

Bringing Paradigm shift in Future e-Voting through Blockchain - A Social Initiative from theory to practice and finally executing

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Blockchain is the technology of the new age which has the potential to disrupt many industries; similar to how internet did in the early 1990s and has the potential to revolutionize how society trades and interacts. In this article an attempt has been made to analyze the benefits and impacts of blockchain in e voting over the conventional voting system. This has the potential to address the shortcomings of the existing system that will make possible the concept of blockchain from theory and practice to the final execution. Since the Election carnival is going on a pan India basis hence it would be the duty of all citizens to glimpse about this phenomenon, so that it get implemented in holistic manner across the country and bring transparency in totality.

Introduction

The Internet of today has great advantages of collaboration and communication, but while coming to the concerns of privacy and commerce it has been intensely flawed. The blockchain technology allows peer-to-peer transactions by eliminating the need of any intermediary or any governing body. By keeping the information of user's as anonymous, it validates and retains a permanent public record of all the occurring transactions. Information via blockchain is highly secure and private, while all the activities involved are incorruptible and transparent. At present due to the widespread mistrust in governance and by the influence of external factors in the countries' processes the democratic process for voting has become the need of the hour and therefore it has become more critical than ever

before. Voting is one of the most crucial aspect of democracy in determining their right to decide who will lead the country. Blockchain is paving the way for a direct democracy, where people can decide the course of policy themselves, rather than rely on representatives to do it for them. Fairness and transparency in election process is the paramount need these days. Conventional election system (offline) suffers from the threat of security and transparency. They use a centralized system that is governed by a single organization that has full control over the database and system that has a greater possibility to tamper with the database of considerable opportunities. If you compare this to the way we conduct elections presently, the differences are stark. It currently takes hours and sometimes days to count votes after elections—and sometimes the

results are muddled up on account of human or machine error, which of course results in the process taking even longer. Most important aspect in voting is to ensure that vote is counted correctly. Currently counting of votes is done manually by pen and paper that gives the room for human error.

Blockchain technology can improve the voting system in many ways details of that are given in the following sections of the paper. Blockchain technology enjoys the advantages of a decentralized system in that database is owned by a number of users rather than a single entity. E voting system governed by the blockchain technology uses smart contracts that will result in more cost efficient elections that also ensures voters' privacy and also reduces the instances of cheating and data manipulation.

Background on Blockchain:

The blockchain technology was first introduced in 2008 by Satoshi Nakamoto. Blockchain is known as a distributed ledger or decentralized technology that records the transactions anonymously. This means that blockchain technology enables to maintain the ledger of transactions simultaneously across a network of unrelated computer or servers known as nodes rather than storing the data at a single place. The transactions over blockchain are cryptographically signed and publically verifiable at every step, when any new transaction occurs a block is added to the existing set of blocks that makes the tampering with the data almost impossible. Thus, blockchain is an append-only data structure on which blocks of data can be written but cannot be misused or deleted. Information stored on the blockchain doesn't live in one or two platforms rather it lives in thousands or even in million locations, making the tampering with the data almost impossible.

How Blockchain Technology Can Improve Voting:

The present process of voting consists of two steps; first is to register for the vote and the next is the process of voting itself. The system of e voting presented through the blockchain will have an extra step in it; that will enable the users to verify their votes and to get an affirmation of their votes. Blockchain technology in voting has the potential to address all the concerns, shortfalls and barriers of the present system.

Blockchain in voting stands to solve society's ultimate challenge of trust that will also eliminate the need of any middleman in

between. Blockchain holds to offer cost effective and smart solutions to the existing issues of the current voting process. Blockchain preserves voters' confidentiality and privacy of votes while being open to public scrutiny. It is capable of maintaining accountability, auditability and authentication of votes with more transparency and convenience by streamlining counting and minimizing costs involved. Although nothing is free of faults and secure these days, yet blockchain enabled voting process holds to make tampering, manipulation and altering almost impossible that will also help in possessing general public faith in the governance and thus will result in increased public participation and turnout. Some of the examples of blockchain enabled solutions are explained below:

- 1. Privacy:** In the conventional voting system voters' privacy has been of greater concern. Data and information being handled by the central authority has the higher chances of tampering. Such information can be leaked and also can allow listing for individuals those voted for a single candidate that keeps the voters privacy at stake and gives higher chances of misuse of such information. In a democratic system protection of voters' privacy is of greatest concern. Decentralized nature of blockchain ensures the voters privacy and confidentiality to greater extent.
- 2. Fairness and transparency:** In the present system of voting transparency is actually non-existent as there is no system through which ballot has

information on which participant voted the aforesaid vote and also no system to locate whether the casted vote has either been counted or if counted has that been counted correctly. Any individuals' vote can be counted incorrectly or misplaced due to human errors or sometimes intentionally as well for ones' own sake; simply on the ground that individual counting the vote may dislike the party voter voted for. Blockchain enabled e voting will promote more transparency and fairness in the system. Voters will be able to verify their votes on the real time basis and will also be able to make sure whether their vote has been counted or not.

- 3. Verifiability:** Blockchain ensures the verifiability of votes once it has been inserted, due to its decentralized nature each voter can verify one's vote whether it has been counted correctly by counting the votes and can also ensure that results includes one's vote. Results can also be verified by external auditors by taking a copy of blockchain to ensure that votes in it are legitimate.
- 4. Remote voting:** Remote voting takes place when a person votes at some other place or time than the assigned polling station, or vote is cast by an assigned proxy. Remote elections are subject to coercion and don't ensure the privacy of the voter that can lead to misconfigured results. If the elections are conducted via blockchain privacy of the voters in remote voting can be protected and that will also result in the smooth flow of voting process.

Conclusion:

The adoption of digital voting system in the today's modern society will result in a easier, faster and more reliable public electoral process. That will also bridge the power gap between the general public and elected officials by putting a certain amount of pressures on them. To have the general public faith in the present governance system of blockchain enabled voting is the need of the hour. Blockchain enabled voting will impact the society in many ways. It will help in removing the obstacles of the voting system for a voter to vote. It will bring more transparency, security, immutability and accountability in the system. It will increase the general public

participation and will increase the convenience for voters. Voting will be done more quickly with least possibility of manipulation with database. It will increase the general public trust in the government since it will be more transparent than the existing system. As compared to the present voting system the proposed system will also be more environmental friendly by eliminating the needs of paper voting and also by reducing the carbon content emitted by the logistics of those ballots. Hence, the blockchain based comprehensive voting solution has the potential to address all the requirements and shortfalls of the current voting scenario.

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