

# “E-Smart Voting System with Secure Data Identification Using Cryptography”

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## Abstract

Currently voting process throughout the world is done using Electronic Voting Machines. Though this system is widely followed, there are many drawbacks of the system. People have to travel to their assigned poll booth stations, wait in long queues to cast their vote, face unnecessary problems and so on. It becomes difficult for working profession people or elderly/ sick people to cast their vote due to this system. This calls for a change in system which can be done if voting processes in conducted online. Few developed countries are trying to implement online voting system on small scale and have been successful in doing so. We propose a system which overcomes limitations of existing online system which uses bio-metric technologies and instead use One Time Password system which is more secure and accurate.

**Keywords:** Face detection, OTP, bio metric, time-synchronized

## Introduction

E Smart Voting System is the software aimed at providing a wide range of access to the administrator in managing and

Monitoring the requirement registered Voters to vote.

### 1.1 Overview

Online voting system is a web based application. Online voting system is an online voting technique in which people who are Indian citizens and age is above 18 years and are of any sex can cast their vote without going to any physical polling station. Online voting system is a software application through which a voter can cast votes by filling forms themselves which are distributed in their respective ward. All the information in forms which has to be entered by data entry operators is stored in database. Each voter has to enter his all basic information like name, sex, religion, nationality, criminal record etc. correctly in form taken from ward. Online voting system project is implemented in java platform using My sql database as back end. Main aim of online voting system is to develop an online application like online reservation system, for citizens who are above 18 years of age to vote through online. Using these system citizens of India can vote through online without visiting polling booth. A centralized database is maintained by election commission of India where citizen's information is maintained whenever citizen is using online voting system his/her information is authenticated with the data present in database if user is not in the list he cannot use online voting system.

Users are provided with a online registration form before voting user should fill online form and submit

details these details are compared with details in database and if they match then user is provided with username and password using this information user can login and vote. If conditions are not correct entry will be canceled. Also given voter ID. when registration of user is completed user gets sms with his aadhar ID and voter ID.

### Motivation

The average election turnout over all nine phases for 2014 Lok Sabha election was around online is a possible idea. India's mobile phone subscriber base crested the 1 billion users mark, as per data released recently by the country's telecom regulator. People of all age group must willingly exercise their right to vote without feeling any sort of dissatisfaction. Currently 42 percent of internet users in India have an average internet connection speed of above 4 Mbit/s, 19 percent have a speed of over 10 Mbit/s, and 10 percent enjoy speeds over 15 Mbit/s. The average internet connection speed on mobile networks in India was 4.9 Mbit/s. Online Voting overcomes various other problems faced during election process such as creating awareness among rural areas and youths, cost reduction, security, etc.

### Objective

Implementation of safe and secure online system application which will make casting votes from home/office/institutes possible and thus avoiding waste of time by standing in long queues, nullifying travelling time and cost to visit given voting center, avoiding the risk of being manhandled and other related problems and in turn enable maximum voters turn out.

### Existing System

The average election turnout over all nine phases for 2014 Lok Sabha election was around online is a possible idea. India's mobile phone subscriber base crested the 1 billion user's mark, as per data released recently by the country's telecom regulator. People of all age group must willingly exercise their right to vote without feeling any sort of dissatisfaction. Currently 42 percent of internet users in India have

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### Literature Survey

#### 2.1 E Smart Voting System with Secure Data Identification using Cryptography -

Prof. Sunita Patil, Amit Bansal, Vaibhavi Pujari, Utkarsha Raina, Roushan Kumar

This paper describes the strategy and functioning of E smart voting system (ESVS) which is highly secure, biometric authentication system along with OTP based verification system to improve the voting process during election. Further the vote casted by a user is encrypted before storing in database. ESVS utilizes Aadhar number of user for identification and verification of voter.

#### 2.2 Advance Online Voting System -

Pallavi Divya, Piyush Aggarwal, Sanjay Ojha (School of Management, Center For

Development of Advanced Computing (CDAC), Noida

In this paper authors propose an approach for e actively user-friendly application for all users. This system is being developed for use by everyone with a simple and self-explanatory graphical user interface (GUI). The GUI at the server's end enables creating the polls on behalf of the client.

#### 2.3 Online Election Voting Using One Time Password-

Prof. Uttam Patil, Asst.Prof. at Dr.MSSCET. Computer Science branch Vaibhav More,

Mahesh Patil ,8th Sem at Dr.MSSCET. Computer Science branch.

Authentication technique proposed is - One Time Password (OTP). One Time

Password principle produces pseudorandom password each time the user tries to log on. This OTP will be send to voters mobile phone. An OTP is a password that is only valid for single login session thus improving the security. The system takes care that no voter can determine for whom anyone else voted and no voter can duplicate anyone else's vote. This technique is imposed to ensure that only the valid person is allowed to vote in the elections.

## 2.4 Electronic Voting System Using Aadhar Card -

C. Tamizhvanan, S. Chandramohan, A. Mohamed Navfar, P. Pravin Kumar, R. Vinoth

Assistant Professor, B.Tech Student Department of Electronics and Communication

Engineering Acharya College of Engineering Technology, Puducherry, India Electronic voting system provides improved features of voting system over traditional voting system such as accuracy, convenience, edibility, etc. The design of the system guarantees that no votes in favor of a given candidate are lost, due to improper tallying of the voting counts.

## 2.5 Efficient Voting system with (2,2) Secret Sharing Based Authentication

Ms. Ashwini Walake, Prof. Ms. Pallavi Chavan

This paper deals with the design and development of a web-based voting system using fingerprint 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 new design is proposed an election for a university for selecting the president of the university. The proposed EVS allows the voters to scan their fingerprint, which is then matched with an already saved image within a database. Developed Web-based Voting System using Fingerprint Recognition. This system has provided an efficient way to cast votes, free of

fraud, and make the system more trustable, economic and fast. We have used Minutiae-based fingerprint identification and matching with high accuracy.

## Proposed Work

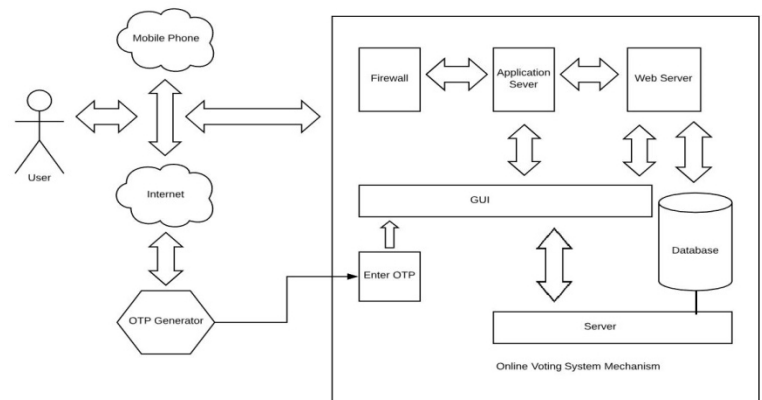
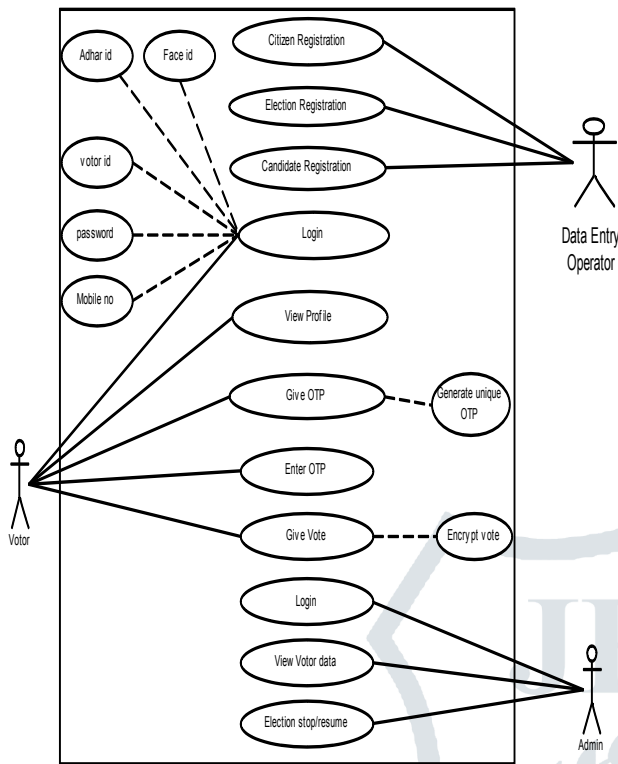


Fig 1: Architecture Diagram

The above diagram shows that the voter needs an active mobile network and internet connection to start interacting with the system. Once the voter logs in using any of the latest browsers i.e. Chrome, Firefox or Internet Explorer, the recall of system protects the voter. A recall is a system designed to prevent unauthorized access to or from a private computer network. Firewalls are frequently used to prevent unauthorized Internet users from accessing private networks connected to the Internet. The interactive GUI will help users navigate through system. For logging in the system, the voter has entered all the valid credentials, and then only he/she can access other features of system. All the details are checked on database which is connected to server. For voter to cast vote, he/ she has to enter Election ID, first name, password and mobile number. If all entries are correct, then Generate OTP button will show. On clicking it an OTP of 4 or 6 digits will be sent to user's mobile number, which when entered will allow voter to cast vote.

**Use Case Diagram**



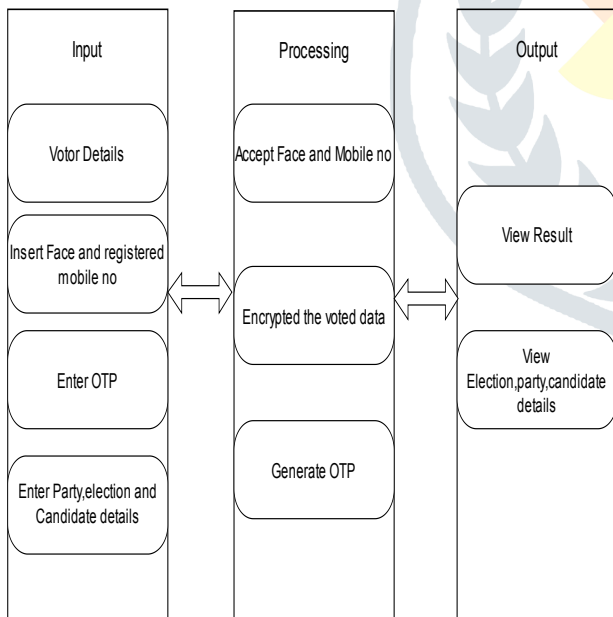
identification and verification of voter. With smart voting system, voter can cast their vote with mobile phone and avoid all kind of queues at polling booth. At first the user must punch in his Aadhar number in the SVS, it then utilizes the Aadhar number to authenticate the user through OTP which will be received on their registered Aadhar linked mobile number. People without Smart phones can vote through SVS with an additional step of authentication through highly sophisticated Aadhar based biometric authentication. Smart Voting System successfully allows people to vote using smart phones thus reduces the queues piled up at polling booth. Also, it provides a highly reliable biometric authentication mechanism for people who do not want vote using smart phones thus prevent electoral fraud.

**5.2 Mathematical Model**

Simply minimizing total expected waiting time across all polling stations is insufficient as this may allow long voter waiting times in some polling stations in order to decrease voter waiting time in other polling stations. This is undesirable in an election process as we seek to provide equity to all voters so that no one particular group of voters is disadvantaged or disenfranchised. However, there is no universal way to interpret “equity.” The ideal case is that the expected waiting time in queue at every polling station is the same. But it is generally not feasible to achieve this ideal situation. Therefore, the following metric (the average absolute differences of expected waiting times among polling station) can be used as a proxy for “equity:”

$$Z(X) = \sum |W_i(x_i) - W_j(x_j)| / (N(N-1)/2);$$

**Block Diagram**



**5.1 Overview**

A Smart Voting System (SVS) is a highly secured, biometric authentication system along with OTP based verification system which is used to improve the voting process during election. Further the vote casted by a user is encrypted before storing in database. SVS utilizes Aadhar number of users for

(where N is defined as the total number of voting polling station,  $X = (x_1, x_2, \dots, x_N)$ ,  $x_i$  ( $i = 1, \dots, N$ ) is the number of voting machines allocated to polling station  $i$ , and  $W_i(x_i)$  ( $i = 1, \dots, N$ ) is the expected waiting time for voters at polling station  $i$ . Thus, the allocations that provide the best “equity”



are the global optimal solutions to the following optimization problem:

$$\text{Min}\{Z(X) \mid X \in \Lambda\}$$

where  $\Lambda$  is the set of feasible solutions, and  $|\Lambda|$  is finite.

## Algorithm

### OTP

A one-time password or pin (OTP) is a password that is valid for only one login session or transaction, on a computer system or other digital device. OTPs avoid a number of shortcomings that are associated with traditional (static) password-based authentication; a number of implementations also incorporate two factor authentication by ensuring that the one-time password requires access to something a person has (such as a small keyring fob device with the OTP calculator built into it, or a smartcard or specific cellphone) as well as something a person knows (such as a PIN). The most important advantage that is addressed by OTPs is that, in contrast to static passwords, they are not vulnerable to replay attacks. This means that a potential intruder who manages to record an OTP that was already used to log into a

service or to conduct a transaction will not be able to abuse it, since it will no longer be valid. A second major advantage is that a user who uses the same (or similar) password for multiple systems, is not made vulnerable on all of them, if the password for one of these is gained by an attacker. A number of OTP systems also aim to ensure that a session cannot easily be intercepted or impersonated without knowledge of unpredictable data created during the previous session, thus reducing the attack surface further.

OTP Generation OTP generation algorithms usually make use of pseudo randomness or randomness, making prediction of successor OTPs by an attacker difficult, and also hash functions, which can be used to derive a value but are hard to reverse and therefore difficult for an attacker to obtain the data that was used for the hash. This is neces-

sary because otherwise it would be easy to predict future OTPs by observing previous ones. Concrete OTP algorithms vary greatly in their details.

Various approaches for the generation of OTPs are listed below:

A time-synchronized OTP is usually related to a piece of hardware called a security token (e.g., each user is given a personal token that generates a one-time password). It might look like a small calculator or a keychain charm, with an LCD that shows a number that changes occasionally. Inside the token is an accurate clock that has been synchronized with the clock on the proprietary authentication server. On these OTP systems, time is an important part of the password algorithm, since the generation of new passwords is based on the current time rather than, or in addition to, the previous password or a secret key. This token may be a proprietary device, or a mobile phone or similar mobile device which runs software that is proprietary, freeware, or open-source. An example of time-synchronized OTP standard is Time-based One-time Password Algorithm (TOTP). Example of this technology is the new security key that Google has started to use for last couple of years.

### 7.3 Methodologies

The online voting system will be having many people/ users interacting with it. These mainly consist of voters/ citizens, administrators and candidates. Let us discuss these users in brief-

#### 1. Voters/ Citizens

This user class will consist mainly of all the people who are eligible for voting i.e citizens above 18 years of age and have election id sanctioned by Election Commission of India. The voters will login the system using their registered details and will be able to cast the vote. the voters will also be able to view their profiles that are uploaded on the website.

#### 2. Administrator

This user class will mainly consist of all the admins that are chosen by the Election Commission of India (ECI). The admin will have privileges like adding new voter, candidates, etc. or discarding any voter/ candidate if any discrepancies are found in the data lled by them.

The admin will have a different username, id and pass key assigned to them by ECI. Once logged in the admin can monitor the voting process, generate result and also start/ stop the voting process at given time.

### 3 Candidate

This user class will consist mainly of all the candidates that are contesting from their respective or allotted wards/ areas. It will contain details such as candidate name, his/ her party, education details, criminal records, address and contact number of their Party, etc.

tools for maintaining voters vote to every party and it count total no. of votes of every party. There is a DATABASE which is maintained by the ELECTION COMMISSION OF INDIA in which all the names of voter with complete information is stored.

In this the user, who is above 18 years register his/her information in the database by filling the form available in ward numbers and when he/she want to vote he/she has to login by his/ her id and password and can vote to any party only single time. Voting detail store in database and the result is displayed by calculation. By online voting system percentage of voting is increases. It decreases the cost and time of voting process. It is very easy to use and It is varying less time consuming. It is very easy to debug.

### Future Scope

This system can enhance the application by linking it to the Aadhar Card database in order to retrieve more details of the license/vehicle owner.

### Tools and Technologies Used:

This application is mounted on the Internet, to user has to make sure that the machine, which he is using, is connected to Internet through Lease Line, Telephone line or Cable.

Also, Microsoft Internet Explorer 4.0 and above or Netscape Navigator 4.74 and above must be installed on the machine.

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### Conclusion

This Online Voting system will manage the Voters information by which voter can login and use his voting rights. The system will incorporate all features of Voting system. Its provide the

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