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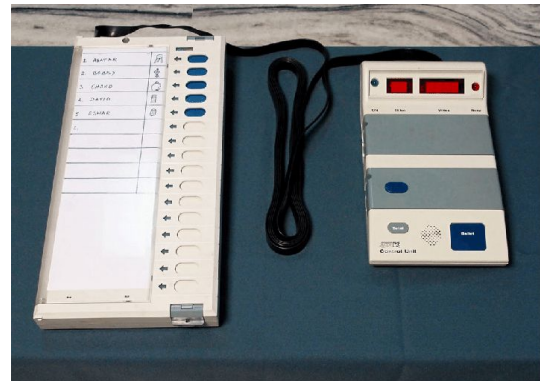
EVM Controversy: An Opportunity lost for the EC

As the 2019 Lok Sabha elections come to a close, it has been reported that a physical count of 20,625 VVPAT machines done by the Election Commission of India (ECI) showed that there wasn't a single mismatch between the EVM and VVPAT slip count. However, not too long ago, there was an outcry raised by several parties across the country demanding a manual counting of at least 50% VVPAT slips, claiming that EVMs are being tampered with. While it is worth examining the legitimacy of these claims, a relook at how the EC handled this situation is warranted for.

History of EVMs in India

Electronic Voting Machines (EVM) were first introduced in 1982 by-election, to the North Paravur constituency in Kerala. In 1988, the Representation of People's Act, 1951

(Section 61A) was amended validating the use of EVMs. The EC then decided to use only EVMs from 2004.



Ballot Unit (left) and Control Unit (right) joined by a five-meter cable¹

The EVMs are jointly designed by Bharat Electronics Limited (BEL), Bangalore and Electronics Corporation of India Limited (ECIL), Hyderabad. An EVM consists of a Ballot Unit which is used by the voter to cast their vote, and a Control Unit, which stores,

¹ Maximilian Herstatt and Cornelius Herstatt, India's EVMs: Social construction of a frugal innovation

calculates and displays the total voter counts.

One of the main purposes of introducing EVMs was to prevent the large-scale organised booth capturing observed at the time. The machines were designed to prevent fraud by limiting the number of votes polled to five per minute.

Introduction of VVPATs

The voter-verified paper audit trail (VVPAT) system was introduced following the recommendations of a committee headed by P. V. Indiresan, to ensure voters could verify the vote they cast, and also create a paper trail that could be used to crosscheck data stored in the EVM. The system was piloted in 8 parliamentary constituencies in the 2014 general elections. In the 2019 parliamentary elections, VVPAT-fitted EVMs were used in all 543 constituencies.

Are EVMs “tamperable”?

A paper was published in 2010 co-authored by Hyderabad-based technologist Hari Prasad and J.

Alex Halderman, Professor of Computer Science at the University of Michigan, after gaining access to an EVM through an anonymous source. They exposed flaws in the technology and demonstrated theoretical and live hacks.²

Later, the EC held an “EVM Challenge” in 2017, similar to one conducted in 2009, and offered the opportunity to political parties to demonstrate that EVMs could be tampered with.³ While no one had been able to demonstrate a live hack at the 2009 challenge, the one conducted in 2017 ended up becoming a futile exercise with most political parties either not accepting the challenge, or refraining from turning up to the event.

The EC also introduced its third generation EVMs in 2018, with more robust technical safeguards. Its tamper detection feature which makes the EVM inoperative the

² J. Alex Halderman et al, Security Analysis of India's Voting Machines, <https://jhalderm.com/pub/papers/evm-ccs10.pdf>

³ PIB, EVM Challenge by EC, <http://pib.nic.in/newsite/printrelease.aspx?relid=161986>

moment anyone tries to open the machine, prevents access to its internal components, while its encryption technology would prevent memory manipulation.

The EC seems to be responding well to changing technologies as time progresses by strengthening the technical safeguards of EVMs. It must continue to do so in the future, and allow timely feedback from experts and researchers towards the same.

Also, with the introduction of VVPATs, there now exists a system which allows the EC to conduct audits that could verify the validity of EVMs and detect fraud, if any.

Better audit mechanisms

VVPAT-based audits are the final safeguards to detect any tampering of the machines, which makes it all the more important to conduct them in a satisfactory manner. The key to a proper audit lies in choosing an adequate sample picked randomly. The sample size for manual counting of VVPATs, previously prescribed at 1 EVM per

assembly constituency was later increased to 5 per constituency on Supreme Court orders after 21 opposition parties filed a writ petition.

A report authored by K. Ashok Vardhan Shetty dismisses the EC's prescribed sample size and proposes a more statistically acceptable and administratively viable audit plan.⁴ Also, Risk-limiting Audits (RLAs) proposed by Lindeman and Stark⁵ are well known across the world, to be the most advanced and efficient way of conducting audits.

Apart from not choosing a scientifically deduced sample size, the EC has also been criticized for not specifying guidelines in the event of a mismatch in EVM and VVPAT count. It is not made clear as to what 'population' of VVPAT

⁴ K. Ashok Vardhan Shetty, Winning voter confidence: Fixing India's Faulty VVPAT-based Audit of EVMs, <https://www.thehinducentre.com/publications/policy-watch/article25632039.ece/BINARY/Policy%20Watch%20No.7.pdf>

⁵ Mark Lindeman and Philip B. Stark, A Gentle Introduction to Risk-Limiting Audits, <https://www.stat.berkeley.edu/~stark/Preprints/gentle12.pdf>

slips would be recounted in such an event - would it be all 100% of the remaining VVPAT slips, or just those in the neighbouring constituencies?

Lessons from other countries

While the EVMs manufactured in India are reasonably well equipped with technical safeguards, it is worth looking into why most other countries refused to adopt electronic voting as part of their elections.

There are currently only four countries in the world which use some form of electronic voting nationwide, including India - the rest being Estonia (the only country in the world to adopt nationwide internet voting), Brazil, and Argentina. Several countries have piloted and later discontinued the use of EVMs or online voting.

A closer look at the Netherlands, for example, reveals that there was significant pressure from civil society activists who organised effective advocacy campaigns against electronic voting, with

slogans reading “We don’t trust voting computers”. Authorities on several occasions ignored signs of problems with the voting machines and the absence of a strong regulatory framework resulted in the failure of suppliers updating technology to meet the highest security standards.

While it is alarming to encounter the most technologically advanced nations rejecting the use of electronic voting, it’s important to keep in mind the context as well as the alternatives. EVMs were introduced in India to tackle the rampant issue of booth-capturing. This was a failure of our administrative safeguards.

Regaining trust in institutions

We must remind ourselves that no institution is fool-proof, and what keeps systems running - be it EVMs or paper ballots, is the presence of checks and balances and a level of transparency and accountability that can gain the trust of citizens. The Netherlands was unable to gain the trust of its citizens, who preferred ballot paper

voting over voting machines, hence they reverted - in true democratic spirit.

In that vein, EC dismissing requests from the opposition parties to increase audits calling it “not feasible”, and SC labelling the demand to recount all VVPAT slips in case of a single EVM mismatch a “nuisance plea” is certainly not in their best interests, and only creates distrust amongst voters irrespective of an occurrence of tampering and regardless of whether all safeguards were in place.

The EC could have easily taken this opportunity to regain the citizens’ trust by performing a manual count of as many VVPAT slips as it could - delay of a couple of days in declaring the results of an election held over a month shouldn’t have been an issue. With rising concerns over government interference in the matters of independent institutions in the country, this quarrel was without a doubt, an opportunity lost for the EC. •

- Gayathri Meka