



# DECENTRALIZED VOTING SYSTEM USING BLOCKCHAIN

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**Abstract:** Voting online requires the highest level of security as certain things/results relay upon it. An online voting platform should have features like tamper-proof functionality, scalable, reliable, real time - updation. Major of the security related issues can be solved using the latest technologies like blockchain which ensures the safe and secured storage of data using the strong cryptographic algorithms. Ethereum provides us virtual machine which provides the environment for creating a blockchain space and moderation upon it using the smart contracts. Our proposed system will implement all the required and desired functions necessary for online voting. As earlier mention the limitations of the existing voting becomes very important to overcome those problems to ensure a safe, fast and reliable voting process. Immune Ballot is platform created on the Ethereum network to overcome major problems mention above and promise to reform the outdated voting process.

## INTRODUCTION

Blockchain is a peer-to-peer network that was introduced in October 2008 as part of a proposal for Bitcoin, a virtual currency system that is deliberated by central authority for issuing currency, transferring ownership, and confirming transactions. In a blockchain system, the ledger is replicated in large number of alike databases, each hosted and maintained by an interested one's. When changes are entered in one node, all the other nodes are simultaneously updated. The records of the values and assets are exchanged permanently when any transaction occur. There is no need for third party intermediaries to verify only the user and the system. If any transaction took place on a block chain-based system, it would take hardly few seconds to settle that too, securely and verifiably. Bitcoin and other crypto currencies rely on blockchain technology and this technology can be used in many fields to solve the problems at great extent. As transactions are stored in distributed and secure format, Voting is the field that is struggling from lack of security, centralized-authority, management-issue and many more.

## PROPOSED SYSTEM

1. **Muscle Power:** Criminalization of politics and politicization of criminals, freely indulged in now, are responsible for the manifestation of muscle power at elections. By using violence, the criminals are able to achieve success in elections for their benefactors.
2. **Misuse of Government Machinery:** It generally complains that the government in power at the time of election misuse official machinery to further the election prospects of its party candidates. The misuse of official machinery in the ways mentioned above gives an unfair advantage to the ruling party at the time of elections. This leads to the misuse of public funds for furthering the prospects of candidates of a particular party.
3. **Criminalization of Politics:** Criminalization of politics has become an all-pervasive phenomenon. At one time politicians hired criminals to help them win elections by booth capturing. Today, those same criminals have begun entering parliament and the state legislature.
4. **Money Power:** Electioneering is an expensive affair in every democratic polity which plays a more vital role in many countries. Money power plays in our electoral system a destructive role affecting seriously the working of periodic elections, It leads to all round corruption and contributes mainly to the generation of black money economy which rules at present our country. Political leaders and workers considered it unethical to work with a desire for any reward. But the scenario now has changed.
5. With physical ballots, you can always recount the results; and, in theory at least, the ballots get stored for years. With electronic votes, any amount of tampering could theoretically happen to the votes.



6. In practice it's less simple. At the physical level, timestamps can get in the way of perfect anonymity if the user-related tokens themselves aren't anonymous as well - but then you also need to figure out how to securely and anonymously deliver the token.

### OBJECTIVES

As mention that voting is one of the most important parts of every election & elections are the identity of true democratic country it is very important to conduct transparent, tamper-proof & secure election i.e., voting but current voting or election process lacks from many problems which are very important to consider for example:

- **Muscle Power**
- **Misuse of Government Machinery**
- **Criminalization of Politics**
- **Money Power**

### RELATED WORK

YEAR	DESCRIPTION
2019	Research conducted by Ahmad Fajar Prasetyo, Dr. Ir. Rinaldi Munir, titled "Online Voting Application using Blockchain technology." Research that discusses the design of applications for choosing online using blockchain technology.
2020	Research conducted by Ashwathy Menon, Vijayalakshmi Bhagat, under the title "Blockchain-Based E-voting System." The study discussed the utilization of blockchain technology using a decentralized system on e-voting for voter authentication in displaying Turnout.

### METHODOLOGIES

- **Decentralized:** As each vote on the network is stored in distributed ledger, no single entity has control over the network it's almost impossible for hackers to do any modification of the votes on the network. The ledger exists in many different locations therefore no single point of failure in the maintenance of the distributed ledger.
- **Secure:** Blockchain technology has a better security because there is not even a single chance of shutting down of the system. Theoretically to hack blockchain it would require world's fastest 500 computers but practically it is impossible. Each vote is stored in network in form of block which is result of strong encryptions and cryptographic functions.
- **Fast:** If blockchain makes voting transparent, then we can follow and tally votes in real time. This means that elections can happen on a much shorter time span. Additionally, if they are digital, they require less investment in polling infrastructure. As a result, elections could be held with a short lead time to vote on a referendum quickly. This could completely change daily life. Imagine if you could vote on your phone on how traffic in your city would be routed today or whether to increase taxes to pay for a new park in your community. Voting could become highly targeted, even neighborhood specific. There would be little overhead to voting more often, possibly making voting a daily occurrence.
- **Corporate Governance & Autonomous Organizations:** Governments aren't the only institutions that could benefit from blockchain voting. Employees or shareholders could vote for initiatives within a company as well. It's possible to even imagine ownerless businesses where every decision is an open vote from shareholders.
- **Increased Voter Engagement:** A big advantage of blockchain voting could be increased engagement. If blockchain makes digital voting possible from your smartphone or computer, voting becomes as easy as logging in and casting your ballot in just a few minutes. This would likely increase voter turnout drastically, leading to more direct

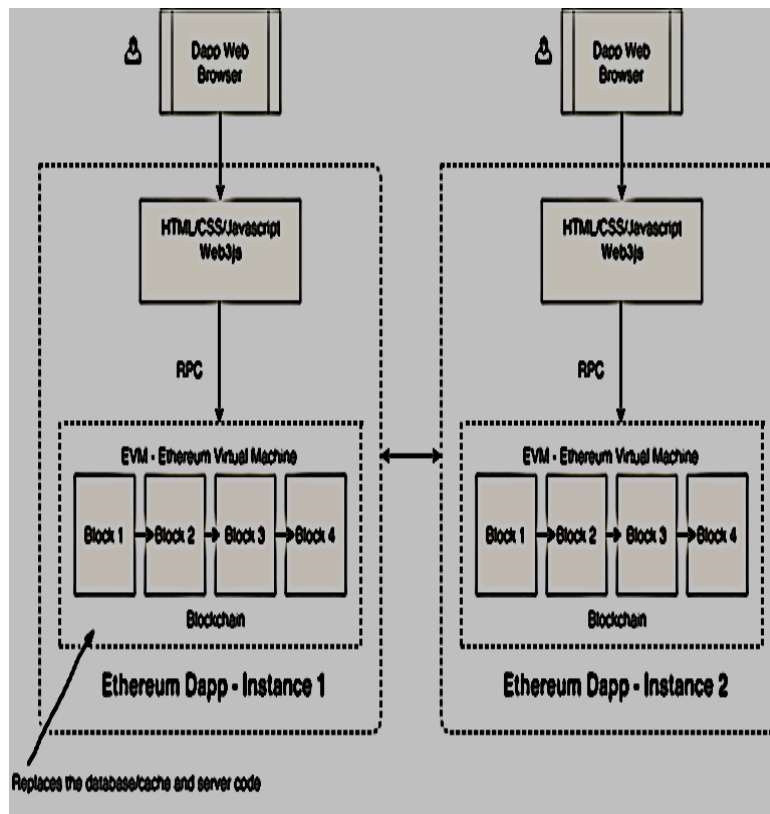


democracy. Alternatively, it could lead to voting fatigue, where voters realize they liked electing representatives to worry about policy for them.

- **People>Power:** As distributed network makes power of money and capital useless in front of people and their votes. People can choose their leaders independently without any external pressure.

### SYSTEM ARCHITECTURE

Ballot is relay on Blockchain as its undelaying technology below is detail architectural description of our system. Decentralized Apps generally have similar development approach from front end perspective but completely different from backend perspective. Immune Ballot runs on some of the major components which every DAPP (Decentralized App) is required which includes Truffle as a major framework which provide us with deployment tools and to write our smart contract. Web3.js Lib is required to turn our conventional browser into decentralized browser. Ganache provide us with local blockchain running and Meta mask (Chrome Plugin) to connect with our local blockchain.



### ADVANTAGES

- **No Central Point of Failure:** Since DApps are distributed and don't rely on one single server, there is no central point of failure. DApps allow data stored in them to be decentralized across all their nodes. These nodes are independent of each other. In case of failure of one node, the other nodes won't get affected and will run on the network accordingly.
- Nevertheless, current blockchain-based applications are still limited to utilizing smart contracts for core data and functionality that should be resistant to modifications. Smart contract users need to run their programs locally in order to complete the application.
- Voters can vote from home during a pandemic situation instead of going to other places.
- Digital voting based on Blockchain provides private and secure solutions
- Voting online saves time and eases vote management.

**CONCLUSION**

The idea of adapting decentralized voting systems to make the public electoral process cheaper, faster and easier, is a compelling one in modern society. Making the electoral process cheap and quick, it removes a certain power barrier between the voter and the elected official.

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