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Blockchain Based Solution for Online Voting System

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ABSTRACT: In today's world, online voting is becoming more popular. It has a lot of potential for lowering administrative expenses and increasing voter turnout. It eliminates the need for voters to travel to polling locations or print ballot papers because they can vote from anywhere with an Internet connection. Despite these advantages, online voting methods are viewed with skepticism since they pose new concerns. When utilized in elections, electronic voting systems must be legitimate, accurate, safe, and convenient. Blockchain technology was created to address these concerns, and it provides decentralized nodes for electronic voting. It is used to create electronic voting systems primarily because of its end-to-end verification benefits. With dispersed, non-repudiation, and security protection features, this technology is a lovely replacement for traditional electronic voting solutions. The major purpose of this study was to look at the current state of blockchain-based voting research and online voting systems, as well as any issues that can arise in predicting future advances. This research gives a conceptual description of the anticipated blockchain-based electronic voting application as well as an overview of the blockchain's core structure and properties in relation to electronic voting. As a result of this research, it was determined that blockchain systems may be able to assist in the resolution of some of the challenges that currently afflict election systems.

KEYWORDS: Online Election System, Blockchain, Ballot Papers, Electronic Voting.

I. INTRODUCTION

The election system is a critical phase in the development of a democratic society in which citizens have the right to elect a leader who they believe will help them achieve their goals. Instead of one voting paper for each individual elector, EVMs were introduced to replace ballot paper, requiring only one ballot paper to be fixed on the balloting unit at each polling station.This results in huge savings by way of the cost of paper, printing, transportation, storage and distribution. Counting is very quick and the result can be declared within 2 to 3 hours as compared to 30 to 40 hours on an average, under conventional systems. A country like India because of its huge demography it is very difficult to conduct elections in traditional fashion wherein every voter needs to go to an allocated booth and cast their vote. People in remote areas feel it is very difficult to reach centers and as a result a lot of people miss out on an opportunity to choose their leaders. Even in cities where people are so busy with work, pressurenegates themselves from voting because of which, we see a drastic percentage reduction in voting. But it is important to know that a single organization maintains a database. This makes a single organization, a central authority. Chances are that, database might be altered or tampered with which can change the fate of a country. Even though, chances are very bleak that any such mischief is managed. Even then, a small percentage of uncertainty can cause havoc in the election system and can create doubts. People then, would hardly believe the system. Hence, this would provide room for opportunities for innovative solutions and one such is the online voting system using blockchain. This technology would definitely be out of the way initially in a big country. But, working towards achieving it can definitely be a cherry on cake in the near future. Here, all the data is not allocated on a central server, it is a decentralized database. The data will be present in several systems called nodes. A node will be able to communicate with other nodes and similar responsibilities are shared among nodes. Every node will have the copy of the data that is sharedover the blockchain. If there are any foggiest of changes made in a node the nodes that are followed after that affected node becomes invalid and we come to know about the tampering. Hence, one cannot even think of tampering with the data if such technologies are used. Every one of these data are contained in bundles of records called blocks which are connected together to make complete informationabout any event conducted. This also develops a strong belief towards the system as a voter will always be confident that his vote will reach the candidate that he/she intended for. Through this project we would like

to demonstrate a voting application using blockchain which keeps fraudulent activities at bay.

II. LITERATURE SURVEY

Ali Mansour Al-madani et.al. (2018) [1] proposed E-voting as a decentralized system. Voter and candidate registration process is done prior and after verifying identity through coin or token one can cast their vote. Solidity, which is an object-oriented programming language used for writing smart contracts notably for Ethereumplatforms, is taken into consideration.

Harsh Jain et.al. (2019) [2] proposed that voters will have to register themselves prior to election. They will generate their public-private key pair online. For registration, they will have to provide voter- id details and mobilenumbers. During voting, a transaction is created using voters' public key and hash value of the candidateand signing it with his private key.

K. Lakshmi SaiPriya and Ch. Rupa (2020) [3] proposed on giving a secure e-voting system that has privacy and security compared to current systems using blockchain technology which is reliable in providing immutability. system considers candidate/party registration process, unique BCT based voter ID creation, voter registration process, and voting process. Eth cryptocurrency is used. So, Eth balance is required to perform any operations on the BCT environment. the number of voters BCT IDs are created in the ganache platform.

HimanshuAgarwal and G.N. Pandey (2017) proposed [4] a unique approach for an online election system using Aadhaar Id wherein, information of each voter is added or uploaded in the main database of election commission of India according to Aadhaar identity number. Candidate sends all his/her information with Aadhaaridentity numberto the administrator and only after verifying candidate data, the administrator will register the candidate according to constituency.

KritiPatidar and Dr.Swapnil Jain (2019) [5] proposed A client-side user interface built to use Ethereum accounts to cast votes. This system considers the registration of voters and the candidate to be done in advance. Identity verification should be done before creating accounts. After identity verification, authorized persons should authenticate eligible users by providing a coin or token. A contract account of Ethereum network is used whichis a smartcontract that stores Ether- cryptocurrency of Ethereum.

III. METHODOLOGY

3.1 Structure of Blockchain
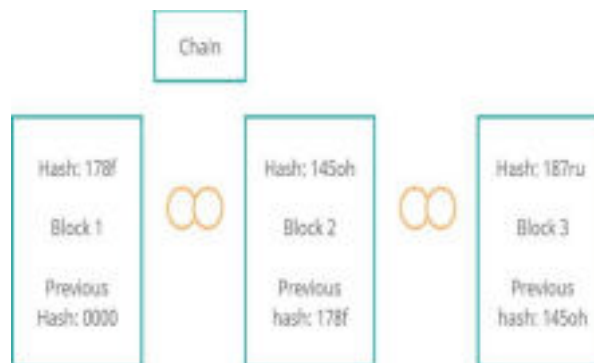
A block is formed whenever a new transaction is executed. The number of blocks grows in tandem with the number of transactions. They are formed in such a way that each old block is linked to the newly created block. It's made up of a previous hash value and a new one. Previous hash value of a new block is nothing but the new hash value of the old block [7]. Hence, tampering of data becomes very difficult as their hash values in this case don't match making the rest of the connected blocks invalid. Therefore, making it more secure and reliable.

3.2 Working

Registration: The voters will have to register themselves before casting their vote. They will also be able to generate their own public-private key pair online. The voter will mention their Aadhaar card and Voter Id details [6]. Then, the voter will be verified using OTP sent to the registered mobile number. After successfulregistration a key-pair will be generated along with registration Id.
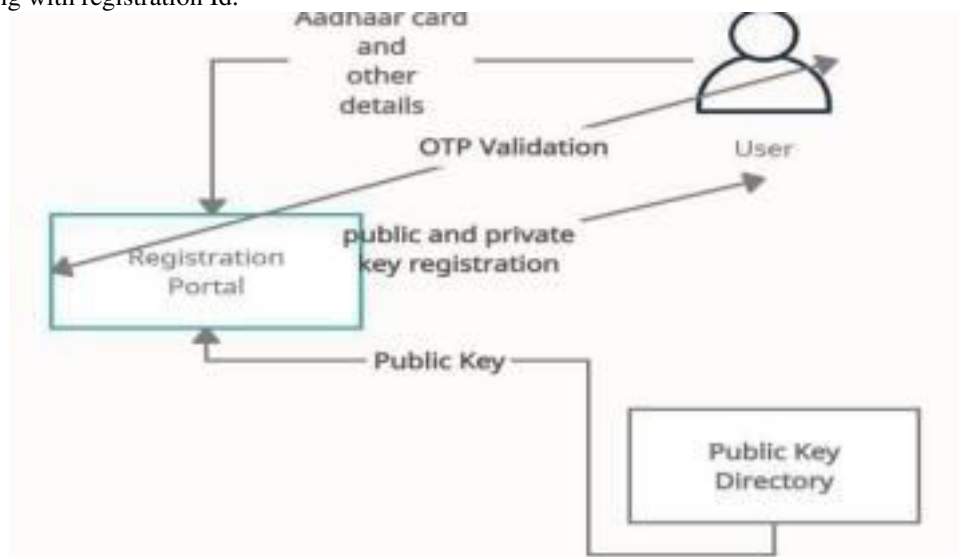
Voting: Voters will be able to cast their vote using a web portal. Initially, the voter must enter his/her Registration Id based on that, the portal will display the names of the candidates that are contesting for elections.The voter will then vote for his/her preferred candidate. In this process, the voter is actually creating a

transaction with his public key and the hash value of the candidate and signing it with his private key. Block Creation: Here, the miners are bots who will calculate the proof of work and create a block. Miners will compute the value for a random number called Nonce, such that the target hash is acquired; this task is called mining. A chain will be formed through hash pointers. Each new block consists of the hash value of the previous block.

Counting: A simple code that could traverse the blockchain would achieve this target. The results will be released towards the end of the election. The result will be released towards the end of the common key-pair.

3.3 Tools Used

Latest version of Google Chrome or Firefox as browsers. Frontend technologies like HTML, CSS, JavaScript. Microsoft Visual Studio Code as the IDE.MySQL for data storage and retrieval.

IV. CONCLUSION

The purpose of this study is to better understand and discuss blockchain-based electronic voting systems. Blockchain is a developing technology that has the potential to improve the voting system. Many experts believe that blockchain is the most appropriate technology for a decentralized electronic voting system. The voting records kept in these suggested methods are accessible to voters and unbiased observers. There has been a lack of studies in electronic voting that need to be addressed in future studies. Expandable attacks, lack of clarity, reliance on traitor systems and resistance to obligation are all potential drawbacks that must be addressed. As further research is required, we are unaware of all the risks connected with the security and expandability of blockchain-based electronic voting systems. Technology has bloomed to such an extent in this century that people expect every job to be done within their fingertips provided, securely and efficiently. When talking about a process that is going to be held nationwide it is obvious that the task needs to be done efficiently and successfully. This particular technology proposed above just satisfies what people of this age expect. This solution can provide a fair, successful process in such a manner that people will have an unbiased thought about the election system. Adopting blockchain voting methods may expose users to unexpected security risks and flaws. Blockchain technologies require a more sophisticated software architecture as well as managerial expertise.

ACKNOWLEDGEMENT

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