

## Decentralised Voting System

Mrs M.Kamala<sup>1</sup>, Dharmikesh Kalakonda<sup>2</sup>, Abiram Muppaneni<sup>3</sup>, Mahesh Pala<sup>4</sup>

<sup>1</sup>Associate Professor Dept of CSE St.Peter's Engineering College Hyderabad TS

<sup>2</sup>B.Tech Student 16BK1A0523 Dept of CSE St.Peter's Engineering College Hyd

<sup>3</sup>B.Tech Student 16BK1A0537 Dept of CSE St.Peter's Engineering College Hyd

<sup>4</sup>B.Tech Student 16BK1A0540 Dept of CSE St.Peter's Engineering College Hyd

**Abstract—** *The electoral system in India also as in some countries abroad is flawed and may be easily manipulated and hampered by those with power to suit their personal benefits. It allows people with money to shop for the votes or tamper the machine that record it. A current example can be the recent elections in Uttar Pradesh where the ruling party manipulated the voting machines to gain the unfair advantages. The system features a user-friendly interface and may be wont to run polls and elections with total security and 0 percent chance of manipulation. It is totally on a peer to see network so virtually impossible for an individual to hack or line up on a network. A person cannot vote more than once. A distributed system means no tampering or manipulating. We are using blockchain technology because the backbone of our product. Because of blockchain, the info (of the voting) can't be tampered or manipulated because it is distributed over the network. We used ganache which may be a tool that collects alittle percentage of test ether whenever an individual votes verifying the identity of the person and that we also used solidity test cases to verify if the candidates and the voter is valid.*

**Keywords-** *Blockchain Technology, Distributed System, End to End Transactions, Aadhar API, Biometric Verification.*

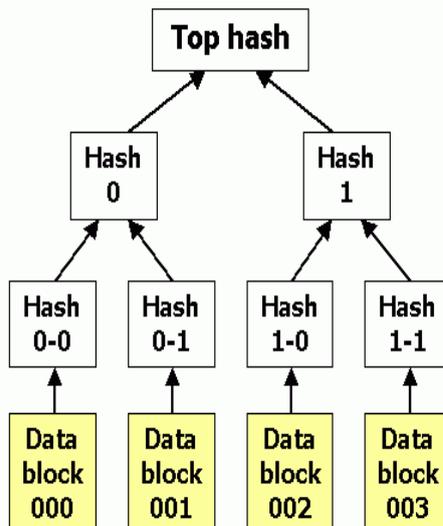
### 1. INTRODUCTION

The term "blockchain technology" typically refers to the transparent, trustless, publicly accessible ledger that permits us to securely transfer the ownership of units useful using public key encryption and proof of labor methods. The electoral system in India as well as in some countries abroad is flawed and may be easily manipulated and hampered by those with power to suit their personal benefits. It allows people with money to shop for the votes or tamper the machine that record it. A current example can be the recent elections in Uttar Pradesh where the ruling party manipulated the voting machines to gain unfair advantage. A distributed system means no tampering or manipulating. We are using blockchain technology because the backbone of our product.

### 2. What is a Blockchain and how is it Commonly Used?

Blockchain technology was first used within Bitcoin and may be a public ledger of all transactions. A blockchain stores these transactions during a block, the block eventually becomes completed as more transactions are administered. Once complete it's then added during a linear, chronological order to the blockchain. The initial block during a blockchain is understood because the 'Genesis block' or 'Block 0'. The genesis block is typically hardcoded into the software; it's special therein it doesn't contain a regard to a previous block. ('Genesis Block', 2015) Once the genesis block has been initialized 'Block 1' is

made and when complete is attached to the genesis block. Each block has a transaction data part, copies of each transaction are hashed, and then the hashes are paired and hashed again, this continues until a single hash remains; also known as a merkle root (Figure 1). The block header is where the merkle root is stored. To ensure that a transaction can't be modified each block also keeps a record of the previous blocks header, this suggests to vary data you'd need to modify the block that records the transaction.



#### Existing system:

Electronic Voting is that the standard means of conducting elections using Electronic electoral system sometimes called "EVMs" in India. The use of EVMs and electronic voting was developed and tested by the state-owned Electronics Corporation of India and Bharat Electronics within the 1990s. They were introduced in Indian elections between 1998 and 2001, during a phased manner. The electronic voting machines are utilized in all general and state assembly elections of India since 2004. Prior to the introduction of electronic voting, India used paper ballots and manual counting. The paper ballots method was widely criticised due to fraudulent voting and booth capturing, where party loyalists captured booths and stuffed them with pre-filled fake ballots.

#### Proposed system:

We need to first devise a system that ensures voter registration that might guarantee the anonymity of voters and also ensuring that everybody casting a vote were authorized to do so which nobody would be ready to vote quite once within the same election and also ensuring that vote given by the voter can't be changed, which can only be achieved through blockchain. A user will walk into a government authorized centre and complete his/her biometric verification. Once the verification is complete the user will be taken to a web-based portal (developed by us) where he/she will be presented with the voting options. The portal then sends the information of the user's vote (encrypted) to backend (developed by us) where the data will be decrypted and the vote's transaction from the user to the candidate will happen using the Azure blockchain service. The candidate with the most votes is elected. During each election time the users that are voted are logged which will make sure only one transaction can be made by the user during the whole election process.

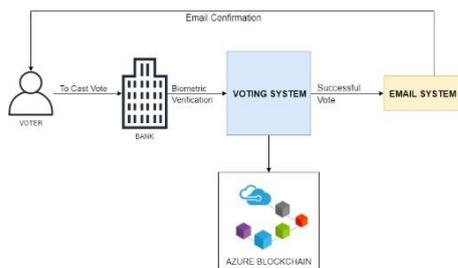
#### Advantages:

- **No VoterID required** as a user's validity (age: 18+) is determined dynamically using the Aadhaar API
- **Secure vote** by Azure blockchain and biometric authentication (using pre-existing Aadhaar database)
- **Reduced cost** during election process
- **Shorter wait times** as it is decentralized
- A vote can be cast from **anywhere in the country**
- **Highly scalable** design
- **Efficient election system** in which the portal can be up for days together, in turn **increasing voter turnout**
- Portal **front end** can provide useful information on the

candidate and can aid in their decision making (display promises, proposals etc.)

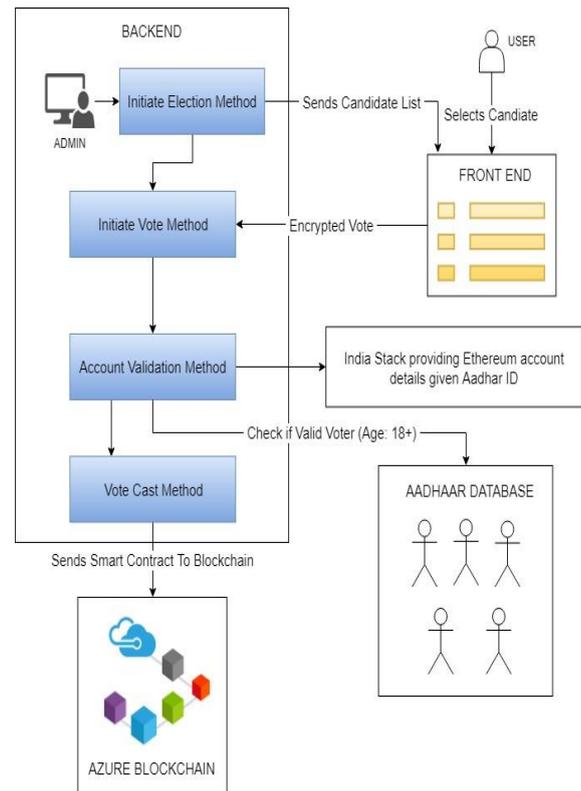
**Software requirements:**

- Azure Blockchain
- Aadhaar API service (for biometric authentication)
- Python (to communicate with blockchain and for backend and frontend API calls)
- Truffle (provides tools to create and test smart contracts)
- Ganache (to create private blockchain network for testing on localhost)
- Flask (web framework)
- Docker (deployment of portal on the cloud)



**MODULE DESCRIPTION**

1. Initiate Election Method
2. Initiate Vote Method
3. Account Validation Method
4. Vote Cast Method
5. Candidate Selection
6. Checking Aadhar Database
7. Azure Blockchain
8. Output



**3. Discussion of Results**

Within our proposal we've tried to style a service and system that minimises the dimensions of attack vectors to stop potential malicious attacks. we've tried to gauge and analyse our design from various perspectives to form sure we've considered each step of the voting process. This section of the report discusses the potential risks related to our proposal and suggests actions which will be taken to assist mitigate them. One risk is that if a voter were to forget their ID, password or polling card on the day of voting. In this case the voter are going to be unable to cast their vote as they can't enter the system. Possible risk mitigations include the voter returning later that day with the right information or the implementation of a backup authentication service like by phone. Alternatively, a forgotten password system might be added to the voter registration website; this might add much an equivalent way as recovering a

password works on other websites. However, this increases the danger of a hacker attempting to vary a voter's password without their knowing.

#### 4. Conclusion

The transparency of the blockchain enables more auditing and understanding of elections. These attributes are a number of the wants of an electoral system. These characteristics come from decentralized network, and may bring more democratic processes to elections, especially to direct election systems. For e-voting to become more open, transparent, and independently auditable, a possible solution would be to base it on blockchain technology. This paper explores the potential of the blockchain technology and its usefulness within the e-voting scheme. The blockchain is going to be publicly verifiable and distributed in a way that nobody is going to be ready to corrupt it. These blockchains are held completely separately to get rid of any threat to link votes surely parties back to individual voters while maintaining the power to trace who has voted and the way many votes are literally present. The blockchain containing information of who has registered to vote also allows our service to make sure each voter in a unique way.

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