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Blockchain Based Online Voting System

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ABSTRACT: Voting is the fundamental right for every nation. An Electronic Voting (E-Voting) system is a voting system in which the election process is notated, saved, stored, and processed digitally, which makes the voting management task better than the traditional paper-based method. Blockchain is offering new opportunities to develop new types of digital services. While research on the topic is still emerging, it has mostly focused on the technical and legal issues instead of taking advantage of this novel concept and creating advanced digital services. Blockchain-enabled e-voting (BEV) could reduce voter fraud and increase voter access. Eligible voters cast a ballot anonymously using a computer or smartphone. BEV uses an encrypted key and tamper- proof personal IDs. Electronic credibility services have become an integral part of the information space. With the reliable implementation of basic services as an electronic signature and electronic authentication, it is possible to build more complex systems that rely on them, particularly the electronic voting system.

KEYWORDS: Smart contract, Etherium, Blockchain, Transactions, Vote, Voter, Online voting system.

I. INTRODUCTION

Modern democracies are built upon traditional ballot or electronic voting (e-voting). In these recent years, a device which is known as EVMs are hugely criticized due to irregular reports of the election results. There have been many questions regarding the design and internal architecture of these devices and how it might be susceptible to attacks. Online-voting is pushed as a potential solution to attract the young citizens and the nonresident of the country. For a robust online election scheme, a number of functional and security requirements are to be met such as transparency, accuracy, auditability, data privacy, etc. We have worked the following ideas by having the two different set of modules: election commission and the voter(s). Election Commission creates elections and adds registered candidates along with the parties for contesting the election. Using an election's REST API hosted on Ethereum's Blockchain, the details are shown at the front-end of the voter for casting the vote. Then, while polling the vote is stored on our blockchain framework of which the Election Commission fetches the vote count. The limitation which we have faced due to not using the traditional way of smart contracts is that the blockchain framework which we have coded cannot run on the main net as it needs to be hosted and a separate web3 provider have to be used for interacting with it and not having a public API of voter ID creates a drawback of not having authentication of a voter.

II. PROBLEM DESCRIPTION

Manual voting system has been deployed for many years in our country. However, in many parts of our country people cannot attend the voting because of several reasons. To illustrate, sometimes people may not be in their own registration region and due to this fact, they cannot fulfill their voting duties. In order to solve these problems, there is a need of online election voting system with this keeping in mind that EVM votes tampering issues are also encountered, so this online election system will be integrated with Blockchain Technology to make it tamper proof.

DRAWBACKS OF EXISTING SYSTEM

EVM's are universally used in India since the general elections of 2004, when ballots were completely out of trend. They have been used in all the assembly polls and general elections of 2009. By using EVM's, Votes are correctly recorded and there is no problem in counting, scalability, Accuracy, fast declaration of results and robustness of system. Main Problem lies in authentication, the person who is voting may not be the legitimate person. Other problems like capturing of booth by political parties, casting of votes by underage people and fraud voting may occur. A person is provided with the voter id card as a proof of identity, issued by Indian government. Lot of problems are seen in voter id cards like name misprinting, missing of name, no clear photo on photo id card, etc.

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III. RELETED WORK

In this paper [1], discusses the possible opportunity for applying BC technology in e-voting systems to improve the process of voting by tackling the issues of trustless, privacy, and security. This paper aims to evaluate different applications of blockchain as a service to implement distributed electronic voting systems. Some of them have been only a draft paper; others are implemented in the real world. A blockchain based e-voting application improves security, privacy, and decreases the cost, even more, which can be achieved.

In this paper [2], Donors Building a secure electronic voting system that offers the fairness and privacy of current voting schemes, while providing the transparency and flexibility offered by electronic systems has been a challenge for a long time. In this work-in-progress paper, we evaluate an application of blockchain as a service to implement distributed electronic voting systems.

In this paper [3], Online voting is an alternative to age old paper ballot system and the currently popular electronic voting machines (EVM). An electronic voting portal should offer security and integrity along with the transparency of votes and privacy of voters. This paper proposes an e-voting system based on blockchain that eliminates some of the limitations in existing voting systems.

In this paper [4], E-Voting or electronic voting is a means for the election process to be conducted without the use of traditional paper ballots. The e-voting process, to be implemented in a largescale scenario, requires the addressing of concerns concerning the security and reliability of such a system.

In this paper [5], Electronic Voting Machine (EVM) is a simple electronic device used to record votes in place of ballot papers and boxes which were used earlier in conventional voting system. Fundamental right to vote or simply voting in elections forms the basis of democracy. All earlier elections be it state elections or center elections a voter used to cast his/her favorite candidate by putting the stamp against his/her name and then folding the ballot paper as per a prescribed method before putting it in the Ballot Box.

IV. SYSTEM ARCHITECTURE

This paper is all about transportation facilities. The objective of the system is to make daily life easier and more effective with the blessings of technology. This is a car related system that helps you to find new and used cars for sell, buy, rent near you and also guides you towards car maintenance facilities. The existing system focused on all aspects such as buying, renting, and selling. They focused on each aspect but for just one entity i.e. cars. They developed the mobile application and a web site for these operations.

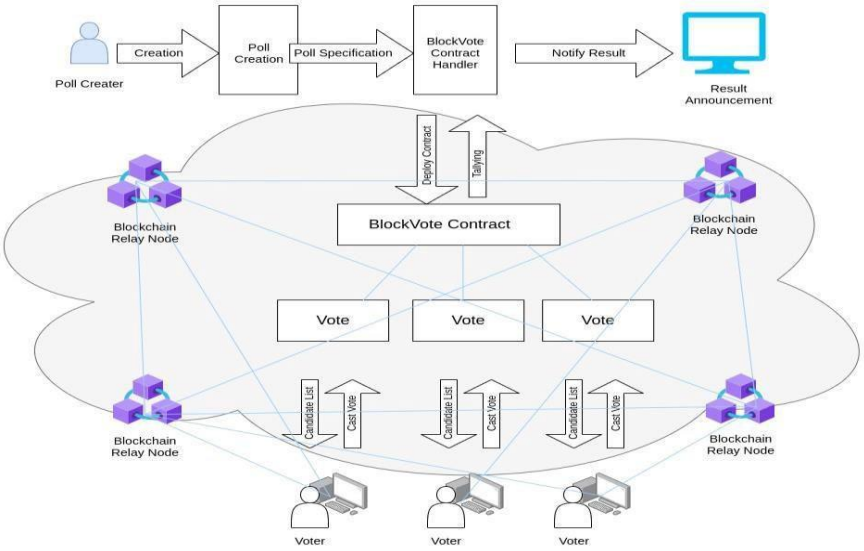

Fig.1. System Architecture

Our architecture is named BlockVOTE. This section describes the architecture overview, data models, algorithms, and all related formal definitions. The details regarding the implementation of our proposal are later described in the next section. The architecture of BlockVOTE is depicted in Figure 1 Our architecture is designed based on the smart contract capability of Blockchain. For the clarity of the explanation, we explain our architecture in a step-by step manner according to the three main steps of any voting process, which are (i) Poll Creation, (ii) Voting, and (iii) Result Tallying. The details are as follows.

A. Poll Creation: Before creating a poll, a list of candidates would be needed to be prepared first. The internal process of choosing candidates (e.g., verifying the profile of each candidate in a political election) can be varied between each organization. This process is not covered within our architecture as it is considered to be outside of the scope of the system

B. Voting: After the poll creator uses Poll Creation module and BlockVOTE Contract Handler module to create a new BlockVOTE contract, voters can invoke the vote functionality of the contract to cast a vote. In short, a voter casts a vote by passing, (i) a contract to be voted, (ii) an ID of a candidate that a voter wants, and (iii) their own cryptographic hash identity, to the vote function.

C. Result Tallying: The result tallying is a process that is done when the poll deadline has been reached. The tallying process is modeled as a smart contractbased function that is executed automatically by the BlockVOTE Contract Handler module when a poll deadline is reached.

V. OBJECTIVES

- The election system must be openly verifiable and transparent.
- The election system must ensure that the vote cast by the voter has been recorded.
- The election system should be tamper-proof.

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VI. CONCLUSION

In this project, we introduced a blockchain-based electronic voting system that utilizes smart contracts to enable secure and cost-efficient election while guaranteeing voters privacy. Blockchain technology offers a new possibility to overcome the limitations and adoption barriers of electronic voting systems which ensures the election security and integrity and lays the ground for transparency. Using an Ethereum private blockchain, it is possible to send hundreds of transactions per second onto the blockchain, utilizing every aspect of the smart contract to ease the load on the blockchain.

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