

# A Review Paper on E-Voting Using Blockchain Technology

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**Abstract** – Electronic voting system using blockchain technology fill in as a stage towards establishing a protected and transparent environment for decisions where the voters will actually want to cast their votes only once and vote cannot be tampered. The working of block chain will guarantee the votes are kept up with and the situation is not manipulated by any outsider. The secure electronic voting frameworks use block chain which is a decentralized, distributed exchange record and also follows peer to peer transaction. Each vote that is given will be viewed as a role as a single transaction. These votes will be counted and the outcomes will then, at that point, be reported. Voting is a very crucial and serious event that is organized in every country through a secret ballot or by use of ballot. Those processes have many drawbacks like tampering of votes, low voter turnout etc. To overcome all these vulnerabilities, we are going to introduce block chain to the voting process.

**Key Words:** BLOCKCHAIN, E-VOTING, VOTES, BALLOT.

## 1. INTRODUCTION

Extensive research has been done on electronic democratic frameworks that empower electors to cast a ballot whenever it might suit them utilizing a cell phone, PC or some other electronic gadget. Block is an assortment of the relative multitude of exchanges. Block chain have striking components like permanence, Decentralization, Security, Straight forwardness and namelessness. Block chain with keen agreements arises as a promising contender for building a more secure, secure and straightforward E-casting a ballot framework. Block chains have turned into a significant innovation in a somewhat brief time frame. So, voting using block chain can be considered as the safest method.

Online casting a ballot framework is a democratic framework by which any citizen can practice his/her democratic privileges from any place in the country. Different components like innovation, social issues and political decision organization are identified with the contentions in regards to web casting a ballot. Electronic voting is fit for changing over the most common way of casting a vote, less difficult and more open for voters. This is legitimate for web projecting a polling form because the democratic structures can be projected from any PC with a web affiliation. These strategies liberally decrease the majority rule cost for some voters by creating numerous

paths from which they can project a polling form. There is the probability to kill long queues at reviewing stations and give better receptiveness to individuals with ineptitudes, those encountering illness, those serving in the military or living abroad and those away on up close and personal travel and others who feel that its difficult to recognize the looking over station. In addition, web projecting a voting form can bear the expense of the electors the significant shot at having the choice to project a polling form at whatever point. Youths developed 18 to 30 are the extraordinary people of electors and web is the procedure for attracting those residents who are seen as the hardest to reach.

### 1.1 Actual Architecture of E- Voting

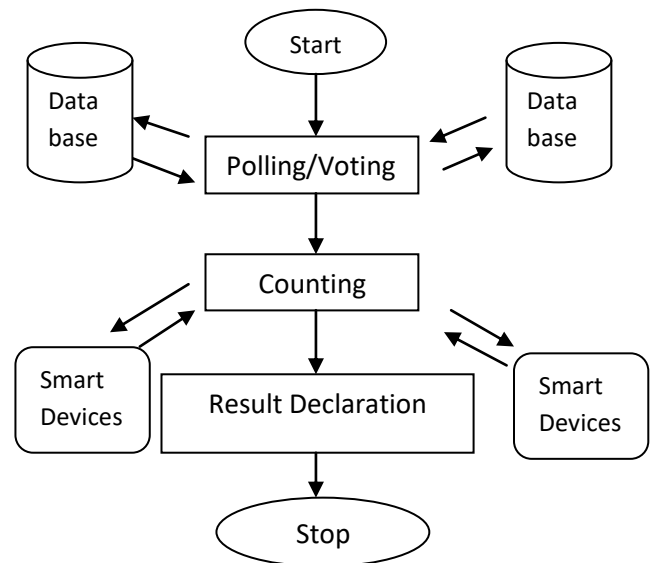


Fig 1. Actual Architecture of E-Voting

### 1.2 Literature Survey

We have undergone a lot of research before commencing our project which included many research papers published under various publications. At the time of detailed references through the literature surveys, we have come across some terms which included:

- Truffle
- Ethereum and ethers
- Web3.js
- Metamask

## Truffle

Truffle is a tool that makes it simpler for designers to construct blockchain-based Decentralized applications with respect to Ethereum. It permits designers to construct and test keen agreements and to make public and private organizations utilizing dialects like JavaScript. A remarkable and fascinating element about Truffle is its command line tool. We can run different significant commands, for example, compile, migrate, debug, etc. The control center is additionally a fast and simple way of connecting with the blockchain.

## Ethereum and Ethers

Ethereum is an open source platform that depends on the standards of blockchain innovation. The primary benefit of Ethereum is that it permits engineers to assemble and send decentralized applications. Ethereum assists designers with making tasks dependent on their necessities, and this implies that engineers can construct great many various applications. Ethereum utilizes nodes to replace individual cloud frameworks and servers claimed by significant internet services. These nodes are controlled by volunteers. The thought is for these nodes to associate with become a "world PC." This would assist with giving framework to individuals across the globe. A glorified Ethereum model is one that would be less helpless against hacks and closures, as no element will have authority over your own information. Ether is a computerized resource conveyor like a security or bond and is the solution for the issue of installment. Ether acts like money as in it doesn't need an outsider for supporting or handling the exchanges. Be that as it may, Ether isn't actually a digital currency. It tends to be considered as a fuel for the applications on the decentralized Ethereum organization

## Web3.js

Web3.js is a Programming interface with a huge JavaScript library, which permits engineers admittance to their shrewd agreements. Depending upon the difficulty of the decentralized App, a designer can assemble complex back ends with designing driven projects written in Java or even become familiar with their decentralized app information with artificial intelligence related projects coded in Python. This associate with our decentralized app on the blockchain through a convention called JSON RPC. One can undoubtedly connect with everything directly from the order line by essentially making an occurrence of Web3.

## Metamask

MetaMask is a lightweight crypto wallet. MetaMask can help designers in testing and examining dApp exchanges. MetaMask effectively interfaces with the neighborhood

blockchain running on an engineer's machine. Inside your Truffle console, essentially duplicate your localhost port, and glue it into the custom RPC accessible in the program augmentation. Records can then effectively be imported from Truffle to MetaMask.

MetaMask has been an incredible and well known commitment to the Ethereum biological system. Developers can undoubtedly switch between blockchains. At the point when a client visits a dApp, MetaMask goes about as a mediator of the blockchain. MetaMask's GUI is likewise extremely easy to use. It associates a client to the blockchain consistently. MetaMask prompts a client to support an exchange. This exchange is here and there just a charge a client may pay in some cryptographic money to associate with the blockchain

## 2. BLOCKCHAIN FOR E-VOTING

Blockchain is another innovation, booming in a large portion of the businesses. Blockchain was first proposed for a cryptocurrency (Nakamoto, 2008). A clever component of circulated blockchain network has no focal data set. The blockchain data rehashed over all of the hubs in the coursed structure. The three parts of the blockchain are decentralization, transparency, and immutable. Every one of the exchanges put away in the blocks. When the block checked with peer nodes, then, at that point, it is put away in the blockchain. Each block contains a rundown of transactions. The blocks arranged in sequential request, consent, decentralized record the board framework, which permits individuals to share the data in a reliable way. It is a secure database, where it is constrained by the entire organization, not by a single client.

**Table -1:** Types of block chain

S.No	Type	Description
1	Public Blockchain	Open Block chain
2	Private Blockchain	Centralized (Multichain)
3	Consortium	Managed by group of individuals
4	Hybrid	Same as private, but strict.

Blockchain initially named from the square and chain, the rundown of exchanges called block, which associated with the cryptography strategy. Each square connected with the past block header. Blockchain is a dispersed information base and overseen by a peer-to-peer organization. It is utilized to store and access information. Each square contains the Square header and exchanges. The square header keeps up with the Hash of past block header, timestamp, nonce, and Merkle root esteem. The wellbeing information put away in the square can't be changed. The essential utilization of blockchain is to stay away from irregularities. Blockchain is a

common record of exchanges. It enables individuals in a gathering to impart the information to different suppliers without an outsider association and screen the exchange. Maybe than store the record on a solitary server, it is kept up over different laptops, which makes the data unquestionably hard to edit or delete. That carefully planned characteristics brand name nearby a procedure that guarantees any data put into the blockchain is significant and empowers trust between the gathering individuals.

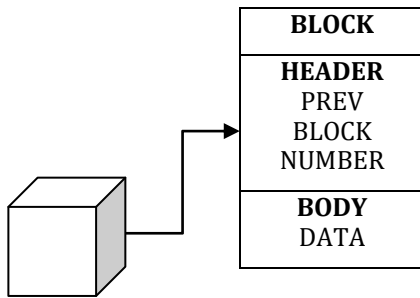


Fig 2. A Block in block chain

### 2.1 Properties of Blockchain

The major properties of block chain are decentralization, transparent, immutable, autonomy, open-source, anonymity and consensus.

- a. Blockchain as a data structure: The blockchain contains a list of the transactions and arranges them as a block. The design starts with a solitary block called a beginning block. As the proportion of exchange increments, more blocks getting added. The past block was connected with the current block. The chain of the block gives this kind of information structure. The blockchain is commonly planned to be carefully designed and irreversible.
- b. Decentralized: The decentralized shared organization; the gatherings of the framework make it as decentralized and one of the key features of blockchain advancement that works marvelously. Anyone can store the resource and later on, access the resource through the web without needing support from the outsider. Store any exchange like cryptographic forms of money, records, contracts, computerized asset.etc, and in future access the exchange with the assistance of private key.
- c. Consensus: The consensus is the method where the blockchain framework can endorse and believe the exchanges before they add to the chain. The transaction interferes with one of the concurred rules, then, at that point, that exchange will be seen as invalid. Block chains are conveyed in an arrangement based show, which is either permission less or authorization. Public agreement infers that anyone can endeavor to incorporate exchanges and take an interest in agreement. In Permission-based shows, the nodes are to

be endorsed and recognized to take part in the understanding or to add exchanges to the chain.

### 3. E-Voting using block chain

Blockchain is turning into an imperative innovation, with so many different use cases. While distributed applications, for example, document sharing have been around since the days the Web initially became fundamental to our lives, their utilization for secure and unchanging exchanges just traces all the way back to 2008. Afterward, with the ascent of Bitcoin, individuals and associations have become more mindful of the advantages that blockchain innovation gives.

One of the freshest yet most encouraging blockchain applications is in the area of casting a ballot frameworks. In the normal flow of mechanical turns of events, e-casting a vote will ultimately turn into the standard. E-voting will further develop the political race process by making it quicker, more straight forward, and less expensive while expanding elector turnouts and supporting more compelling vote based systems. As per numerous specialists in the field, e-voting requires progressive security frameworks, which can be offered by only block chain technology with it's decentralized nature where a voter cannot tamper his/her vote.

The major advantages that block chain voting system meet are:

- Transparency
- Security
- Anonymity
- Processing time

### 4. CONCLUSION

As of now, at the end of this paper, we can conclude that we have come across many research papers related to electronic voting system using block chain technology and ultimately we have learnt that there are several ways and approaches to build an electronic voting system with the help of block chain technology. We have also found that there are various technologies like Ethereum, truffle to be aware of in order to attain our project.

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