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A Secure Approach Using Fingerprint for Online Voting

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Abstract— Casting vote is a right given to every person by the constitution and whether the person actually cast votes according to the law is the major issue that has been observed. The vote casted by a voter is it reached to a candidate or party safely is also the actual right to be known by the voter. This paper shows a proposed model using a finger print as the security which is considered as the high security password for casting the vote and the confirmation ID to login and cast the vote online using internet connected devices. This model actually gives importance to people who actually want to cast their vote, but can't return to their native places to just cast vote. Instead people can sit in their preferred location and cast their votes securely. Thus makes people cast their precious vote easily and securely to the party/candidate they actually want to.

Keywords—Finger print, Online voting system, Internet devices, Secure network .

I. INTRODUCTION

Information security research gives a high interest on concept of online voting. Voter hesist to vote online due to security issues. The belief of the election process is more concerned. Voters would appreciate the possibility of voting from anywhere. From that point of view, an implementation of secure online voting would be another application of cryptography and network security. Anatomy and types of attack against computer network was issue seen [2].

It is hard to make the voting system trustworthy because of high security requirement, places voting is addressed in [3], describes the public needs a more secure way of casting their vote[4].Confidentiality means voters get assured about the privacy of votes and prevent selling of votes.

Online voting system definition given in [5].Online voting systems offer advantages compared to other voting processes. An Online voting system should satisfy requirement such as: Accuracy, Simplicity, Democracy, Verifiability, Privacy, and Security. The system tells that the votes will be done automatically, thus saves lot of time and enables to get results in a very short period of time.

For such online voting system security and privacy are the most main concerns. While in [6] the voting security has been analyzed.

Early the voting could be done only at the places where the voting places are installed. This proposed system helps to overcome this advantage, where the person can vote from anywhere and requirement for security will be required depending on the wireless circumstances. The question of faith on the electronic voting has been discussed in [7]. The proposed system provides the voter to cast their vote in the secured manner without any fear .The fingerprints act as the main role of security in the proposed system of online voting. This also guarantees the voters that their vote casted will not be leaked to others. The system tends to overcome the failure to ensure even one of the specification can lead to chinks and glitches that can be exploited by a middleman to forge or manipulate the intricate details.

The next sections of the paper jots down the brief information of the security provided through fingerprint for online voting.

II. LITERATURE SURVEY

This paper [1], review that the online voting currently provides the security methods and the verification done securely. The finger print is the login password used by the voter to login and cast the vote. The threats faced from the one time password given during the login can be hacked by the intruder. Hence to overcome these issues this paper has been proposed and gives the procedural solution to overcome the threats.

Author [2] proposed, the anatomy and the type of attack in the computer network issue is deployed and the system is proposed to overcome the issue of this is explained.

When there is more number of people to vote the network may face denial of service hence an efficient secure online voting system is proposed and detailed information is given.

The author of paper [3], implements the design on election process which as strong coverage particularly when something goes wrong. Votes which has been casted needs to be highly confidential and the paper shows about the system which increase the level of security and also the trust of the voter.

Author [4] proposed design on the problem of the affected places for the voting. The paper deploys on the verification method. The kick given to aim on a more reliable and robust way to vote is addressed in the paper. The verification technique which would be able to vote against the high threats that may occur and enables the voter to verify the votes.

Author [5], designs to provide the public more secure way to vote. Increase the dependability to a great extent by this solution provided. The design may respond to more requirement of the voting. The security is concerned as the key attribute and provides the voter with the high level security.

Author [7], details on how the voter can trust on the electronic device. The voter needs to get registered and then he gets the login Id and the password to login. During the time of login the person needs to enter the login Id and password which will the security provided to the voter.

Author [8] ,proposed the system on the security provided by the finger print. The different technique used to provide security where to avoid the hackers. A unique identity of a person which provides the high confidentiality for the data.

Author [9] , reviews the web based Internet voting system provided vote during travelling from voter client to server. The voter are provided with the one time password which will the security tool of this system. The main goal is to provide the multiple encryption and decryption.

III. EXISTING SYSTEM

The earlier voting system which is shown below in the Figure 1 shows how the voter is casting his vote in the ballot. Here the voter has to write down the name of the candidate of interest and drop his paper into the ballot there were many disadvantages of this system people who were not educated found it difficult to vote hence uneducated people would not prefer to vote, secondly since the voting is written in a paper manually they had to count the number of votes due to which the accurate number of votes couldn't be estimated manual work is always bound to mistakes.



Figure 1: Ancient Voting System

The Figure 2 shows how the procedure which does not ensure voter's and candidate's confidentiality and accuracy. This leads to ballot buying activities which are against the law.



Figure 2: Counting Procedure

While the vote is being casted there are two types of attacks possible passive attack and active attack. Passive intruders can access the vote casted by the voter and hence the secrecy and privacy is not maintained. Active intruders can manipulate the vote casted by voter, this does not maintain the voter's confidentiality.

IV. PROPOSED SYSETEM

We are designing this system for voting online by increasing the security as well as assuring that the same person is casting his vote. The information of each voter will be uploaded in the main database of the election commission of India which provides a matter of confidentiality among the voter and administrator. The details of the voter are provided to the administration during the registration process. The voter casts his vote by following the steps mentioned below.

1. *Registration phase:* The person who tends to vote online has to first get registered, thus the registration process takes place in the following way:

- Election commission provides a website for the voters to login and get the registration form.
- The people will login to fill the registration form and based on the details given.

The below Figure 3 shows the format of registration form.

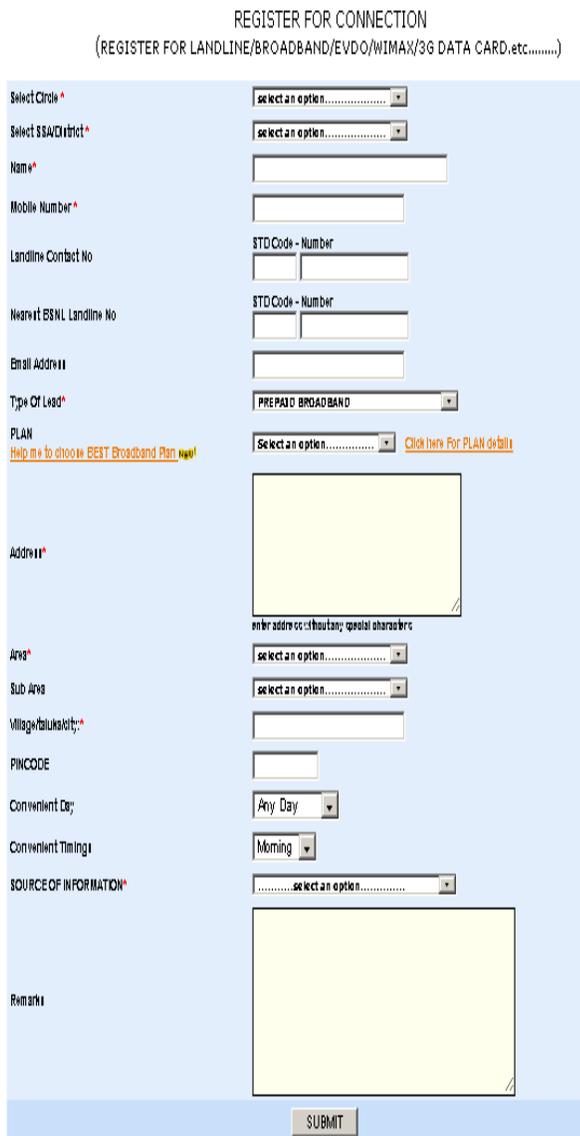


Figure 3: Registration Form

The government of India has provided not a compulsion of AADHAAR CARD as an id proof for voting purpose. Based on our security online voting system finger print plays a crucial role and a voter without an AADHAAR CARD can update his finger print for verification shown in Figure 4.

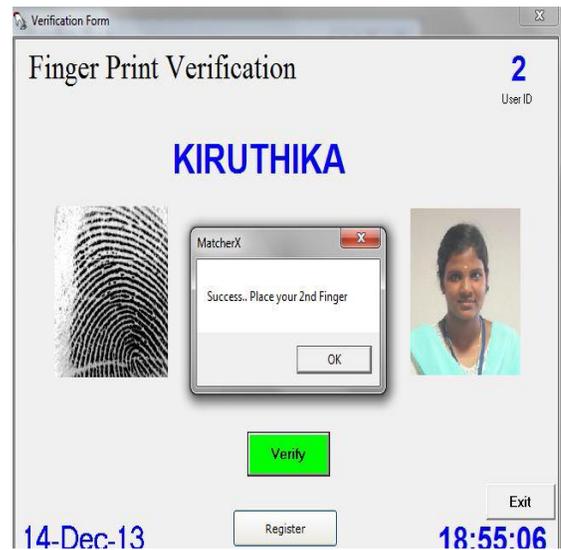


Figure 4:Finger print Verification

2. *Verification phase:* The details given in the registration phase needs to be verified for the confirmation of the voter. The finger print of the voter will be considered as the authentication of the voter for login purpose, which shows only that particular person can cast his vote.



Figure 5:Finger print Module

The Figure 5 and Figure 6 shows how the finger print module can be taken as security to the voter which is unique for each person



Figure 6: Finger print Module

The captured finger print must be matched with the updated database of the administrator and this process of matching the finger print is done using 'Rabin-Karp-Matcher'. Along with this algorithm other algorithms also exists for verification purpose.

3. *Voting phase:* The authentication is successfully done then the voter can cast his vote. This phase which guarantees that no other person can cast the vote of others ,because only when the finger print is verified the person can login in and vote as shown in Figure 7.

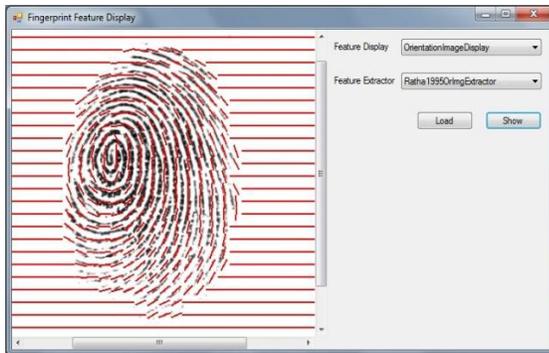


Figure 7: Login Form

V. SYSTEM DESIGN

The architecture shown below in the Figure 8 is concerned with the different security proof which is matched for authentication purpose of the voter. The voting server side computing how the voter details are matched with finger print of the voter is checked with details of the database.

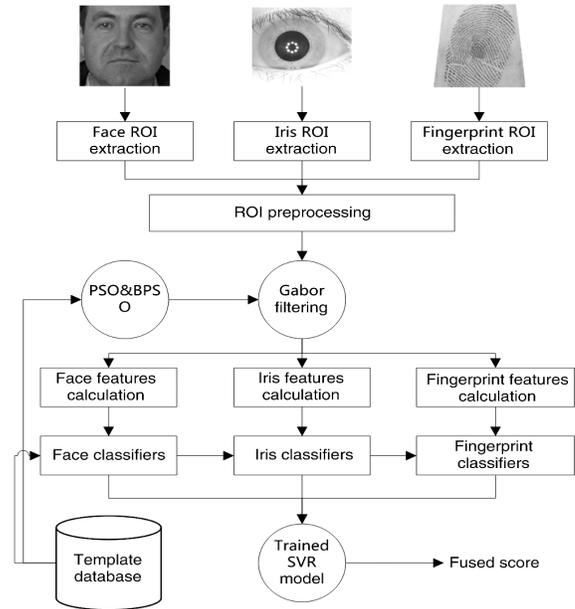


Figure 8: Procedure Of Matching

A. Detailed architecture of online voting system.

The architecture signifies each and every process of the online voting system. The working of Election commission of India and its field officers and the voters is been explained below. The client and the server side work distribution and verification of voters login are checked and then the submission of vote is done. This online voting system which gives a efficient and faster way of result declaration. This system is also leads to easier verification of both voters and candidates.

Figure 9 shows the system architecture of the proposed system. The voting software is installed in two machines one is voter ballet and another in election commission office. Both of these machines maintain the same database present in the DAO layer to store the details of the voter, party names, results etc.

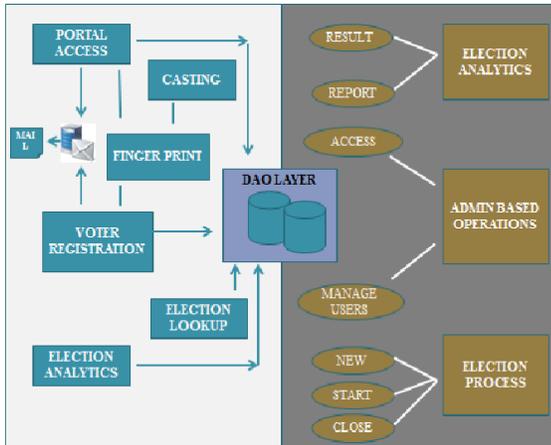


Figure 9: System Architecture

B. Steps performed in voter ballot are:

- Voter registers himself to cast the vote through the e-mail.
- With this voter will be given access to the voting portal.
- Once he accesses he is allowed to cast his vote by selecting the candidate of his interest.
- The candidate to whom the voter has casted his vote is stored in the database present in the DAO layer.
- Progress of the election process is lookup.

Steps performed in election commission office are:

- Mainly consists of election analytics, admin based operations and election process.
- Election analytics contains the results of election process and provides the report based on the results obtained by computing the sum of votes gained by each candidate.
- Admin based operations include providing access to the voter for login and maintaining the database of voters, parties etc.

Election process includes adding new eligible candidates into the voter list, start the election process and end it.

C. Advantages

- Security can be increased to great extent since we used finger print as unique identity.
- Voter can verify his vote once he has casted his vote.
- Ballot buying can be avoided.
- Intruders cannot hack the vote casted by the voter.
- One person can cast his vote only once.
- Cost effective

- Reduces the counting time and risk.

VI. RESULT AND IMPLEMENTATION

Once the voter enters the web page for voting he/she is asked to enter all details along with giving his/her thumb impression. Figure 10 shows the login page where the voter is asked for his/her details and thumb impression.

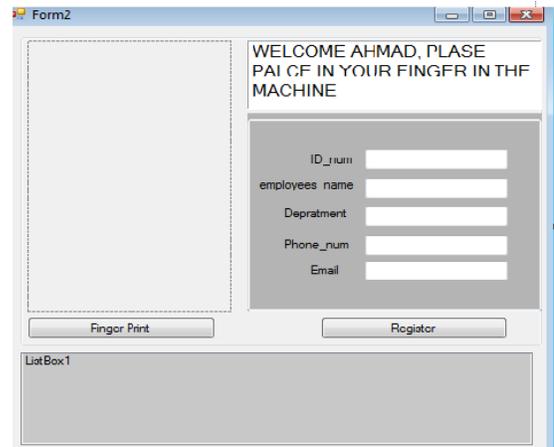


Figure 10: Login Page

The voter needs to be registered and get his verification done which will be stored in the database for the verification during casting his/her vote.

The registered voter can cast his vote by giving the finger print as the login Id and access to vote and cast his vote as the screen shot shown in Figure 11.



Figure 11: Verification Status

If the thumb impression doesn't match he/she will be given an alert indicating invalid identity or try again later. This is shown in Figure 12.



Figure 12:Confirmation

VII. CONCLUSION

In our approach we make use of finger print to secure the login of the voter and also the vote casted by the voter, this avoids the duplication of voters (i.e. one person can vote only once). The finger print proves as a unique identity of the voter where the problem of hacking can be overcome. This system cannot be used by handicap people but ensures security and individuality of the voter. Since the voter's individuality will be maintained and duplication of voter is not allowed this system can be used for large scale election such as government.

This system can also be implemented by capturing the voter's retina or face recognition as the identity for login. Once these features match the voter is allowed to proceed further to cast his vote.

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