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# Advanced electronic voting machine system

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**ABSTRACT:**

*Advanced Electronic Voting Machine (AEVM) is a simple electronic device used to record votes in place of ballot papers and boxes which were used earlier in conventional voting system. Fundamental right to vote or simply voting in elections forms the basis of democracy. All earlier elections be it state elections or centre elections a voter used to cast his/her favourite candidate by putting the stamp against his/her name and then folding the ballot paper as per a prescribed method before putting it in the Ballot Box. This is a long, time-consuming process and very much prone to errors. This situation continued till election scene was completely changed by Advanced Electronic voting machine. No more ballot paper, ballot boxes, stamping, etc. all this condensed into a simple box called ballot unit of the Advanced Electronic voting machine. Because biometric identifiers cannot be easily misplaced, forged, or shared, they are considered more reliable for person recognition than traditional token or knowledge-based methods. So, the Advanced Electronic voting system has to be improved based on the current technologies viz., biometric system. This article discusses complete review about voting devices, Issues and comparison among the voting methods and biometric EVM.*

## 1. INTRODUCTION

Elections allow the populace to choose their representatives and express their preferences for how they will be governed. Naturally, the integrity of the election process is fundamental to the integrity of democracy itself. The election system must be sufficiently robust to withstand a variety of fraudulent behaviours and must be sufficiently transparent and comprehensible that voters and candidates can accept the results of an election. This paper presents a survey of the state of the art in Advanced Electronic Voting, including the various works done in Internet Voting and the arguments against its use, as well as in Advanced Electronic poll-site voting. Advanced Electronic voting refers to the use of computers or computerized voting equipment to cast ballots in an election. Sometimes, this term is used more specifically to refer to voting that takes place over the Internet. Advanced Electronic systems can be used to register voters, tally ballots, and record votes. The design of a "good" voting system, whether Advanced Electronic or using traditional paper ballots or mechanical devices must satisfy a number of competing criteria. The anonymity of a voter's ballot must be preserved, both to guarantee the voter's safety when voting against a malevolent candidate, and to guarantee that voters have no evidence that proves which candidates received their votes. The existence of such evidence would allow votes to

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be purchased by a candidate. The voting system must also be tampering resistant to thwart a wide range of attacks, including ballot stuffing by votes and incorrect tallying by insiders.

## 2. DESCRIPTION

There have been several studies on using computer technologies to improve elections. These studies caution against the risks of moving too quickly to adopt Advanced Electronic voting machines because of the software engineering challenges, insider threats, network vulnerabilities, and the challenges of auditing. Advanced Electronic voting machine is a simple machine that can be operated easily by both the polling personnel and the voters. Being a standalone machine without any network connectivity, nobody can interfere with its programming and manipulate the result. Keeping the erratic power supply position in many places in the country, the machines have been made to run on batteries. It has mainly two units: Control unit and Ballot unit. The Control Unit is the main unit which stores all data and controls the functioning of EVM. The program which controls the functioning of the control unit is burnt into a microchip on a "one-time programmable basis". Once burnt it cannot be read, copied out or altered. The EVMs use dynamic coding to enhance security of data transmitted from ballot unit to control unit. Although there has been cryptographic research on Advanced Electronicvoting, and there are new approaches such as currently the most viable solution for securing Advanced Electronic voting machines is to introduce a "voter-verifiable audit trail". A verifiable audit trail does not, by itself, address voter privacy concerns, ballot stuffing, or numerous other attacks on elections. Some vendors have claimed "security through obscurity" as a defence, despite the security community's universally held belief in the inadequacy of obscurity to provide meaningful protection.

## 3. ADVANCED ELECTRONIC VOTING AND CHARACTERISTICS

It is also known as e-voting is a term encompassing several different types of voting, embracing both Advanced Electronic means of casting a vote and electronic means of counting votes. Advanced Electronic voting technology can include punched cards, optical scan voting systems and specialized voting kiosks (including self-contained direct-recording Advanced Electronic voting systems, or DRE). It can also involve transmission of ballots and votes via telephones, private computer networks, or the Internet. And, of course, EVM helps maintain total voting secrecy without the use of ballot papers. And, at the end of the polling, just press a button and there you have the results.

India is the world's largest democracy with a population of more than one billion. India has an electorate of more than 668 million and covers 543 parliamentary constituencies. Voting is the bridge between the governed and government. In previous manual elections in India, a nationwide ballot could consume around 8,000 tons of paper and 400,000 phials of indelible ink and require some 2.5 million strongboxes to store them under heavy security until the votes were counted. In the past, it took up to three or four days to count the votes, with hired personnel spending day and night in secured areas manually counting each ballot. Sometimes demanding for

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recounting resulting for the low margin of difference of votes between the top two candidates coupled with large number of invalid and doubtful votes. The Advanced Electronic voting machines are intended both to reduce errors and to speed the counting process. The country developed its Advanced Electronic voting machines (AEVM) through an indigenous technology. It was designed by Bharat Advanced Electronic Ltd, and the Advanced Electronics Corporation of India Ltd, with the microchip imported from Japan. The country developed over one million EVM s for its 668 million voters. It would have cost them a great deal of money. The machine was able to Cater for 64 candidates per election, in pages of 16 candidates each. The technology was able to solve a lot of problems associated with the traditional voting system. However, before its adoption there were pilot schemes in five states to familiarize the voters with the technology.

Researchers in the electronic voting field have already reached a consensus pack of following core properties that an Advanced Electronic voting system should have,

Accuracy:

(1) It is not possible for a vote to be altered,

(2) It is not possible for a validated vote to be eliminated from the final tally, and

(3) It is not possible for an invalid vote to be counted in the final tally.

Democracy:

(1) It permits only eligible voters to vote and,

(2) It ensures that eligible voters vote only once.

Privacy:

(1) Neither authorities nor anyone else can link any ballot to the voter who cast it and

(2) No voter can prove that he voted in a particular way. Verifiability: anyone can independently verify that all votes have been counted correctly.

Availability:

(1) The system works properly as long as the poll stands and

(2) Any voter can have access to it from the beginning to the end of the poll.

Resume Ability:

The system allows any voter who had interrupted his/her voting process to resume it or restart it while the poll stands.

The last few years have brought a renewed focus on to the technology used in the voting process. The current voting system has many security holes, and it is difficult to prove even simple security properties about them. A voting system that can be proven correct has many concerns. There are some reasons for a government to use Advanced Electronic systems are to increase elections activities and to reduce the elections expenses. Still there is some scope of work in Advanced Electronic voting system because there is no way of identification by the Advanced Electronic voting system whether the user is authentic or not and securing Advanced Electronic voting machine from miscreants. The comparative focus is on the adoption of Advanced Electronic voting systems adopted at the international level.

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## ISSUES OF EVM

Around the world, electoral officials are examining various technologies to address a wide-ranging array of voting issues like, System adaptability and acceptability by all stockholders including common People residing in remote villages, probably some of them illiterate too. System functionality as close to conventional ballot paper system as possible. Cost effectiveness and ease of deployment / maintenance of the system. System reliability and security in terms of tamper resistance, errors free operation etc., Speed and efficiency of voting and results declaration.

## ACCESSIBILITY

One of the largest issues related to DRE voting systems is accessibility.


For designers of computer programs, accessibility is the easiest design factor to ignore. Many classes of voters can easily be disenfranchised by a voting system that accommodates only "normal" users. The most obvious of these is disabled voters. The federal Voting Accessibility for the Elderly and Handicapped Act (VAEHA), passed in 1984, mandates that polling places be available and usable by the elderly and handicapped. According to the National Organization on Disability, DRE balloting systems are the most accessible technology, compared to lever, punch-card, optical scan, and hand count systems.In addition to general disabilities, the issue of "computer disability" can cause problems in DRE Elections. Research suggests that older adults consistently perform more poorly than younger adults in performing computer-based tasks. This is true both with respect to the amount of time required to perform the task, as well as the number of errors made. In one recent study, age was positively correlated with difficulty in performing tasks with a computer mouse. Although popular DRE systems do not use a computer mouse, similar issues are present. Older adults have greater difficulty in viewing a computer screen, and correct conceptualization of the relationship between screen or button manipulation and program activity may be a problem. Aside from accessibility, the issue of bias presents both a logistical and a legal problem for elections.

Actual ballot design is fairly contentious, in part, because candidates believe that their location on the ballot changes the likelihood that a voter will select them. For example, candidates listed first on a ballot are generally favoured. For this reason, many jurisdictions pre-select a designated balloting order; often, candidates are listed by party in a specified configuration, by lottery, or alphabetically. Advanced Electronic ballots cannot avoid these pitfalls for the same reason that paper ballots cannot; names on a ballot must be presented in some fashion.

**Accountability and Verifiability**

Traditionally, votes were cast on paper and counted by hand. Voters were confident that the marks they made on ballots reflected their intended vote. Voting machines that used levers and punch card systems also provided

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voters with a high degree of confidence that they cast their votes as intended. Until the 2000 elections voters also routinely.

## CONCLUSION

This review discussed introduction about EVM and its variation, Issues of EVM. Our efforts to understand Advanced Electronic voting systems leave us optimistic, but concerned. This paper suggests that the EVM system has to be further studied and innovated to reach all level of community, so that the voter confidence will increase and election officials will make more involvement in purchasing the innovated EVM's for conduct smooth, secure, tamper-resistant Elections.

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