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An Online Voting System Using Biometric Fingerprint and Aadhaar Card

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Abstract-The problem of voting is still critical in terms of safety and security. This paper deals with the design and development of a web-based voting system using fingerprint and aadhaar card in order to provide a high performance with high security to the voting system .Also we use web technology to make the voting system more practical. The proposed Online Voting System allows the voters to scan their fingerprint, which is then matched with an already saved image within a database that is retrieved from aadhaar card database of the government. The voting system is managed in a simpler way as all the users must login by aadhaar card number and password and click on his/her favorable candidates to cast the vote. This will increase the voting percentage in India and reduces the cost of voting process. By using biometric fingerprint it provides enough security which reduces the false votes.

***Keywords*- Biometric fingerprint, PHP, MYSQL, CSS, HTML, Java Script, WAMP, Dreamweaver ,aadhaar card.**

1. Introduction

Voting schemes have evolved from counting hands in early days to systems that include paper, punch card, mechanical lever and optical-scan machines. An electronic voting system which is used nowadays provide some characteristic different from the traditional voting technique, and also it provides improved features of voting system over traditional voting system such as accuracy, convenience, flexibility, privacy, verifiability and mobility. But Electronic voting systems suffers from various drawbacks such as time consuming, consumes large volume of paper work, no direct role for the higher officials, damage of machines due to lack of attention, mass update doesn't allows users to update and edit many item simultaneously etc.

These drawbacks can overcome by Biometric Online Voting System[1]. This is a voting system by which any voter can use his/her voting rights from anywhere in the country. We provide a detailed description of the functional and performance characteristics of biometric online voting system. Voter can cast their votes from anywhere in the country without visiting to voting booths, in highly secured way. That makes voting a fearless of violence and that increases the percentage of voting.

2. Problem Statement

2.1. Existing Voter Registration System

The problems of the existing manual system of voting[2] include among others the following:

Expensive and Time consuming: The process of collecting data and entering this data into the database takes too much time and is expensive to conduct, for example, time and money is spent in printing data capture forms, in preparing registration stations together with human resources, and there after advertising the days set for registration process including sensitizing voters on the need for registration, as well as time spent on entering this data to the database.

Too much paper work: The process involves too much paper work and paper storage which is difficult as papers become bulky with the population size.

Errors during data entry: Errors are part of all human beings; it is very unlikely for humans to be 100 percent efficient in data entry.

Loss of registration forms: Some times, registration forms get lost after being filled in with voters' details, in most cases these are difficult to follow-up and therefore many remain unregistered even though they are voting age nationals and interested in exercising their right to vote.

Short time provided to view the voter register: This is a very big problem since not all people have free time during the given short period of time to check and update the voter register.

Above all, a number of voters end up being locked out from voting. Hence there is great desire to reduce official procedure in the current voter registration process if the general electoral process is to improve.

2.2 Proposed System

The proposed system is the Biometric online voting system with biometric fingerprint using aadhaar card. It

determines the particular voter by his/her fingerprint whether he/she is a valid voter or not. It allows particular voter to cast the vote online and update the database in the server. Biometric online voting system uses aadhaar card to retrieve the complete details about the voter.

Functional Modules

Administration module: It refers to the system administrator who controls the entire voting system. Administrator is responsible for storing the information of the new voter; modify any voter's information, deleting any voter's information and also some operations related to candidate information. Administrator can see the results of the election process also.

Server module: Server is a computer network that stores application programs and data files accessed by the clients in the network. Database is maintained in server computer and all the main codes related our project is stored in this server computer.

Client module: A computer program is used to contact and obtain data from a program on the server computer linked in the network. In our project the voter can cast the vote in the client computer and vote count of the particular candidate is updated in the server computer.

3. System Design

3.1. Architecture

The architecture of the system, shown in Fig. 1, is based upon the functionality provided to different users by the system.

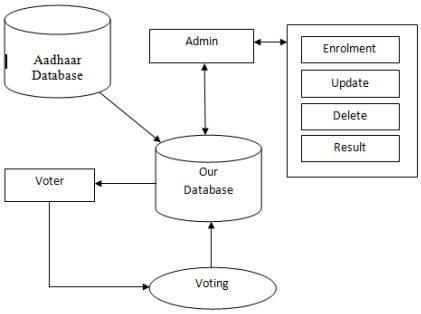

Fig 1 Architecture of the system

It contains two database government aadhaar card database and our database. We will retrieve each voter's details from government aadhaar card database and store it in our database. Admin controls all the events like enrolment, update, and deletion of candidate and at last announces the result.

3.2. Flow Chart

This shows step by step representation of voting process. There are two types of voter's normal user and power user. If he/she is a normal user a, onetime transaction code is sent to voter's mobile phone or email. Once any individual passes the authenticity criteria, he/she will be logged into his/her voting account. Then the status is checked, if status is 0 then voter is allowed to cast his/her vote. If status is 1 then voter has already voted and he/she is not allowed to vote again. Then the vote and status is updated in database. If voter is a power user his/her fingerprint is checked with our database. If it matches then their status is checked and further process will be same as the normal user. This completes the voting process. The methodology of the voting process is described in the Fig. 2 .

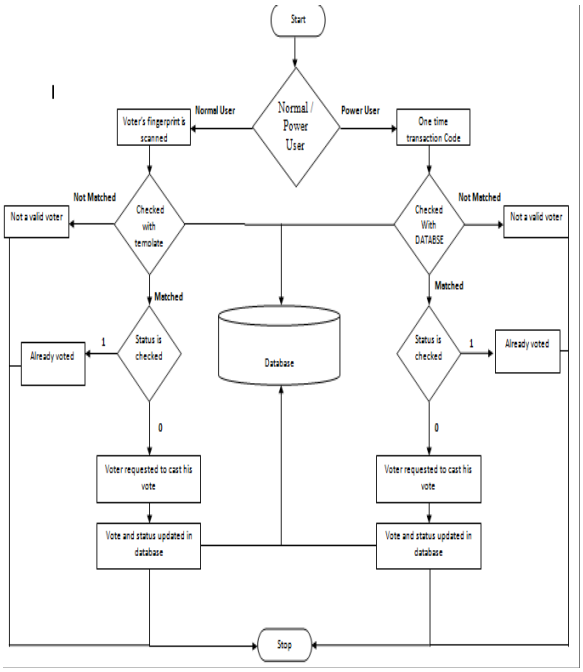

Fig 2 Voting Process Flow Chart

3.3. Why Fingerprint

The "Online Voting System Using Biometric Security" uses fingerprint as a mode of authentication. The fingerprint [3] is selected for identification because of following reasons:

3.3.1 Performance

Fingerprints are formed in the womb at around five months and remain constant even after the death. Fig. 3 shows the fingerprint an individual in different years

Fig 3 Fingerprint of individual in different years

3.3.2 Uniqueness

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

A. Types of Fingerprint

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

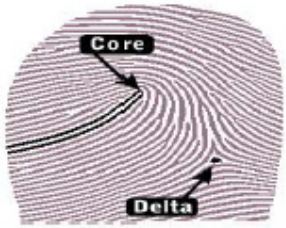

Fig. 4 Core and Delta

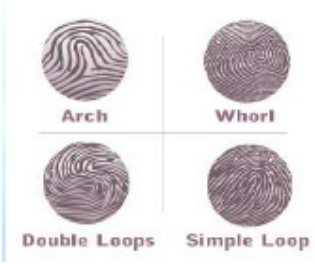

Fig. 5 Core and Delta of Fingerprint

B. Minutiae

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

i. Ridge Ending
ii. Enclosure
iii. Bifurcation
iv. Island

The use of the ridges and valleys (minutiae) ,shown in Fig. 6 ,found on the surface tips of a human finger is to identify an individual.

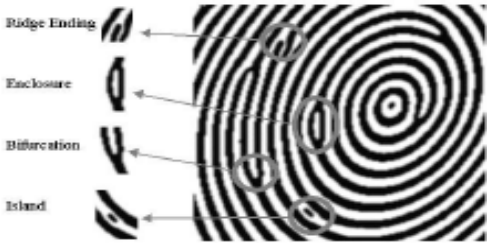

Fig 6 Types of Minutiae

4. Result and Discussion

Fig. 7 Home page

It is the welcome page of the website, shown in Fig. 7, having all the feature options of the website.

Fig 8 Admin login

Admin will be provided with unique username and password as shown in Fig. 8.

Fig 9 Enrollment

Admin enrolls the candidate's details before the last date of nomination. Fig. 9 shows enrollment page.

Fig 10 candidate update

If candidates wants any modification in his/her details it can be done here. Candidate modification page is shown in Fig.10.

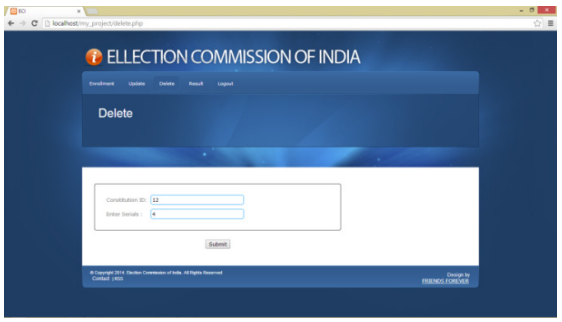

Fig. 11 Deletion

If the candidates want to take back his/her nomination then he/she must enter serial number and constitution id. The deletion page is shown in Fig. 11.

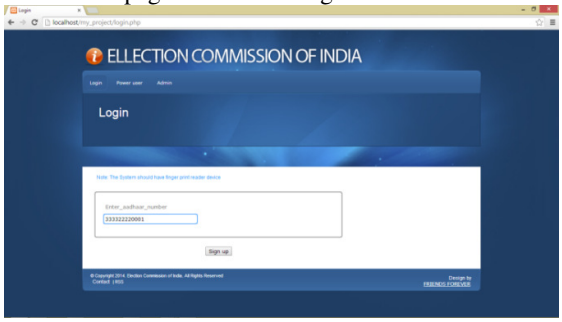

Fig 12 Normal user

The normal user can Login to the website, as in Fig. 12, with his unique username which is aadhaar card number.

Fig 13 Confirmation code

A confirmation code will be sent to his mobile or email. If the voter enters correct code which is sent to mobile then he/she is a valid voter as shown in Fig. 13.

Fig 14 Voter details and candidates list

It contains the details of the voter and the candidates list who have stood for the election in their constitution. The voter can choose any one among them. Fig. 14 shows the voter details and candidate list.

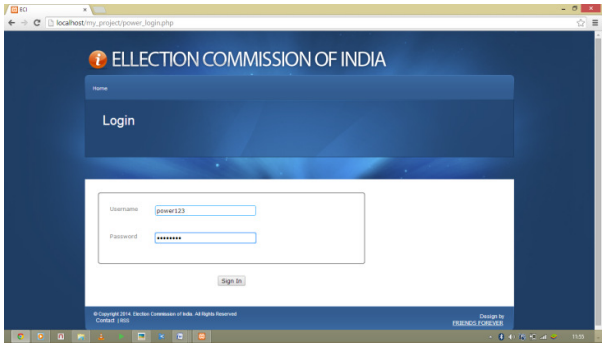

Fig 15 Technician login

The technicians will use their username and password to get access for the further pages as shown in Fig. 15

Fig 16 Power user login

Technician will enter the power users aadhar card number and password, if it is valid then voter will sent to a separate cabin. Power user login page is shown in Fig. 16

Fig 17 Voter details and candidates list

It contains the details of the voter and the candidates list who have stood for the election in their constitution. The voter can choose any one among them as shown in Fig. 17.

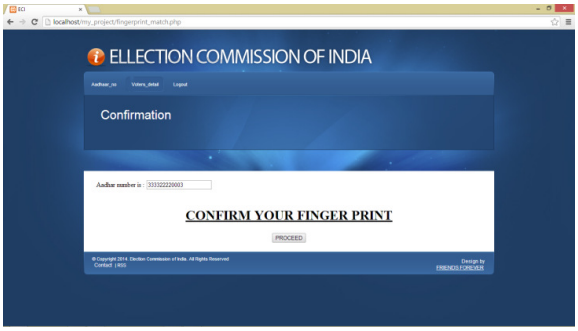

Fig 18 fingerprint confirmation

To verify whether he/she is a valid voter their fingerprint is checked with the fingerprint which is stored in database shown in Fig. 18

Fig 19 Candidates List

The candidates list who have stood for the election in their constitution will be displayed. The voter can choose any one among them. This is shown in Fig. 19.

Fig 20 Result sheet

After the elections the admin will announce the results. The result page is shown in Fig. 20.

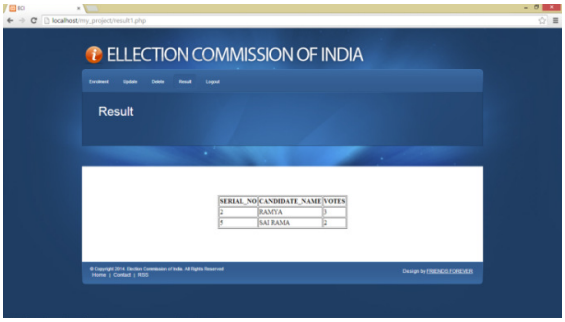

Fig 21 Individual result display

Here the result of the particular constitution can be display as shown in Fig. 21.

4. Conclusion

Our proposal enables a voter to cast his/her vote through internet without going to voting booth and additionally registering himself/herself for voting in advance, proxy vote or double voting is not possible, fast to access, highly secure, easy to maintain all information of voting, highly efficient and flexible. Hence, by this voting percentage will increase drastically. The using of online voting has the capability to reduce or remove

unwanted human errors. In addition to its reliability, online voting can handle multiple modalities, and provide better scalability for large elections. Online voting is also an excellent mechanism that does not require geographical proximity of the voters. For example, soldiers abroad can participate in elections by voting online.

References

[1]. Ankit Anand[1] , Pallavi Divya[2] ,"An Efficient Online Voting System", Vol. 2,Issue.4, July-Aug. 2012, pp-2631-2634.

[2]. Alaguvel.R[1],Gnanavel.G[2],Jagadhambal.K[3], "Biometrics Using Electronic Voting System With Embedded Security", Vol. 2,Issue.3,March 2013.

[3]. Firas I. Hazzaa[1],Seifedine Kadry[2],Oussama Kassem Zein[3], "Web-Based Voting System Using Fingerprint: Design And Implementation", Vol. 2, Issue.4,Dec 2012.

[4]. Malwade Nikita[1], Patil Chetan[2], Chavan Suruchi[3], Prof. Raut S. Y[4], "Secure Online Voting System Proposed By Biometrics And Steganography", Vol. 3, Issue 5, May 2013.