International Journal of Recent Advances in Multidisciplinary Topics
Volume 3, Issue 12, December 2022
https://www.ijramt.com | ISSN (Online): 2582-7839

Blockchain based Voting System

Harshwardhan Solanki[1], Nilay Sole[2], Tilak Solunke[3], Ameya Sonarkar[4*], Mihir Solankurkar[5], Prathmesh Somkuwar[6]

[1,2,3,4,5,6]*Vishwakarma Institute of Technology, Pune, India*

***Abstract*: Decentralization is a need of the hour in today's world and electing the right leader through a transparent process is necessary so a Decentralized Voting System is necessary and must be implemented, Blockchain Technology gives us this opportunity to help create a system that is transparent and immutable once deployed you cannot change it is easy to code and deploy on the net and with the help of some API's we can authenticate the voter and make it secure. Also, Blockchain is very difficult to hack or tamper with so it makes a perfect tool for a voting system as everyone on the net can see the changes that are being made.**

***Keywords*: Blockchain, Decentralized, Immutable, Transparency voting system.**

1. Introduction

According to [1], there is a total of 1365 electoral frauds conducted throughout the globe which has led to the political instability of multiple countries which

could have some serious consequences. We cannot control the other factors but what we can do is ensure that the votes are given by the citizens or generalize the concept that votes are not to tamper with, which is why we came up with this project which is mainly focused on making the voting system more reliable by making it not owned by a central authority, where it is not easy to tamper with the outcome, and keeping the vote taken open, i.e., decentralized, immutable, transparent. Which is why we are using blockchain technology.

Stuart Haber and W. Scott Stornetta introduced the concept of blockchain back in 1991 intending to develop an immutable way of storing information. The actual implementation of blockchain was started in 2008 by Satoshi Nakamoto [8] by introducing Bitcoin, a cryptocurrency. Ethereum was founded in 2013-14 with the main additional feature over bitcoin: smart contracts. A smart contract is a set of code which gets executed automatically when certain defined parameters are met.

Ethereum blockchain deploys the smart contract and then will ask the user to whom the person wants to vote and they are only able to vote one time from a certain wallet id.

2. Literature Review

For this research paper, we have studied around 14 research papers which is how we are planning on designing our system. We went through them and figured out some problems we could address and work on. Blockchain served as a decentralized database and provides new tools for creating a trust less and decentralized system which is why the public would rely on its security. Voter confidentiality and end-to-end encryption still remain fundamental right which is being addressed and respected. The Aadhar API will allow only one vote per mobile number which will eliminate the chances of fake votes. Since there is no central authority, the entire system is peer-to-peer. One of the main problems in the voting system is location and accessibility our website solves both these problems as you can vote from anywhere with a stable internet connection with the help of a mobile phone. This is a brief summary of all the research papers we have referred to which helped us to design this model.

3. Methodology

Let us understand the methodology behind developing this technology. We have used the knowledge of the Design Thinking course to supplement our knowledge of designing this project.

To explain in brief, the user has to first login after which they shall be redirected to a page where they must select one of the two options available which are admin or voter. Admin will play the role of a moderator rather he would be providing a helping hand to carry out the entire voting procedure. Admin will help the candidates willing to run for the election register by adding their names in the system, also admin shall grant access to the voters to start the voting and must carry out the entire procedure after voter login which is registration of the voter and the actual voting.

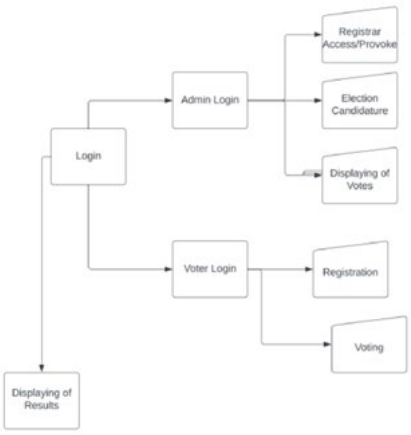

Fig. 1. Flowchart

*Corresponding author: ameya.sonarkar21@vit.edu

A. Implementation

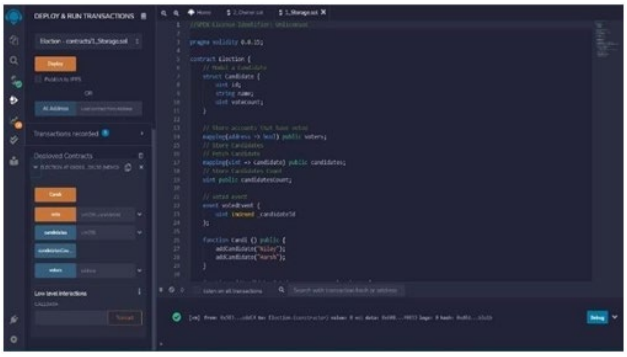

Fig. 2. Smart contract

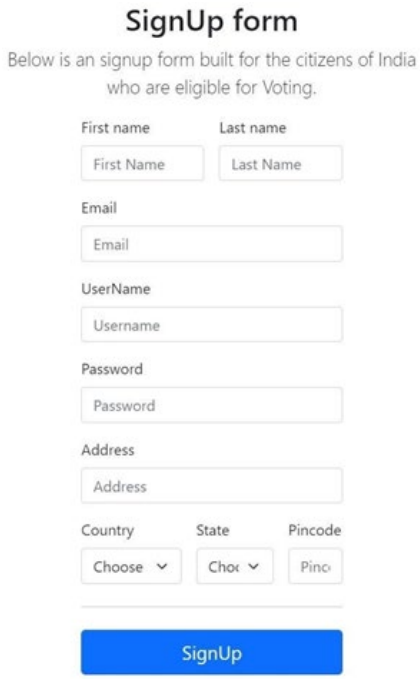

Fig. 3. Signup form

B. Algorithm

First, we'll deploy the smart contract then using an ABI we will enter the block no and then deploy the client-side server from there the voter then the voter can select the preferred candidate to vote then we'll be able to see the end result of the vote. We can ensure only one person can vote we can just give one block id to a certain person by the government and then our smart contract can confirm only one transaction from one id only also we can see the changes made on the blockchain. First, we have to create a smart contract which is the backbone of the whole project then we'll have to deploy and connect to our meta mask account now meta mask is a web3 socket or blockchain wallet you could say so for each change in the contract right from deploying it we need a certain amount of transaction fee i.e., the gas fee which we can get from the test net i.e., Rinke by Test net, Ropsten Test net etc.

We need a gas or transaction fee so as to each node on the blockchain so they need to be rewarded so the Ethereum does so by asking for a gas fee.

Then we can deploy the contract on JavaScript VM (LONDON) or on a web3 site for a web3 provider we need to create an app or site that has web3 dependencies and then can be easily used to connect the frontend with the backend there is no need for backend storage or databases as blockchain creates specific unique hashes for each transaction which we can for a lifetime check it on Ether scan a site which shown the details of the hashes or we can store the data using IPFS (Inter -Planetary File System). The end part is displaying the votes to everyone and announcing the winner.

4. Results and Discussions

The entire voting system is working perfectly fine. The user after arriving at our website will have a clean and reliable interface where the voters can vote. The votes are immutable and transparent which will help the users to rely on the sanctity of the vote. This system is ideal for elections conducted in large societies.

5. Limitations

The system is quite efficient but when it comes to limitations, we can add a feedback mechanism, and enhance the frontend a bit more. The system is not strong enough to carry out elections on a large level.

6. Future Scope

In future, our system can be implemented or changed in many ways, such as local languages being included, which will assist the rural population as well as the uneducated and a complaint system being implemented, which will allow people to file complaints against candidates. The system can still benefit from some implementations, though. Our goal is to use blockchain technology and its related variable tools to develop an E-voting system that is more efficient and sophisticated. We can also include a comment box where we can take feedback from the voters and candidates. Also, we can have an entire profile of the candidates where we the voters can see the entire history which will help them make a better decision. To scale up this project and establish it to conduct government-level elections, we can set up different nodes across the country/state.

7. Conclusion

By developing this project, we have tried to get rid of the malpractices which used to and at times still take place during the election procedure. We are focused on making the voting system transparent, trustworthy, immutable and decentralized. By taking these factors into consideration, we think that the existing flaws in the voting system would have a credible and easy solution.

Acknowledgment

Firstly, we would like to thank our college Vishwakarma Institute of Technology to provide us with this amazing opportunity wherein we get to learn so many topics which are not actually a part of our syllabus yet are equally important and also provide us with a helping hand whenever necessary. They

have also honourably given us a chance to target a very existing but unacknowledged problem which has given us a different approach to looking at problems now. We would also like to show our gratitude to our guide Shri. Ranjeetsingh Suryawanshi who has helped us throughout this project. Finally, we would like to thank the HOD (DESH) and also the coordinator (DESH), for their very helpful and essential feedback on our project.

References

[1] Dipali Pawar, Pooja Sarode, Shilpa Santpure, Poonam Thore, "Implementation of Secure Voting System using Blockchain," 2020.

[2] Uzma Jafar, Mohd Juzaiddin Ab Aziz and Zarina Shukur, Blockchain for Electronic Voting System—Review and Open Research Challenges," 2021.

[3] Kashif Mehboob Khan, Junaid Arshad, Muhammad Mubashir Khan, "Secure Digital Voting System based on Blockchain Technology."

[4] Michał Pawlaka, Aneta Poniszewska-Maranda, Natalia Kryvinska, "Towards the intelligent agents for blockchain e-voting system," 2018.

[5] T. Vairam, S. Sarathambekai, and R. Balaji, "Blockchain based voting system in Local Network, 2021.

[6] Wei Cai, Zehua Wang, Jason B. Ernst, Zhen Hong, Chen Feng and Victor C. M. Leung, "Decentralized Applications: The Blockchain Empowered Software System," 2018.

[7] Ali Kaan Koç, Emre Yavuz, Umut, Can Çabuk and Gökhan Dalkılıç, "Towards Secure E-Voting Using Ethereum Blockchain," 2018.

[8] Satoshi Nakamoto, "Bitcoin: A Peer-to-Peer Electronic Cash System," 2008.

[9] Min Xu, Xingtong Chen and Gang Kou, "A systematic review of blockchain, 2019.

[10] Kashif Mehboob Khan, Junaid Arshad, Muhammad Mubashir Khan., "Investigating Performance Constraints for Blockchain Based Secure e-Voting System."

[11] Kashif Mehboob Khan, Junaid Arshad, Muhammad Mubashir Khan, "Secure Digital Voting System based on Blockchain Technology."

[12] Qixuan Zhang, Bowen Xu, Haotian Jing and Zeyu Zheng, Ques-Chain, "An Ethereum Based E-Voting System."

[13] Kurakula Tanu Sri, Kurakula Rupa Sri, Nikhita Pedamallu, E-Voting System using Block Chain," 2021.

[14] David Khoury, Elie F. Kfoury, Ali Kassem, Hamza Harb, "Decentralized Voting Platform Based on Ethereum Blockchain," 2018.

[15] Voter Fraud Map: Election Fraud Database, The Heritage Foundation. https://www.heritage.org/voterfraud