International Journal of Computer Engineering in Research Trends
Multidisciplinary, Open Access, Peer-Reviewed and fully refereed
Research Paper Volume-10, Issue-5 ,2023 Regular Edition E-ISSN: 2349-7084

ONLINE VOTING SYSTEM

Jothika Kumar [1], Srilakshmi Selvaraj [2], Sai MeghanaBommana [3], Anupriya R [4], Jagadeesh Gopal [5]

[1,2,3,4] *SITE, Vellore Institute of Technology Vellore, India*

e-mail: latteri.manikumar@gmail.com, gjagadeesh@vit.ac.in

**Corresponding Author: latteri.manikumar@gmail.com*

https://doi.org/10.22362/ijcert/2023/v10/i05/v10i0502

Received: 25/03/2023, Revised: 17/04/2023, Accepted: 21/04/2023 Published: 28/04/2023

Abstract: - Online voting system is an electronic way of choosing leaders via internet. In traditional voting system, the voters need to reach the booth place and wait in a long queue during peak time to cast their votes. The main drawback faced in manual voting system is some other politicians involve in illegal activities to give duplicate votes. The security is also low in the manual voting system. To overcome all these problems, the solution can be building an online voting system. The technologies such as Facial Recognition and Block chain Methodology helps reduce these problems. In online voting system, the 2-step verification is achieved. The Voter ID and other personal details will be captured and stored in secure database. After user credentials, the user need to provide OTP for verification and biometric verification such as facial recognition before casting vote to know the particular individual. And then the backend working and storing the database of each user's details and casted votes will be maintained using block chain technology. The main aim of the project is to bring more secured, user-friendly, and flexible online voting system to all the citizens of India.

Keywords- Online voting system, Voter ID, Facial recognition, Block chain, Security, Aadhaar Database, Mobile phones, Cryptographic, Blocks, and Networks.

1. Introduction

Both India and its neighbouring nation are democratic. With the Aadhaar card, a digital ID, all Indian citizens are now a part of the growing digital India.In olden days, votes are counted by hands. Then paper voting system was introduced and then the punch card system came into existence. Now the voting system evolved into electronic voting. The current election system is manually operated. To vote for a candidate, the voter must visit booths, wasting time. As a result, a lot of people don't go out and vote, which is one of the most important and worrying factors. Each and every vote matters in a democracy. Our online system that reduces voter fraud and improves voting and counting efficiency and transparency can replace this traditional method. The online voting system improves the process of voting by developing a highly secured application with many levels of authentication thus providing an efficient and flexible way of voting from any remote place.This eliminates any intermediates in the process of election and also to overcome any difficulty caused due to the damage of the voting machines due to lack of attention, elderly people cannot visit the booth to poll, lack of security and false votes, low reliability, high cost and voter intimidation. Conclusively, to overcome the drawbacks and challenges in traditional election system, blockchain technology is used to offer reliable voting system with ease of use.It also improves voting by providing user-friendly ***Mobile***interface. The cost, effort and time will be highly reduced. Voters can cast their votes from anywhere. Fraud, corruption, voter intimidation will be eliminated on using this system.

1.1 Problem Statement

There are several disadvantages associated with the traditional voting system, including time consumption, excessive paper usage, lack of involvement from higher officials, machine damage due to negligence, inability to update and edit multiple items at once, geographical

constraints forcing people to visit voting booths, limited accessibility for elderly individuals, insufficient security measures, and potential for fraudulent voting. These issues collectively contribute to lower voter turnout and a lack of appreciation for the significance of choosing one's representative.

1.2 Background

The block chain is an advanced database mechanism that allows sharing information over the network. The block chain offers a back-end. Initially the block chain contains chain of blocks which are connected by cryptographic connection. Each block has hash, timestamp, and transaction data of present and previous block. Whenever the transaction was made the block updates its data with new set of information. The Block Chain has distributed blocks which are connected by a Cryptographic connection. Each Block contains multiple nodes in it. The voters voting data are stored in multiple nodes of block chain. So, it cannot be easily modified. Whatever data which passed on to the block was decentralised encrypted. Therefore, it can withstand manipulation and fraudulent activities.

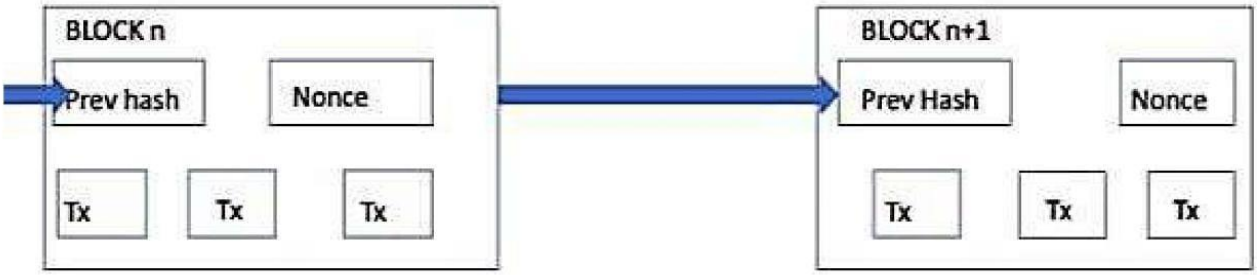

Figure 1. Previous hash in Block n

2. Proposed System

The user provides their details during registration with the Online Voting page. The user details will get stored in the Database which is secure. The Block Chain consists of many blocks which are connected in the form of a Chain. The connection is done with the help of Cryptographic connection. Each block is having its own hash, timestamp and transaction data of present and previous block. The user provides their details and gets registered with the Voting Page and the data will be stored in the secure database. The secured database data also passed on to the block chain and the information is stored in multiple blocks and gets connected with each other. When the user wants to cast their vote, the need to login to the system, the details will get verified with the Secure Database and then the details will be sent to Peer-to-Peer (P2P) network, this network was connected with the block chain. Whenever the user sends their details, it is passed to the Block chain via P2P Network. The voters voting data will be stored in multiple nodes of block chain. Whenever the user made a transaction that will be validated and verified. And the verified data will be passed on to the multiple notes so that the data cannot be easily modified. The block chain concept is mainly used to get away from malicious activities such as fraudulent and manipulation of data. All data in block chain.

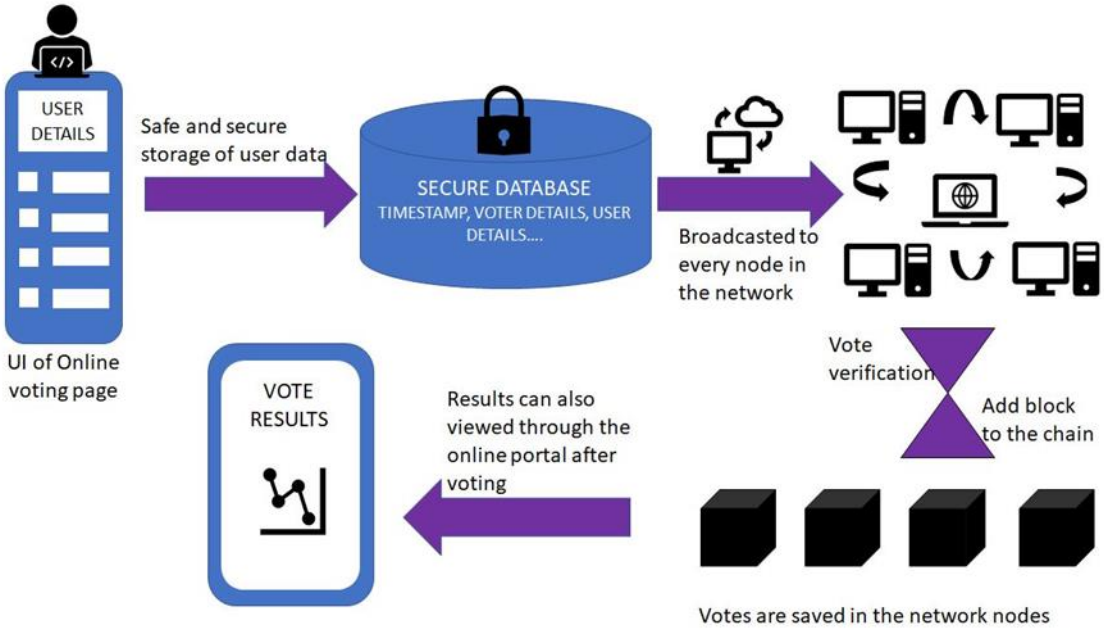

Figure 2. Block diagram of the proposed model

3. System Implementation

The user provides their details such as name, phone number, and email-id and voter id. While registration itself the user can set their Password by setting their Password and Confirm password. After registration the user can login to the system using username as voter Id and Password. After Login, ***OTP*** will be sent to their registered email-id and mobile number. After verifying the OTP, the face recognition will be done by enabling the front camera in the mobile. After verifying with the ***facial recognition,*** the user can view the voting page; there they can cast their votes. After Voting, ***Voting Successful*** message will be displayed.

Figure 3: Registration Page for iVote: This is a webpage where a user can register to use the iVote online voting system. The user may have to provide their personal information, such as their name, address, and voter ID number.

Figure 3 Registration Page for iVote

Figure 4 Login page for iVote

Figure 5 Verify OTP for iVote

Figure 6 Face scan for iVote.

Figure 7 Voter list symbol for iVote

The mentioned lines are referring to different pages and features of an online voting system called iVote: Figure 4: Login page for iVote: This is a webpage where a registered user can log in to the iVote system using their credentials, such as their email ID and password. Figure 5: Verify OTP for iVote: OTP stands for One-Time Password, which is a temporary password sent to the user's mobile number or email ID to verify their identity. This is a webpage where the user can enter the OTP sent to them to authenticate their login.

Figure 6: Face scan for iVote: This is a feature that uses facial recognition technology to verify the user's identity. The user is required to take a selfie or upload a photo of their face, which is then compared with the photo on their voter ID card to confirm their identity. Figure 7: Voter list symbol for iVote: This is a symbol or icon that represents the list of registered voters in the iVote system. The symbol may be used to help users locate and access the list of voters who are eligible to vote in a particular election.

4. Results

4.1 *Benefits of our system over current system*

4.1.1. Decentralized database

Blockchain based technology is decentralized, the voting details are stored in multiple nodes, which leaves no place for tampering.

4.1.2. Security

Voters can come and enter their biometric details, and a hash key will be generated for them to login and vote, preventing any intervention. And the transaction timestamp is recorded on a block.

4.1.3. Transparency

Ensures all transactions are transparently viewed at each node which, in turn, has a copy of the blockchain. This implies that anybody may count the votes but no one knows who voted to whom.

4.1.4. Encryption

Sends a single cryptocurrency or token to each eligible voter. Each candidate contesting the election will have a unique wallet address. Voting is done by sending their crypto to the candidate of their choice.

4.1.5. Immutability

Any validated records are immutable, cannot be changed, no deletion or updation is possible, making fraudulent voting very difficult.

5. Conclusion

Online Voting System has more advantages than traditional voting system. Though it works with the help of Internet facility, the security is ensured. The security was achieved with the Block Chain mechanism. The manipulation of data cannot be done as the data will be sent to the multiple nodes of a block chain which are in the encrypted and hash form. Therefore, the highest level of security and privacy was maintained. Provide voting security, privacy, proper authentication and processing.There is low risk of human and mechanical error.

References

[1] Hjálmarsson, F. Þ., Hreiðarsson, G. K., Hamdaqa, M., & Hjálmtýsson, G. (2018, July). Blockchain-based e-voting system. In 2018 IEEE 11th international conference on cloud computing (CLOUD) (pp. 983-986). IEEE.

[2] Ayed, A. B. (2017). A conceptual secure blockchain-based electronic voting system. International Journal of Network Security & Its Applications, 9(3), 01-09.

[3] Adiputra, C. K., Hjort, R., & Sato, H. (2018, October). A proposal of blockchain-based electronic voting system. In 2018 second world conference on smart trends in systems, security and sustainability (WorldS4) (pp. 22-27). IEEE.

[4] Roh, C. H., & Lee, I. Y. (2020). A study on electronic voting system using private blockchain. Journal of Information Processing Systems, 16(2), 421-434.

[5] Patil, H. V., Rathi, K. G., & Tribhuwan, M. V. (2018). A study on decentralized e-voting system using blockchain technology. Int. Res. J. Eng. Technol, 5(11), 48-53.

[6] Pawlak, M., Guziur, J., & Poniszewska-Marańda, A. (2019). Voting process with blockchain technology: auditable blockchain voting system. In Advances in Intelligent Networking and Collaborative Systems: The 10th International Conference on Intelligent Networking and Collaborative Systems (INCoS-2018) (pp. 233-244). Springer International Publishing.

[7] Ahmed, M. R., Shamrat, F. J. M., Ali, M. A., Mia, M. R., & Khatun, M. A. (2020). The future of electronic voting system using blockchain. International Journal of Scientific Technology Research, 9, 4131-4134.

[8] Sudharsan, B., MP, N. K., & Alagappan, M. (2019, October). Secured electronic voting system using the concepts of blockchain. In 2019 IEEE 10th Annual Information Technology, Electronics and Mobile Communication Conference (IEMCON) (pp. 0675-0681). IEEE.

[9] Roopak, T. M., & Sumathi, R. (2020, March). Electronic voting based on virtual id of aadhar using blockchain technology. In 2020 2nd International Conference on Innovative Mechanisms for Industry Applications (ICIMIA) (pp. 71-75). IEEE.

[10] Pawade, D., Sakhapara, A., Badgujar, A., Adepu, D., & Andrade, M. (2020). Secure online voting system using biometric and blockchain. In Data Management, Analytics and Innovation: Proceedings of ICDMAI 2019, Volume 1 (pp. 93-110). Springer Singapore.

