

E-Voting System with Physical Verification Using OTP Algorithm

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Abstract

E Voting system requires strong voter verification. voter verification is achieved by using two factor authentications method i.e. something the voter know that is static code and something the voter has that is one time password. The key benefit of encompassing a mobile handset is that maximum voter previously have mobile headsets, and therefore no need of any additional hardware essentials to be bought, installed, or maintained. This system mainly develops to increase the overall voting percentage and to reduce the overall cost which is used in election.by using this system people who live out of their native place are able to cast the votes. This system manage the user detail, candidate detail, and election related details and provide result efficiently.it provide hassle free voting to the general public

Keywords: Register for Voting, General public, Candidate Registration, OTP-one time password, OVS-online voting system

1. Introduction

The main objective of this implementation is to increase the overall voting percentage. In the present system the voting percentage across the country is less, so to increase the voting percentage this development is needed. Voters who live out of their home town or native place are not able to cast the vote [1, 2]. Election allows the voters to elect the candidate of their choice freely from the list of the candidate.

This project development is to manage election in the country and manage voter details, candidate detail, and provide result efficiently. The need of this project is required because of less voting percentage. In the present time people have to visit the polling booth to cast the vote but people are interested to visit the polling booth to cast the vote because of less security. Citizen of our country scared for voting process. In a survey conducted by times of India new paper citizen of the country wants to cast the vote online [3].

In our country area of north east India is not safe and have less security for citizen due to local sponsored terrorism. Voters of this area are scared to come out from their home to cast the vote due to low security conditions. This of problem solve by solve by only e-voting process as a solution to increase the voting percentage in this type of area. As a system is online peoples are able to cast the vote online without any scared and able to select the favorite candidate.

The goal of e-voting system is to reduce the fraud held in offline mode poling and decrease the money invested in the organizing the election, reduce the voting time and the counting the voters vote so that the result of election comes in short of time [4]. Every year government invests too much money to conduct the election across the country so that government faces a financial problem. Money which is used in development of the country is invested in conducting the election process.

As we seen in previous paper published on e-voting the problem is comes in front of is that verification of a valid user. Previous concept of authenticate a user for e-voting is not

strong. It can be easily hacked by the hackers. The concept of one time password is feasible for authenticate the voter. OTP is one of the best solutions for physical verification of valid voter [5, 6].

There are four modules in this project development administrator module, voter registration module, nominated candidate module, and field officer module. One time password algorithm is implemented here to verify the voters. This proposed system has a functionality that allows the citizen of the country to cast the vote online from the polling website. E-voting contains legal, monitoring, development and sociology features of the existing system [7].

This proposed system is to provide physical verification of the voter. In this implementation is to verify the voter one time password technique i.e. OTP algorithm is used. One time password algorithm is explain in next section. The voter first time registers on the e-voting portal with personal details like Adhar card number, mobile number, address *etc...* The field officer will generate the report and submit to administrator. Administrator has the responsibility to active the voter for cast the vote or note. If report generated by the field officer is correct the admin active the voter registration process else cancel the registration process. Mobile number is used to voter verification so those voters ensure that mobile number provided by the voter should be correct. Accuracy of details provided by the voters will be verified by the field officer [8].

2. OTP Algorithm

OTP means one time password which used for voter login authentication. In e-voting system it is most important that a valid user can cast the vote. In previous implementation for e-voting voter identity is not identified by the administrator. In this system first voter register on the site and give the personal details like user name, date of birth, address, gender, and unique Adhar card number and mobile number for physical verification. Indian Government has issue Adhar number to each citizen of India. Adhar number is a unique number so that it is used as a user ID for casting the vote online [12, 14]. E-voting system –User id and password can be a big security and management of password for it administrator is a big task. Voters creates simple and easy password to remember and write down to make sure that they will remember them [13]. A static password is change when require or the user forget the password or the password has expired or reset by the voter. Normally password is store in computer hard drive or in server so there is a change for stolen of a password. With respect to laptops password can be easily stolen.in the proposed system unlike static password, one time password changes every time whenever voter wants to login. One time password is generated by using the two techniques time-synchronized or counter-synchronized [12]. Bothe technique requires the voter must carry a hardware device i.e. mobile phone that is synchronized with a server, and both normally use algorithm to create the keyword. Figure 1 is showing the OTP components.

2.1. Synchronized OTP

It is widely used technique to set up an OTP code. In this approach voter must enter the OTP code within a time limit if it not happen then OTP code will expire and generate an another OTP code [16].

2.2. Counter Synchronized OTP

It synchronized a security between the voter hardware and the OTP server. Counter is progressive every time an OTP value is demanded of the hardware device and the remaining steps same as time synchronised OTPs, when the voter wants to login, voter enter the OTP code that is display on the mobile phone.

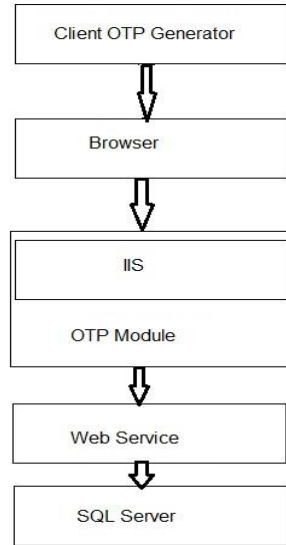


Figure 1. OTP Components

2.3. Registration of a Voter

In proposed system voter has to be register on the voting website and then administrator allow the voter for cast the vote. Field officer first verifies the voter details and submits a report to admin after that admin grant the permission for e-voting [9]. If voter details are not correct then voter registration mark as cancel and he/she is not able to cast the vote.

2.4. Login and Authentication

The process of voter login is shown in the figure. The operation of voter verification between voter and OTP server is explained step by step.

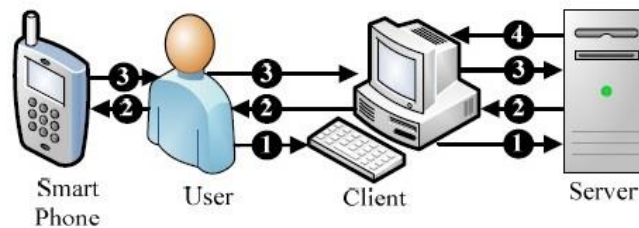


Figure 2. One Time Password Generation between Voter and Server by using Hash Function

- (i) Voter login into the voting web site with voter id as Adhar number as he/she register. As a response of call, a protected session is establish *i.e.*, allow a voter to enter voter ID. After that server fetch the data from the database related to voter ID.
- (ii) Server send a random generated hashed code *i.e.*, OTP code to voter mobile number.
- (iii) Voter response with the same OTP code and server compare with the generated OTP code and provide a secure login session.
- (iv) With respect to server check complete in prior step server handover the request to authentication and authorization server [10, 11].

3. Implementation

OTP authentication technique is implemented here. Election management require high security when voter login, voter must be authenticated to guarantee the security of the system access.

In this project to develop Microsoft visual studio 2010 ASP.net platform is used. Model view controller (MVC) architecture is implement that separate the application into three parts the model, the view and the controller.ASP.net MVC framework provide asp.net web form to create web application.

The model: working of model layer to handle the logic for the application data. Model object retrieve the data from the database.

The view: Working of view to display the data to the voter.

The controller: working of this layer to handle the business logic or user interaction.

Sql server 2008 is used to create a database for voters. It will manage the all voter details like voter name, date of birth, address *etc.*

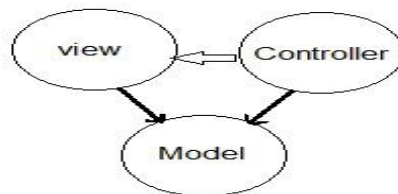


Figure 3. MVC Architecture

4. Result and Analysis

In this proposed system the security which is implemented in this project *i.e.*, OTP algorithm. The concept of one time password is implementing here for voter login authentication [12]. The process of OTP verification is shown in Figure 4. If the voter enters a correct OTP code generated by OTP server then voter verification done.

In previous implementation voter verification is not clear and it is not clearly verified that the exact voter has cast the vote or not. By using the concept of one time password it is clearly verified that the original voter has cast the vote because the login OTP password only send to voter mobile number at the time of election [10]. If the voter enters a wrong one time password then login authenticator failed the login process as shown in the figure [11].

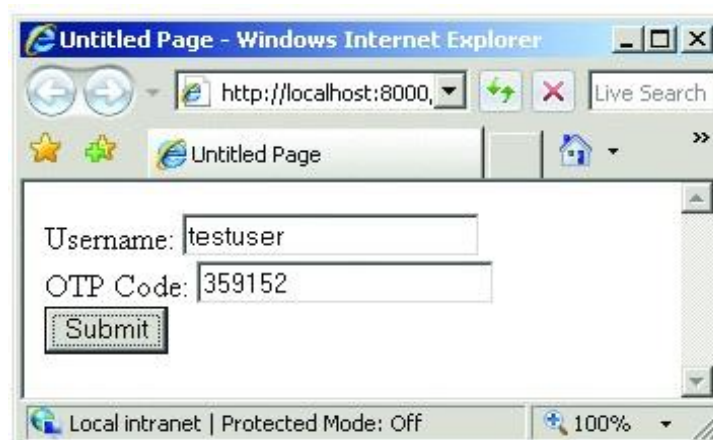


Figure 4. Voter Login Authentication Process

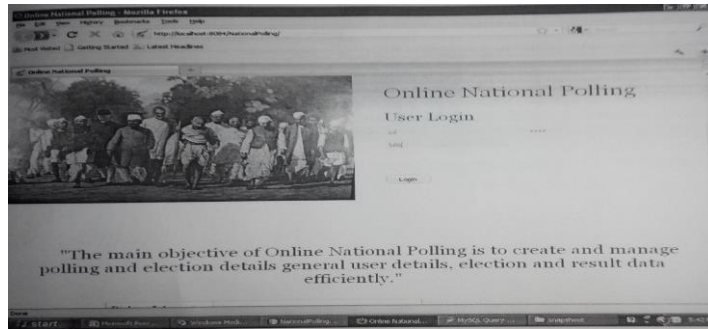


Figure 5. Home Page

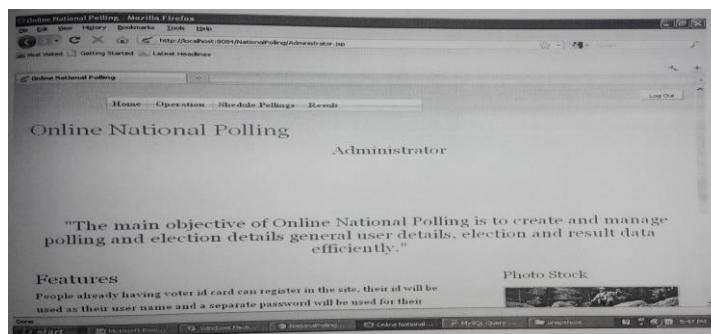


Figure 6. Administrator Page

In OTP system, from the both server and the client that is voter generates the one time code keys. With codes, message sent or received can be encrypted or decrypted, and then two way verification will be realized. To provide a safer authentication, OTP codes are encrypted by RSA algorithm and stored in the server database, the new proposed system is highly secure and safe [15].

Advantages of security

- (i) It is easy to use and no need to install extra software and hardware device on the voter side.
- (ii) It has high flexibility. The verification/ authentication and access control are strongly combined.
- (iii) It has high security and efficiency, and play back attack can be avoided.

5. Conclusion

The purpose of e-voting system is to increase the overall voting percentage. It provides online voting functionality to all voters as well as NRI, who live out of their home country. It also reduces Government money which is invested in the election process. It enhances the voting system and provides fair results. One time password technique ensures that a valid and exact voter has cast the vote. Civilian of the nation state can vote without any stress. They feel free to cast his vote. This implementation change will improve the voting percentage of our country.

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