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INTELLIGENT ELECTRONIC VOTING SYSTEM USING BLOCKCHAIN TECHNOLOGY

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***Abstract*— Building an electronic voting system that satisfies the legal requirements of legislators has been a challenge for a long time. Distributed ledger technologies are an exciting technological advancement in the information technology world. Blockchain technologies provide an infinite range of applications benefiting from sharing economies. We will show how blockchain can be used to transfer votes between two peers. In our case, one peer is the voter and the other is the candidate who receives the vote. We will explain how blockchain can be employed in mass electoral voting procedures in a more secure way without needing a central authority body.**

We will explain a voting system using blockchain that is more robust, tamperproof (immutable to voting changes either by the voter or by any other third parties) and cost effective. We have reviewed various blockchain technologies available today to use in our voting system. Also, we will elaborate on the architecture, design and design constraints and implementation implications of such a voting mechanism in our society. We aim to evaluate the application of blockchain as service to implement distributed electronic voting systems. Here we highlight some of the popular blockchain frameworks that offer blockchain as a service and associated electronic E-voting system which is based on blockchain that addresses all limitations respectively, it also preserve participant's anonymity while still being open to public.

***Index Terms*— Blockchain, Decentralization, Voting scheme, Distributed System**

I. INTRODUCTION

Blockchain become a new technology, a representative sample of research is presented, spanning over the last ten years, starting from the early work in this field. Various types of usage of blockchain and other digital ledger techniques, their challenges, applications, security and privacy issues were investigated. Some countries have already taken the initiative to improve their voting system by using blockchain technology and decentralized peer to peer network accompanied by a public ledger. Sierra Leone is the first country in the world to use blockchain Technology to verify votes in an election in March, 2018.

The lack of ability to change or delete information from blocks makes the blockchain the best technology for voting systems. Blockchain technology is supported by a distributed network consisting of a large number of interconnected nodes. Each of these nodes have their own copy of the distributed ledger (information) that contains the full history of all transactions the network has processed. There is no single authority that protect the network. If the majority of the nodes agree, they receive a transaction. This network allows users to remain anonymous.

A basic analysis of the blockchain technology (including smart contracts) suggests that it is a suitable basis for e-voting and moreover, it could have the potential to make e-voting more acceptable and reliable. Modern democracies are built up on voting system, whether traditional ballot based or electronic voting (e-voting). In recent years voter apathy (lack of interest) has been increasing, especially among the younger computer/techno savvy generation. Evoting is pushed as a potential solution to attract young voters. For a robust e-voting scheme, a number of functional and security requirements are specified including transparency, accuracy, auditability, system and data integrity, secrecy/privacy, availability, and distribution of authority. Existing works examine how blockchain can be used to improve the e-voting schemes or provide some strong guarantees of the above listed requirements. In this proposed work, we form both the possibilities of an e-voting scheme, along with the challenges and limitation of the blockchain technology in the e-voting context.

II. EXISTING METHODOLOGY

- We replace a old part with a small part of the machine with a look-alike component that can be silently instructed to steal a percentage of the votes in favor of a chosen candidate.
- Electronic voting machines have been viewed as flawed, by the security community, primarily based on physical security concerns.
- Anyone with physical access to such machine can sabotage the machine, thereby affecting all votes cast on the aforementioned machine.
- One candidate casts the votes of all the members or few amounts of members in the electoral list illegally.
- This results in the loss of votes for the other candidates participating and also increases the number votes to the candidate who performs this action.
- This can be work externally at the time of voting.

III. PROPOSED SYSTEM

We propose a blockchain-based e-voting system that uses permission blockchain to enable liquid democracy**.** We

discuss some of the security and legal considerations and limitations regarding designing an electronic voting system for national elections**.** We will use a permission blockchain, a variation of the consortium-based chains, which uses the proof-of-authority consensus algorithm. In proof-of authority-based networks, transactions and blocks are validated by approved accounts, known as validators. This process is automated and does not require the validators to be constantly monitoring their computers. A permission blockchain which uses the POA consensus algorithm enables us to set restrictions on a set of selected known entities to validate and certify transactions on the blockchain and censor transactions arbitrarily, with their identity and reputation at stake. These otherwise needs to be done by miners on a public blockchain which uses the proof-of-work consensus algorithm.

A. BLOCK DIAGRAM

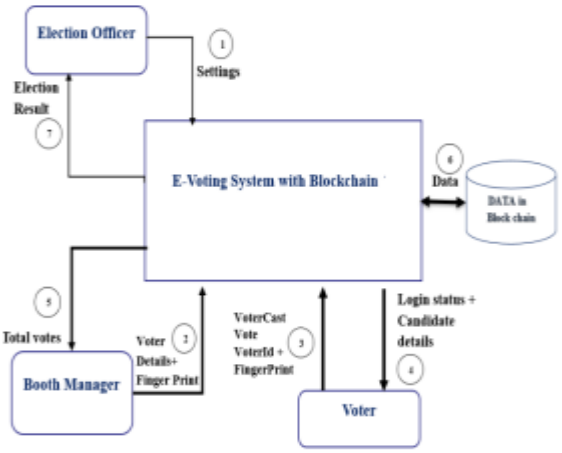


Fig.1. Block Diagram

B. METHODOLOGY

1) Blockchain

A block chain is originally block chain, is a growing list of records, called blocks, which are linked using cryptography. Every block contains a cryptographic hash of the previous block, a timestamp, and transaction data (generally represented as a Merkle tree root hash).

2) Blockchain Structure

This permits the participants to verify and audit transactions in expensively. A Blockchain database is managed autonomously using a peer-topeer network and a distributed time stamping server. They are proved by mass collaboration powered by collective self-interests The result is a robust workflow where participant's uncertainty regarding data security is marginal. The utilization of a Blockchain removes the characteristic of infinite reproducibility from a digital asset. It confirms that each unit of value was transferred only once, solving the long-standing problem of doubled spending. Blockchain have been described as a value-exchange protocol. This Blockchain-based values can be finished quicker, safer and cheaper than with traditional systems A Blockchain can assign title rights because, when properly set up to detail the exchange agreement, it gives a record that compels offer and acceptance.

C. Types of Blockchains

Currently, there are three types of Blockchain networks - public Blockchains, private Blockchains and consortium Blockchains.

1) Public Blockchains

A public Blockchain has absolutely no access restrictions. If anyone with an internet connection can send transactions to it as well as become a validator (i.e., participate in the execution of a consensus protocol). Basically, such that networks offer economic incentives for those who secure them and utilize some type of Proof of Stake or Proof of Work algorithm. Most known public Blockchains are Bitcoin and Ethereum.

2) Private Blockchains

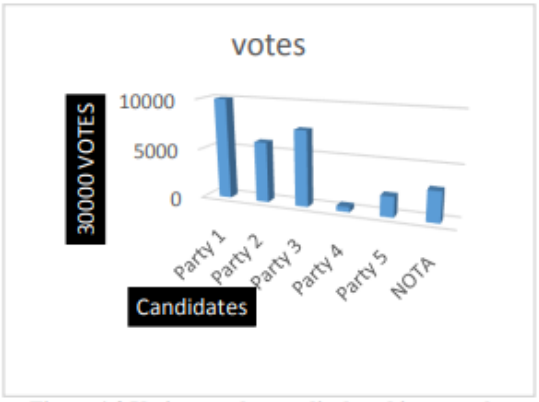
A private Blockchain is permissioned. One cannot able to join it unless invited by the network administrators. Participant and validator access is restricted. This Blockchain types are examined a middle-ground for companies that are interested in the Blockchain technology in general but are not comfortable with a level of control offered by public networks. They are used find to incorporate Blockchain into their accounting and record-keeping procedures without sacrificing autonomy and running the risk of exposing sensitive data to the public internet.

3) Consortium Blockchains

A consortium Blockchain is generally said to be semi-decentralized. It, too, is permissioned but rather than of a single organization controlling it, a number of companies might each operate a node on such a network. The main administrators of a consortium chain confine users' reading rights as they see fit and only allow a limited set of trusted nodes to execute a consensus protocol.

IV. EXPERIMENTAL EVALUATION

No. of voter	Correct Verifica- tion	Correct Voting Count	Accuracy
50	50	50	98-100%
100	100	100	96-100%
150	150	150	94-100%
200	200	200	94-100%



V. CONCLUSION

In our journal we also consider the security voting and authentication with finger of the corresponding officers and peoples for voting. Computerized process was needed to maintain all the records and provide facilities at high speed; it also reduces manual work and does the job in an easy way and in an effective manner.

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