Smart and Secure E-Voting System using Blockchain Technology

Nitima Malsa[1], Dr. Vaibhav Vyas[2], Dr. Jyoti Gautam[3]

(1, 3) JSS Academy of Technical Education, Noida , C-20/1 Sector-6 , Noida, India

nitimamalsa@jssaten.ac.in

(2) Banasthali Vidyapith ,P.O. Banasthali Vidyapith, Rajasthan, India.

Abstract

General elections use a centralized system, i.e. there is one organization that manages it. One of the issues that may arise in this traditional electoral system (centralized one) is that the organization has full control over the database and the data can be easily tampered. Such a kind of System exists in **India**. According to the **Business Today report on 18 April 2019**, different cases of EVM glitches have been reported in Lok Sabha Election 2019 Phase 2 across different parts of India such as Uttar Pradesh, Maharashtra, Assam and Tamil Nadu. Security, transparency, reliability and verifiability are the major issues regarding EVM used so far in the different countries. Hence, many countries banned the EVM in the elections: **Netherlands** banned the EVM in 2007 due to lack of transparency and security issues, likewise **Germany** also banned the EVM after 2005 elections, when they knew that EVM is prone to hacking. In 2006, **Italy** used NEDAP voting machines for voting and after completion of their voting project they realized that the voting using paper is easy to manage and cheaper also. After spending large money in EVM, **Ireland** realized that the EVM machines have lack of trust and transparency. Hence, EVM was banned there. In 2016, the **UK parliament** announced not to use EVM machines for statutory elections. **California** Secretary of State Kevin Shelley banned EVMs in the November 2004 elections as certain security conditions were not met with. Supreme Court of **Finland** declared the result of pilot electronic voting machines invalid in the municipal corporation elections of 2009. The above addressed issues in EVM can be overcome with the use of the Blockchain Technology. The technology has potential to overcome the issues of EVM. Certain evaluation metrics such as Throughput, Latency, and Scalability and Security metrics exist for evaluation and comparison. Since a lot of money and efforts are involved in conducting a smooth and a fair election. There is a need of a Transparent System. Information about the candidate's profile should be made available to the public. Details about the candidate's assets, liabilities, convicted and pending cases as well as association with the political party should be made available to the public in a democratic system. In the present system, the candidate is given the freedom to choose from at most two constituencies but, he should not be allowed to do so. Information about his constituency should be made available on the interface. Interface for the Blockchain based system has been proposed, which includes Login page, Candidate's profile page and Opinion polls results page. Interface should also include opinion polls results, which channelize the public for a better judgment. Blockchain Technology is one of the solutions; because it embraces a decentralized system and the entire database are owned by many users. Blockchain-enabled e-voting could reduce voter fraud and increase voter access. Eligible voters cast a ballot anonymously using a Computer or a Smartphone. It uses an encrypted key and tamper-proof personal IDs. The Blockchain based system will be secure, reliable, and anonymous, and will help increase the number of voters as well as the trust of people in their governments. Since Blockchain enabled system is using online voting, so it saves a considerable effort of the voters. At the same time, it reduces the efforts of so many people who are involved in conducting a smooth and a fair election. Blockchain based Secured E-Voting System can be evaluated and compared with the existing EVM system

based on the **evaluation metrics** such as **Throughput, Latency, and Scalability** and **Security metrics.**

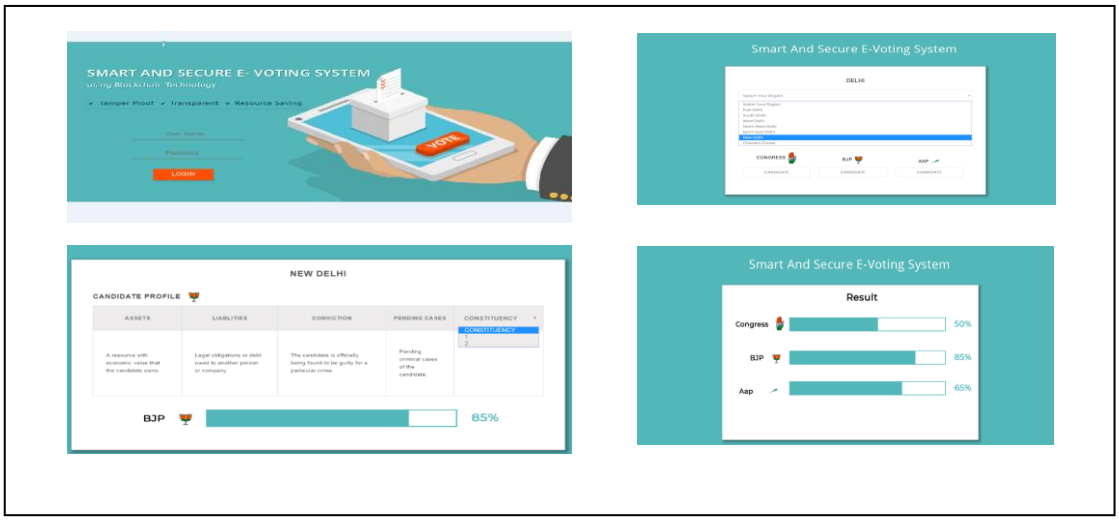

Figure 1: Graphical user interface for Smart and Secure E-Voting System

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