Review on Decentralized Blockchain-Based E-Voting System: General Elections of the Society

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Abstract. Voting is a form of collective decision making or group opinion which can be used to solve any kind of ideological issues in society. The most common way to vote is through a paper-based system where it uses a paper ballot to collect votes and marked ballot papers will be put into a box. The cost of this traditional system is very high along with the counting process which takes a long time with an additional cost as well as increasing the time to publish results of the election. Election fraudulently activities violating election rules and corruption charges are also pushing along with this traditional voting system. Which encounters a huge impact on the final results of the election as well as on the public trust towards the system and constitution of the country. As a solution for existing issues for the traditional voting system, an e-voting system can be considered. However, it required a highly secure solution and that's where Blockchain comes in. Blockchain is one of the most suitable technologies which can be used for highly secure environments. Blockchain is a decentralized system with a hashing mechanism that helps to increase security. The Specialty of selecting Blockchain for these e-voting Systems is its collective trust. Using peer to peer networks with decentralized timestamping servers made these Systems are hard to hack or change information. These Systems create an improved secure digital voting method and cost-effective manner to conduct it. This paper presents a review study on cost-effective corruption-free secured voting Systems that have been developed through blockchain technology and agent technologies. Mainly highlighting the social status on how well the awareness of technology and the level of trust among society, how blockchain researchers have been inventing new paths coming out from crypto, Rise and Fall of world 1st e-voting system, limitations and incorporation of agent technology with blockchain for an e-voting platform and security at the endpoints of the blockchain. This review will support the development of a Blockchain-based e-voting system depending on the requirement and behavior of the election process and more favoring to Srilankan constitution. Finally, an e-voting system for the Srilankan election process is proposed by reviewing all the aspects in a technological and sociological manner.

Keywords: *Blockchain, E-voting, Distributed Systems, Blockchain Voting, Secure Voting*