# ONLINE VOTING SYSTEM USING BLOCK CHAIN

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**ABSTRACT:**

Election could be an important event during a trendy democracy however massive sections of society round the world don't trust their election system that is major concern for the democracy. E-voting schemes bring problems mainly regarding security, credibility, transparency, reliability, and functionality. Estonia is the pioneer in this field and may be considered the state of the art. But there are only a few solutions using blockchain. Blockchain can deliver an answer to all of the mentioned problems and furthermore bring some advantages such as immutability and decentralization. The main problems of technologies utilizing blockchain for e-voting are their focus on only one field or lack of testing and comparison. In this paper, we present a blockchain-based e-voting platform, which can be used for any kind of voting. It is fully utilized by blockchain and all processes can be handled within it. After the start of the voting, the platform behaves as fully independent and decentralized without possibilities to affect the voting process.

***Key words: Block chain, E voting, Secured voting.***

## I INTRODUCTION

Lately, electronic voting systems have begun being used in many countries. Estonia was the first in the world to adopt an electronic voting system for its national elections. Soon after, electronic voting was adopted by Switzerland for its state-wide elections, and by Norway for its council election. For an electronic voting system to compete with the traditional ballot system, it has to support the same criteria the traditional system supports, such as security and anonymity. An e-Voting system has to have heightened security in order make sure it is available to voters but protected against outside influences changing votes from being cast, or keep a voter's ballot from being tampered with. Many electronic voting systems rely on Tor to hide the identity of voters. However, this

technique does not provide total anonymity or integrity since many intelligence agencies around the world control different parts of the Internet which can allow them to identify or intercept votes. That is why we have decided to create safe elections in which voters do not have to worry about someone abusing the electoral system. In recent years blockchain is often mentioned as an example of secure technology used in an online environment. Our e-voting system uses blockchain to manage all election processes. Its main advantage is that there is no need for confidence in the centralized authority that created the elections. This authority cannot affect the election results in our system. Another challenge in e-voting is the lack of transparency in the functioning of the system, leading to a lack of confidence in voters. This problem is solved by blockchain in a way of total transparency that allows everyone to see the stored data and processes such as how these data are handled. In the field of security, this technology is more suitable in every way than the classic e-voting platform without blockchain.

## 2. RELATED STUDY

**"Block-chain-Enabled E-Voting,"** Blockchain-enabled e-voting (BEV) could reduce voter fraud and increase voter access. Eligible voters cast a ballot anonymously using a computer or Smartphone. BEV uses an encrypted key and tamper-proof personal IDs. This article highlights some BEV implementations and the approach's potential benefits and challenges. .

**"Voting Process with Block-chain Technology: Auditable Block-chain Voting System,"** There are various methods and approaches to electronic voting all around the world. Each is connected with different benefits and issues. One of the most important and prevalent problems is lack of auditing capabilities and system verification methods. Blockchain technology, which recently gained a lot of attention, can provide a solution to this issue. This paper presents Auditable Blockchain Voting System (ABVS), which describes e-voting processes and components of a supervised internet voting system that is audit and verification capable. ABVS achieves this through utilization of blockchain technology and voter-verified paper audit trail.

**"Bitcoin: A Peer-to-Peer Electronic Cash System,"** A purely peer-to-peer version of electronic cash would allow online payments to be sent directly from one party to another without going through a financial institution. Digital signatures provide part of the

solution, but the main benefits are lost if a trusted third party is still required to prevent double-spending. We propose a solution to the double-spending problem using a peer-to-peer network. The network timestamps transactions by hashing them into an ongoing chain of hash-based proof-of-work, forming a record that cannot be changed without redoing the proof-of-work. The longest chain not only serves as proof of the sequence of events witnessed, but proof that it came from the largest pool of CPU power. As long as a majority of CPU power is controlled by nodes that are not cooperating to attack the network, they'll generate the longest chain and outpace attackers. The network itself requires minimal structure. Messages are broadcast on a best effort basis, and nodes can leave and rejoin the network at will, accepting the longest proof-of-work chain as proof of what happened while they were gone.

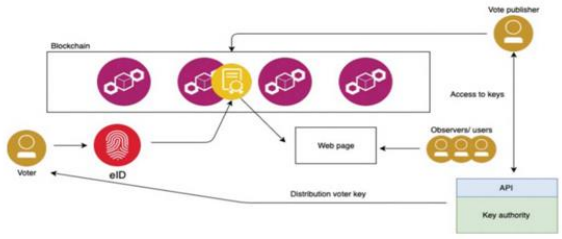
**Existing system:**

In recent years blockchain is often mentioned as an example of secure technology used in an online environment. Our e-voting system uses blockchain to manage all election processes. Its main advantage is that there is no need for confidence in the centralized authority that created the elections. This authority cannot affect the election results in our system. Another challenge in e-voting is the lack of transparency in the functioning of the system, leading to a lack of confidence in voters.

**PROPOSED SYSTEM:**

The proposed blockchain voting system considers all requirements for voting and is designed generally for any elections e.g. president, student parliament, etc. The system allows more round elections and preferably uses a public blockchain. The public blockchain can be replaced by other types of blockchain but the stored data (votes) have to be easily verified by any user. The user represents any observer who is interested in the blockchain voting. In our proposed system we identify three main roles: vote publisher; key authority; and voter. These three roles can represent an organization, a company, or a user. The roles vote publisher and key authority can be grouped to one role due to that they can be the same organization or person. The voter attends the elections depending on vote configuration. The configuration of the votes is performed by the vote publisher and is included in the smart contract. The vote publisher has to know all cipher keys before

publishing the smart contract. The close collaboration between the vote publisher and the key authority is required. The key authority creates and distributes all cipher keys to a voter and vote publisher. The distributing channel has to be secured and should not be vulnerable to any 3rd party.



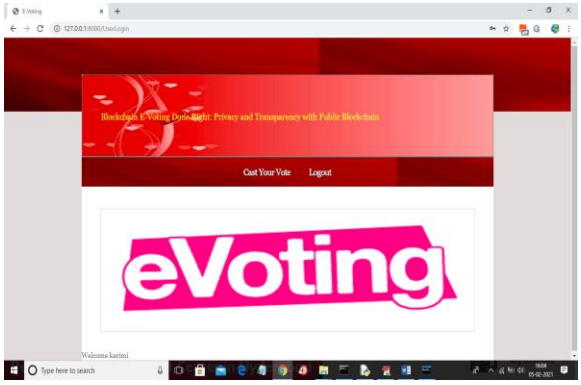

## 3 METHODOLOGY

In this project we are using public python Blockchain API's to store and manage voting data as Blockchain provides secure and tamper proof of data storage and to implement this project we have designed following modules.

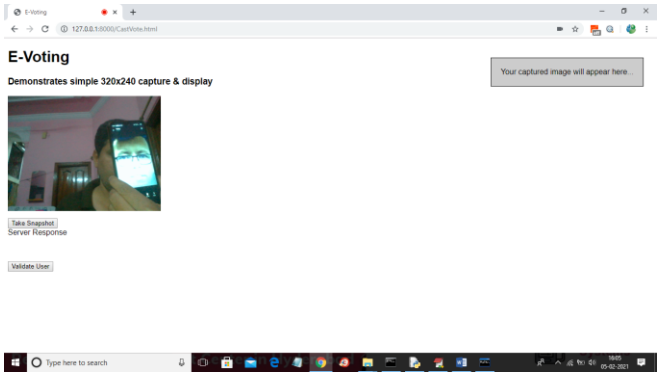
**Admin module:** this user responsible to add new party and candidate details and can view party details and vote count. Admin login to system by using username as 'admin' and password as 'admin'.

**User Module:** this user has to signup with the application by using username as his ID and then uploads his face photo which capture from webcam. After registering user can go for login which validate user id and after successful login user can go for cast vote module which execute following functionality.

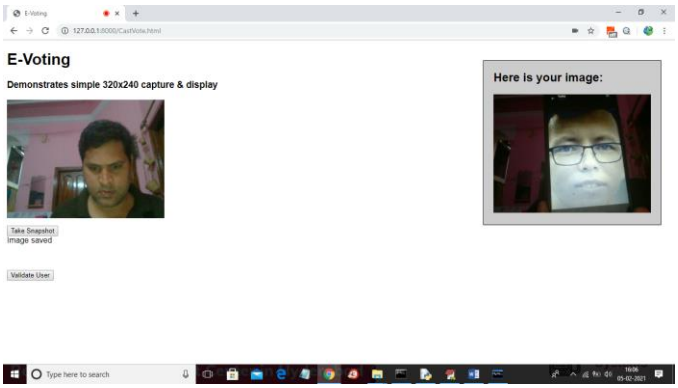
## 4 RESULTS EXPLANATION



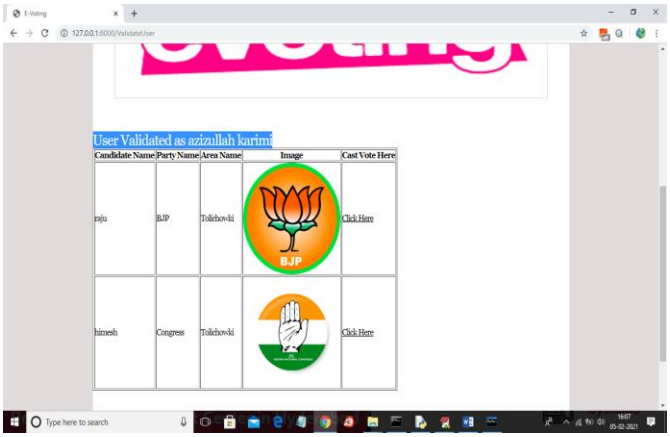

In above screen user can click on 'Cast Your Vote' link to get below webcam screen



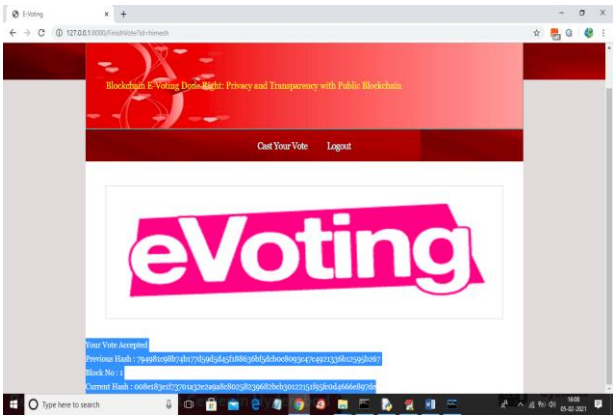

In above screen webcam is running and then by showing person face we need to click on 'Take Snapshot' button to capture his face



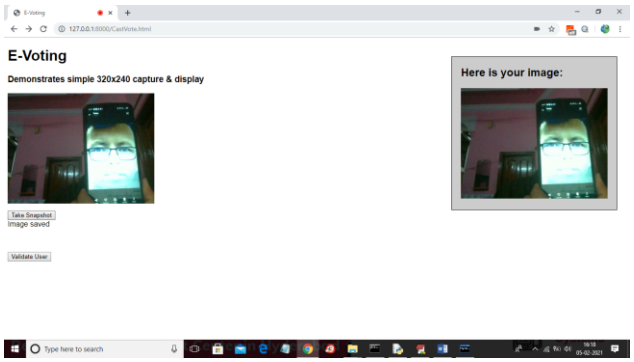

In above screen person face is capture and now click on 'Validate User' button to validate user



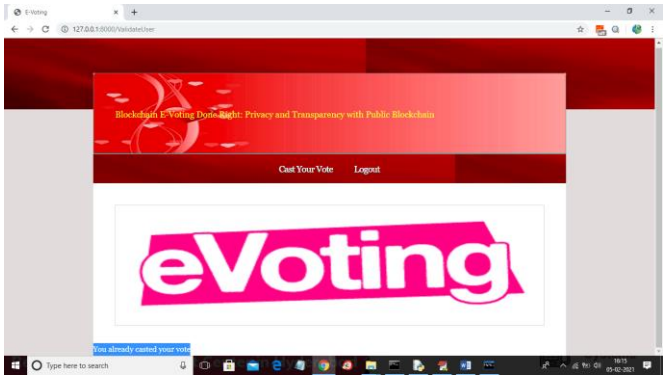

In above screen in blue colour you can see user is identified as 'azizullahkarimi' and then displaying list of candidates and now user can click on 'Click Here' option to cast his vote and to get below screen



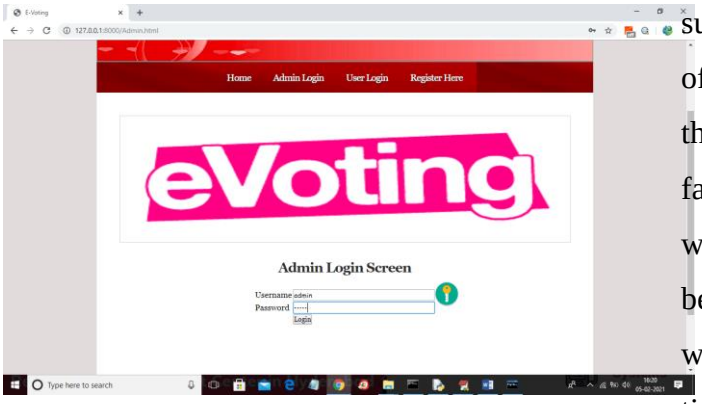

In above screen as this is the first vote so block will be added to Blockchain with block No as 1 and we can see Blockchain created a chain of blocks with previous and current hash code validation. Now try again with same user to cast vote



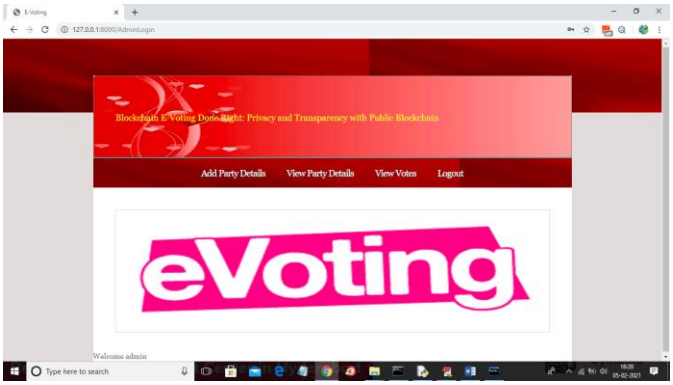

In above screen same user trying again and below is the result



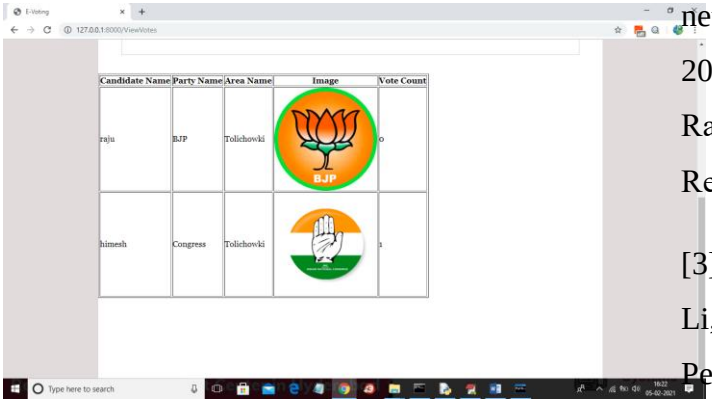

In above screen if same user try again then will get message as 'You already casted you vote' and now logout and login as 'admin' to get vote count




In above screen login as admin and after login will get below screen




In above screen admin can click on 'View Votes' link to get below screen




## CONCLUSION

Although we can see slight differences in network times, they are so negligible that public blockchain has more advantages in such an electoral system due to its openness of data and that anyone can watch them in the real time. A private blockchain is a bit faster, but it reduces the credibility of the whole system by being partially centralized because it only runs where the authority wants it. The table shows that the average times to add one person's voice are: Ganache 6.32 s (median 6.34 s), Hyperledger Composer 6.05 s (median 6.04 s), and Ethereum Ropsten 17.75 s (median 17.93 s). These times are influenced by the used consensus algorithm and also by the block time.

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