

Electronic Voting- Indian Experience

Presentation

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E-Voting in Indian Electoral processes

- Idea of EVM mooted in 1977
- E-voting to save avoidable and recurring expenditure on *printing, storage, transportation and security* of Ballot papers.
- From 1992 to 1998, awareness about EVMs created through demonstrations and mass media campaigns
- Since, November 1998, EVMs have been used in every general/bye elections
- General Elections for Parliament in 2004 and 2009 were conducted exclusively on EVMs
- Technically controlled by technical evaluation committee(TEC) of Best Technical Brains in The Country
- Manufactured only by Government Owned Public Sector(ECIL,BEL)

Versions of EVMs

- 1989-90
 - Amendments in Law
 - Development of Machine and identification of Processes
- Pre-2006(2000 – 2004)
 - 1 Ballot Unit & 1 Control Unit machines
 - Microprocessor Controlled and Strong memory
- Post-2006 (2007-2009)
 - date and time, stamping of all keys pressed and dynamic key coding
- EVM Upgraded post 2006 (Under Development)
 - Private Key Infrastructure and Digital Signature
 - Open source code
 - Self destruction in case opening of the EVM

EVM – Technology Features

- Masked/OTP microprocessor - Software code can neither be retrieved nor altered.
- Software developed in-house by Govt. Agencies
- No operating system
- Stand alone machine
- No input possible from any source except ballot unit
- Double redundant resilient memory storage for securely retaining data without a backup battery

EVM – Operational Features

- Custom made to fit into procedure of balloting
- Each EVM can cater to a maximum of 64 candidates with 4 Ballot Units cascaded
- Once the close button is pressed, the poll is closed and no more balloting can take place
- After a voter casts his/her vote, the machine goes dead till the presiding officer enables the ballot unit again by pressing a button to allow the next voter to vote

Security at Manufacturing Level

- Separate hardware and software groups & audit
- Secured access control
- Micro chips programmed outside India with non disclosure agreements
- Microchip one time programmed
- Self diagnostic tool, a unique number programmed and encrypted on the chip

Judicial Validation of EVM

- Complete legal framework
- Endorsements by various higher courts

Confidence Building Measures -1

- Secure storage in strong rooms with Single Entry, without windows & double Locks.
- Awareness among voters and political parties – continuous Program.
- First level check of each EVM before election.
- Two Levels of Randomization Done
- Candidates are allowed to check EVMs at the time of candidate set before the election
- Actual sequence of candidates on the ballot paper is known only 14 days before the poll
- Mock Poll, Sequential prints done before the poll



Confidence Building Measures -2

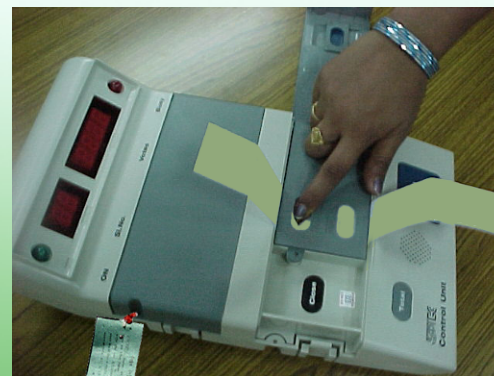
EVM Tracking

- Information about 1.5 million EVMs is in a centralized database
- Software to track all EVM movements
- Software to randomize EVMs twice – Once for Assembly Constituencies and then for polling stations
- ID Information of EVM used in polling booths maintained in the history table
- Status of each EVM checked on-line – working order, repair, petition pending or not etc.

Confidence Building Measures-3

Counting & Results

- Seals are checked when EVMs are brought to counting table
- To begin counting seal over RESULT Button is pierced and Button is pressed
- The machine first displays the total number of votes cast, and then the votes by each candidate one by one
- The result is noted by all concerned and announced
- All operation in presence of candidates/agents



Confidence Building Measures-4

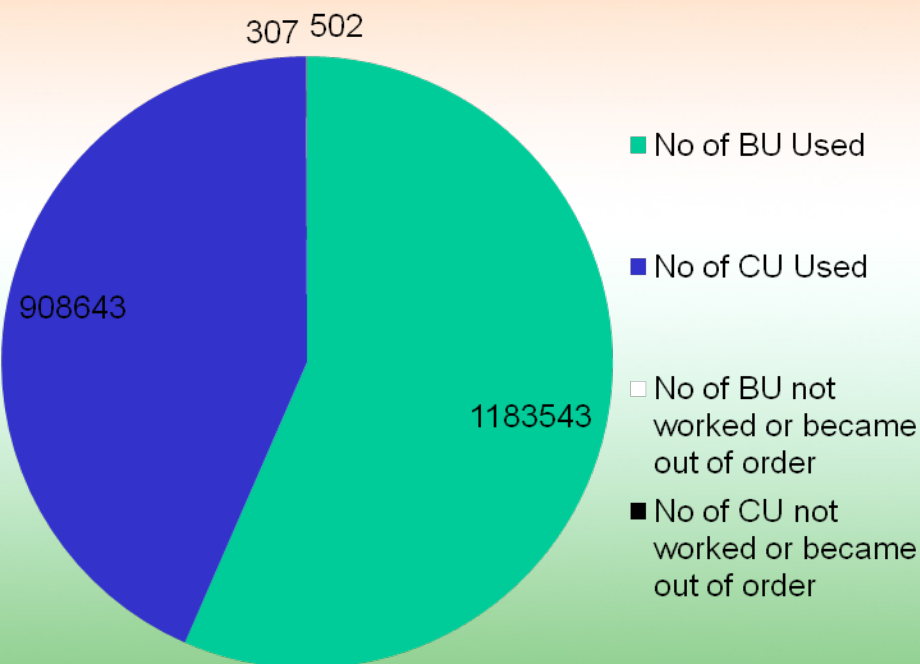
Advantages of EVM

- Modernizes the election process
- User friendly – can be used even by illiterates
- Simple to operate and can be installed in a short time
- Preserves voting secrecy
- No scope for invalid votes
- Facilitates quick and accurate counting – possible to declare results instantaneously
- Re-usable by simply erasing votes recorded in earlier poll
- Trust generated among citizens

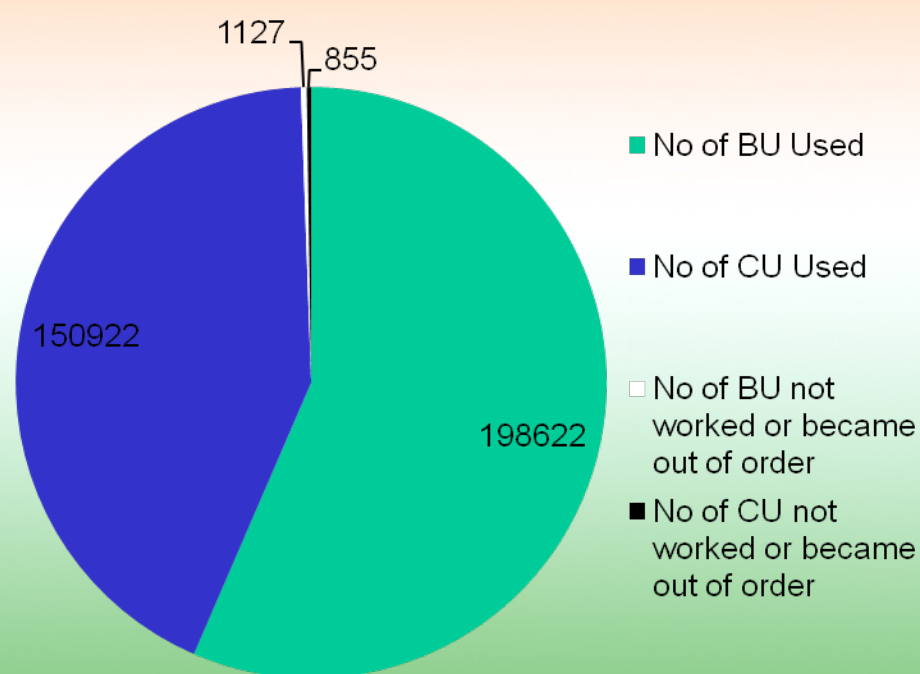
Confidence Building Measures-5

- Around 1.5 million EVM machines in Parliament General Elections 2009 polls,
- Low malfunction rate (0.1%)

General Election to Parliament, 2009



General Election to UP Province, 2012



Confidence Building Measures-6

VVPAT

- Voter Verifiable Paper Audit Trail System(VVPAT) unit works with EVM for paper verification trail designed to allow voters to verify that their vote was cast correctly to the candidate of his choice.
- Voter cannot take the printout home.
- In case of a dispute the votes can be tallied electronically as well as by paper count
- VVPAT checked in First Level Check.
- The print on the slip to last for about 7 years.
- Use of secured paper with security features such as water mark

Confidence Building Measures -7

Recent Experience

- Recently VVPATs were used in a bye Election in Nagaland on 04-Sep-2013
- Total no. of Polling Station -21 and voter-12074.
- Total Votes polled-8459 i.e. 70.1 %
- Counting of votes was taken on 07-Sep-2013.
- All the paper slips matched with Electronic Counting.
- Total 42 VVPAT i.e. 2 in each polling stations were used.

Some Concerns and Remedies in EVM

Concerns	Remedies
Can the data be tampered with ?	<ol style="list-style-type: none"><li data-bbox="981 442 1767 649">1. It incorporates a microprocessor that has 'burnt-in' software code which cannot be altered or retrieved<li data-bbox="981 664 1497 714">2. No operating system<li data-bbox="981 721 1371 771">3. No Networking
How does the machine operate in remote areas without electric power ?	It is independent of mains power and operates on a special power pack (7.5 volts battery)
Can the data be stored long enough to be used as evidence in a court of law in case of electoral disputes ?	All the data is recorded on non-volatile dual redundant memory chips and can be retained for years even when the power pack is removed

Security Auditing of IT Applications

- **1. Application subjected to Security audit by ECI through third identified by NIC**
- **2. NIC data centre provide space for hosting ECI applications**
- **4. NIC undertakes second security audit. Provides security audit certificate to ECI.**
- **5. Applications allowed hosting for public usage.**

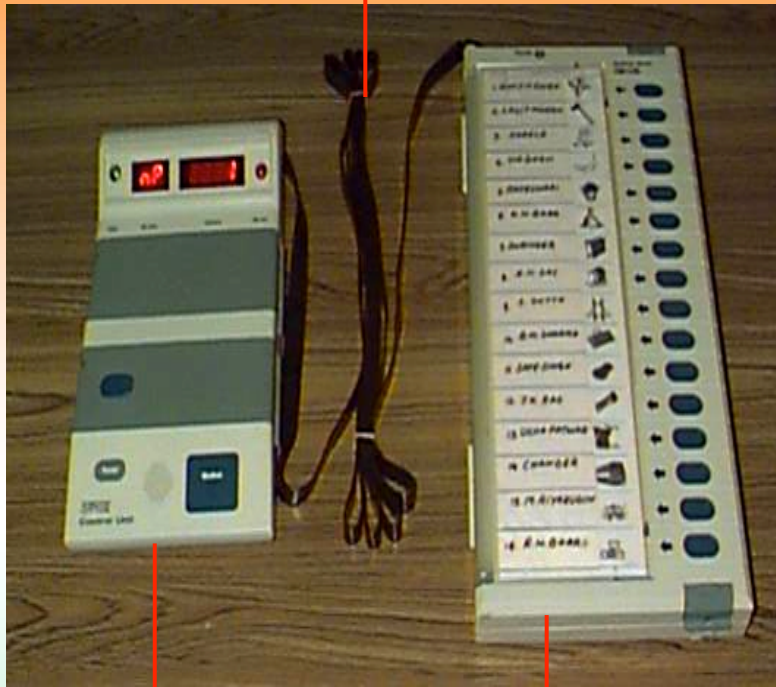
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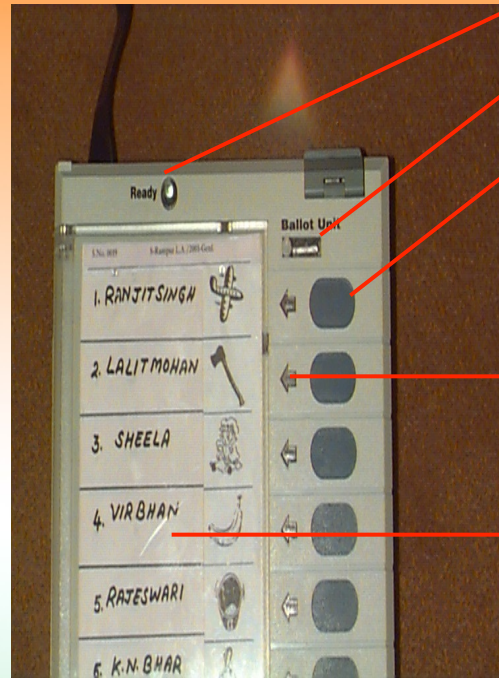
<http://www.eci.gov.in>
Email: nasimzaidi@eci.gov.in

Sub-Units of EVM

Interconnecting Cable



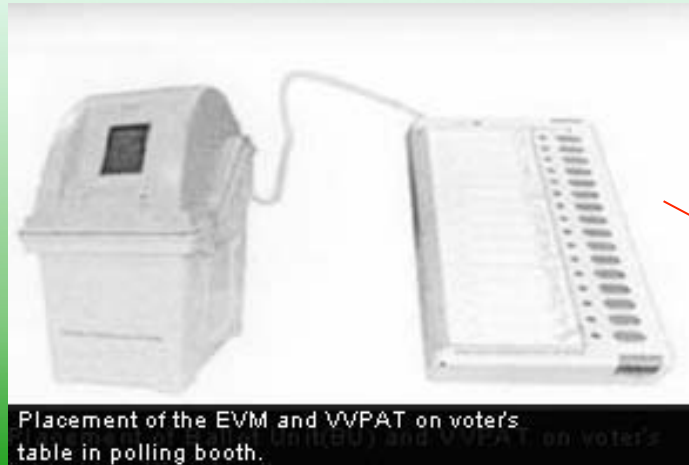
Control Unit Ballot Unit



Ready Lamp
Slide Switch Window
Candidate's Button

Candidate's Lamp

Ballot Paper Screen



VVPAT System

Placement of the EVM and VVPAT on voter's table in polling booth.