

# MULTI PURPOSE ONLINE VOTING SYSTEM USING SMARTPHONE

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**Abstract** - The voting systems are a very important tool for any organization and institution. There are various tools and techniques used for voting such as traditional voting system or paper ballot voting system, e-voting system or electronic voting system, website voting system, sms and missed call voting system. In this paper, we discussed about the various voting systems and their functionalities. Also we have discussed about multi-purpose online voting system using smartphone.

**Key words:** SMS; Biometric; UIDAI; Voting system; Smartphone.

## 1. INTRODUCTION

Now days it's of prime importance to provide security to any kind of data and it becomes even more crucial when we require such data for voting. Voting system is the backbone of any institution may it be an institution or any corporate organization as well as for the government. So the main concern is to make this backbone safe and secure from external threats [1].

A voting system is only successful when a majority of a population participates in the voting procedure. To do so, we have to make the voting system accessible to people without making them to go places. Keeping all these concerns in mind, several systems and ideas have been implemented and been proposed over the years. The primary goal of the idea proposed here is to implement a system which will animate maximum number of voters to cast their vote remotely which will reduce time consumption. Thus, it will encourage more and more people to participate in voting process.

## 2. VARIOUS VOTING SYSTEMS

There have been several changes in the voting system over the year. Different voting system, have been adopted by different institution in order to meet their voting requirements, making it fast and secure in every means possible.

Traditional voting system used to make use of paper and stamp for the voting process. This was earlier used widely in most parts of the world.

Later e-voting system, also known as electronic voting system, came into limelight and replaced the conventional paper ballot voting system. It uses electronic devices to store the votes and to transfer them to the election officials online.

Internet based voting system, which is online voting system, are a type of e-voting system. The difference between the two is that in internet based voting system, voting ballot are created and transferred over the internet through browser.

Nowadays, we can also find voting system that can be used through the browser of a computer. They are website voting system. In which all the functioning of the voting system is carried out on the browser accessing the website. [2,3,4,5]

In reality shows, votes are collected by means of Short Message Service (sms) or missed calls. The content of the sms or the number in which they have to give a missed call is unique for different candidates.

**TABLE-1:** STRENGTHS AND WEAKNESSES OF VOTING SYSTEMS [6, 7, 8, 11]

Voting System	STRENGTHS	WEAKNESS
Traditional Voting System	<p><b>Effortlessness:</b> Traditional voting systems such as paper ballot voting system are the easiest way of casting a vote. Illiterate public can also cast the vote, in this system, without any assistance.</p> <p><b>Transportable:</b> The system can be arranged easily at any place, by taking the help of sufficient manpower</p> <p><b>Less Costly:</b> As no external resources are involved</p>	<p><b>Sluggish:</b> As only a single voter is allowed to cast a vote at a time, others have to wait for their chance to cast a vote. Which leads to time consumption?</p> <p><b>Booth Hijacking:</b> This is a type of electoral scam. In India, there were cases where the polling station was being taken over by political party supporters.</p> <p><b>Low Computational Speed:</b></p>

	in traditional voting system, except for human resource, the voter doesn't have to pay anything before casting a vote.	Results of the election cannot be declared immediately, as all the votes first needs to be tallied.
e-Voting System	<p><b>Ease:</b> The software's developed in this system are user friendly, enabling the user to vote with much ease.</p> <p><b>Agility:</b> There is no restriction on the location. Voters can cast their votes from any location from where they can establish an internet access.</p> <p><b>Computational Speed:</b> System can declare the election results as soon as the voting is finished.</p> <p><b>Economical:</b> e-Voting is affordable. It is a one-time investment, in which the initial cost for building the entire system is high. Later, the expenses made are much lesser.</p> <p><b>Malleability:</b> As this system work on electronic devices, just by altering the configuration of the system it can be made to work for a variety of ballot formats.</p>	<p><b>Less Privileged:</b> As this voting system makes user of external equipment's, that cost money, the deprived section of the society lose their right to vote.</p> <p><b>Vulnerable:</b> The system faces threat of an external attack.</p> <p><b>Power Consumption:</b> There are places which lack electricity or have intermittent service. So at such places the electronic devices work on batteries, which can be drained out at any instant.</p> <p><b>Costly:</b> For each set of units, the parts used in the e-voting system cost about \$200.</p>
Internet Based Voting System	<p><b>Accessibility:</b> As the system works on internet, the system can work on any device that supports internet.</p> <p><b>High Speed:</b> Multiple voters can cast their vote simultaneously. The voters can cast their vote with the help of devices, thus he doesn't have to wait for his chance to vote.</p> <p><b>Malleability:</b> As for this system, internet plays an important role on which the major functionality is based on, the systems can be made to follow a variety of voting.</p> <p><b>Freedom to vote:</b> Voters have the freedom to vote from anywhere they wish to, without having to go to</p>	<p><b>Intricacy:</b> The designing of the system is intricate and requires careful analysis of all the aspects related to the internet based voting system (online voting system).</p> <p><b>Security Vulnerabilities:</b> As the system functions over the internet, the risk of being attacked by the external risks and unauthenticated users are high.</p> <p><b>High Cost:</b> The system is costlier than other systems, as hardware requirement and software needs are to be met. Which requires resources which are expensive which adds on to the total expenditure of the</p>

	the polling booth and wait in a long queue. <b>Reusability:</b> The system can be used again and again as minimal changes are only required.	system.
SMS Voting System	<p><b>Elasticity:</b> As such system could be modified as per the requirement of specific show, such a voting system is quite flexible.</p> <p><b>High Computational Speed:</b> The counting of the votes is done by a machine instead of a person. Thus it is done at a much faster rate.</p>	<p><b>Complication:</b> The designing phase of this system is highly complex.</p> <p><b>No uniqueness:</b> Since a person having two sim cards can give two votes, therefore there is no way in knowing whether the user has already given a vote or not.</p>
Missed Call Voting System	<p><b>Reusability:</b> The extent to which the existing application can be reused in new application.</p> <p><b>Portable:</b> It is very much portable system as the system works on sms and missed calls received from users.</p>	<p><b>Complication:</b> The designing phase of this system is highly complicated and careful attention is to given to the users accents, way of talking and clarity.</p> <p><b>No uniqueness:</b> Since a person having two sim cards can give two votes, therefore there is no way in knowing whether the user has already given a vote or not.</p>

### 3. MULTI PURPOSE ONLINE VOTING SYSTEM USING SMARTPHONE

The system that we propose basically focuses on voting system that will prove handy in the future. As the numbers of smartphone users are rising exponentially, we may say that most of the world population will own a smart phone. So we propose a system which will work on smart phones using the finger print scanning functionality embedded in them.

In this system, a user can create their own unique voting ballot. Doing so, same system can be used for a variety of scenarios. For instance, election being conducted for any institution, government elections, gathering votes to decide the member of a committee. This makes the system flexible. By enciphering the vote's data at the voter's end and deciphering them only to display the results to the local administrator, would make the system would be made secure.

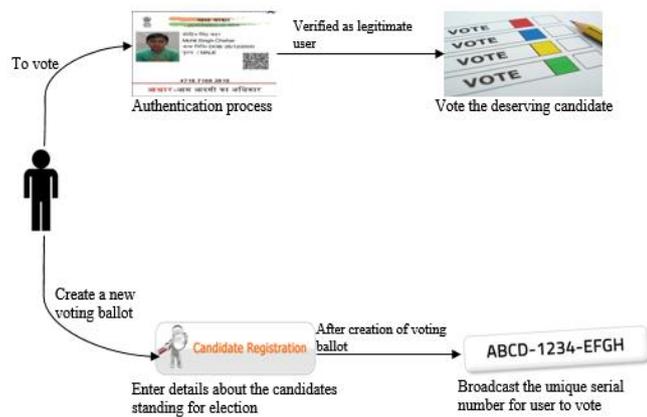


Fig-1: Overview of the multi-purpose online

#### 4. DESIGN OF THE SYSTEM

The user won't have to register into any account, they just have to provide the unique national identification number for instance UIDAI (Unique Identification Authority of India) Card in India. This would ensure the uniqueness of the user as the database would be consisting of contents such as finger print of the user, and other information (example: Iris, retina, face) for biometric verification. Thus, a user can simply enter his national identity number, pass through some verification steps and get authorised for performing the voting [9].

The system also enables the user to create local voting ballots. In this functionality, any user can create a voting ballot may it be for a college election, for company or for government elections and give a small description about it. The user who creates the local voting ballot will be the local admin of that ballot. The local admin will then be given a unique random number which he may broadcast to all the voters. The details of the voting and the votes will be calculated and shown to the local admin in form of graph or pie chart.

Once the votes are submitted by the user, it will be encrypted using some enciphering technique (example: Advanced Encryption Standard (AES)) which will only be visible to the local admin in the decrypted.

The system basically comprises of three phases:

- i. Voting Ballot Creation Phase
- ii. Voter Voting Phase
- iii. Security Phase



Fig-2: Phases of multi-purpose online voting system using smartphones

#### PHASE 1: Voting Ballot Creation Phase

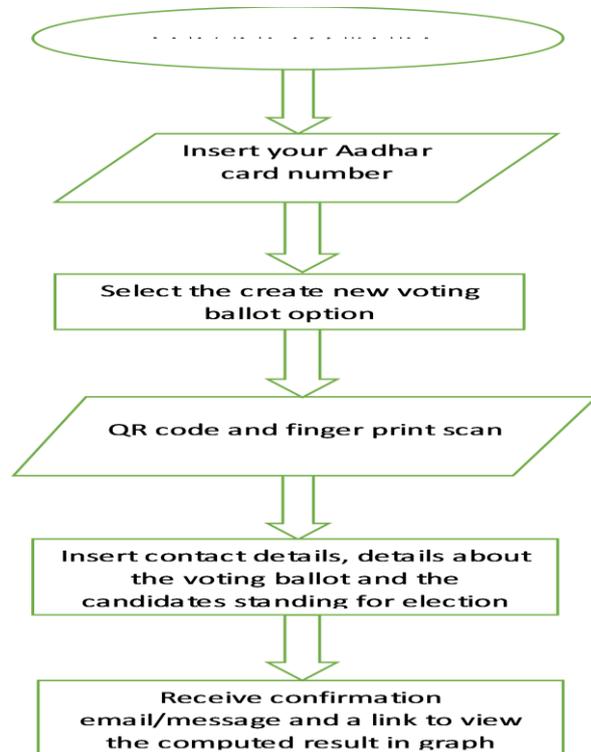


Fig-3: Voting Ballot Creation Phase

Here the user who desires to create a new voting ballot gets to become a local admin. The voting ballot can be for any reason may it be for government elections, taking votes to decide who will become the General Secretary (GS) of the college or to select the committee members. The local admin, after clicking create new voting ballot option, has to pass the authentication phase by scanning his finger print or any other biometric data. After being identified as a legitimate user, they have to enter the required field such as title of the voting ballot, description of the voting ballot, number of candidates participating in the election, their contact detail. After all the data are stored in the system's database, local admin will be given two unique serial numbers - one can be used by them to see the progress of the voting ballot in a graphical view such as graph, pie chart, etc.

#### Phase 2: Voting Phase

In this phase, the voters after entering their unique national identification number (in this case AADHAR card number) into the application, has to enter the unique voting ballot token number. This token number has been broadcasted to them by the local administrator prior to the voting. After doing so the user has entered the voting ballot, but in order to successfully cast their vote they have to authenticate themselves as a legitimate user. After passing through the authentication phase i.e. biometric identification, QR scanning the voter can register their

vote. As the votes get stored in the database the user will be acknowledged about the votes being successfully submitted.

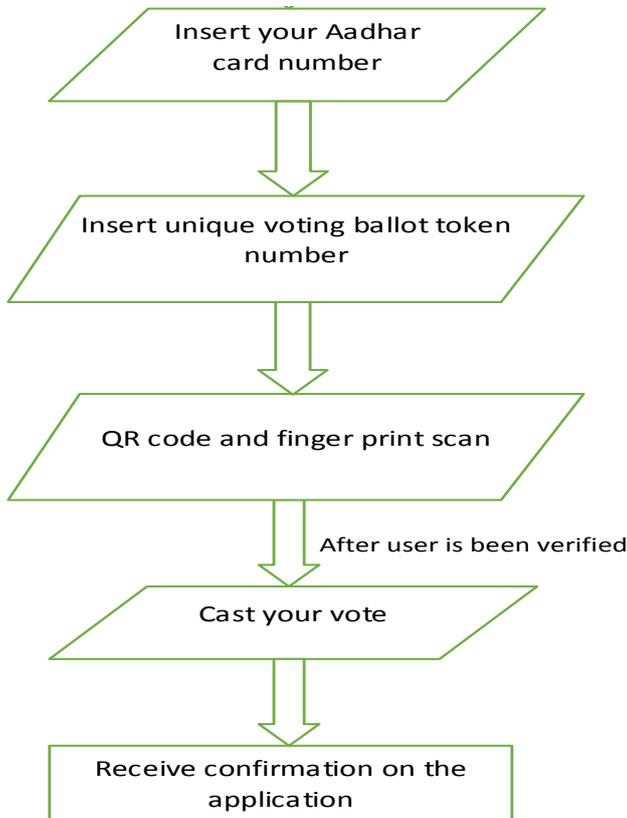


Fig-4: Voter Voting Process

**Phase 3: Security Phase**

For a voting system, it’s security is the most important aspect of the system. While using an online voting system using smartphone, the votes submitted by the user will be first encrypted using an enciphering technique such as AES. This encrypted vote data is stored in the database of the system. While retrieving the encrypted data, it is first decrypted at the local admin smartphone. Once the encrypted votes are deciphered, it can be used then to compute and find the total number of votes given per candidate. This computed data is presented to the local administrators in a graphical view for instance, a graph or a pie chart.

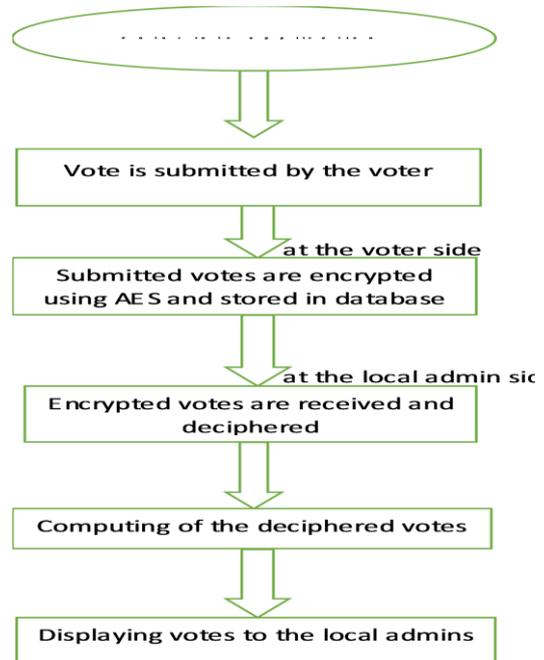


Fig-5: Security of the system

**5.CONCLUSION**

The online voting system using smartphone, described over here, is a multi-purpose system which can be used by any institute who wishes to conduct an election. The user just has to have their national identification number such as UIDAI and a smartphone which has a finger print scanning feature embedded in them. As the application based on the system will be operating online, the user can cast their vote from their current location. The voters don’t have to personally go to the voting booth to cast his vote. Thus, encouraging maximum participation of the voters.

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