



TECHNOLOGY-BASED PAPER BALLOT POLLING SYSTEM ADDRESSING THE WEAKNESSES OF EVM IN INDIA

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Abstract : The election is an important matter; all the responsibilities of social development depend on its result. It can be accomplished through several voting methods. With the times, the paper ballot system was replaced by the EVM. This EVM system is no longer reliable in the modern world. The present work provides extensive details on a novel approach using the Technology-Based Paper Ballot electoral process. Regarding this method, various confusions among people have been mentioned and resolved through proper reasoning and explanation. It has also been acknowledged that this approach may become less effective as time passes.

IndexTerms - Door-to-door vote collection, voter verification by machine, ballot polling, public monitoring polled ballots' movement, ballot verification and counting by machine.

I. Introduction

An appropriate democratic society can only be established through an effective voting mechanism. It is now essential to find eligible voters with the goal of strengthening this democracy's infrastructure. Sukumar Sen, [1] India's first Chief Election Commissioner, provides a thorough explanation about acquiring the right to adult suffrage. In this regard, the best summary of the arguments made by philosophical theorists can be found in James Bryce's [2] following observation.

“Every man is the best judge of his own interest, and therefore, best knows what sort of government and what laws will promote that interest.

Two men are presumably better able than one to judge what is for the common good. Three men are wiser still, and so on

Individual men may have selfish aims, possibly injurious to the community, but these will be restrained by the other members of the community whose personal aims will be different”

Following the identification of eligible voters, a certain voting process must be implemented in order to finish it. Voting can be done in a number of ways, including by show of hands, casting a ballot, Electronic Voting Machines (EVM), etc. However, there are particular limitations of the procedures. Voters' privacy cannot remain secret, and even there arise problems with the show of hands voting system for large numbers of people, though it makes to satisfy voters. The issues with the show of hands system are rectified by the ballot casting mechanism. S. A. Akhtar [3] studied the Indian electoral system's history. According to the author, in the Lok Sabha elections of 1952 and 1957, each candidate was allocated an individual ballot box displaying their symbol and voters were required to insert a pre-printed ballot paper that did not contain any candidate code into the ballot box of the candidate they preferred. Due to some tampering and manipulation, the system was updated by marking all candidates with symbols on ballot papers from 1960-61 and was continued up to the 1999 Lok Sabha elections. R. Ramesh [4] pointed out that the Indian electoral system experienced no significant negative impact until the 1967 general election. The general election of 1971 revealed a distortion that has continued to grow in subsequent elections. To prevent unconstitutional voting, the Chief Election Commissioner (1990-1996) T. N. Seshan established the Electoral Photo Identity Card (EPIC) in 1993. Nevertheless, a situation arose where the ballot casting process was unable to stop obstructing vote polling, voting by other voters, adding extra ballots, and vote-counting deception. The inclusion of extra ballots and counting fraud, such as when a vote for A counts as a B vote, can now be corrected by the EVM technology. A Voter-Verified Paper Audit Trail (VVPAT) [5] has been used with an EVM to make elections more transparent and verifiable

since 2012. Even though the VVPAT was added to the EVM as well, the technology is becoming less trustworthy as times change.

S. Kumar et al. [6] commented that the current voting system has numerous security holes, and it is difficult to prove even basic security features regarding it. The authors also felt that there is no way for the electronic voting system to verify whether a voter is genuine or to secure the voting machine from miscreants. The electronic voting systems of several nations, especially Brazil and India, were studied by C. Avgerou et al. [7]. Concerning the lack of regard for voter confidence, they commented that especially fragile democracies are embracing electronic voting. D. A. Kumar et al. [8] suggested that many issues could be resolved by integrating biometric technology into the EVM system. The Honorable Supreme Court of India's judges, Justice S. Khanna and Justice D. Datta [9], reviewed a number of objections against EVM that are available in their judgment dated April 26, 2024. Although the lawmakers did not ignore the critiques of the EVM system, they did not forbid it since there was insufficient proof.

Just as viruses enter the human body when it is weak, devastating it and leading to death in large numbers, similarly, some antisocial individuals infiltrate the social infrastructure through the weaknesses of the voting system and create a toxic environment by shattering the rules and principles of that system. Therefore, the procedure for sensitive matters like elections, in which the interests of the entire nation are intimately involved, must be flawless. This paper discusses a Technology-Based Paper Ballot electoral procedure that overcomes the limitations of EVM and restores public trust.

II. Demerits of EVM for vote polling and counting

Some significant negative issues of the Indian electoral process using EVMs are mentioned below.

1. Election tampering, such as when someone votes more than 50 or 100 times, cannot be prevented by EVM, including VVPAT, because they are unable to identify voters. Furthermore, these are unable to prevent polling obstruction.
2. To reassure attendees, the Election Commission of India inspects voting devices and works to make improvements. They do not check the individuals involved in completing the election. The workers engaged in the election may bear the biggest guilt and destroy the evidence. This is where the system is most vulnerable.
3. Voters are not satisfied after polling their vote. Though the EVM displays a light, VVPAT gives a slip for the candidate who received the vote, the voter is unsure if it will add another contender. The voter is also unsure if the EVM utilized for the polling will be counted. You claim that the EVM can't be changed because of the numerous security, political agents and several signatures. However, EVM and VVPAT slip may be readily replaced or re-pollled with the help of strong room guards, the corresponding presiding/other officer and agents (humans can be swayed by threats or offers) or by forging some signatures and the outcome will be altered. When EVM remains in strong room for a long time, it becomes easy.
4. Suppose someone says that he/she surveyed the vote for candidate X (say) and EVM showed the light in favour of another candidate Y. Everyone knows that it is impossible, but the Election Commissioner is unable to provide evidence to support it.
5. Political leaders can understand election result booth as well as part wise of any region which may caused to '*post poll violence*'.
6. If poll workers do not want to settle with corruption, they are not safe.
7. EVM can't publish result directly and manipulation is possible by manual result publication.

III. Technology-Based Paper Ballot polling system

3.1 Highlights

1. Votes will be gathered door-to-door except for remote areas. This will stop impediments to vote polling and election-related fatalities.
2. The voters will be verified by a machine. Polling agents are not required and voters do not need to hold ink.
3. Voting is to be done by ballot so that only the details of the candidate who gets the vote will be printed. Voter can see the polled ballot for a few seconds and then it will be stored. No need for a large sized ballot containing all candidates. Voters will be strongly satisfied with their poll.
4. After submission of the voting machine, all activities till completion of counting shall be visible to the public by some video link.
5. A machine will verify, count the ballots and display the result. Fewer counting staffs are required and there is no need for counting agents.
6. All eligible voters have to poll.
7. Very little security is needed.

3.2 Preparations

The Central Election Commission selects a secret person as the Center Officer who oversees the polling and counting process for each election center (Lok Sabha or Assembly; in the case of a municipality or panchayat, the assembly is regarded as a center). We need to prepare the following first.

3.2.1 Voter identification

Only 7–10 days before the election, poll workers go door-to-door to gather voters' current short videos, photos, voter ID numbers, Aadhaar numbers and mobile numbers. They also tell voters when the voting machine is expected to arrive, provide them with their serial number, list of candidates, all the video links related to their booth's/part's ballot, and the email address of the police station. Additionally, they advise that the voter must remain at home; if not, they must provide detailed information on emergency scenarios. The Central Election Commission receives voters' information electrically; no intermediary may retrieve it, and the voter list is produced automatically. Emigrants (with documentation) get in touch with the election commission for online voting. The government website may provide all part/booth wise voter lists for each center prior to the election day. If any residents are not listed or are listed illegally, poll workers and the appropriate official should face disciplinary action. This enables the removal of voters who have passed away and the identification of individuals who are unlawful or on multiple lists.

3.2.2 Preparation of ballot

The new, un-pollled ballots are kept together on a paper roller. The size of the ballot should be around $6 \times 11.5 \text{ cm}^2$. A cutting line separates the areas $6 \times 9.5 \text{ cm}^2$ for storage at the top and $6 \times 2 \text{ cm}^2$ for voter's copy at the bottom. Six or seven distinct light colors should be used to multi-color the ballot, and each color should be positioned indiscriminately such that there is no particular arrangement for each color (see Figure 1). The ballots may appear identical to the human eye, but it is very difficult to find the same ballot among ten thousand.

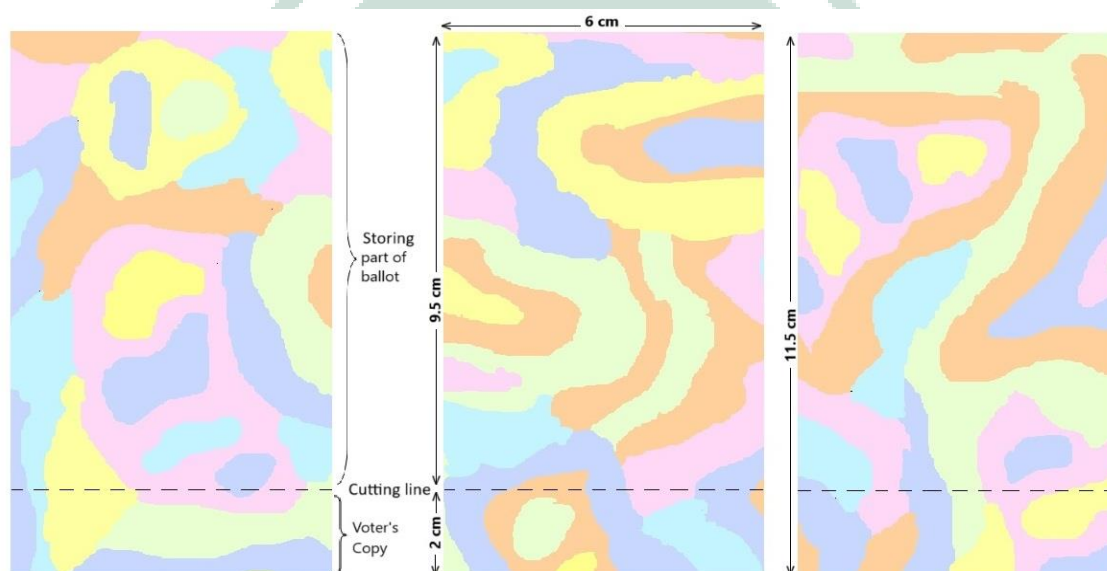


Figure 1: Structure of ballot with variations.

3.2.3 Preparation of voting machine

The voting machine contains a keyboard (just numerical numbers, confirm and back keys), a display screen, a green light signal beside the display screen to permit polling, a fingerprint input area, a small printer machine, two blades to separate countable part of the ballot and the voter's copy, a polled ballot visiting place, a scanner, three buttons for choosing ballot storing box, a green light signal to allow the next voter on the front wall. The display screen and ballot visiting area are protected by glass. However, only the fingerprint input area is accessible to touch the ballot and is shuttered later. The machine's body is separated into two halves. Three separate trays for storing polled ballots are positioned beneath the ballot visiting place and the other half houses the batteries, device, and fresh ballots roller. Each machine has a unique hexadecimal number that consists of the date, production center code, and device ID. The machine must be in-built. From the middle of the machine's bottom edge to the rear, a camera is connected by a length-changeable handle. If the camera is not attached, the machine cannot be opened and the camera begins operating as soon as the machine opens.

3.2.4 Preparation of counting machine

A ballot counting machine resembles to a cash counting machine. A huge machine has multiple boxes with a 20 counting device in two rows, each carrying 10. The center officer controls the devices. A data cable connecting device to receive the data from the voting machine and a gate to enter the bundles of ballots and to remove counted bundles from each box are located at the backside. The machine does not count ballots if the gate is open. The front is entirely closed except for a small glass-covered area, allowing only the candidate's information (no personal details of the voters) on the ballots in each

box to be seen. The devices randomly choose a bundle of ballots, confirm the ballots, count instantly and the combined results come out on the display screen.

3.2.5 Pre-polling work

Preparing a fresh ballot roller, the center officer inserts an appropriate quantity into each voting machine, marks the election center, booth, and part number, installs the ballot printing format and voter information (for voter verification) on the voting machine's device and seals it with a melt seal or M-seal having a secret code. The closest police station is thereafter to receive the voting machine. Every poll worker needs to have a registration. The voting machine, an area map with voter serial numbers and the precise voter list (which excludes emigrating individuals and poll workers who have polled online) are given to the presiding officer and team one day before election day.

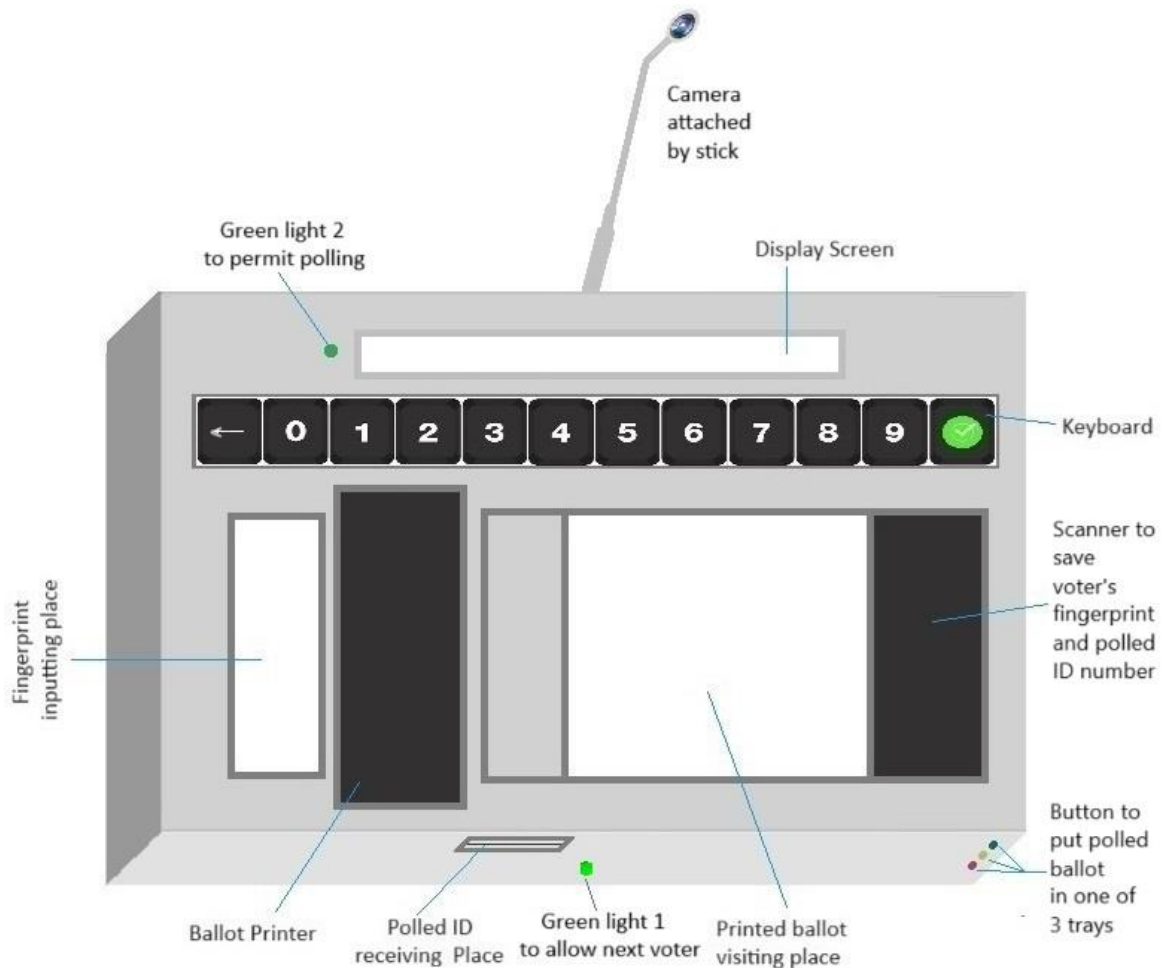


Figure 2: Voting Machine

3.3 Vote polling process

The team of the presiding officer arrives at the voter's home along with a voting machine which is supported by a portable table or small trolley. A non-movable pitch board or thermocol covers the left, right and back sides as well as a part of the top of the voting machine to ensure that no one else can see the voter's polling. If the camera is not positioned to cover the entire voter's body, except for the knee to chest, poll workers will be disciplined. The poll worker places the voting machine adjacent to a wall (may be in a room) so that only one person can stand in front of it and no one else can follow from another floor (this is their decision and voters are requested not to interfere).

The voting machine's green light 1 now permits polling and members of the house come one by one to poll. No one else, not even a close family, may be within 10 ft or 3.5 m of the machine maintain the voter. As soon as the voter enters his/her serial number, the green light 1 turns off and his/her name appears on the display screen (the poll worker may assist and then leave). The system then uses the camera to verify the voter and the green light 2 indicates that the voter is authentic. "Input fingerprint" comes on the display screen immediately. The shutter of "Fingerprint inputting place" is opened and the voter inputs his/her fingerprints on the ballot using any finger on their left or right hand, as well as a personal or given ink pad. The shutter closes off and the display screen shows "Poll your vote" and voter polls the vote using the "numerical number key" that corresponds to the serial number of the selected candidate. "You polled for xxx (candidate's serial number), xxx (candidate's name), xxx (party name)" is displayed on the screen. The voter utilizes the "back key" to enter the correct number again if he/she makes any mistakes otherwise confirms using the "confirm key". Then the 'display screen' displays

the message "Put two-digit number (optional)". After entering a two-digit number, the voter presses the "confirm key"; if they don't, the system selects a random number after five seconds. The ballot moves into the "visible place" as soon as the printer begins printing it. After five seconds of seeing the printed ballot, a blade cuts it along the cutting line and the scanner scans the 2.5 cm section from the top of the ballot that contains the voter's fingerprint, poll ID, and voting machine ID number. "Choose a button" appears on the display screen. By pressing a button, the voter saves the scanned file in the appropriate folder (of the three) with the name's first letter, which is either a, b, or c (indicating tray), and the next six digits are derived from the poll ID's final six digits. Otherwise, the ballot is stored at random. The folder cannot be opened again within 24 hours after it has been opened once. After receiving the poll ID, the voter completes the poll. The voter's thumb is finally placed on the voter's name (in the voter list) on the designated tab that is connected to the center officer by the presiding officer. Thus, the polling rate is automatically determined.

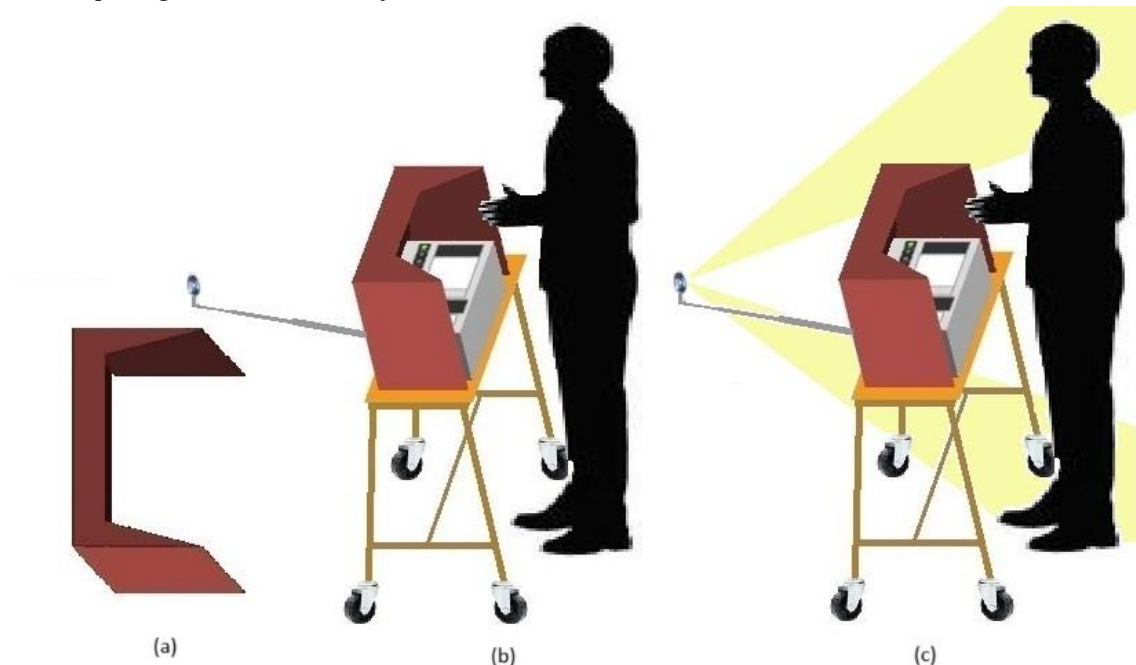


Figure 3: (a) Voting machine cover, (b) Vote polling by Voter (c) Highlighted camera capturing portion of Voter

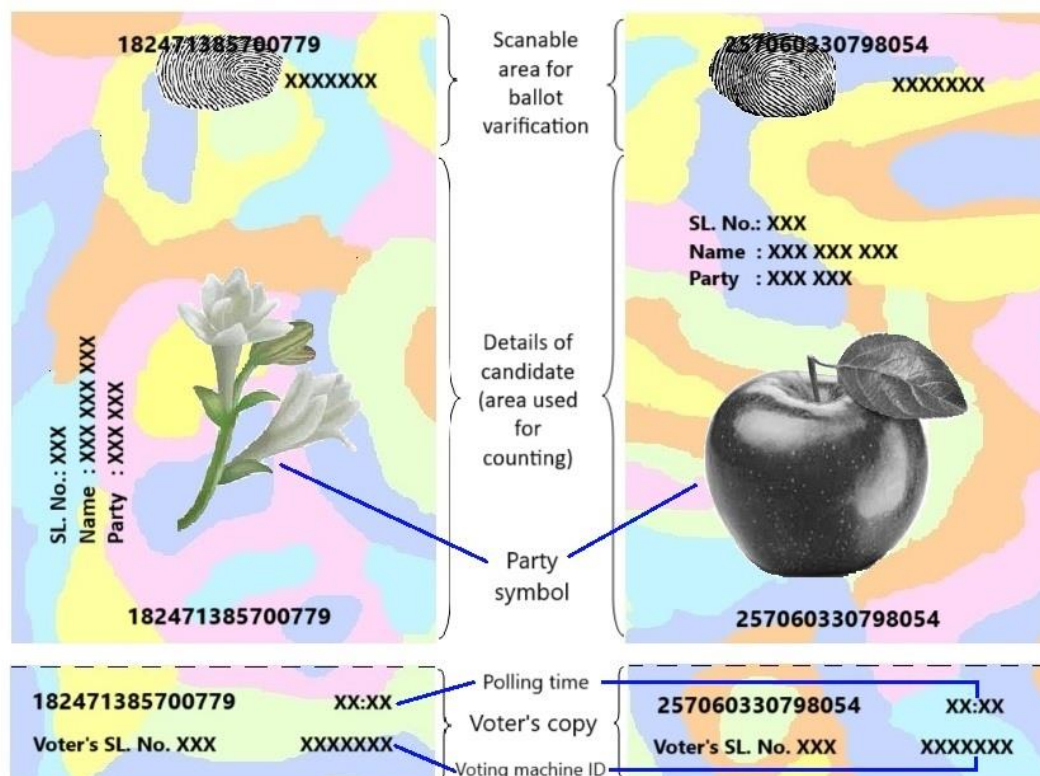


Figure 4: Ballot after polling

The following rule is now used to calculate poll ID.

poll ID = election center code – four digits from the fractional part of

$\sqrt{\text{part number as integer and booth number as fractional}}$ –six digits from the fractional part of

$(\sqrt{1. \text{ASCII code of 1st 3 letters of voter's short name} + \sqrt{\text{time number}}})$,

where time number = hour as integer and minute, second as successive numbers in fractions of polling time. The notation “–” separates the numerals; it does not indicate subtraction.

Suppose the detail of a voter's polling information is as follows.

Name/ Short name	ASCII code of 1st 3 letters of short name	Election center code	Booth /Part	Vote polling time	Personal number
Manna Dey/MD	7768	182	165/2	2:32:27 PM	79

Here $\sqrt{\text{part number as integer and booth number as fractional}} = \sqrt{2.165} = 1.4713939$,

time number = 2.3227,

$\sqrt{1. \text{ASCII code of 1st 3 letters of voter's short name} + \sqrt{\text{time number}}}$

$= \sqrt{1.7768} + \sqrt{2.3227}$

$= 1.33296661 + 1.52404068 = 2.85700729$.

Therefore, Manna Dey's poll ID is **182471385700779**.

Similarly, from the following polling data

Name/ Short name	ASCII code of 1st 3 letters of short name	Election center code	Booth /Part	Vote polling time	Personal number
Chandrasekhara Venkata Raman/ CVR	678682	257	245/4	9:07:42 AM	54

the poll ID is **257060330798054**.

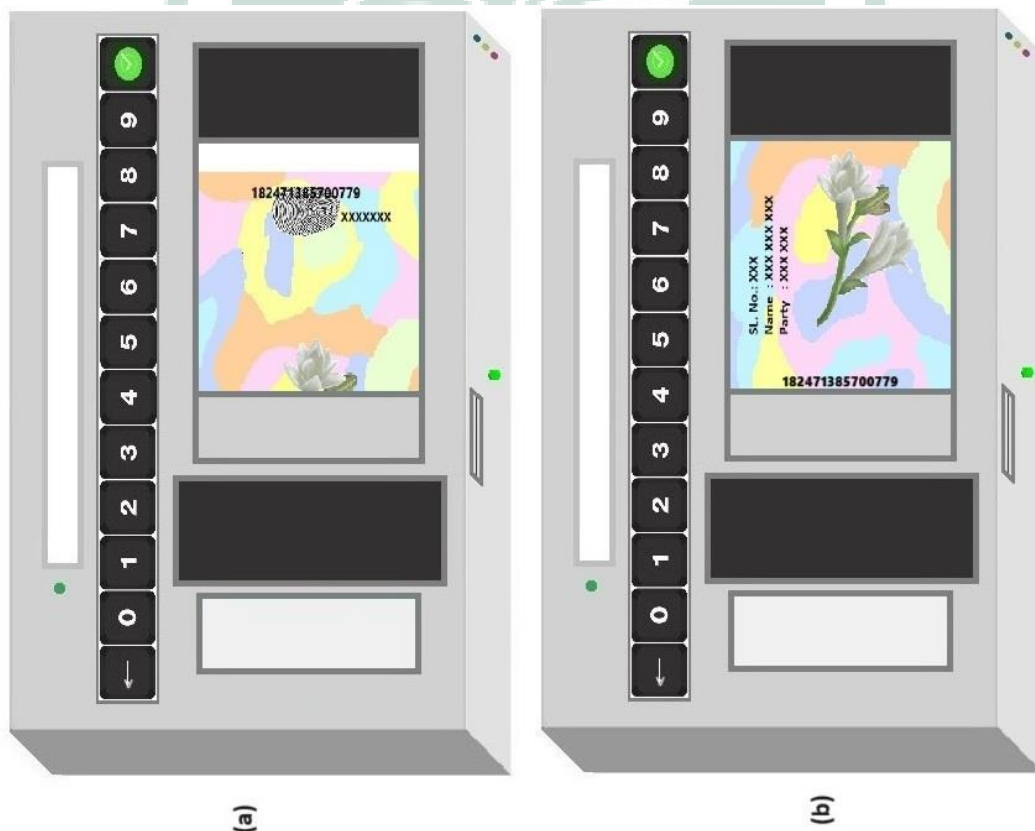


Figure 5: (a) Ballot is printing and moving forward, (b) Polled ballot visible by voter

If the poll ID matches another one, the device successfully introduces another digit at last, like 1, 2, 3, ... in succession. For example, 257060330798054 successively become 2570603307980541 for 1st matching, 2570603307980542 for 2nd matching and so on.

Physically invisible voters should use headphones connected to the voting machine during their polling process. Voters should listen to each candidate's name and party affiliation randomly, and then participate in a poll by answering 'Yes'

or 'No'. The system will repeat it if voters cannot understand it and will ask for the candidate or party name for polling if they still do not understand the second time.

Also, the manufacturing company creates the voting machine ID number based on the device.

The Center officer creates the printing format. Figure 4 depicts two distinct forms. Additionally, the officer has the option to spin the candidate's details at an angle θ ($5^\circ < \theta < 25^\circ$) in either clockwise or counterclockwise directions (see Figure 6).

If any voter says that he/she polled for one and the machine printed another, then the presiding officer requests the voter to fill up the claim form. Furthermore, the officer alerts the voter that it is sensitive and the claimer will be penalized for polling violation if it is wrong and requests him/her to write three candidates or party's names, including the candidate or party polled by him/her. Since the officer is registered as a poll worker, he/she is permitted to poll and the machine prints only 'polling time' rather than 'six digits from the fractional part of

$$\sqrt{1. \text{ASCII code of 1st 3 letters of voter's short name} + \sqrt{\text{time number}}}.$$

For example, the machine produces 023227 if the polling time is 2:32:27 PM. The officer now surveys each of the three prospects individually. But without scanning, these ballots exit the voting machine through the top gate on the right (which is invisible in the figure and is just open in this specific instance). The presiding officer promptly stops polling and notifies the higher authorities if the claim is shown to be accurate; otherwise, he/she takes action against the claimer and continues the polling process.

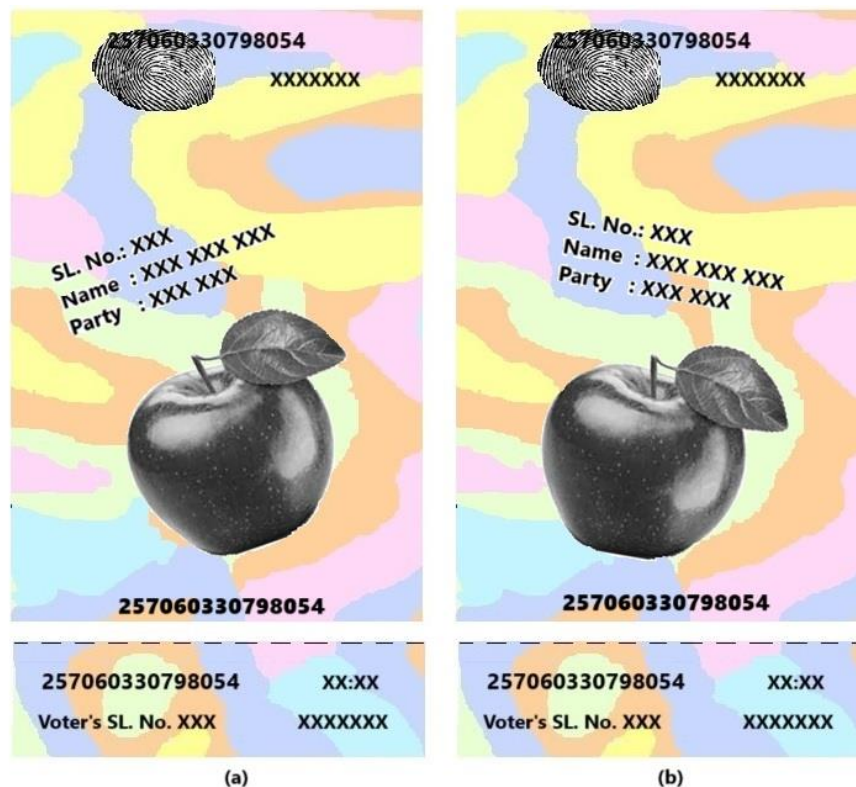


Figure 6: (a) Anti-clockwise rotation of body (b) Clockwise rotation of body

In case any voting machine becomes inoperable after a few hours, the presiding officer immediately informs the higher authorities. The voting machine should be under public observation through an immediately creating video link; otherwise, all voters have to poll using a new machine. The center officer splits the part into two subdivisions: completed and incomplete voters. The officer allocates a new machine, installing only incomplete voters and uses a polycarbonate seal to protect it. The remaining work, along with previous voting machines, should be monitored by the public with the assistance of a videographer.

After completing door-to-door vote collection, the presiding officer and team should wait at the closest school and call the remaining voter(s) to come to the polls. Again, if anyone is missing, then they inform P.S. and the center officer. The police thereafter provide the specific details of the voters' absence. The center officer will order an investigation if he/she not satisfies with the cause. The machine is now ready to submit ballots.

N.B.:

- The local regional language should be used to operate the keyboard and display screen.
- In order to save time, by keeping the voting machine in a voter's (not a leader) house, the presiding officer may ask nearby voters (at most 10 families) to come to poll if the guardian of the house and the other voters agree.
- If anyone misses the poll on time, then either he/she is allowed at the end or has to poll on the road. Because someone might do it on purpose and target another family to threaten them. Those who want to vote now but whose polling time is a few hours later are subject to a similar rule.

3.4 Ballot storing process

The entire ballot storage room (sometimes called the "strong room") is covered by CCTV, both inside and outside, and all audio and video footage is accessible to the public through a multi-video link until counting is complete. They should also be allowed to save this video, and it is their legal right to view the entire process. A siren will sound if an unregistered individual, including a candidate, enters the restricted area.

After collecting all votes in part of a booth, the Presiding officer goes to the counting center and submits the voting machine under CCTV. The voting machine is placed in a seal breaker machine by the counting worker, which breaks the seal after verifying that it matches all of the other information on the machine. The employee then attaches it to a counting device (out of 20) which first checks whether the machine ID number matches with part/booth. If it doesn't match, the center officer punishes the relevant poll workers and guards and orders a new poll to be conducted in the part or booth; if it does, the process proceeds. The center officer retrieves the ballot verification file from the voting machine (obtained from the scanned area of the polled ballot) and stores it on the corresponding counting machine device. Furthermore, the officer collects the video footage of voter's polling at their office and immediately sends it to the people who paid for its collection. At the same time, another machine tray-wise collects all the ballots from the voting machine and creates a bundle after receiving a preassigned number of ballots. If the number is not sufficient to form a bundle, wait for the same tray of ballots to come from the upcoming voting machine. The voting machine ID number(s), tray code (a or b or c) and counting device number are written on each bundle's cover. In case of Panchayet or Municipality election all ballots of a particular ward is to be connecting with same devise. Finally, the bundle is placed in a box corresponding to the counting machine and held such that the counting device number, tray code and voting machine ID number come into contact with the ground, so that it is not possible to specifically identify a bundle.

N.B.: The number of ballots in a bundle depends on the situation and is determined by the center officer. There should not be more than four fixed numbers for each tray within the same numbered tray at a center; otherwise someone may identify the area of the ballot bundle.

3.5 Vote counting process

The counting machine must be in front of the strong room and both will be covered by a pandal. Two well-registered counting workers wearing special dress (others will be reserved and all of them are other than ballot-storing workers) enter inside the strong room on time. The special dress is a shirt and pants combination that has no pockets, belts around the hands and legs, and a chain across the back. To open all 20 devices, they first turn on the counting machine. The employees enter 15 to 20 bundles of ballots into the appropriate box of counting device. They must be configured so that the quantity of bundles never falls below 15. The machine rotates a randomly selected bundle to adjust its position. If the bundle is of the right device, the machine will cut the cover and place the ballots on the paper tray, but if it is not, it will warn and separate the bundle. Now, the machine checks the ballot with the scanned file, counts it, and records the date and time on the back of the ballot. After that, the ballot passes through the front side glass that displays the candidate's details and is placed on a different tray. Completing the count of all ballots in the bundle machine again creates the same bundle as before from this tray. The machine stops counting when it has completed all of the bundles in all 20 devices. Employees clean the machine's interior, open the rear gate, place all of the counted bundles in the appropriate box, and then enter another set of bundles. At all times, the total result is shown on a giant screen. The public can view the picture of the complete display screen via a separate link due to a camera positioned in front of the counting machine. The public cannot enter near the counting machine, but a select group of authorized reporters are allowed to record the counting machine's display screen. The counting workers will be replaced once there have been two rounds.

As before, the authorities store all the boxes containing counted ballot bundles under CCTV for three to five days after completing the count of all the bundles at the election center in case they encounter any issues.

If one or more ballots do not match, the center officer takes appropriate action against the relevant officers and guards and issues re-polling instructions. The individual found guilty will be responsible for covering the expenses associated with the re-polling.

IV. Restrictions

To prevent uncomfortable circumstances, reduce anti-democratic activity, cut down on election-related costs, and minimize material waste, the following restrictions should be implemented.

- In any election, door-to-door campaigning is prohibited because it could endanger voters.
- The wall painting is completely close as it is a cause of clutter.
- In order to reduce visual pollution, each candidate is allowed just 100 posters (including flags) for each booth that is no larger than $1 \times 1.5 \text{ ft}^2$ and 5 posters (including flags) per city or town that is no larger than $4 \times 7 \text{ ft}^2$. It also decreases paper waste.

- Postal ballots are strictly forbidden. Poll workers are required to conduct their voting online and should be allowed to alter their polls. Otherwise, poll workers may be compelled to poll in front of a third person. Online or offline polling is available to all employees. To participate in online voting, immigrants are required to apply at their nearest police station.
- Loudspeakers used for advertisements must have decibel levels below 75.
- Voting is mandatory for all voters. If there is no interest in polling any candidate, they must vote for none of the listed candidates. Otherwise, someone could threaten people to abstain from voting in an attempt to tamper with the election process.
- In case, anywhere none of the listed candidates wins, all listed candidates' nominations should be forfeited in their whole lives.

V. People's Confusions and Explanations

1. Using ballots for voting is a waste of paper.

Explanation: The only way to accomplish a perfect electoral process through voter complacency is paper ballot polling. Additionally, the ballot size is modest in the procedure outlined here and is similar to the VVPAT slip. We can avoid more paper waste if we use fewer posters.

2. People without education cannot comprehend the procedure.

Explanation: A poll worker may assist a voter in entering their fingerprints, after which the worker leaves and the voter has to poll for a candidate by a simple number, with the remaining tasks possibly being finished automatically.

3. After verification of the voter, whether another person can poll the vote.

Explanation: A camera records the voter's movements and anyone who pays the appropriate fee for the video can watch it. Therefore, the offender will face penalties if anyone reasonably shows the Election Commission.

4. Voters could be marked.

Explanation: In the normal eye, a fingerprint out of ten fingers is not able to identify a person. The only way to identify the person using fingerprints is by a machine. The original ballots are not seen by the center officer, who collects the voters' fingerprints in the outline procedure. The center officer cannot keep track of which voter placed their ballot on which tray when thousands of people are voting at once. The voter is solely aware of the tray where the ballot is kept, so the counting workers can't distinguish the voter. Again, the counting machine does not look for whose ballot it is; it simply confirms the ballot and counts the vote.

5. While the center officer operates the counting devices online, a hacker could get the scanned files for ballot verification.

Explanation: During polling, there is no internet connection to the voting machine. It only has an internet connection when the ballot is being submitted. Now, since the original ballots have already been submitted and are being watched by the public, a hacker who manages to obtain the ballot verification files is ineffective. Additionally, counting workers enter so dressed that they are unable to carry anything or put anything in their pockets.

6. If there is a possibility of adding more ballots or altering ballots.

Explanation: There is no question of adding extra ballots, because each ballot will be verified. The process of replacing a ballot involves breaking the seal, copying the top portion of the ballot, and then changing the candidate information on a same designed ballot. First of all, there are a lot of differences across ballots, making it difficult to obtain the same one. Second, the wrongdoer does not have enough time to finish it. Third, the newly made seal will be caught by the machine since it won't coagulate, and the original seal holds a secret code.

7. Whether it is possible to influence results.

Explanation: There is no possibility of manipulation because ballots are counted by machines, which also publish the results immediately. Once again, the front-line video of the counting machine in slow motion, which displays the original counted ballots, allows the public to confirm the results.

8. If the ballot is replaced by intentionally turning off the internet or video link.

Explanation: This is certainly feasible, and the Election Commissioner must take a proactive role in preventing this. When a claim arises like this, the Election Commission publishes the corresponding non-edited, continuous video. If any instances of fraud are identified, the Commissioner will order a re-poll for that specific region, and the associated expenses will be borne by the video management team.

VI. Conclusions

Every person has the right to live with dignity and individual thought in society, and only democracy can respect this. Elections are a way to express individual opinions. A maximum number of people supporting the opinion of the public interest of society is always expected. But when the public interest is overshadowed by individual interests using the power obtained through election results, it is clear that the electoral process is incorrect. This study presents a novel technique for the electoral process named the Technology-Based Paper Ballot system, in accordance with the current circumstances.

Human beings in our society are diverse, possessing a wide range of personalities and opinions. Socials and anti-socials are living together, and anti-socials may not carry out their criminal activities without the assistance of regional administration. Therefore, the wrongdoers rig the election to establish a government that supports and facilitates their activities. When a new electoral system is first implemented, it is difficult to rig it heavily. However, their system-wide investigation naturally identifies some security and systemic weaknesses, which allow them to abuse the election and undermine democracy. Thus, no electoral system can remain safe for long, and we must always consider modifying the electoral system to combat election rigging.

We now go out to discuss some points regarding how we should change the electoral procedure outlined here in the future.

- In the future, voters should need to be verified by fingerprints, retinal scans, and photos or short videos in order to stop fraudulent votes.
- Voters should trim 1 mm or 2 mm or not at all from the top of their ballot to separate it from their previous ballot.
- Some people may be forced to come to a specific house to vote; the presiding officer should visit each individual house in the future. Additionally, poll workers should carry a voter's backside cover made of thermocol/polystyrene foam (semi-cylindrical frame), which can fully protect both the voting machine and the voter.
- A touching display screen should be used in place of voting machine keyboards since some voters might purposefully attempt to break a specific key. Though in this way, the offender can only disturb polling but can't change ballot.
- In the future, poll workers and counting workers should be replaced by robots, and their activities will be monitored by the public through some video links. The voting machine will be transported by a robot instead of a trolley, and except for voter, no one else should be permitted to approach the robot. If someone is found to be covering their face or has visited more than four times, the robot will siren and show the picture of the person. Also, if the person is found more than 6 times, the photo will be sent to the commission for further action.

The most important aspects of the outlined technique are that the citizens of a nation receive priority and that no one else is above suspicion; counting is accurate, and fewer election workers and securities are needed.

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