

A Survey on Voting System Techniques

Mr. Mayur Patil, Mr. Vijay Pimplotkar, Ms. Anuja R. Zade, Mr. Vinit Vibhute, Mr. Ratnakar Ghadge

Department of Information Technology
Rajarshi Shahu College of Engineering
Pune, India

Abstract --The election system is the pillar of the every democracy. The democratic administration is totally dependent on the results of the election. The election process provides the right to every citizen of a country to select a legitimate representative among themselves who can guide the democratic system towards the welfare of the society. The voting system has observed many effective changes over the past few decades, right from the traditional paper ballot voting to electronic voting and now towards the online voting. The voting system is improving step by step, advancement in the new system eliminates the drawbacks of the previous system. Every system tries to overcome the loop holes of the previous system. The primary goal of this paper is to understand the traditional voting system with the recently proposed voting systems.

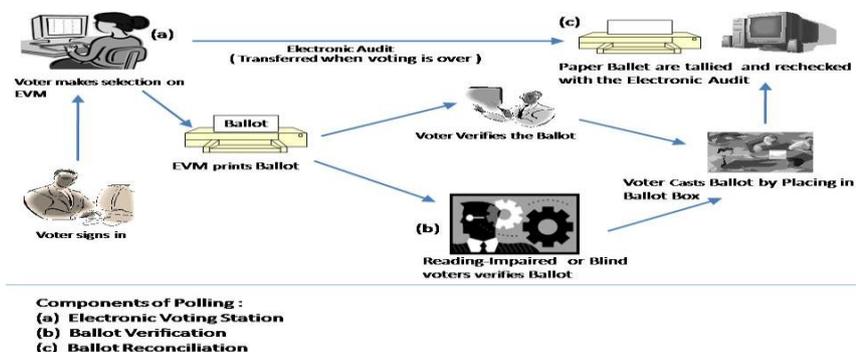
Keywords: Democracy , Election System , Voting System.

I. Introduction

The election system must be secure and robust against a variety of deceitful actions, should be transparent and intelligible that voters and candidates can accept the results of the election[8]. But in the past, there are examples of elections being manipulated in order to influence their result. A secured voting system should meet at least following four criteria's:

- **Meddle-proof:** The voting system must also be meddle-proof to obstruct a wide range of attacks, including ballot stuffing by voters and incorrect tallying by insiders.
- **Anonymity:** Anonymity of ballot should be conserved, both to guarantee the voters safety when voting against a malevolent candidate and to guarantee that the voter doesn't have any evidence that proves which candidate received his/her vote.
- **Usability:** A voting system must be understandable and usable by the entire voting population, regardless of age, disability.
- **Authenticity:** The voting process is very important and secret process as whole democratic administration is centralized on voting so the genuineness of votes and voters should be maintained at the highest priority to make the voting process fair and effective.

Authentication, scalability, speed and accuracy these are few other important criteria's to be satisfied by a typical voting system. Authentication can be considered as the most critical issue among all the above mentioned criteria. As the role of online voting system is crucial, it is difficult to come up with a system which is highly secure & accurate in all senses. If these factors of security are satisfied, then electronic voting could be a great improvement over paper systems.



Fig(i): A Typical Voting System

II. Few Voting System Techniques

2.1 Paper Ballot Voting System:

Paper ballot system is a commonly used as traditional voting system. Widely used before the introduction of Electronic Voting System[2]. Paper ballot system includes casting the vote using the paper and the stamp. Each voter uses one ballot, and ballots are not shared. In regular elections, a ballot may be a simple piece of paper on which each voter writes in the name of a [candidate](#), but [governmental](#) elections uses pre-printed sheets to maintain the [secrecy of the votes](#)[5]. The voter casts his/her ballot in a [box](#) at the polling station.

2.1.1 Advantages of Paper Ballot Voting System

- **Simplicity:** The paper ballot system gives a simplest way to cast vote. Illiterate people can also cast their vote easily. No need to guide the individual.
- **Portable:** The arrangement of this whole system can be made easily and whole system can be assembled easily. With the sufficient man power the arrangement of this system can be done easily and quickly.
- **Less costly:** The system is very much affordable than the electronic system as the major requirements are only paper and a ballot box which are provided by the election commission. The voter doesn't have to pay a single bug form his/her pocket for voting.

2.1.2 Disadvantages of Paper Ballot Voting System

- **Time Consuming:** This system is very much time consuming and slow. As only one person can vote at a time and all the voters has to wait in the queue for their turn. Which in turns increases the crowd at the polling stations.
- **Booth Capture:** It was the major type of electoral fraud found in India, wherein the polling station was taken over by the party loyalists. Better policing makes such attacks less of a threat today.
- **Low Tally Speed:** Once the voting schedule is over, the result of the election cannot be declared immediately. All the ballot boxes are collected at a specific location and then the counting of the votes is carried out which is very much time consuming.

2.2 Electronic Voting System:

An electronic voting system is a type of voting system which uses electronic ballot that would allow voters to broadcast their secret vote ballot to election officials over the internet[3]. With the prosperity of internet over the years, inventers start to make the use of electronic voting in order to make the voting process more convenient and to raise the participation of the civic[7]. From now on, engineers have repeatedly created new technology to improve the feasibility of electronic voting system[1].



Fig(ii): Electronic Voting Machine (EVM)

2.2.1 Advantages of Electronic Voting System[12]

- **Convenience:** With the well-designed software and system, the voters can simply use his/her voting equipment with the minimal time and skill to finish the voting process.
- **Mobility:** Voters can cast their votes from home, or any other place from where they can get easy access to the internet. People can even use the mobile device such as cell phone or PDA to vote. There is no restriction on the location.
- **Tally Speed:** Once the voting time is over, the system can immediately calculate the result of the election. It is much faster than the traditional ballot counting method used in traditional voting system.
- **Less Cost:** As compared to paper ballot voting, electronic voting is very much affordable. It

reduces the personnel expense, expense for location management and administration fee etc. In the beginning, the investment expense for building up the whole electronic voting system would be very high. But after the system is built up fully, the total expense would be much lesser than the traditional paper ballot voting system.

- **Flexibility:** Electronic voting system can be designed to support a variety of ballot question formats. It can be used to collect public opinions also.

2.2.2 Disadvantages of Electronic Voting System

- **Inequality problem:** It is obvious that the people with low salary might not be able to pay for the equipments. And the person who doesn't have proper computer knowledge might lose their privilege in voting.
- **Vulnerable to Security:** The security issue is the main concern of the electronic voting system. So far, there are still many classes of attacks which are tough to thwart completely.
- **Power:** The Many polling places are located in areas that lack electricity service or have only intermittent service. Thus, the EVMs operate entirely from battery power, rather than merely using a battery as a backup.
- **Cost:** The cost of the system is a major concern. The current EVMs are built from expensive parts and cost approximately \$200 for each set of units. Which costs several thousand dollars.

2.3 Online Voting System:

Online Voting System is the latest electronic voting system introduced. In which the voted ballot is transmitted over the public internet through web browser[1]. The voter can directly vote online from anywhere in the world. Security is the major issue in the Online Voting System[6]. It is very efficient and portable.

2.3.1 Advantages of Online Voting System

- **Portable:** It is very much portable system as the system works on internet only the internet supporting device is required.
- **Fast:** It is very fast as compare to traditional paper ballot voting system. The voter doesn't need to wait in long queue for voting. He /She can cast their vote just on a single click.
- **Flexibility:** As this system is functional on the internet that makes this system more flexible to support variety of paper ballot question formats.
- **Mobility:** This system gives the freedom of casting the vote from anywhere in country. This is beneficial for the voters who are regularly out of station.
- **Reusability:** The extent to which the existing application can be reused in new application. The system can be reused a number of times without any technical difficulties.

2.3.2 Disadvantages of Online Voting System

- **Complexity:** The designing phase of this system is highly complex. As the system has deal with large no of users and has to maintain huge database
- **Security Issues:** The whole system operates over the internet which makes the system more susceptible to online threats so the security issue is the main concern of this system.
- **High Expense:** This system is very much costlier than the other systems because various equipments and utilities are required to be purchased which are quite costlier.

III. Recent Voting System Techniques

3.1 Reality show Voting through sms:

This system finds wide scope in the Reality Shows. As this system can be modified according to the needs of the particular show. The system can be made functional to a specific event. In this type of voting system the voters cast their vote through sms. For casting vote voter has to send a message in specific predefined format with candidate name to given phone number. The candidate with highest supporting messages is declared as a winner. Usually in reality shows this type of voting system is -used.

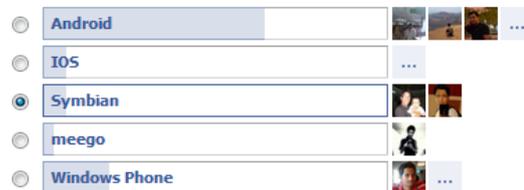
3.2 *Daily News Polls:* The system can be used for the daily online news polls carried out by the number of national news paper eg Times of India, Hindustan Times etc. Security is not main requirement of this system as it is done for analysis purpose only. Through polling the analysis is done on social or other important topics. Anyone can caste his/her vote in this system irrespective of age[11].



Fig(III) : Example of Daily News poll

3.3 Social site polling: The system can be used on the social network to conduct polling on general and social topics. For the sites like facebook, twitter this system can be used for getting public suggestions and views on the social or any recent issues.

Which mobile Operating platform do you prefer?



Fig(III) : Example of facebook polling.

III .CONCLUSION

Day by day the population is increasing enormously which in turns demands the improvement in the voting system. The primary goal of every voting system is to increase the participation of the civic. Undoubtedly the above discussed voting techniques are exceptionally good, but there is always scope for further improvement. This survey paper can be helpful for finding the loopholes and drawbacks of current voting systems. A comparative study all these systems would definitely help in developing a new system that combines all the advantages and overcomes the drawbacks of these systems.

REFERENCES

- [1] Armen, C. and Morelli, R., "E-Voting and Computer Science: Teaching About the Risks of Electronic Voting Technology" ACM ITICSE, 2005.
- [2] D.Chaum , "Secret-ballot receipts: True voter-verifiable elections" IEEE Security & Privacy, 2(1):38-47, 2004.
- [3] Robert Krimmer, Rudiger Grimm (Eds.) Electronic Voting 2008 3rd international Conference on August 6th- 9th, 2008, In Castle Hofen, Bregenz, Austria.
- [4] Craig James British Columbia "Discussion Paper: Internet Voting" August 2011 Prentice Hall, 2003.
- [5] "A Survey of Current Secret-Ballot Systems", David. Chaum.
- [6] "A Report on the Feasibility of Internet Voting", California Internet Voting Task Force, 2000
- [7] Tadayoshi Kohno, Adam Stubblefield, Aviel D., Rubin Dan, S. Wallach- "Analysis of an Electronic Voting System"
- [8] <http://theory.csail.mit.edu/~rivest/Rivest-TheThreeBallotVotingSystem.pdf>
- [9] Internet voting: http://www.justitie.regeringen.se/propositionermm/sou/pdf/sou2000_125.pdf.
- [10] www.eac.gov/assets/1/Documents/SIV-FINAL.pdf : A Survey of Internet Voting.
- [11] Times of India polls : <http://timespolls.itimes.com/polls>
- [12] Security Analysis of India's Electronic Voting Machines_NetIndia, (P) Ltd, Hyderabad y The University of Michigan April 29, 2010.