

Immune Ballot Decentralized voting system

Jajoo Vedant P.¹, Bhavsar Lakshmi M.², Panpatil Yash³, Shirsat Shrutika N.⁴

Prof. S.P. Kholambe⁵

^{1,2,3,4,5}METs Institute of Polytechnic Adgaon, Nashik: 422003

bhavsarlakshmi@gmail.com , mail2vedj@gmail.com

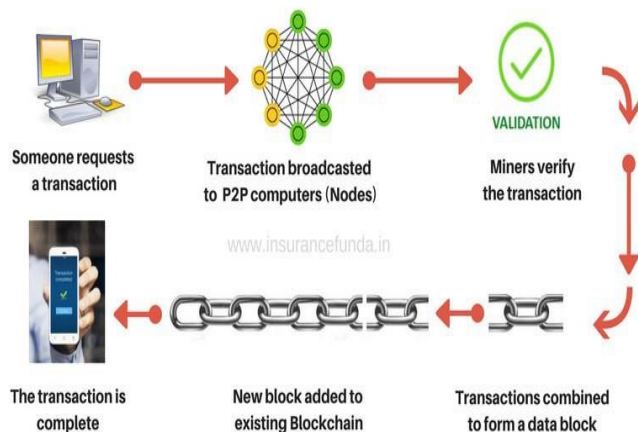
Abstract:

Voting is always been the most important aspect of true democratic country. Providing free and fair and safe election is necessary and at the same time most difficult task of election process. We have seen many faults in current election process like Corruption, Manipulation, Steady Process. We need to reform current Voting process with completely new strategies. Technology has positive impacts on many aspects of our social life. Designing a 24hour globally connected architecture enables ease of access to a variety of resources and services. In addition, technology like Internet has been a table for innovation and creativity. One of such best innovation is blockchain that is the keystone of crypto currencies. The technology named blockchain is presented as a game changer for many of the emerging technologies/services and existing. With its rigid property and decentralised architecture, it is been taking centre stage in many services .This is one of such lanent quality applications of the blockchain is in electronic-voting schemes. The objective of such a scheme would be to provide a decentralised architecture to run and support a voting scheme that is open, fair and independently verifiable. In this paper, we propose potentially a new e-voting protocol that utilizes the blockchain as a transparent ballot box.

I. INTRODUCTION

Blockchain—a peer-to-peer network —was introduced in October 2008 as part of a proposal for Bitcoin, a virtual currency system that is deliberated a central authority for issuing currency, transferring ownership, and confirming transactions. Bitcoin is the very first application of blockchain technology. In a blockchain system, the ledger is replicated in a 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 occurs .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. Earlier Blockchain was limited to just crypto currencies, but its potential were enormous due its unbreakable capabilities. 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. These all issues can be solved on major basis using decentralized, fault-proof & secure system i.e. by using Blockchain technology. Now it has become very important to change current outdated voting process into completely new way.

HOW BITCOIN TRANSACTION WORKS



II. LIMITATIONS OF EXISTING SYSTEM

1. **Muscle Power:** Violence, pre-election intimidation, post election, victimization, most of the riggings of any type, booth capturing both silent and violent are mainly the products of muscle power. Criminalization of politics and politicization of criminals, freely indulged in now, are like two sides of the same coin and are mainly responsible for the manifestation of muscle power at elections. By using of violence, the criminals are able to achieve success at elections for their benefactors.

2. **Misuse of Government Machinery:** It is generally complained 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 takes different forms, such as issue of advertisements at the cost of government and public exchequer highlighting their achievements, disbursements out of the discretionary funds at the disposal of the ministers, use of government vehicles for canvassing etc. 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 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 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 scenario now has changed. The elections in Indian polity are becoming increasingly expensive and the gap between the expenses incurred and legally permitted is increasing over the years.

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.

III. PROBLEM DEFINITION

As earlier mention the limitations of the existing Voting it becomes very important to overcome those problems to ensure safe, fast and reliable voting process.

Immune Ballot is platform created on etherum network to overcome major problems mention above and promise to reform outdated voting process.

- **Smart Contracts:** Smart Contracts act as the back-end logic and storage. A contract is written in Solidity, a smart contract

language, and is a collection of code and data that resides at a specific address on the Ethereum blockchain. It's very similar to a class in Object Oriented Programming, where it includes functions and state variables. Smart Contracts, along with the Blockchain, are the basis of all Decentralized Applications. They are, like Blockchain, immutable and distributed, which means upgrading them will be a pain if they are already on the Ethereum Network. Fortunately, here are some ways to do that.

- **The Ethereum Virtual Machine (EVM) :** The Ethereum Virtual Machine(EVM) handles the internal state and computation of the entire Ethereum Network. Think of the EVM as this massive decentralized computer that contains "addresses" that are capable of executing code, changing data, and interacting with each other.
- **Web3.js:** Web3.js is a Javascript API that allows you to interact with the Blockchain, including making transactions and calls to smart contracts. This API abstracts the communication with Ethereum Clients, allowing developers to focus on the content of their application. You must have a web3 instance imbedded in your browser to do so.
- **Truffle:** Truffle is a popular testing development framework for Ethereum. It includes a development blockchain, compilation and migration scripts to deploy your contract to the Blockchain, contract testing, and so on. It makes development easier!
- **Metamask:** Metamask brings Ethereum to your browser. It is a browser extension that provides a secure web3 instance linked to your Ethereum address, allowing you to use Decentralized Applications. We will not be using Metamask in this tutorial, but it is a way for people to interact with your DApp in production. Instead, we will inject our own web3 instance during development. For more information, check out this link

- **Ganache:** The next dependency is Ganache, a local in-memory blockchain. You can install Ganache by downloading it from the Truffle Framework website. It will give us 10 external accounts with addresses on our local Ethereum blockchain. Each account is preloaded with 100 fake ether.

IV. ADVANTAGES

- **No Central Point of Failure:** Since DApps are distributed and they don't rely on one single server, there is no central point of failure. DApps allow the data stored in them to be decentralized across all its 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 contract for core data and functionality that should be resistant to modifications. The smart contract users still need to run their programs locally in order to complete the application. One of the key reasons is the performance limitation of current blockchain technologies, which cannot meet the requirements of many applications.

V. FEATURES

- I. **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.
- II. **Secure:** This 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.

- III. Fast: If blockchain makes voting transparent, then we can follow and tally votes in real time. Which means that elections can happen on a much shorter time-span. And one more feature is, if they are digital, they require less investment in infrastructure. As a result, elections can be held with a short time to vote on a referendum quickly.

This could completely change daily life. Imagine if you can vote on your mobile-phone on how traffic in your city would be. Voting could become highly targeted, even neighborhood specific. There would be little overhead to voting more often, possibly making voting a daily occurrence.

- IV. Co-operate Governance & Autonomous Organizations: Governments aren't the only institutions that could benefit from blockchain voting. Voters can vote for initiatives within a organization as well. It's possible to even imagine ownerless businesses where every decision is an open vote from shareholders.

- V. Increased Voter Engagement: A big advantage of blockchain voting could be increased engagement. If blockchain makes digital voting possible from your computer, voting becomes as easy as logging in and casting your ballot within no time. This would likely increase voter turnout quickly, 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.

- VI. 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.

VI. TECHNICAL SPECIFICATIONS

Hardware Specification:

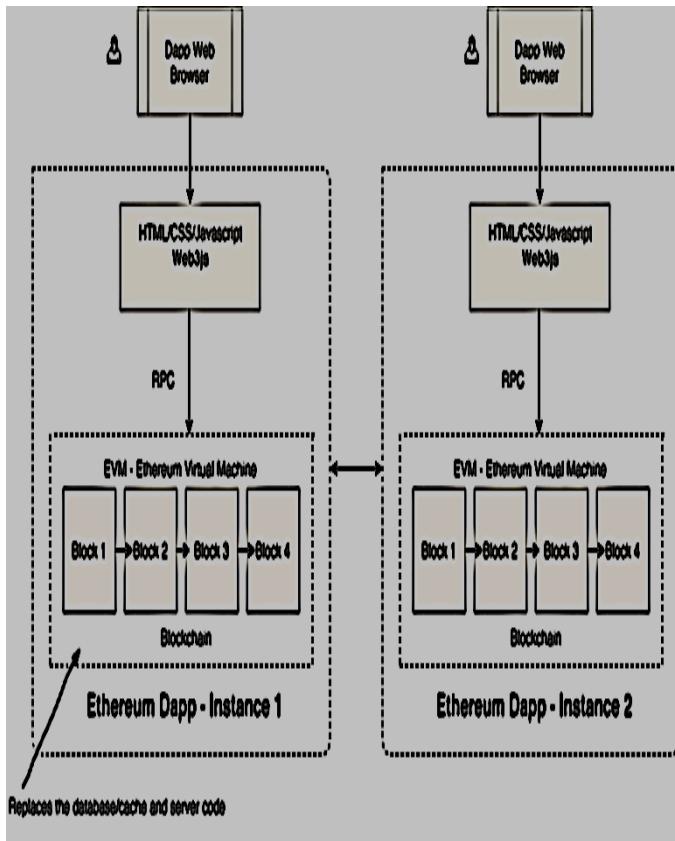
1. 1GB RAM, dual core 1.7 GHz. Minimum 1 GB RAM should be available on customer's computer.
2. Pentium IV and higher Processor with internet. The system must be configured with minimum Pentium IV and higher processor with internet to support on-line transaction.

Software Interface:

3. Operating system: Windows 7+, Linux, Windows 8. Version: 2007, 2010.
4. Language :HTML , CSS, Javascript, Php, Solidity
5. Back end : Truffle, Ganache, MySQL
6. Plugins : Metamask

Architecture:

Immune Ballot is relay on Blockchain as its underlying 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 Metamask (Chrome Plugin) to connect with our local blockchain.



VII. FUTURE SCOPE

1) Moving on HyperLedger Fabric: Due to the misconception between the Bitcoin (cryptocurrency) and blockchain, we consider to move on new development platform which is HyperLedger fabric developed and maintain by Linux Foundation and provide Blockchain solution for enterprises and is free from any type of cryptocurrencies.

2) Building Ready to use Platform: Main and most important goal of ours is to build complete platform as soon as possible. So that we can help organizations to conduct their elections on our platform.

3) Focus on Privacy: We believe that privacy is the fundamental right of any user. Thanks to strong cryptographic function we have used in our project (Ethash) your identity remains safe and only your public key is displayed to outside world.

4) Expanding on other platforms: Main goal of Immune Ballot is to provide our platform on almost every platform available today. For now we are on Web and in future we are moving on Android and IOS.

VIII. CONCLUSION

The idea of adapting digital 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, normalizes it in the eyes of the voters, removes a certain power barrier between the voter and the elected official.

IX. REFERENCES

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- <https://politics.stackexchange.com/questions/27700/drawbacks-of-online-votingial>
- <http://www.dappuniversity.com/articles/the-ultimate-ethereum-dapp-tutorial>