

Effectiveness of Electronic Voting Machine in the Electoral System of India: New Opportunities and Challenges



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Abstract To ensure the privilege of voting rights of the citizens, the procedure of election with security and integrity is a basic condition of any nation. Voting in India is a constitutional and fundamental right under the Representation of People Act 1951 and under Article 19(1)(a) of the Constitution of India. The Elections in India are performed almost completely using electronic voting machines (EVM) build up over the past 2 decades by a pair of government-owned companies. However, in India these devices is known as Electronic Voting Machines ,have been praised for their easy devise, ease of use, and reliability, but recently they have also been criticized and despite this criticism, several particulars of the machineries' design have never been publicly disclosed, and they have not been subjected to a rigorous, independent security evaluation. This research paper will evaluate the machine's effectiveness and function in detail, as well as address its safety in light of related election procedures. Presently , in India available Electronic Voting Machines(EVM) has been applauded for their uncomplicated design, dependability as well as usability, yet as of late they have moreover been condemned taking after across the board reports of race abnormalities. In spite of this feedback, numerous subtle parts of the machines' outline have never been freely unveiled, as well as they have not been subjected to a thorough, autonomous security assessment. However, the whole world efficiently dismisses the electronic voting machine (EVM) and in fact, just a couple of nations are presently using the electronic voting machines (EVM). The research paper examines the effectiveness of the EVMs in the electoral system of India with new challenges and opportunities.

Keywords: Electronic Voting Machine (EVM), Election Commission of India (ECI), India, Voter Verifiable Paper Audit Trail (VVPAT),

I. INTRODUCTION

India is the largest democratic country and with about 850 million recorded voters, it is the Participatory Democracy of the world. The Constitutional mandate of superintendence, control and directions of Elections to the State Legislative Assemblies and the parliament has been conferred on the Election Commission of India. As an independent Constitutional entity, the Election Commission of India has effectively conducted regular elections to the various state legislative assemblies and Parliament for the past 66 years in a

free and fair, informed, Participative and credible manner. The Election Commission which has been at the forefront of embracing, adopting and implementing the latest technological advancements in promoting and fine-tuning the election systems and processes. However, the Election Commission has taken the ground-breaking project of initiating Electronic Voting Machine (EVM) for storing, recording and even counting of public votes across the breadth and length of the Country in a credible ,transparent and secure manner as well as backed by proper legal support. The Election Commission has successfully used Electronic Voting Machine (EVMs) in conducting 3 Lok Sabha Elections and even 113 Elections to the lower house of the state legislature over the last 23 years. However, the Electronic Voting machine (EVMs) is an electronic device, which is utilized to store votes in place of earlier voting system. The EVMs can be easily utilized by the Voters and polls employees. In Indian Elections the electronic voting machines (EVMs) used are globally known as Direct Recording that trace votes directly in electronic memory. The Electronic Voting Machines (EVMs) were developed by the electronics Corporation of India Limited (ECIL) and the Bharat Electronics Limited (BEL) and generally the foreign companies in Japan and US supplying microcontrollers and these companies are owned by the Indian government(Goswami, 2017).

II. METHODOLOGY

It will describe the growth and development of Electronic Voting Machines in India from its implementation to the present use of it and the effectiveness of the EVMs in the electoral system of India with its opportunities and constraints. The proposed research is based on document study of a multiplicity of publicly existing sources consisting of official reports from the Election Commission of India(ECI), books and articles about the Indian Electronic voting and universal, technical studies and economic studies on Electronic Voting Machines. Different valid literature and related literatures have been consulted to examine the proposed work in a scientific way. In the secondary data the characteristics such as reliability of data, Suitability of data and adequacy of data have been considered.

A. Background of Electronic Voting in India

The Election Commission of India enhanced the EVMs in India in collaborating with two government-owned agencies, Bharat Electronics Limited (BEL) and the Electronics Corporation of India (ECIL)

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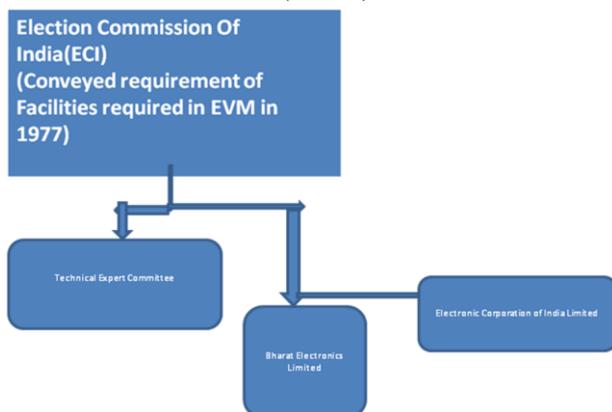
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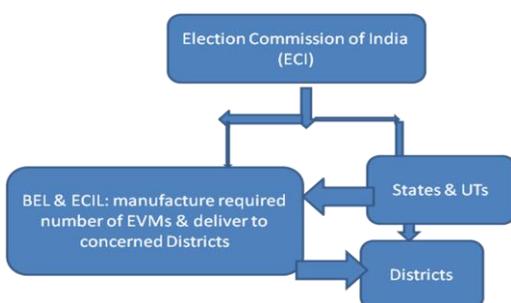
These two are not under the executive control of the Election Commission of India, though the two agencies are owned by the administration of India. However, they are benefit-seeking vendors that are trying to market EVMs internationally. In the early 1980s the first Indian EVMs were developed by ECIL and they were used in definite areas of the nation, however but were never adopted countrywide. They launched the technique of structure used to this day together with the separate control and ballot units as well as the layout of both components. In fact, these first-generation EVMs were based on Hitachi 6305 microcontrollers as well as utilized firmware stored in external UV-erasable PROMs along with 64kb EEPROMs for preserving votes. However, in the year 2000, The BEL and ECIL introduced Second-generation models as well as these equipment moved the firmware into the CPU and upgraded extra components. In fact, they were gradually deployed in larger numbers and utilized country wide opening in 2004. In the year 2006, the producers adopted a third-generation design including extra changes recommended by the Election Commission in India (Gonggrijp, 2010).

Flow Chart (EVM process at a Glance)

Concept and Designing of Electronic Voting Machines (EVMs)



Procurement of EVMs



Flow chart 1: EVM process at a glance

However, on the basis of information of Election Commission statistics, it is found that there were 1,378,352 Electronic Voting Machines in use in the month July 2009. Of these, with 253,400 from BEL and 194,600 from ECIL, 448,000 were third-generation machines manufactured from 2006 to 2009. In fact, with 440,146 from BEL and 490,206 from ECIL, and from 2000 to 2005, the remaining 930,352 were the 2nd-generation models manufactured. It is noticed that the first generation equipment are deemed too unsafe to utilize in general elections due to their 15-year service life has terminated, although they are apparently still utilized in definite state and local contests. There were 417,156,494

votes cast, for an average of 302 votes for each machine in the 2009 central legislature election (India, 2010).

B. Evolution & Incorporation of Technology in EVMs:

The Electronic Voting Machine (EVMs) being electronic equipments, are based on a speedy evolving equipment, both in hardware as well as software. It was observed that many useful suggestions have come from political parties and public. With utilize of EVMs in Polls, and the Election Commission of India (ECI) has responded by including newer features with each edition of Electronic Voting Machine produce and from time to time, current software performs as developed over time, existing components as enhanced over time as well as current safety practices were taken into account to make sure that the Electronic Voting Machine (EVMs) of each version had the greatest of all practices being used. However, the non-tamperability of electronic voting machines is of highest reflection in all versions and to that extent security features have been used based on the machineries accessible at that time as well as customized for the desires of the Electronic Voting Machine. However, this along with the Election Commission of India's strict administrative practices on exercise of electronic Voting machines (EVMs) has make sure honest functions of electronic voting machine (EVMs) over years. From time to time, On recommendation of Technical Expert Committee, certain features were launched in electronic voting machines, based on obtainable equipments along with state-of-the-art for software as well as hardware (Election voting machine – Election commission of India).

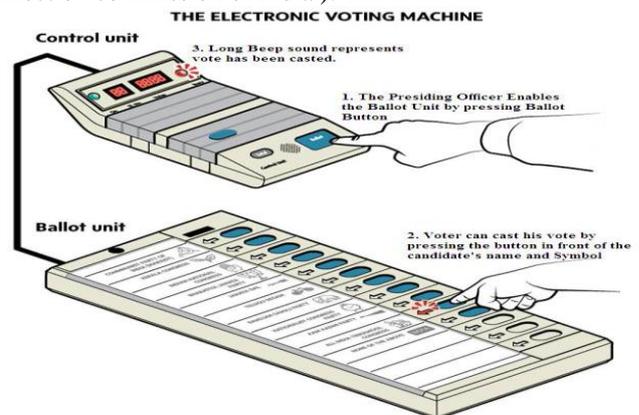


Fig.1: The EVM Machine

When developments have been brought in the designs of Electronic Voting Machines which were allowed through the accessibility of highly developed technology in Electronics as well as which have led to assimilation of many features in newer electronic voting machines, Electronic Voting Machines of former versions also had such vital features built in. Notwithstanding all this, the non-tamperability of Electronic Voting Machine has been of highest concern in every version of Electronic Voting machines (India, Election Commission of India. Election laws.). However, some original features added by Technical Expert Committee (TEC) in M2 (Post 2006) electronic voting machines because of technological improvements:



- Dynamic Coding among Control part as well as Ballot unit.
 - Real time clock
 - Time stamping of key presses
- However, it was observed that some new features added by Technical Expert Committee (TEC) in M3 (post 2013) electronic voting machines (EVMs) due to most recent advancements in technology:
- Reciprocal validation among the entire mechanisms of electronic voting machines i.e. CU, BU as well as Voter –Verified Paper Audit Trail.
 - Automatic self-diagnostics
 - Battery existence predication
 - not working on releasing of covers
 - Digital documentation used for recognition of authentic units

Qualities of M2 Voter-Verified Paper Audit Trail:

- Publishes applicant’s name, series digit and election mark on thermal paper slips.
- Secondly, Sensors to identify mistakes
- Lastly, be able to be promoted from M2 to M3(Rao,2017).

Techniques provided by Technical Expert Committee in M3 Voter-Verified Paper Audit Trail:

- To provide upto 384 Candidates, capable to attach by 24 Ballot Units linked with 01 Control Unit
- Inter-operability among Bharat Electronics Limited as well as Electronics Corporation of India Limited-Electronic Voting Machines.
- Inoperative upon releasing of cover
- Digital documentation for identification of authentic elements (A. K. Agarwala, 2006).

In a democratic country like India it is observed that the electronic voting machines are really exceptional compared to the electronic -voting technologies exercised in another regions of the earth due to the below mentioned factors:

- The Election Commission of India-EVMs is stand-alone non-networked machines
- The Election Commission of India-Electronic Voting Machines are constructed in two PSUs specifically BEL as well as ECIL , not like technologies utilized in another nations, that were constructed completely by personal entities and therefore, there is nothing possibility of participation of vested attention of private companies or equipment vendors in choice building or construction of the Election Commission of India-Electronic Voting Machines.
- The Election Commission of India-Electronic Voting Machines have been time as well as once more effectively confirmed as well as certified by an autonomous TEC after an end-to-end testing procedure. STQC an accredited third party entity, under Ministry of Information and Technology, performs standardization as well as certification of Election Commission of India- EVMs shaped by companies or manufacturers, unlike the machinery utilized in Netherlands,
- In Election Commission of India- EVMs data is stored on the inside as well as not transferrable by any mechanism, not like extra nations in the DRM where voting data verification is shifted through way of compact disk, etc.
- The Election Commission of India has developed complete end to end safety set of rules as well as executive protections for the storeroom, transportation, use as well as tracking of Election Commission of India’s- Electronic Voting Machines,

dissimilar in another nations where NEDAP equipments were utilized.

- The Election Commission in India is fully backed by a TEC including of well-known experts and professor, however unlike MOIKR of Netherlands.
- It was observed that every Electronic Voting Machine has a exceptional figure connected to it, in the data base of Election Commission that is recorded by Electronic Voting Machines Tracking Software and this figure of the Electronic Voting Machine can at all times be cross-checked against the record.
- One Time Programmable (OTP) software used in these EVMs, that can’t be re-written after manufacture.
- As per legal framework across the country, the Election Commission of India-EVMs is all the time under uniform, high profile executive and physical safety and strict.

• In fact, the Section 61 A of the Representation of the Peoples Act(1951) permits the utilize of Electronic Voting Machines by Election Commission of India. However, the various High Courts of justice across the nation have uphold the utilize of Electronic Voting Machines time as well as again in different decisions as well as in 2004, Karnataka High Court has stated Election Commission of India-EVMs “national pride” due to its robustness and transparency(Gangwar, 2015) However, in the year 2013 the VVPAT was initiated to give still better clearness to the poll practice. The Voter Verifiable Paper Audit Trail is an extra unit connected to the Electronic Voting Machine, that issues a little slip of paper that brings the name, symbol as well as serial figure of the contender chosen by elector, in the viewing window which is noticeable for 7 (seven) seconds. Behind pressing the button on Ballot Unit the elector be able to outlook the written slip on Voter Verifiable Paper Audit Trail during the viewing window as well as hence be able to confirm that the vote is confirmed for the Candidate of their choice. Accordingly, as per the prescribed procedure by ECI ,the paper slips are routinely cut as well as stored in a preserved section of Voter Verifiable Paper Audit Trail as well as be able to utilized later to cross check the votes in Control Unit. However, besides glowing of LED near candidate button as well as the beep in Electronic Voting Machine system, the publishing of slip in Voter Verifiable Paper Audit Trail is an extra authentication to the elector. However, in every coming election station to the Central legislature as well as lower house of state legislature, the Election Commission is dedicated to the hundred percent use of Voter Verifiable Paper Audit Trails with Electronic Voting Machines at every polling. Pursuant to the central administration consent, the electronics Corporation of India Limited and the Bharat Electronics Limited have devoted to construct as well as deliver 16,15,000 Voter Verifiable Paper Audit Trail machines essential for perform of parliamentary Elections to Lower house of parliament 2019 to the ECI by November 2018(Dnyanesh P. Lengure, 2015).

Security features and EVM Safety:

It was observed that the Electronic Voting machines are non-tamperable, Because of rigid executive and safety dealings and technological measures laid out by the Election Commission of India, whereby no access to Electronic Voting Machine/VVPAT is allowed to any unauthorized person.



Therefore, both are protected from any kind of manipulation or tampering whether during polls, or before the polls, or after the polls, in storage or carrying from company to the District/state or vice versa, or when transported from one state to the another state(Desna Sebastian, 2015).

However, Technological protections that give to non-tamperability of Electronic Voting Machine are the followings:

- It is observed that the Electronic Voting Machine (EVM) used by Election Commission is a stand-alone non-networked and one time-programmable (OTP) machine, which is neither connected, nor computer controlled to any network or the internet; and therefore, cannot be 'Hacked'.
- It is seen that the Electronic Voting machine/VVPAT is technologically secured to stop any tampering and the software programme utilized in these technological equipments i.e. EVM is burnt into a masked chip or a onetime programmable (OTP) so that it cannot be tampered or altered with.
- With this connection, however, the software of Electronic Voting Machine is improved in-house through a chosen set of well known Engineers in ECIL (Atomic Energy Ministry's PSU) as well as BEL (Defence Ministry PSU) independently from each other.
- As per the software requirements specifications (SRS) after finishing point of software design, generally evaluation and testing of the software is carried out by an Independent Testing Group.
- Next step is after doing well finishing point of such assessment; the device code is specified to the micro regulator producer for writing in the micro controllers and so, the source code cannot be read from this machine code.
- In fact, the Micro controller manufacturer firstly gives engineering samples to PSUs for evaluation and these samples are assembled into the electronic voting machine (EVM), verified and evaluated for functionality at great length. Only after doing well achievement of this authentication, the Bulk production authorization is given to micro controller maker by PSU.
- At all times the source code for the electronic voting machine is stored under restricted conditions .However, Checks and balances are in place to make sure that it is accessible to certified employees only.
- As per the laid down value plan as well as presentation test procedures, functional testing is done by production group during production in the factory.
- It has been found that the software is thus planned that it permits an elector only once to cast the vote and accordingly the vote can be traced by an elector from the BU(Ballot Unit) just behind the Presiding executive allows the ballot on the Control Unit. However, at any time the Electronic Voting Machine does not accept any signal from outside and after the Presiding executive permits the ballot on the CU, the next vote can be recorded only. In

between, the machine becomes lifeless to any signal from outside (except from the Control Unit).

- For functionality, Samples of the electronic voting machine from making batches are repeatedly examined through Quality Assurance Group and it is an independent unit within the PSUs.
- It is noticed that in M2 generation of Electronic Voting Machines (Post-2006), certain other technologies were launched such as dynamic coding between **Control Unit (CU) and Ballot Unit (BU)**, installation of full display system, installation of real time clock and date as well as time stamping of key-pressing in Electronic Voting Machines(Shrivastava,2016).

Role of Technical Expert Committee on Electronic Voting Machine (EVMs):

The ECI has maintained an independent Technical Expert Committee(TEC) to assist and evaluate designs, specific technical features and performance development of electronic voting machine (EVMs). The main functions of **Technical Expert Committee (TEC)** have been to:

- Give technical suggestion to build design and specifications of newer versions of Electronic Voting Machines/Voter Verifiable Paper Audit Trails so that they include most up-to-date equipment together in software as well as Hardware Design and progressing strength against Tampering.
- Scrutinize design proposals of manufacturers on Electronic Voting Machines and suggest recommendations for development.
- Mentor designs process wherever asked.
- Observe concerns raised on Electronic Voting Machine (EVMs) tamper ability.
- Any other suggestion that the Election Commission may seek or any other technical effort that the Election Commission may entrust from time to time.

However, The Election Commission holds regular extensive and intensive gatherings with the **Technical Expert Committee** as well as evaluates mechanical specifications, design as well as connected problems of the Electronic Voting Machines/Voter Verifiable Paper Audit Trails or some additional technological issue rising from time to time (Ashok Kumar D., 2011).

III.RESULT AND DISCUSSION

The Electronic Voting Machine (EVM) and its system in India

In India, an EVMs in India consists of two Units –a Balloting Unit as well as Control Unit – joined with a five-meter cable . However, The Control Unit is with the Presiding official and sometimes, a Polling executive and on the other hand, the Balloting Unit is positioned within the voting booth. In fact, Instead of issuing a ballot paper, the Polling Officer in-charge of the Control Unit will force down the Ballot Button and accordingly this will allow the elector to cast their valuable vote by pressing the blue push button on the Balloting part against the symbol and candidate of their choice.



Generally, it is seen that the Electronic Voting Machines run on an ordinary 6 volt alkaline battery constructed by Electronic Corporation of India Ltd., (Hyderabad) as well as Bharat Electronics Ltd., (Bangalore). Thus, even in regions with no power associates, the Electronic Voting Machine (EVMs) can be used. However, the Electronic Voting Machine be able to record a highest number of 3840 votes and generally as usually the total figure of electors in any polling place will not exceed 1500, but the ability of the Electronic Voting Machine (EVMs) is more than sufficient. It is observed that the Electronic Voting Machine (EVMs) can accommodate to a highest of 64 candidates and there is stipulation for 16 candidates in a Balloting Unit. However, it is found that if the entire figure of candidates exceeds 16, a second Balloting Unit can be connected matching with the first Balloting Unit and accordingly, if the entire figure of candidates exceeds 32, then a next Balloting Unit can be linked as well as however, if the entire figure of candidates exceeds 48, then also a next Balloting Unit can be connected to provide to a highest of 64 candidate.

The common process of electronic voting on the most general Electronic Voting Machines models as

- On the first step the voter makes sure the voter's ID with poll workers. The polling employees as well as agents identify the voter as well as verify the name. Accordingly, to prevent duplicate voting they thumbs print of the voters or take signature and mark the right index finger of voter by indelible ink.
- Next step, accordingly the voter enters the polling booth; on the control unit, a poll worker presses the Ballot button (BU) to permit one cast your vote, a green ready light to glow on the (BU) ballot unit. Then, The elector presses the button of his or her choice for the candidate and the control unit emits a loud beep to point out that the vote has been cast., the ready light turns off, a red light button glows and then the red light turns off automatically.
- The presiding executive in the polling station at the closing stages of the poll, removes a plastic cap on the control unit (CU) as well as presses the close button, that stop the Electronic Voting Machine from recognizing further votes and the ballot unit is accordingly disconnected as well as the control unit is placed in storeroom until the public count.
- On the counting day, at counting centre an election executive breaks a seal of the control unit as well as presses result key. Accordingly the sequence of outputs displays on the control unit i.e. the total votes, the number of candidates as well as the figure of votes received by every candidate.
- To decide the results of the election, the Counting personnel physically record the total votes from all Electronic Voting machine (EVM) as well as attach them jointly.

Security Requirements in EVMs

The security necessities that electronic voting system must satisfy are –

- **Eligibility:** it means only qualified voters can cast their votes in the election era.
- **Verification:** it means that the one who votes is the right one as well as no one else.

- **Confidentiality of Voter:** it enable's voters to vote in a greatly secret way in which the voting process and personal information of voters are secured as well as can't be known by someone.
- **Robustness:** it means that the electronic voting system must be protected against any kind of fraud, attacks and disruption.
- Lastly, fairness in declaring voting consequences only at the last part of allowable voting period.

EVM Challenge in India

In all parties meeting held on 12th may, 2017 the Election Commission of India (ECI) had informed members of regional as well as central level parties that it would hold an Electronic Voting Machine (EVM) challenge as well as recommend opportunity to the both national and regional parties to express that Electronic Voting Machines utilized in the elections of state legislature in the month of Feb-Mar 2017 were tampered and that Electronic Voting Machines can be tampered even under the laid down technological and executive protects. However, it is found that in 20th May, 2017, the Election Commission held a Press Conference to publicize Electronic Voting Machine Challenge as well as sent invitation to every state as well as national Parties to take part in the Electronic Voting Machine Challenge from 3rd of the June, 2017 onwards. Interestingly, two well known parties, i.e. Communist Party of India (Marxist) as well as Nationalist Congress Party (NCP) presented their attention in sharing the Electronic Voting Machine Challenge as well as the said parties reported to the Challenge Venue on 3rd June, 2017. But, they did not wish to participate in the Challenge; however they presented only their attention in accepting the Electronic Voting Machine process. To clear their questions, the said political parties cooperated widely with the TEC of the Election Commission of India.

Present Status of Electronic Voting Machine:

With its order dated 8th Oct 2013 the Hon'ble Supreme Court has experimented that Electronic Voting Machines and Voter Verifiable Paper Audit Trail method guarantees the exactness of the voting method. In this regard, it was observed that to renovate the trust of the voters, this is important to introduce Electronic Voting Machines with Voter Verifiable Paper Audit Trail systems and it is necessary because in a democratic country like India the vote is an act of expression that has vast significance in parliamentary form of Government. However, it was observed that the Supreme Court respected the hard works as well as excellent gesture prepared by the Election Commission of India (ECI) in bringing VVPATs as well as permitted the Election Commission of India to begin the same in gradual stages or geographical wise in the ensuing parliamentary elections in India. The Apex Court of India also instructed and suggested the Central government to make available necessary economic aid for the procurement of units of Voter Verifiable Paper Audit Trails to the execution of Voter Verifiable Paper Audit Trails method in phased method. The Election Commission of India not only reaffirmed its trust on the clearness, reliability, non-tamperability as well as robustness of the machinery and but also given interest on the urgent use of Voter Verifiable Paper Audit

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Trails for protecting the integrity of the voting method and promoting self-confidence of the voters. However, in order to make sure the compliance of apex court order, The Chief Election Commissioner of India energetically pursued the allocation of finances to the producers for the well-timed manufacture as well as provide of necessary amount of Voter Verifiable Paper Audit Trails to the Election Commission of India for guaranteeing hundred percent Voter Verifiable Paper Audit Trail (VVPAT) coverage at every polling places. On the basis of the advice of the Election Commission an amount of Rs. 2616.30 crore has been allocated on 19th April, 2017 to buy of 16,15,000 Voter Verifiable Paper Audit Trails as well as orders have been issued to the manufacturers. However, It is significant to point out that a remarkable amount i.e. Rs 1939.95 crore has been approved as well as released by the Central administration of India for the construct of M3 Electronic Voting Machine. The makers have dedicated to construct Electronic Voting Machine and Voter Verifiable Paper Audit Trails as well as deliver to the Election Commission of India (ECI) by Sep 2018. It is observed that the ECI is fully dedicated to using Voter Verifiable Paper Audit Trail technology along with the Electronic Voting Machine in every upcoming elections to be carried out under its direction as well as superintendence for the lower house of the state legislature and Parliament.

Advantages of Electronic Voting Machines

In the year 1989-90, at the time the machines were bought, the expenditure of per Electronic Voting Machine was 5,500 Rupees and in spite of the fact that the basic speculation was heavy and it has following been relied upon to spare operating expense of invention as well as publishing of ticket papers in lakhs, storage as well as considerable diminishment in the checking staff, transportation as well as the compensation remunerated to them. However, the most crucial deal view points are:

- Firstly, the making of millions of ballot papers can be eradicated through Electronic Voting Machine essential only a single Balloting element for several voters and however, this outcomes in huge preserve of money by process for expenditure of paper, transportation, stockpiling, printing as well as distribution.
- Secondly, the smallest effort of the technology as well as the recycle reduces the cost-of-ownership.
- Thirdly, through the Electronic Voting Machine (EVM) the fast, counting of votes reduces assessment connected stress as well as aggression. However, there is no probability of unacceptable votes due to voting under Electronic Voting Machine.
- Fourthly, the Electronic Voting Machine (EVMs) removes ballots stuffing and however, it make booth capturing very difficult
- Fifthly, The Electronic Voting Machine (EVMS) have improved voter trust in India.

Problems and the Electronic Voting in India

To operation under more demanding environmental situations as well as functional restrictions the voting machinery in India should be designed than additional electronic voting methods. These necessities have impacted the easy design of the recent

equipments as well as impact our safety study. Among the problems are mentioned:

- Price by well over a million Electronic Voting Machine in utilize, the cost of the structure is a main concern. The present Electronic Voting Machine are constructed from economical commodity elements as well as price around \$200 for every set of units, and far less than various DREs utilized in the United States. Several polling spaces are situated in regions that have only intermittent service or have lack electricity service. Therefore, Electronic Voting Machine works completely from battery control, rather than just utilizing a battery like a backup.
- Issue of Natural hazards

However, varied climate in the democratic country like India has immense extremes of temperature, and other natural hazards i.e. pollution as well as dust. Hence, the Electronic Voting Machine should be worked with these difficult situations as well as should be stored in facilities that lack climate control for long periods.

- Illiteracy

Though, it was observed that many voters in India are well literate, whereas some are not educated. However, 74.04% is the literacy rate of India as per 2011 census as well as only about 64.60% among females, so conducting uneducated voters should be the rule rather than the exception. Therefore, without written commands, ballots feature graphical party symbols as well as names of candidate as well as the technology are designed to be utilized.

- Issue of Booth Capture

Before the opening of Electronic Voting Machine (EVMs), a major challenge against paper voting was booth capture, wherein party loyalists would take over a polling place by power as well as stuff the vote box. Better policing makes such attacks less of a risk at present, however the Electronic Voting Machine has also been planned to discourage them through minimizing the rate of vote casting to five per minute.

India's confidence and EVMs

It has observed that no foreign countries in the globe have utilized electronic voting at as huge of a scale as our country. India represents as second biggest populous country in the world as well as, by default, the biggest national residents to vote utilizing the Electronic Voting Machine (EVMs). However, from the initial introduction in 1982, it is noticeable that India has taken 22 years to the nationwide exercise of Electronic Voting Machine in 2004 and a main factor for Electronic Voting Machine acceptance in India is the high assurance of the voters in the EMB. In the year 2009, The ECI had widely affirmed their "trust in the infallibility of the Electronic Voting Machines," saying that, "they are completely tamperproof." And that assurance was eroded when, months later, an educational work by international experts as well as Indian demonstrated definite vulnerabilities as well as troubles with utilize of the Electronic Voting Machine of India. The research completed that, "...despite detailed protections, and Electronic Voting Machines in India are weak to major attacks.



Untruthful insiders or extra criminals with physical access to the machinery at any time in front of ballots are calculated can include malicious hardware that can steal votes for the natural life of the machinery. Attackers with physical access among voting as well as counting can illogically modify vote overall as well as be able to learn which candidate every voter elected and the design of Electronic Voting Machines of India relies wholly on the material protection of the machinery as well as the reliability of election insiders.”

Disadvantages of EVM-

- It was observed that Prof. Alex Halderman, computer science department of Michigan University says, “The Electronic Voting Machine utilized in the West require software attacks as they are sophisticated voting equipments as well as their hardware cannot be replaced cheaply. In contrast, the Electronic Voting Machines in India can simply be replaced either in part or as wholesale units.” The Electronic Voting Machine (EVMs) manufacturers can perform fraud not only by using generic microcontroller but they replace mother board also (contains the microcontroller). These manipulations are undetected. The Bharat Electronics Limited and Electronic Corporation of India Limited (EVMs manufacturers) have shared the top undisclosed Electronic Voting Machines software program to copy it onto the microcontrollers utilized in Electronic Voting Machines with two other foreign companies, Microchip(USA) as well as Renesas (Japan) and whereas it can be done in India by manufacturers. Other than this when they handover the microcontroller chip, the code was unreadable by the Indian EVM manufacturers, and this software not even completed accessible with the ECI for some safety reason. With such facts software as well as hardware both are not safe and secure.
- At the time of Counting the Electronic Voting Machine (EVMs) in India can be manipulated using fraud display board by replacing real display in control unit which shows the fraud vote count consequence.
- Unlike the fraud display there is a mechanism which attached straightforwardly to the memory card of EEPROM inside the control unit. In a democratic country like India the counting of votes gets some days after voting therefore insider or criminal can utilize the clip on mechanism to modify the votes documented and recorded in if security is not properly maintained.
- During the time of Election, the Government of India may hire well known company or manufacturer for built-up Electronic Voting Machines as per the require of the political party in power and suddenly, the Electronic Voting Machine (EVM) can be tampered at the manufacturing stage, that too for the duration of the manufacturing of the Chip. It is not easy to discover it through the third party after tampering the Electronic Voting Machine (EVM).
- It has been found that the votes that are cast with the (EVM) are stored in a secure storeroom in the computer device memory and the time break among

election as well as the calculating of votes is a risk to probable manipulation and hacking.

- It has been observed that there are so many questions which comes in electronic and print media that the result of Electronic Voting Machine (EVMs) is not fair in the election of 2014 and also in election of 2017.

IV. CONCLUSION

It cannot be argued that which method i.e. mechanical, or electronic and manual is perfect for conducting the elections and result process in Indian electoral system. It is true that every system has their own merits and unique uses as well as every nation have their different conditions. However, The Electronic Voting Machine (EVM) is used in the electoral system of India have gone by a lengthy drive of development amidst obstacles as well as came out as an useful mechanism of electoral improvement in India more than the years since its beginning. The Electoral Voting Machine (EVM) has improved legitimacy of Indian elections as well as public confidence in front of the world community. The Electronic Voting Machine in India stands as one of the mainly Non-tamperable, credible, as well as transparent mechanism amongst all such equipments utilized in further areas of the globe. However, the Electronic Voting Machine (EVMs) in India has got the concentration of many African and Asian countries and till date, no single could in fact express that Electronic Voting Machine in control of the Election Commission of India as well as utilized by it, can be manipulated or tempered. In contemporary times, the Election Commission of India once again absolutely reconfirms its trust in the non-tamperability of Electronic Voting Machine of Election Commission of India in vision of the technological safety characteristics as well as the strict executive set of rules along with technical preserves which are compulsorily to be followed after as well as during the polls. The Electronic Voting Machine in India is a “national pride” as well as the reality is the elections system in India is broadly globally accepted as the “universal Gold Standard”. The Election Commission of India will start a concerted, complete as well as universally elector education as well as consciousness programme under its flagship SVEEP initiative, to orient, educate and inform the voters of India about usage, working along with merits of the Voter Verifiable Paper Audit Trial machines as well as their vast usefulness in strengthening the credibility, transparency and legitimacy if the voting process. However, The Election Commission of India sincerely seeks the collaboration and cooperation of every crucial stakeholder, mainly political parties, to unite hands in the context of promoting consciousness about the merits of VVPAT machines. The Election Commission of India is assured that the mutual hard works of all stakeholders in the Indian electoral process will guide to permanent developments in the Indian electoral administration as well as construct our structure more informed, participatory, transparent as well as credible. At last, it can be argued that to achieve a protected and transparent voting structure,



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a democratic country like India should reconsider carefully how to implement a strong and secured voting system which is appropriate to safeguard its state values .

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