engineering and Technology Research (IJSETR) Volume 4, Issue 4, April 2015

[19]. nsifArooj, MohsinRiaz**ELECTRONIC VOTING WITH BIOMETRIC VERIFICATION OFFLINE AND HYBRID EVMS SOLUTION**The Sixth International Conference on Innovative Computing Technology(2016)

[20]. Gomathi.B, Veena priyadarshini.S **MODERNIZED VOTINGMACHINE Using Finger PRINT RECOGNITION**, International Journal of Scientific & Engineering Research, Volume 4, Issue 5, May-2013.

[21]. Amer A and El-gendy H, **TOWARDS A FRAUD PREVENTION E-VOTING SYSTEM**, International Journal of Advanced Computer Science and Applications, Vol 4 No 4, pp147-149, 2013

[22]. Wong, A. K. Y., Cheok, S. M., Tang, S. K., **A USER-FRIENDLY VOTING AND QUIZ SYSTEM FOR CLASSROOM USE WITH CONNECTED DEVICES**, 2016 IEEE International Conference on Consumer Electronics-China (ICCEChina), Guangzhou, pp. 1-6, 2016.