SLIGHTLY bigger than Britain and one of the most populous sub-national entities in the world, Uttar Pradesh is India’s biggest state. The state, comprising 403 constituencies and more than 12 crore voters, voted in March this year to elect its state legislature. With a state of this size, there were plenty of chances of goof-ups— but there were none!

Parliamentary and assembly elections are the mainstay of our democratic setup. The election process in India is governed by the Representation of People Act-1950 that describes the procedure to be followed for conducting free and fair election of the Houses of Parliament and houses of Legislatures in states. At various points in time, it has been amended to bring about improvements in the electoral process. But, it is only in the past few years that there have been visible signs of improvement, with fewer cases of poll-related violence or booth capturing or hoodwinked counting.

In recent years, technological reforms in the electoral process, especially in the field of data collection and reporting, have increased surveillance and reduced response time for the authorities. The recently concluded assembly elections in five states were closely followed by all quarters of the society. And just like the elections in the recent past, the Election Commission once again came in for praise for having conducted free and fair elections.

But very few know the nitty-gritty details of what made this possible; particularly the large role played by information and communication technology (ICT) to make it a success. How does the technological mechanism facilitate the biggest festival of democracy and that too without any error?

Pre-Poll Preparations

With the ever-increasing use of ICT in elections, the role of the National Informatics Centre (NIC) in making the entire event a success has become paramount. Most of the software used by Election Authorities is designed by NIC professionals. As the day of the elections approaches; the NIC District Centres become hubs of election activity.

Initial preparations begin almost a year prior to the expected month of election. The review of the main voter list, addition of names, and creation of supplementary voter list takes almost eight months. The entire process of Voter
ID Card generation is done through an online software application called Electors Photo Identity Card (EPIC), which involves feeding voter details in the system, passing through various stages of online approvals from administration, till the generation of voter-ID cards or slips. Use of a computer database system eliminates the chances of creation of duplicate and fake voter-IDs.

About one month before the first phase of elections, the Election Commission notifies the dates and schedule of elections. Now, the main task is to build a database of all government employees at the district level. This data is then fed into another

**Electronic Voting Machine (EVM)**

An EVM Machine has two parts, a Control Unit which acts as the power supply, recording, storage and retrieval device, and a Ballot Unit which is a voting panel used by voters to cast their votes. A maximum of four ballot units can be attached to one control unit. Each ballot unit can register votes for maximum sixteen candidates. Thus, one control unit can record vote details for a maximum of sixty-four candidates.

One ballot unit can register a maximum of 3840 votes. Generally, a polling booth has one control unit and one or more than one ballot unit. The control unit uses 6-volt rechargeable military grade batteries that have a shelf life of over 10 years.

EVM machines are manufactured by two central government undertakings: Bharat Electronics Limited (BEL) and Electronics Corporation of India Limited (ECIL). Although EVMs were considered to be breach free, some recent experiments suggest that EVM’s are not foolproof. Considering these factors, fingerprint-based EVM machines are being developed to replace the existing sets of EVMs.
software known as Electronic Personnel Deployment System (EPDS) to create a databank.

For better control during the event, the entire district is divided into Zones and Sectors. Each zone comprises of a few sectors, and every sector comprises of some booths. Accordingly, Zonal Magistrates and Sector Magistrates are designated from the pool of government officers. The EPDS software is then used to create a database of booths, sectors, zones and constituencies, which is later integrated with the employee databank.

Meanwhile, another software known as “EVM Tracking System” is used to prepare the database of Electronic Voting Machines (EVMs) that are used in the polling process. This database keeps track of every single EVM being used for polling, including records of all working and defective EVMs. These are regularly cross-verified and checked by local authorities, state level authorities and the Election Commission of India (ECI).

A separate software application hosted on the ECI website is used to prepare a layout called the “Communication Plan”. This plan details the required communication infrastructure in the form of concerned officers, their contact details, their area of work – that is, booth numbers, sector numbers and so on. The plan is available to the ECI, which can directly contact the concerned officials.

Just a few days before the date of polling, final changes in the database of eligible government employees are completed. Just before the polling day, the District Magistrate and District Informatics Officer from NIC randomize the database of employees in three successive stages to create polling parties in the presence of a team of Election Observers (comprising senior IAS officers from other states, district authorities, and representatives from political parties). The polling parties are formed according to the criteria and guidelines given by the ECI. There are more than ten sets of criteria that have to be used by the software while randomly forming the polling parties. Each polling party comprises of a Presiding Officer and at least three Polling Officers.

As an illustration, let us take the example of district Haridol (U.P.). The district had 2750 polling booths and 11,000 employees were needed at the booths while 10% were kept in reserve or as back up. The software randomized a total of 12,100 employees. Each party was finally allotted a particular booth and transport vehicle. The software also randomly allotted EVMs to the booths.

Just one day before the polling, the polling parties were disbursed to the allotted booths in the district. This was ensured by proper coordination between District Authorities, Zonal and Sector Magistrates. All 12,100 people reached their booths the same day and spent the night at the polling centers or booths.

Monitoring the Polling Process
First, a list of candidates with serial numbers is finalized by the Returning Officers of all constituencies and submitted to the District Election Office. This list of candidates is pasted on the ballot unit of the respective constituency in order of the serial numbers. As the ballot unit only recognizes the serial numbers (1, 2, 3, 4….) of the ballot button, the serial numbers allotted should be consistent.

Before the polling begins, the Presiding Officer runs a demo or mock poll on the EVM in front of the candidate’s agent. This mock poll ensures that the EVM is glitch free and there is no manipulation. The EVM is then cleared of all demo votes and sealed using standard ECI material.

When a voter reaches the polling booth, she has to show her voter-ID card for identification. Her name is then checked in the voter register, marked, signature or thumb impression obtained on a separate sheet and a voter slip is issued. The Presiding Officer then collects the voting slip from the voter and activates the control unit by pressing the “Ballot button”, which enables the ballot unit for voting.

Now, the voter can cast the vote by pressing the button adjacent to the symbol and name of his or her choice. Once the “candidate’s button” is pressed, there is a loud beep from the ballot unit and a red lamp lights up, signifying that the vote has been cast and recorded in the control unit. The ballot unit is kept at a distance in a separate cabin called the “Voter Compartment” which is secure from three sides providing secrecy to the voter. The polling officer then places an indelible ink mark on the left hand index finger of the vote.

Once the polling is over, the Presiding Officer presses the “Close” button on the Control Unit to secure the votes in the control unit. The control unit displays the total number of candidates and votes cast, which is noted down in an official record sheet. “Total” button is used to verify the sum displayed on pressing the “Close” button. Thereafter, the Presiding Officer seals the Control Unit and the Ballot Unit in separate boxes and submits them at the EVM Collection Centre. These seals are removed only on the day of counting on the counting table itself.

Another role of IT on the day of the election is to get real time data on the conduct of the poll and rapid intervention mechanisms therein. Consider the General Assembly Elections of five states in 2012, where two additional exercises were supplemented by ECI: “Live webcasting from polling booths” and “Poll Day Monitoring System (PDMS)”. 
The live webcasting setup was formed for 1% booths of the districts, which was basically a pilot project to check the feasibility of the system. The live feed of the polling at these booths was available to ECI and SEC. The eyes of ECI ensured that polling at these booths was further smoothened.

The Poll Day Monitoring System (PDMS) was an effort by ECI to speed up the data collection at the booth level. Firstly, the mobile numbers of all presiding officers and polling officers were registered in the web-based PDMS system. Then, a schedule was formed according to which Presiding Officers were required to send an SMS on safe arrival of the team at the booth, thereafter, on the day of polling, sending SMS of the voting count after every hour of polling from 7 am till 5 pm. This system was highly successful and the ECI was able to monitor the polling data in real time. Real time statistics of polling in all constituencies after every hour were available to the authorities, which could act immediately if any unusual figure was detected.

Another IT effort by the ECI was to put the details of the candidates and their affidavits online in coordination with the NIC. These details were available for public viewing through district websites.

On the completion of polling, the polling parties return to the EVM Collection Centre the same day and by the same vehicle. They submit the EVMs and the remaining polling inventory at the centre. Once the last EVM is deposited, all EVMs are stored in sealed strong rooms, constantly guarded by Central Para-Military Forces or BSF, only to be opened on the day of counting.

Post the Poll
After polling, the preparations for counting begin with the collection of data for counting personnel. These personnel are randomly allotted counting tables by the EPDS software. Counting is done by counting parties in the presence of observers, authorities and political party representatives. Constituency-wise arrangements are made for counting which are similar to the booths. Each counting table has one Counting Supervisor, one Counting Assistant, one Micro-observer and one person for miscellaneous help. Usually fourteen tables are used for counting process of one constituency. Once the 14 EVMs have been decoded for votes of all candidates, a “round” is deemed to be complete.

At the counting table, the counting assistant removes the seal from the control unit and opens the result compartment. Then she presses the “Result” button on the control unit, which displays the candidate-wise result. This booth-wise result is noted in official sheets and shown to the candidate’s agents present at the counting centre. The results from each booth and each candidate are tabulated and summed up to prepare the result of a constituency, candidate wise. The candidate who secures the highest number of is declared winner.

Thereafter, the power supply of the Control Unit is switched off. The Control Units of EVMs are again checked, sealed and sent back to the warehouse of the district on completion of elections.

After completion of each round, the results are tabulated by the officers, which is then cross verified and certified by higher authorities, and then the sheet is fed into “GENESYS Online Entry System”. The results and figures which we see on the ECI website are the live data from this system. Finally, the result of a constituency is considered to be declared only after the same is done through the GENESYS system.

The entire exercise takes almost ten hours. The declaration of result and obtaining of certificate by the winning candidate from the Returning Officer of that constituency marks the completion of the election process.

Future of IT in Elections
Technology has eased the efforts put in by district authorities, their subordinates and NIC officers who work tirelessly for months. The use of Live Webcasting System and Poll Day Monitoring System will further increase the broadband connectivity reaching Gram Panchayats and mobiles will become a handy means for authentic interaction. Polling booths under video surveillance will nullify the chances of frauds and violence. The voter-ID cards will have biometric data and polling booths equipped with biometric readers will enable only genuine voters to cast their votes.

Slowly but steadily, the ECI is evolving a system of conducting elections that will be much more efficient and yet cause lesser burden on the district administration, preventing the governmental paralysis that cripples all other work during the conduct of elections. With better monitoring and surveillance capabilities a bigger portion of the electorate shall be able to exercise its right with more freedom and trust.

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