Blockchain Technology and Election Transparency: An Application of E-Voting Mechanism

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Abstract

This manuscript discusses the potential of blockchain technology in electronic voting systems. It begins by examining previous studies and experimentation with e-voting, particularly in Estonia, Switzerland, and Norway. The manuscript highlights the success of e-voting in Estonia and Switzerland, but also acknowledges the discontinuation of e-voting in Norway due to security concerns and lack of impact on abstention rates. It emphasizes the need for national-scale testing of e-voting in actual settings, which is currently lacking in blockchain-based solutions.

The manuscript then delves into the legal and political concerns associated with electronic voting. It discusses the fundamental legal standards that any electronic voting system must adhere to, including inclusivity, impartiality, non-restriction, and secrecy. It recognizes the challenges of ensuring fairness, unique votes, and voter authentication in electronic voting compared to traditional paper voting. The manuscript also highlights the importance of confidentiality and how blockchain technology can address this requirement. However, it acknowledges that regulatory framework evolution is necessary for countries seeking to implement e-voting systems.

Furthermore, the manuscript explores the political factors that need to be considered when deploying e-voting. It emphasizes the importance of transparency in the voting system and the role of public oversight in ensuring legitimacy. It also acknowledges the financial consequences of creating and deploying e-voting technology and the need to strike a balance between cost-effectiveness and system reliability. The role of private enterprises in the execution of e-voting systems is also discussed.

Technical factors for electronic voting are then addressed, focusing on the restrictions that e-voting applications must meet. These include ensuring privacy and confidentiality, accessibility for all voters (including those with limited internet access), protection against attacks and system malfunctions, and verification of voter identity to prevent duplicate votes. The manuscript highlights the ongoing efforts of the EU