This is a ready reckoner thread for those interested in facts.

The hackability of EVM's has been a longstanding issue and questions have been raised ever since the first time the trial runs began in 1987. However various governments continued with trials claiming that it would stop looting of booths.

I will first talk about the various technical loopholes and then go on to explain how introduction of EVM's didn't stop boot loot but has a severe environmental side effect.

The basic misconception that people have is that EVM's use microprocessors which are not rewritable. This is also the basic argument which the ECI and BEL use. A non-writable microchip is simple microchip in which the writing pin is programmatically or physically disabled.

There are several ways in which a non-writable microchip can also be written over. However, an easier way to hack a EVM is by manipulating the input rather than the program itself. The input comes from BU to CU via cables which can be easily manipulated. 5/n

A micro size chip on the wire can manipulate the input to get the desired output. Thus, without even touching the BU or the CU, the results can be altered. The manipulation of wires is an aspect which most of the time is ignored.

Another interesting aspect is that neither the election commission nor the BEL actually know what the code inside the microchip is. They do a white box testing for expected results and not a thorough black box testing. 7/n

The fact that BEL and ECI don't actually know the code written inside microchip came to the light in reply to an RTI filed by a gentleman called Omesh Saigal. Saigal's research later laid ground for a book by on the issue of EVM hackability.

The book called 'Democracy at risk' launched by Senior BJP leader LK Advani after the 2009 loss of the BJP led NDA to the Congress led UPA give details about various instances and methods pertaining to hackability of EVM's.

Another argument against the hackability of EVM's is that it is not connected to the internet or other wireless network. However, the ECI has never explained why it doesn't allow phones inside polling booths if the devices are blind to all kinds of networks.

Another interesting fact is that the microprocessors are not burnt in India. Till very recently they were sent overseas for being programmed and then assembled in Bangalore unit of BEL by private contractors. No BEL is planning to build at capacity in house.

Interestingly, most advanced Western Nations, including the highly technology dependent ones, like Israel and Japan use ballots and not EVM's. Some like Germany, shifted to EVM's and then switched back to ballots.

EVM's where manufactured in 3 batches called generations. Each has increased security features but same basic program. The EVM which was hacked by Alex Heldermann and VV Rao in 2009 live on TV was a generation 2.

The fact that EVM's can be hacked was established in the Supreme Court of India. Hearing a petition filed by VV Rao the SC ordered in 2013 that all EVM's be fitted with VVPAT's.

Another argument that people have used against vulnerability of EVM's is that it is hard to manipulate machines at such a large scale. How many machines does one have to manipulate in order to rig an assembly election? Let's do some basic math.

The mean of electoral win/loss margin in an assembly election is 5000 votes. Each EVM's can hold up to 3000 votes however the number of voters in a booth is generally around 1200. Let's say 50% of these i.e., 600 are manipulated to go in favor of a certain party.

Thus, to manipulate 5000 votes, one would have to manipulate a maximum of 9 machines. Also remember that each vote added to someone is also one vote deducted from someone. So, by manipulating 5 machines for 50% votes, the result can be completely altered.

Assembly constituencies these days have anywhere between 150 to 200 booths. Each booth has one machine. Let's take an average of 180 booths per constituency. By manipulating 5 of these 180 the result will be completely different from what it could have been.

Basic math shows that by above statistics, manipulating less than 3% of the EVM's can actually change the entire outcome of an election. One doesn't have to rig 100% of the EVM's to win. One doesn't have to be entirely distracted to lose. 3% distraction is good enough.

So, a 50% manipulation at 3% of the booths. That is all it takes to subvert Democracy.

Coming back to VVPAT. They were supposed to be verifiable slips. That is what the acronym stands for. However, the EC's unease in checking VVPAT's raises many questions. EC has repeatedly refused to check VVPAT results.

Coming to the environment aspect - some have argued that EVM's help in saving paper. However, they discount the fact that paper is really recyclable and reusable. After VVPAT, paper is being used in EVM's too. Not making them any better than ballot in paper usage.

Another facet which is ignore is the ridiculously low standard of e-recycling in India. EVM's become unusable after some time. Nobody knows how they are disposed. They were found at a kabad shop in Andhra during one raid.

Lastly, the most interesting part – maintenance. EVM's are supposed to be maintained by ECIL. However, ECIL hires private individuals to do the task. Who are the private individuals? Mostly your nextdoor TV and cable repair mechanic.