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Smart Voting System

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***Abstract* :− Voting system plays a vital role in democratic countries like India. "Vote" means to choose a better candidate who is participating in the election. The process of choosing a leader in all the candidates from a list by casting their votes, is called "voting". In this paper, we propose a system in which, people who have citizenship of India and whose age is above 18 years they can vote without going to their home constituency on the day of Election. Our purpose of Aadhar based Smart voting system in public elections that would allow people to vote electronically, from their current city. In this system, voting is based on Aadhar's biometric database that is a fingerprint. This voting system would offer higher security and hoping that it will increase voting percentage.**

Keywords:- Aadhar, Biometric, Electronic Voting Machine, Fingerprint and voting system.

1. INTRODUCTION

In Democratic countries like India, the voting system plays a major role during elections. Traditionally, the election commission in India uses electronic voting machines which need more manpower, time-consuming and also they are less trustworthy. As we know, in every country Election is a basic process of democracy which allows people to show their opinions by selecting their candidate. India is spending huge money to improve our whole voting system to provide a better government to citizens. In India, voting system should be honest, translucent and fully secure for the better democracy. The current system is used to less transparency because there could be chances of cheating at the voting time. Authentication of Voters, Security of the voting process, protecting voted data these are the main challenges of current Election voting. That's why it is necessary to generate a secure election voting system. 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. After the industrialisation more number of people leave their native places and come to the cities for the job sake. But many of them still have their voter ids in the address of their native places. On the day of voting they can't able to go their places so they don't cast their valuable vote. this is the main reason for reduction of voting percentage in our country. Our government also keep on working to find out a best solution for this circumstance.

2. METHODOLOGIES

The paper [1], describes the RFID based voting system. Where the system deals with the use of RFID, Microcontroller and GSM technology for the improvement of election process by avoiding the electoral fraud and to ensuring the reliability, security, safety, transparency and guarantee for the smooth conduction of election. RFID is Radio Frequency Identification uses electromagnetic fields to automatically identify and track RFID tags attached to Objects. The GSM module that is used in this system is SIM900A. It has a built in RS-232 which is an added advantage and also provides the users to insert SIM. In this paper, where voting process initiates with communication of voting device with voter id's card where RFID Tag is embedded on the Voter id. The RFID tag that has been used in the implementation operates at a frequency of 125 KHz. after the successful verification of ID, if it matches then the device will send a one time password to the GSM Module where it send a OTP to the voter's mobile and voter has to insert the password again device will check the password, if it matches then voter using the keypad can cast the vote. This system makes voting process easy and safety of voting process is enhanced.

The paper [2] discusses the Biometric based voting system. As we know Biometric is one of the unique identity like DNA and Iris. In this Proposed system they are using the Biometric verification to enhance the security and safety of voting Process to avoid the electoral frauds. According to this paper here we are supposed to store voter's database in the server. The database may include mainly Name of the voter, Address of the voter, Biometric information of the voter. Here no storage devices included in the voting device. All the storage or memory are in the server.
Here IOT Technology is used for the server operations and to update the voting details. Here all the voting devices connected to the single server.one server for one constituency. Here at initially Fingerprint verification is done. After the successful verification of Biometric system will check with database. Once it matches then the server will checks about whether the voter is already casted vote or not. if he already casted vote then Buzzer will make sound. if not casted vote then voting device allows to cast his vote. using the keypad voter can cast the vote. after successful voting, server will be updated and GSM module will get activated and using the phone number which is stored in voter's database, it will send a message of successful voting to the voter's phone. When last voter cast his vote, we have

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the voting counts ready in server, election officer can announce the result on the day of Election itself so, it avoids the lot of investment of money and the time. So by using this system we can avoid the counting time of votes and completely free with the man power. So can avoid manual errors which can happen while counting. But the drawback is what can we see is to create a database of all the voters is need maximum investment by a government.

The paper [3], describes the mobile based facial recognition using OTP verification for the voting process. In this proposed system firstly voter has to create a database using his Android mobile phone through the facial recognition. In this system internet connection is essential. In the first step registration has to be done by the voter in an application. here voter should enroll their information like Name, date of birth, Phone number and face of the voter. After the successful registration, on the day of voting voter has to login the application using the id and password given by the software.id is valid on that day only and password is encrypted using MD5 algorithm, then application will captures the face of the voter using mobile camera and compares it with already strored face of the voter. Once the image is recognized or matched with existing image of the database, then the server will send a OTP (One Time Password) to the voter's mobile phone and voter has to be enter the OTP. Then the entered OTP is verified, it is correct then it means he is valid voter. Then Candidate names will be displayed on mobile phone and there will be option called vote is provided for each candidate. Voter has to press any button to his favourable candidate. After the successful vote, voter can logout his session in application. For security sake his session id is destroyed and password is encrypted using MD5 algorithm. All the votes casted by voters are stored in the server, just by seeing it election officer can easily announce the election result. This system provides the high security in voting process. Using this system voter can save time by standing in queue and there is no need to go election booth to cast the vote.

The paper [4] discusses about the Secured Smart Voting System using Aadhar. This paper is mainly focused on the reduction of voting percentage in India. To overcome the above problem this paper is proposed a system which is easy and secure by developing a Mobile Application. Since it is a mobile application based, it is highly secure compared to online voting system. In this system it is app based Biometric online voting system, as we know Aadhar database has the person's name, address, age, iris, fingerprint and the phone number. On the day of election, voter has to login the application, firstly voter has to give fingerprint, it will compared with fingerprint which is stored in database for the verification. After the successful fingerprint verification, age of the voter is verified since according to our Indian Constitution, Voter's age has to be greater than or equal to 18. Then On the GUI candidate names and their party symbol is displayed. Then Voter can cast their vote. This even helps the illiterates to actively cast their vote. The casted vote will be updated on the respective databases. Voter will be notified for the successful vote. Android Studio is used for the development of application and Mysql is used for the relational database management. This system can be used in public elections of a country and also used for committee election. People can cast their vote wherever they may be and even without going to election booth. This system provides helpful for physically challenged people or disabled, patients, military and senior citizens.

The paper [5], provides the Study on Biometric and Multi-modal biometric system modules and its applications, Techniques and challenges. During elections we can see that more number of the fake voters immigrates from the neighbouring countries. This system is proposed to avoid that electoral frauds. Here they have mentioned the Uni modal and Multi modal biometric system. For the verification and for the identification Multi modal biometric system provides combination of two or more biometric traits. This system uses multiple sensors for acquiring the data that captures the multiple samples of a single biometric trait. To provide the safety and security for the biometric sample they are encrypting it using cryptographic techniques like RSA and AES. But the limitation is we have to maintain the decryption key secretly. This system can also be used extensively in commercial purposes like ATM, Credit cards, Network login. Government can also implement this system in border security, National identity cards, passport control and forensic applications.

The Paper [6] briefs about Biometrics Secured Voting System with Finger Print, Face and Iris Verification. This system provides the highest security to the voting process. At initially voter has to give his fingerprint input to the fingerprint scanner. Here FM220 Starttek Scanner is the fingerprint scanner used. It has the capacity that to scan and store the fingerprint. minutiae matching algorithm is the algorithm used for the fingerprint scanning. Face will be input through the Camera that is inbuilt in the Laptop. Iris is detected from the photo of the face. Viola-Jones is the algorithm used for the face detection. PCA [Principal Component Analysis] and Adaptive thresholding algorithm is used for Iris matching and feature extraction. MatLab is the software is used for the comparision and verification of the input data and the trained data. All the input data is compared with the already stored database. If verification of any one stage is unsuccessful then the system will declare user has fake voter. All the stages should be successfully verified and input data should be matched with stored database. Then the candidate names will be displayed and voter can vote to his favourable candidate. Using this system security of voting process is enhanced and it is easy to use. No need of remembering any ids and passwords. Best solution for the security loop holes.

The Paper [7] describes, The Arduino based Fingerprint Voting System. As we know Arduino is the open source electronic prototyping platform enabling users to create interactive electronic objects. here Arduino uno of ATmega328 is used. In this system also we have create database for al the citizens. Here one database for the one district. There will be central database where it can control

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the database. It is offline version of electronic based fingerprint voting system using Arduino. At initially voter has to verify his fingerprint. Fingerprint is verified with the already stored database. Then voter has to enter the voter national id number. Again it is verified with the database. If there is any mismatch in comparing the database, then the user has declared as fake voter. After the successful verification of the voter's information, Then the candidate names will be displayed on the screen. Voter can cast his valuable vote. Vote will be updated on the vote list. After the voting process, to announce a result there will be button of result. For the security purpose this button will be fixed inside the voting device. Only the admin can access the device and can see the result. The one who gets maximum vote will be declared as the winner. It provides easy and accurate result without any trouble. This system prevents access to illegal voters, provides ease of use, transparency and maintains integrity of the voting process. It also allows a person to vote from anywhere provided that the voter is within constituency limits.

The Paper [8] discusses about the Secure Verifiable Ranked Choice Online Voting System Based on Homomorphic Encryption. In this voting system is to encrypt each ballot using the common public key of the distributed ElGamal cryptosystem. This system is proposed for the private authorities. the system has following certain procedures. First step is Initialization of election, all authorities have to generate a common encryption key (PK) that can be used by voters in order to encrypt each cast ballot before submission. Each authority (Ai) owns a each secret Key pair. It is a combination of Public key (PKa) and the secret key (Ska). During the common key generation, each authority (Ai) has to broadcast their public key (PKa). Second step is Registration of the voters. To Register for the vote, voter has to submit his valid ID. Then the ID is verified, after the successful verification, voter generates a signature key pair. It consists of Public Key (PKv) and the Private key (SKv). Public key can be seen on public bulletin board. System requires each voter to sign their ballot using Digital Signature Algorithm (DSA). Next step is ballot casting, where voter has to give points to all the candidates and at last the one who gets maximum points, declared as the winner. The only restriction is that voter can give points that the total number of assigned points must be equal to the total available points (P). In this system the main concern is given to the Confidentiality and security to the votes. Here the security and performance analysis not only confirming the feasibility, but also here demonstrating the improvements achieved in the voting system.

3. CONCLUSION

Most of the methodologies mentioned above provides the safety, security and transparent to the voting process. But we are proposing system that gives the provision to vote from anywhere in India so the voter no need to come to his constituency if he is in any other place on the day of voting. We are using a Aadhar database where the person's information like name, age, address, biometric identity, iris information, phone numbers are stored. For the security purpose we are using a biometric authentication at the initial stage of the voting process and we also verifying the age of the voter too. Vote casted by the voter will update on the voter's constituency database and we can also easily announce the results without any manual error. So we are hoping that may our country's voting percentage will increase in future using this system in the voting process.

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