

Zero Human Contact Voting System

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Abstract:- In earlier times, people used to go to booths and cast their votes through Electronic Voting System(EVM) by pressing the button for the party of their choice. But now this year as pandemic is being faced by the world it is difficult for everyone to go to booths and vote . For solving these type of situations, we created the system where we can vote with zero human to human contact. By using machine learning and web development, people cast the votes and counting of votes can be done with greater ease and efficiency, making procedures simple and long lines at booths can be controlled. We create a voting system with the help of QR code and face matching. Our system can make sure the correctness of voter's identity to a large extent and also tries to implement zero human to human contact.

Keyword:- Electronic Voting System , Zero Human To Human Contact, Pandemic.

I. INTRODUCTION

In democratic countries, election is the key for the proper functioning of country. As the voting are held frequently, the price of voting is rising time to time. For saving large number of human resource and time, information technology can be used in elections.

In current time the dilemma of adding information technology to voting is studied in two ways . The first one is electronic voting (E-voting) and the second is internet voting (I-voting). As years passed, the experts have started using information technology to meet uniqueness, accuracy, completeness, verifiability, auditability and privacy. In our research, we design and implement a system with QR code scanning and face matching for identification. With information technology, we can ease the process and save human resource and time. Along with this we use the system with accessibility, and provide demos to decrease the learning difficulty in using the new system. Demos are provided in all the regional languages along with voter care support helpline.

II. LITERATURE REVIEW

David Chaum [2] addressed the concepts of untraceable electronic mails and digital allonyms, which we can apply to voting system. For reducing price of human resource and enhancing the simplicity in the procedure of polling, E-voting and I-voting has overcome traditional voting in many countries over the years. In this section, we target to review literature related to E-voting and I-voting.

➤ Evaluation of Voting Equipment

In the modern period, voting machines which were used could be divided into five types [10]:

(1) Paper-based voting: The voter is provided with a blank paper ticket and a marker is used to point whom he want to vote for. Counting tickets using hands could be a time and labor consuming process, but paper tickets are often made quickly and easily and therefore the tickets are often retained for verifying. Lever voting machine: Lever machine is an apparatus where each lever is assigned to a specific candidate. The voter needs to pull the lever to select his favorite candidate. In this type of mechanical apparatus automatic counting of the ballots takes place. Its interface is not friendly enough so voter requiresto be trained.

(2) Lever voting machine: Lever machine is an apparatus where each lever is assigned to a specific candidate. The voter needs to pull the lever to select his favorite candidate. In this type of mechanical apparatus automatic counting of the ballots takes place. Its interface is not friendly enough so voter requires to be trained.

(3) Direct recording electronic voting machine: (DRE) is integrated with keyboard, touchscreen, or buttons which are pressed by the voter to poll. Counting the votes can be done very quickly. The other DRE are doubted about its accuracy as they do not keep the voting records.

(4) Punch card: The voter uses a punching metallic apparatus to create a hole on the blank ballot. Automatic counting can be done, but if the hole by voter is not proper, the outcome is probably determined wrongfully.

(5) Optical voting machine: Each voter is asked to mark a circle according to their favorite on the blank ballot ticket, and then apparatus selects the circle which is darkest on each ticket for the vote and finally calculate the total votes. This kind of apparatus counts up tickets quickly. However, if the voter marks over the circle, it leads to the error in optical-scanning.

➤ E-voting in Different Countries

In current years, E-voting in a large number of countries has been adopted. In this section, four examples are enumerated as following:

(1) America: American Government conducts election in different manners. Each state is allowed to select the satisfying way to conduct elections independently. There were some voting arguments, like some vote were not counted, or system used in voting crashed during the Day of Election. [1]. It was proposed that voting should start including voter verifiable paper audit trails (VVPAT) to minimize electoral arguments.

(2) Japan: E-voting was used in Japan for conducting of elections, like mayor and councilor election in Okayama province in June 23, 2002; election for the post of mayor in Hiroshima city in 2003; and election for mayor of Kyoto in 2004. Survey was conducted when the election ended. There were 81% voters who agreed that E-voting is trusted, 56% suggested that the results of E-voting and paper-based voting are the same but we can rely on E-voting. The cause why voters did not trust the E-voting system are: they are tensed about the abuses in voting system and they are not satisfied whether ballot are recorded correctly or not.

(3) Belgium: Federal Parliament conducted elections in 2003. For helping people to get familiar with E voting system, a short-term training is provided. Efficiency in the election counting in E-voting system was better than conventional voting.

(4) Brazil: Brazil used E-voting in 1998. After reaching the booth, he needs to show his identity card for authentication. If he is found eligible for voting, he can get the ballot for E-voting. Brazil's E-voting system conveys votes to center immediately, leading to the quick announcement of votes count while the voting finishes.

➤ *Comparing Different E-voting System*

Besides many developers to develop electronic election machines, there are various open source E-voting systems. We provide some examples as following [4,8]:

(1) AccuVote-TS: This method consists of touchscreen, card reader, keyboard, earphone, and paper printer. The voter marks his favorite candidate using touchscreen, and the printed paper tape is generated for the vote. Balancing of the policy, electoral procedure and technology can be seen. There are huge risks of attack as storing of information takes place in MS Access database without setting of password.

(2) iVotronic: Multi-language and flash memory are features of this system. Personal Electronic Ballot is a device similar to disk to start polling equipment. When the election ends, the staff use PEB to access voting records, providing PEB to electoral center or transmitting data from network. The PEB's password contains only 3 characters, so the danger of password breaking exists.

(3) eSlate 3000: The voter are provided with a personal identity number from workers, then reaches the polling place to provide the PIN into polling apparatus. Selector wheel is rotated to pick the candidate. Each terminal is connected to the server. Counting of votes is shipped to server via every terminal by network and then saved. This system doesn't encode data, so there is a danger of security.

(4) SAVIOC: C language is used to write this system, and

saved in disk. This system do not have connections to any networks and most keys on the keyboard are disabled, which protects attackers from finding a path to attack. Advantages are its simple design and less cost, but on the opposite hand, they are in need of GUI and simple use on SAVIOC.

(5) AVC Edge: Touchscreen and flash memory are used in this system. There were some problems when this equipment was used for the elections. For example, the counting of votes was not correct, the system crashed when the user chose language; and became blank because of the breakdown.

➤ *The Security Issues of E-voting*

Foreign experience [9] revealed that they often faced security issues while the electronic voting system was running. The origin of the security issues happened was not only external (such as voters and attackers) but also internal (such as system developers and administrators), even just because the inheritance of some objects within the code are unsuitable. These errors caused the voting system crashed. The proposed solutions were outlined to control these attacks [5]. For example, to avoid hacking into the voting system via network, we can design our system to transmit data without network. Another example is to limit voter to input particular data, to prevent the command injection from running.

III. SYSTEM ARCHITECTURE

We utilize touchscreen for users to operate this system by touch. The E-voting system is divided into three : QR scanning machine, face matching machine, and a machine for polling vote. The QR scanned is initially printed on the slip provided to people before elections. QR scanning machine scans particular voting information from QR, so that each QR can be verified.

If the QR is matched from QR scanning machine, machine will verify if the QR is previously used for voting or not. For the uniqueness, the QR can't be scanned again. Therefore, the machine will reject the QR. In another situation, polling machine will reject the QR which is not issued from slip as it is possible that the voter uses his own QR. After this the face matching takes place to check if correct voter is voting or someone else is voting. After face matching is over the voter is allowed to vote using a touchscreen contactless machine to cast his vote as shown in Fig.1 .

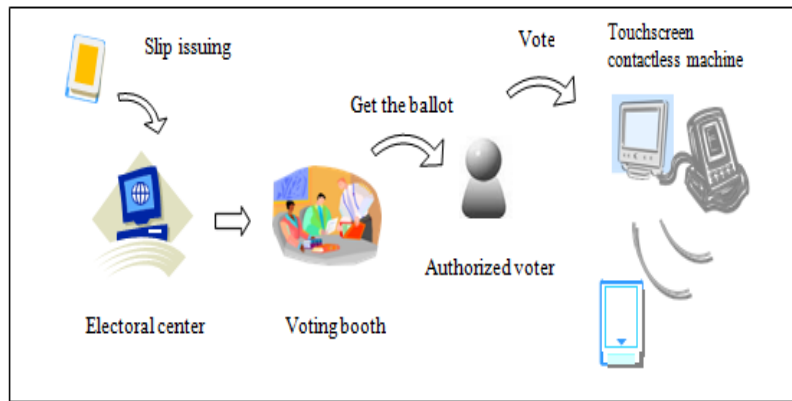


Fig:1

➤ Procedure

- (1) First of all the voter sees a booth login page where he enters the booth id and password provided to him.
- (2) After the login, the system shows a plain screen where user scans the QR code present in the slip. The details are verified at the backend and if the verification is correct a “success” message is displayed on the screen. If the verification fails then voter contacts the voter help service.
- (3) After getting the “success” message the next step is face recognition. If the face matches with the one stored in database then voter moves to the next step otherwise he needs to contact the help services.
- (3) After the face matches in the face recognition the voter casts the vote to his favorite candidate and the voting process finishes with a Thank You message at last.
- (4) If any difficulty is faced at any stage of the voting process, a voter help service is present inside the booth for helping the voter in resolving the issue.

➤ Vote Counting

When the election ends, votes are counted using information stored in the database. After this the counting is combined to get the final result. Before counting of votes, we assure the counting is fair and accurate.

IV. CONCLUSION

This paper states that our implementation provides features like the voter’s identity accuracy is maintained within the system. Next, details of voters are not used to break privacy of the voter. They are kept confidential. The system validates the voter’s authorization to make sure that only legal voter cast the vote. In the future, to eliminate poor processes and human destruction, setting up of a E-voting system which is secure is important. It will rapidly increase the electoral procedures, make counting more efficient and use resources effectively.

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