

Online Voting System Using Biometric Security

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Abstract: Voting process in today's era is behind its time. The voting process used in India is mostly paper based or manual. This manually handled process can be time-consuming and prone to security breaches and electoral fraud. Over the years technology related systems were being developed to resolve some of the issues like electoral fraud, impersonation, double voting etc. One such system is Electronic based voting that has been actively used for voting in countries like India. However, these systems seem to be prone to electoral frauds and voters have to make tremendous effort to cast their ballots. There are still a few very important aspects which have to be identified and addressed namely, a secured process involving a voter to vote in secure manner, the time consumed by overall voting, the efficiency in counting of votes and the cost involved in employing people towards monitoring the voting process. So taking these aspects/issues into consideration we have now come with the biometric authenticated online voting system. The system being proposed now is novel and secured in all terms.

I. Introduction

1.1 Online Voting System Using Biometric Security

This system will enable people to vote online using a biometric finger print scanner. This system in turn will gradually increase the voting percentage, as well as decrease the corruption level. The system also takes into consideration the people who don't have access to internet and biometric device. For them, the system provides a facility of Booth voting using finger print scanner under the supervision of an officer. In order to vote efficiently using the system, the user should register and create his account. Every user must have a unique name and password. After voting process, result declaration is done by the administrator. The administrator is only the one who will approve candidates and provide them username and password. The candidates are approved by the administrator. Candidates can advertise their party as well conducts campaigning online. There are many types of biometric authentication namely, Face recognition, Retina recognition, Fingerprint recognition and so on. As the system is biometric authenticated, we need to specify the mode of authentication.

II. Why Fingerprint

The "Online Voting System Using Biometric Security" uses fingerprint as a mode of authentication. The fingerprint is selected for identification because of following reasons:

1) Performance

Fingerprints are formed in the womb at around five months and remain constant even after the death.



Figure 1: Fingerprint of individual in different years

2) Uniqueness

Empirically, it can be noted that no one has found identical prints, not even identical twins.

2.1 Types of Fingerprint

- 1) Arches - Only represent five percent of the fingerprint patterns encountered. There no core or delta formations.
- 2) Loops - Constitute between 60-70 percent of the patterns found in fingers and have one delta formation and a core.
- 3) Whorls - Constitute between 25-35 percent of the patterns found in fingers and have two delta formations and a core.

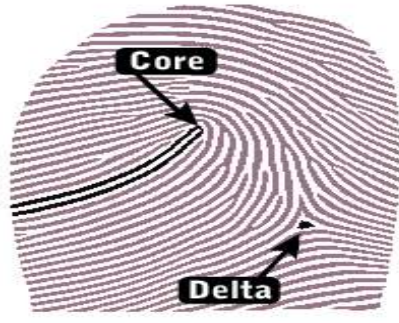


Figure 2: Core and Delta of Fingerprint

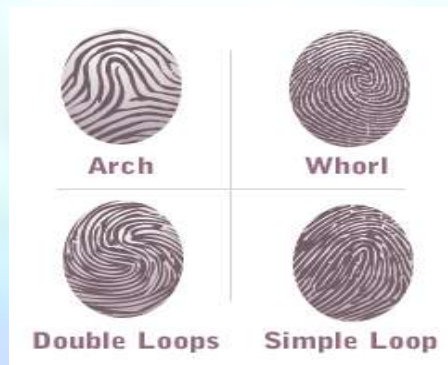


Figure 3: Types of Fingerprint

2.2 Minutiae

The minutiae are point on fingerprint where ridges change abruptly. The types are:

- 1) Ridge Ending
- 2) Enclosure
- 3) Bifurcation
- 4) Island

The use of the ridges and valleys (minutiae) found on the surface tips of a human finger is to identify an individual.

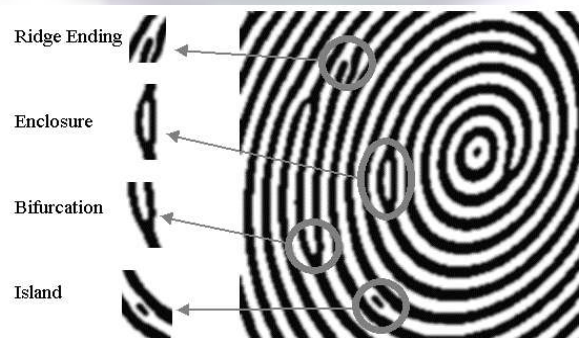


Figure 4: Types of Minutiae

III. Present System

The existing system is not user-friendly system. Disadvantage of the existing system:

1) Extremely insecure

The present system is extremely insecure in every aspect as the process is manually handled and it relies on people who can be bribed any time, which give space for corruption.

2) Time Consuming

The present voting system is a time consuming process as it requires manual verification of voter ID card and counting of votes.

3) Expensive

The system requires expenditure on printing, storage, transportation and security of ballot paper and EVMs.

4) Need of various field or electoral officer

The present electoral system requires three electoral officers at every booth for verification of citizens which is an unnecessary expenditure.

IV. Purposed System

In “Online Voting System Using Biometric Security” architecture of the system is based on functionality provided to different users by the system. The three users of system and their task are:

1) General Public or Citizen

- Registration of voting card.
General public can request for access voting rights. Citizen will be able to apply for voting card by submitting his details online or at the electoral office. In order to get registered in the voting list, he will have to enroll his finger print image at the electoral office along with his documents.
- Online voting.
He can vote to desired candidate and see the result online, in case he has access to internet and a biometric device.
- Citizen’s Forum
He can get information regarding the electoral process, his rights and duties and interact with the leader parties through a forum.

2) Candidate

- Candidate can apply to participate in election.
- Respond to citizen’s concern
They can respond to citizen’s query through the forum and advertise about the work undertaken by them for the benefit of nation.

3) Field Officer

- Add registered & unregistered users after verifying the documents and scanning the finger print image.
- Conduct voting procedure at booths for people who don’t have access to internet & biometric device.
- Statistical analysis of registered citizens and number of votes and result declaration.

In order to use the system every user must have to register first and so they have a unique username and password, which enable different users to use the functionality provided to them by the system.

V. System Architecture

The architecture of the system is based upon the functionality provided to different users by the system.

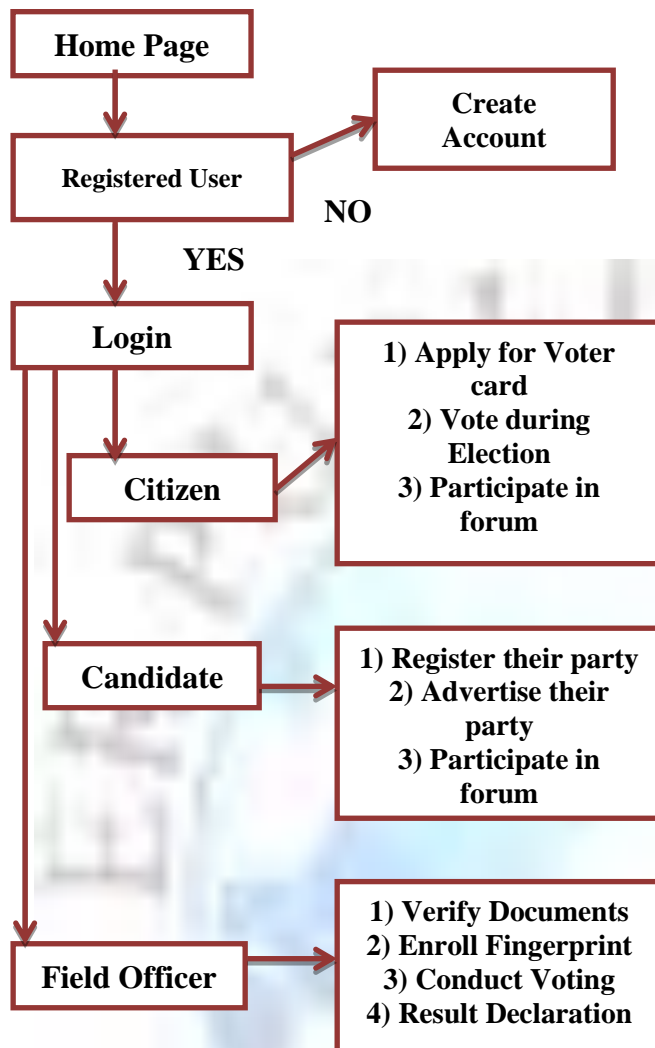


Figure 4: System architecture

VI. Conclusion

After implementation of this project we can change the face of today's voting system making it more secure and corruption less. It will give a fair chance to every leader to win on the basis of his/her capability and not on the basis of strength of money and power. The scope of the project can be raised to the society, institutional or nation level by using a more secure and efficient database management system that could handle hundreds, thousands or billions of users.

VII. References

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