E-Voting Using Ethereum Blockchain

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ABSTRACT: Voting is a very key process for any democratic country or organization. There are many flows in the system that can be exploited to manipulate results. Hence through the use of technology we would like to eliminate some of the core flows. Through the use of blockchain technology we will be able to increase transparency, add security, and decentralize the entire process. We will be using the ethereum blockchain on which our election or voting script will run. This will be connected to the front end UI which will be accessible via the user's browser. We will be interfacing between the front end and the back end via the web3.js library.

I. INTRODUCTION
BLOCKCHAIN:
A Blockchain is a sort of data set. It is an arrangement of recording data such that makes it troublesome or difficult to change, hack, or cheat the framework. A blockchain is basically an advanced record of exchanges that is copied and appropriated across the whole organization of PC frameworks on the blockchain.

ETHEREUM:
Launched in 2015, Ethereum is an open-source, blockchain-based, decentralized programming platform utilized for its own digital money, ether. It empowers SmartContracts and Distributed Applications (ÐApps) to be fabricated and run with no downtime, fraud, misrepresentation, control, or interference from a third party. Ethereum isn't only a platform yet in addition a programming language (Turing complete) running on a blockchain, assisting developers with building and distribute disseminated applications.

ETHEREUM VIRTUAL MACHINE:
Ethereum virtual machine, or EVM for short, is a blockchain-based programming platform. It permits 2 developers to make decentralized applications (Dapps). Developer's value them for having no downtimes and holding all made items

protected back from changing. You don't require broad coding foundation to utilize EVM. It additionally dispenses with the requirement for amazing equipment, making it ideal for an amateur.

TOOLS AND TECHNOLOGIES:
▪ **GANACHE**
Ganache is an individual blockchain for fast Ethereum and Corda conveyed application development. You can utilize Ganache across the whole improvement cycle; empowering you to create, deploy, and test your dApps in a protected and deterministic environment. Ganache comes in two flavors: a UI and CLI.

REMIX
Remix IDE permits creating, deploying and controlling smart contracts for Ethereum like blockchains. It can likewise be utilized as a learning platform. Remix IDE is an amazing open source tool that assists you to write Solidity contracts directly from the browser. It is written in JavaScript and supports both utilization in the browser, in the browser yet run locally and in a work area variant.
Remix IDE has modules for testing, debugging and sending of smart contract and substantially more.

SOLIDITY AND SMART CONTRACT:
The statically composed Solidity language has been made by Ethereum's group and presented in 2014. It is object-arranged, upholds libraries and legacy. While there were more Ethereum programming dialects, Solidity remained as the primary one. The major advantages of solidity are:
Functional: Solidity language is utilized for smart contracts. This for the most part deals with cash related requirements (like closeouts, crowd funding, or wallets with a multi-signature highlight).
Notwithstanding, you can make other decentralized applications as well (say, for casting a ballot). Promising: the world burns through billions on blockchain arrangements consistently.

While it's greater part comes from monetary organizations, a wide range of organizations use Blockchain. That puts Solidity 3 designers in incredibly high demand.

Adaptable: you can utilize a Remix online compiler or download an order line compiler on your PC to compose smart contracts. Both the choices are totally free.

Improving: Solidity language refreshes, for example, new highlights and bug fixes, are presented continually.

Despite the fact that these days smart contracts are related with blockchain, they really are an old concept. The first to depict them during the nineties was Nick Szabo - a researcher with a foundation in computer science technology and cryptography. By combining the two, he thought of an approach to guarantee both speed and safety.

So what is a smart contract? In its quintessence, it's a computer protocol. It is called smart contract because of its capacity to check and execute a contract with no assistance from outsiders or third parties. The contract exists in the decentralized Blockchain organization and contains every one of the provisions of a specific arrangement.

As a rule, Solidity smart contracts are utilized in cash related issue. Notwithstanding, the genuine prospects are unending. They can be utilized in casting a ballot, medical care, law, and a huge load of different fields. Utilizing smart contracts has a great deal of benefits over conventional ones: It saves time: rather than requiring days, a contract can be checked in minutes. It sets aside cash: there is no compelling reason to pay expenses to any delegates (like legal counselors). It is more secure: your reports are encoded as well as kept in a decentralized organization. This implies you generally have reinforcements. It allows you to keep away from botches: there's no compelling reason to fill in reports by hand or endow an outsider (thirdparty). Smart contracts execute utilizing a logic called If-Then. That implies the outcomes rely upon a specific condition. In his compositions, Nick Szabo contrasted it with utilizing a vending machine: you can just get your buy after you pay cash. Smart contracts are written in Solidity, and usually by utilizing the Ethereum virtual machine. You can take a stab at composing your own Ethereum smart contracts in the Remix online compiler.

II. PROBLEM DEFINITION

The main problem that we are trying to solve is that of voter fraud. The general voting process is controlled by the central authority which is undesirable as it creates a single point of failure. The other issue is that because of the centralized nature there is a possibility of vote count manipulation. All of these problems can be solved by the use of blockchain technology as it provides an architecture where you can decentralize this voting process. The blockchain technology by itself provides for an architecture where the data is made transparent and at the same time making the data immutable and irrefutable.

III. PROJECT DESCRIPTION

We first create a solidity smart contract which holds our business logic. We create two structures one for the voter and one for the candidate. The code will handle all of the functions such as adding a candidate, authorizing the voter, handling the voting process, and also it has the functions to start and stop the election. Then we build a web interface where the user will be able to access all these functions via their web browser. The web interface will be created by using html, Css, and JavaScript. In order for the front end to interact with the backend we will be using the web3.js library.

IV. PROPOSED SYSTEM
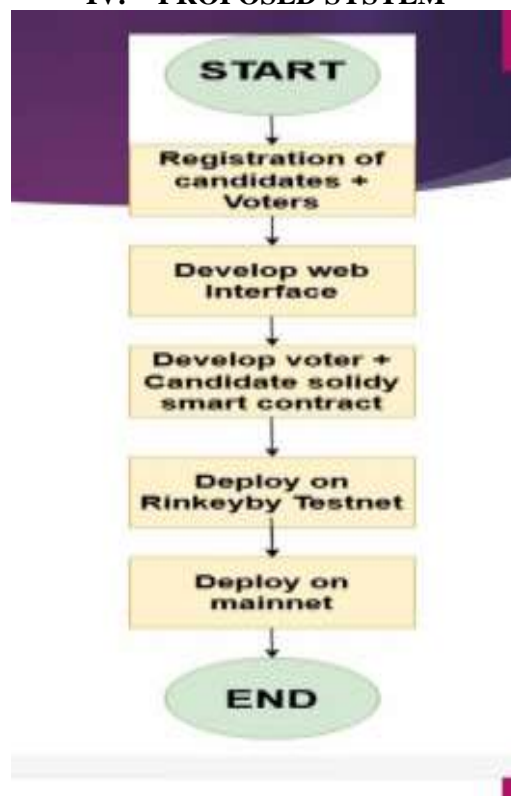
V. CONCLUSION

With this we have proposed a system for e-voting

using blockchain specifically the ethereum blockchain and have constructed a model where elections can be conducted in a decentralized, transparent, and highly secure manner.

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