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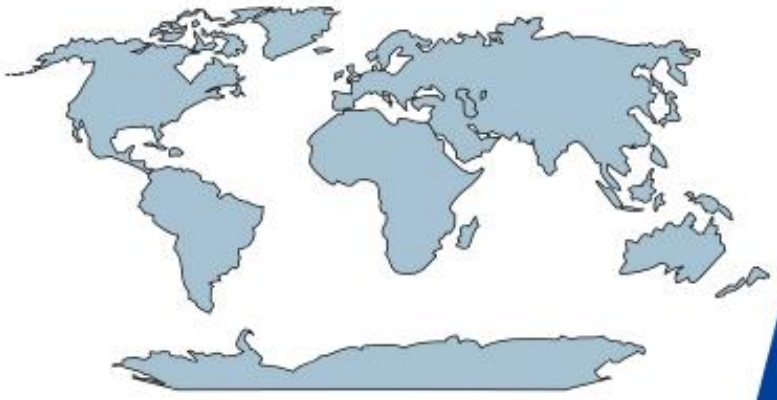

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ETHEREUM BLOCKCHAIN BASED VOTING SYSTEM

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ABSTRACT
Blockchain is the revolutionary concept, which is popularly known for cryptocurrency Bitcoin. Blockchain technologies offers an infinite range of applications which are beyond Cryptocurrencies. Blockchain provides Safety and transparency. Smart Contract is useful in terms of verifying, validating, capturing in secure manner.

Introducing Blockchain in E-voting could solve concerns in voting system. Ethereum's blockchain and smart contracts are helpful to build voter authorization and auditable voting records [4]. This paper illustrates the overview of using Ethereum based Blockchain for e-voting System to overcome the current issues which democratic systems are facing in voting process and evaluating the problems and solutions for using Ethereum based blockchain voting system.

Keywords: blockchain, Smart Contracts, Ethereum 1.Introduction

Entrance of Blockchain technology in cryptocurrencies like Bitcoin, Ethereum is widely accepted, and it is still trending topic today's world. Earlier, Blockchain was used only for trade and monetary transactions but over period, studies and research have started suggesting that it is beneficiary in many areas with its feature of transparency.

The concept of electronic voting was first appeared in 1981. In every democracy, the security of election is most important for national security. Development, Security and Privacy are the main focusing areas of electronic voting research. For the voting system with goal of minimal cost of election, with adequate and increasing security, blockchain is perfect solution. Replacing traditional way of voting with the electronic voting system is more secure and voting process could become traceable. In traditional voting scheme, the voting machines are being guarded by the security community, which is mostly based on physical security, where there is nearly less traceability and anyone who is having physical access to the machine can affect the votes.

The Blockchain is public ledger which means it operates without any central authority. For ensuring data integrity, blockchain store every transaction by verifying all the nodes. Miners gathered into the block after the creation of transaction by the user. For a miner to include his block to the blockchain, he must accomplish a proof such as POW (Proof-of-Work) or POS (Proof-of-sake). This append-only structure of blockchain and the computational power which is required to add a block to the chain, majority of the computational power on network (at least 51%) would need to collude in order to append

changes in part of blockchain. Because of these properties, the blockchain is considered an immutable secure data structure, The Ethereum Blockchain expands this functionality by implementing Smart Contracts [4].

2. RELATED INFORMATION

Our focused goal in this project is to provide secure voting system and to demonstrate that a reliable e-voting scheme is admissible using blockchain. This is because, e-voting is at one's fingertips for everyone who is having computer or mobile phones, so that the administrative decision or selection can be made by people or members. This will encourage fair and transparent voting. It is essential because elections can be corrupted or manipulated. If there are many geographically distributed voting centers and too many voters, then it is expensive and if the voters are not available to physically visit the voting centers then it will lower the voting numbers and with this the result of the votes will not be accurate enough as some people missed to provide their vote. E-voting is the solution to solve these problems if it is implemented carefully.

Blockchain is a decentralized distributed storage database. In which, users obtain a private key, it is randomly generated and assigned by the system. The public key of the user is calculated using private key through the Elliptic Curve Cryptography (ECC). The asymmetric encryption method which is formed by public key and private key is basis for digital signature encryption of data on blockchain so that it can prevent data tempering.

In blockchain, append-only data structure makes the blocks to be chained in such a way that each block has hash that has the function of the previous block, which provides security to the data from altering or deletion and provides the assurance of immutability. Ethereum is open-source Turing complete platform for