International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 06 Issue: 05 | May - 2022 Impact Factor: 7.185 ISSN: 2582-3930

DIGITAL POLLING SYSTEM

Nandini Sharma[1], Dr. Sheikh Fahad Ahmad[2], Neeraj Vaishya[3], Anupriya Dinkar[4]

[1]B. tech student, Department of CSE, BBDITM, Lucknow, India

[2]Associate Professor, Department of CSE, BBDITM, Lucknow, India

[3] B. tech student, Department of CSE, BBDITM, Lucknow, India

[4] B. tech student, Department of CSE, BBDITM, Lucknow, India

Abstract- Digital-polling is a web-based polling portal based on blockchain. Blockchain technology is used to create secure and scalable distributed systems that consists of various benefits over centralized system. Blockchain not only helps in terms of security but also in efficiency and storage along with a proper casting/counting of entries by reducing the travelling cost, any misconduct and mis-placing of important datasets. Development of a smart e-voting portal for easy and smooth polling of government as well as non-government organizations in accordance with their respective criteria is the prime focus of this research paper. "One block one vote"-this quote perfectly supports the idea and objective of polling through e-platforms.

Keywords— polling, e voting, immutable, blockchain, hash, checksum, node.

I. INTRODUCTION

Polling is a defining feature of any elective and competitive entity. This involves who, when and where is allowed to choose their representative with a question of how this is going to happen? Here our focus is on casting the poll securely, safely and with equal rights.

Blockchain is a system of recording information that makes it impossible to hack, amend the dataset of a system in order to create a permanent, pubic, transparent ledger system for useful compiling of information. It's a decentralized system that means, transferring the control or decision making from a single central body to multiple entity. Its functioning depends upon hash. ***Hash*** is a function that turns a random input of data (keys) into a string of bytes with a fixed length and structure called hash value or checksum. Any checksum created from data using a hashing algorithm is always of same length and it cannot be reversed. The purpose of hash is to chop the random values into smaller blocks consisting hash values to store the input permanently and uniquely. A hash function has to be collision resistant which ensures that it has to be impossible for two different input to produce the same output. Where, ***Node*** is a block which has hash values and checks for the same to generate desired result.

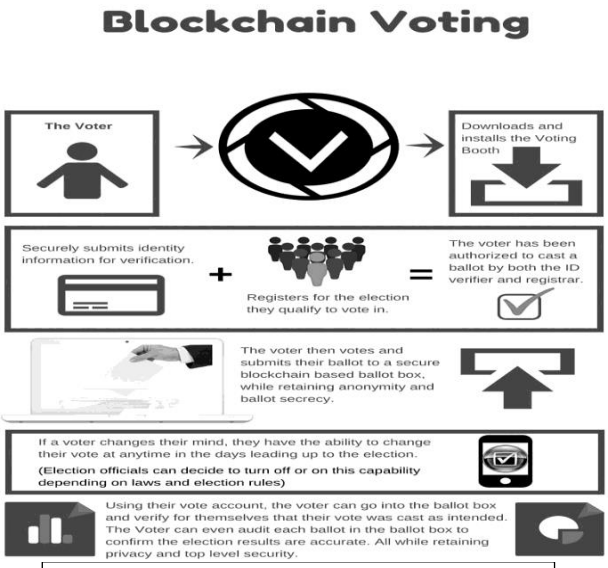


Fig.1 Procedure of Digital Polling

II. AIM AND OBJECTIVE

Our aim is to develop a smart e-voting portal for easy and smooth polling of government as well as non-government organizations in accordance with their respective criteria.

BASIC PROBLEM: -

In general polling our polling goes on for too long, easier voter registration and easier voting is needed, Caucus voting should be replaced by primary voting, super delegates distort the popular vote, winner-take-all systems distort the popular vote.

1. **CONVENIENCE-** Voters sometimes are unable to vote easily, and everyone who is eligible may or may not be able to vote due to some reasons for example distance between places.

2. **VERIFIABILITY-** The inability to trust the vote tallying process upon casting their vote successfully.

3. **SECURITY-** The major issue in voting systems is trust and transparency. Sometimes, an organization or an enterprise conduct polling in his company. But these votes could easily be tempered by a person who holds the strong authority in the same organization or institute.

III. PROBLEM SOLVING APPROACH

We tried to create a system that doesn't entirely replace the current polling and review system but rather integrates blockchain technology in backend within the current system. In the backend we have created a smart contract which is written on the solidity language. Our smart contract will handle all the process of voting. As we know that to store any data on the blockchain we need to do transaction. So that we have used metamask as a wallet to make transaction. In this system, all the voters will be signed in by a blockchain address which will remove the problem of duplicity i.e., same users won't be able to login again. In order to create secure the system, blockchain will use SHA 256 algorithm.

In this system, the votes will be stored in a block and that block will connected with another block by a hash function that is SHA 256. SHA 256 algorithm gives a 256 bits long unique output value for any length of text inputs.

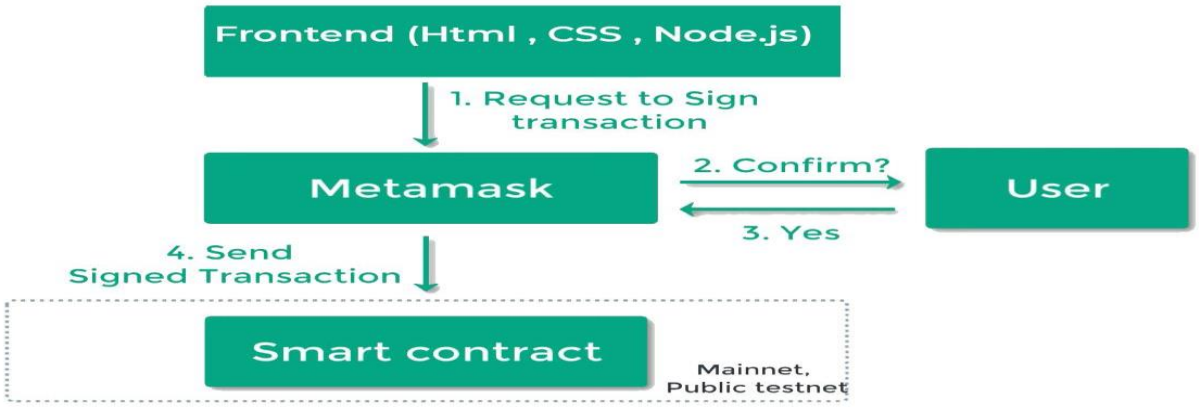


Fig.2 Technical Procedure of Digital Polling System

Our system will go through the several phases to tackle the problem statement which are given below: -

- In order to conduct election/polling, Admin will create a voting instance by launching/deploying the system on a blockchain network with a blockchain account address. After deploying system on network, the admin will have to fill the required details about their organization and then they will have to create an election/polling instance. After successful creation of poll, admin will have to details of candidates.

- After successful creation of poll, voters need to connecting on the same blockchain network with a account address, then they have to register himself/herself by filling necessary details to become a voter. Once the users filled all required details, their respective details are sent/displayed within the admins' panel on verification page.
- The admin then will check/verify all the details filled by voters are correct or not. If all the details are correct, then admin will approve the voters, once voters are verified then they will be eligible to cast a vote. Without verification voters won't be able to cast a vote.
- The voting process will be conducted on the voting page. All the verified voters will cast their vote from voting page.
- After the completion of voting process. Admin will have to end the election. Once the election/ voting process, result will be displayed on the result page.

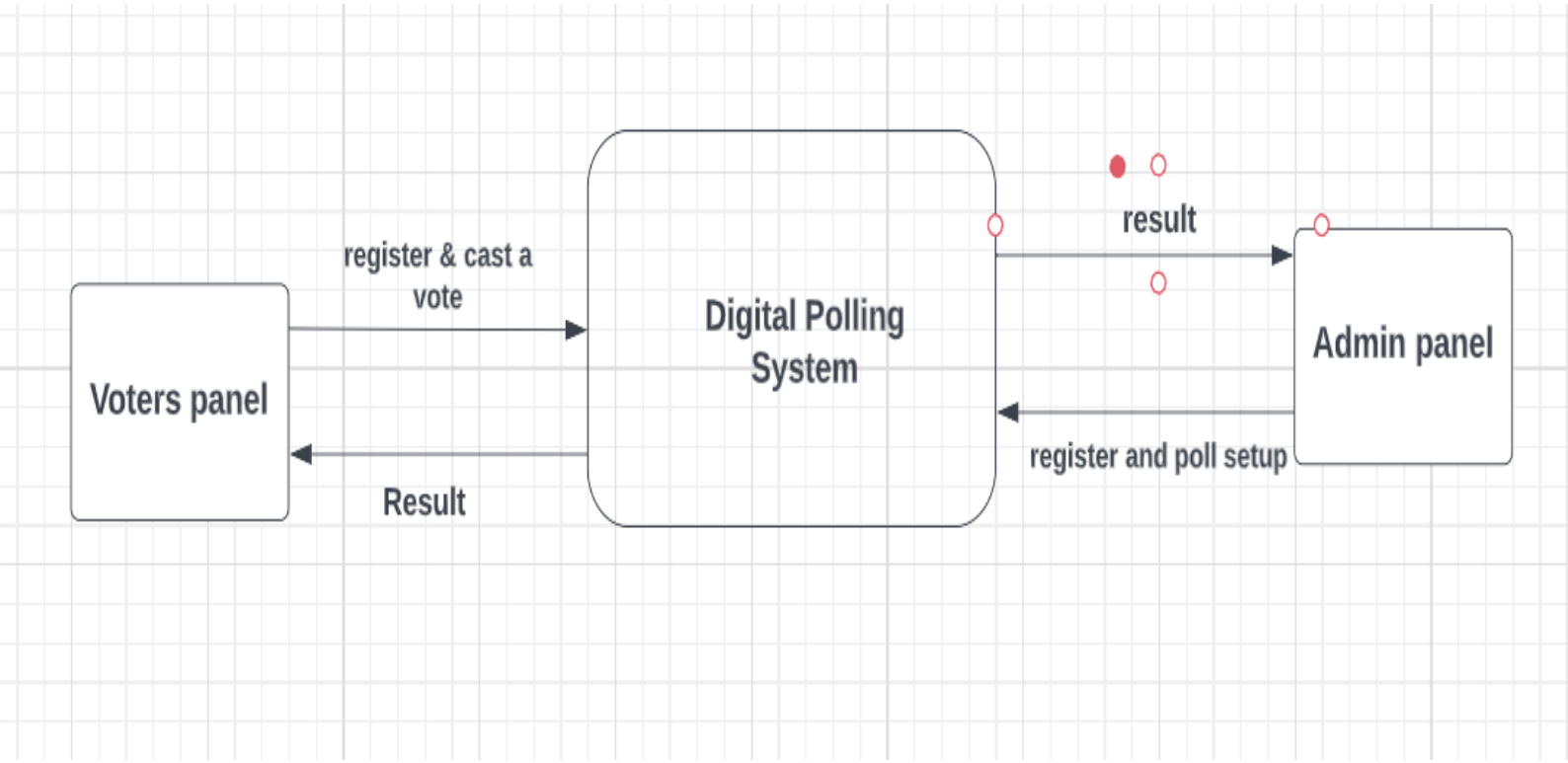


Fig.3 Level 0 DFD

Level 0 DFD: -

In the level 0 data flow diagram we have given abstract view of our digital polling system. In this DFD, our system shows relationship with external entities. As we can see in level 0 DFD only 2 external entities are involved in our whole system. All data flows between only admin and voters only.

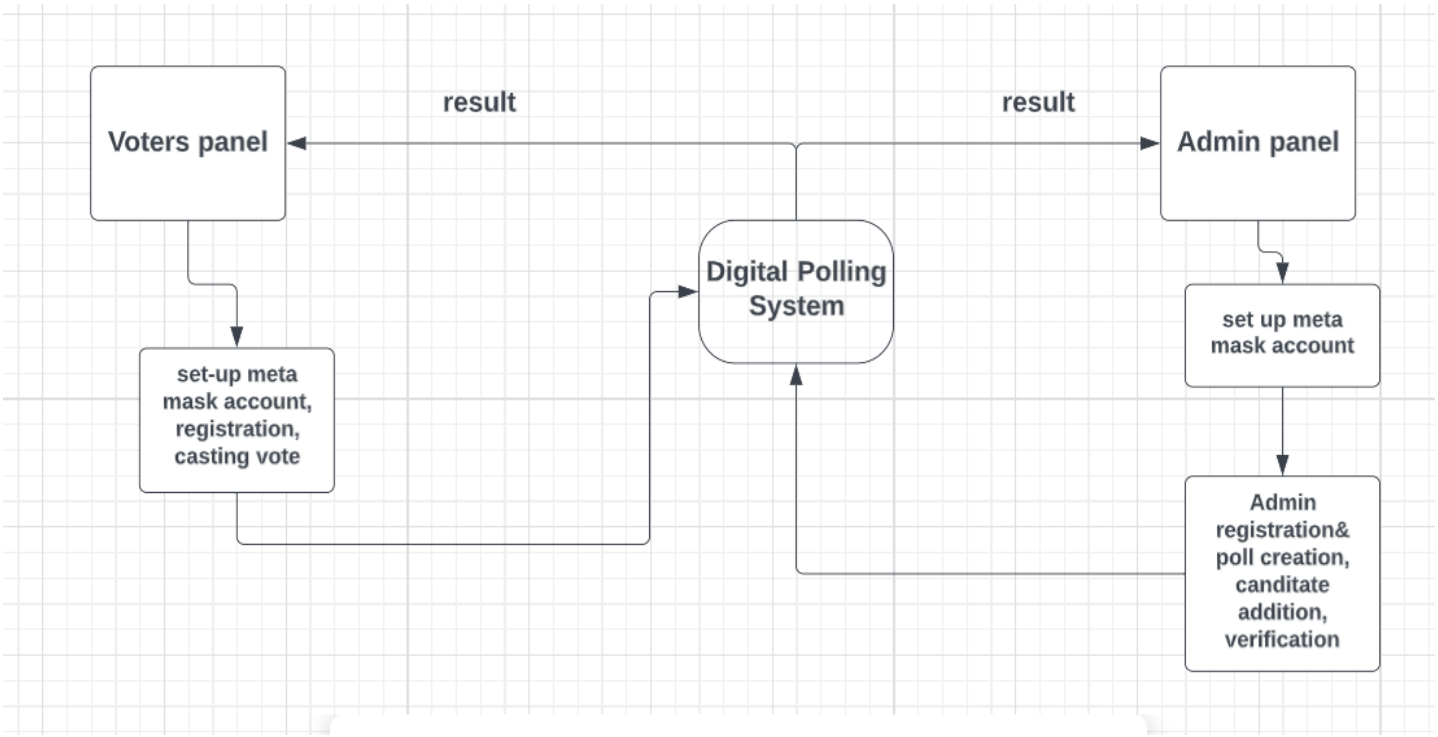
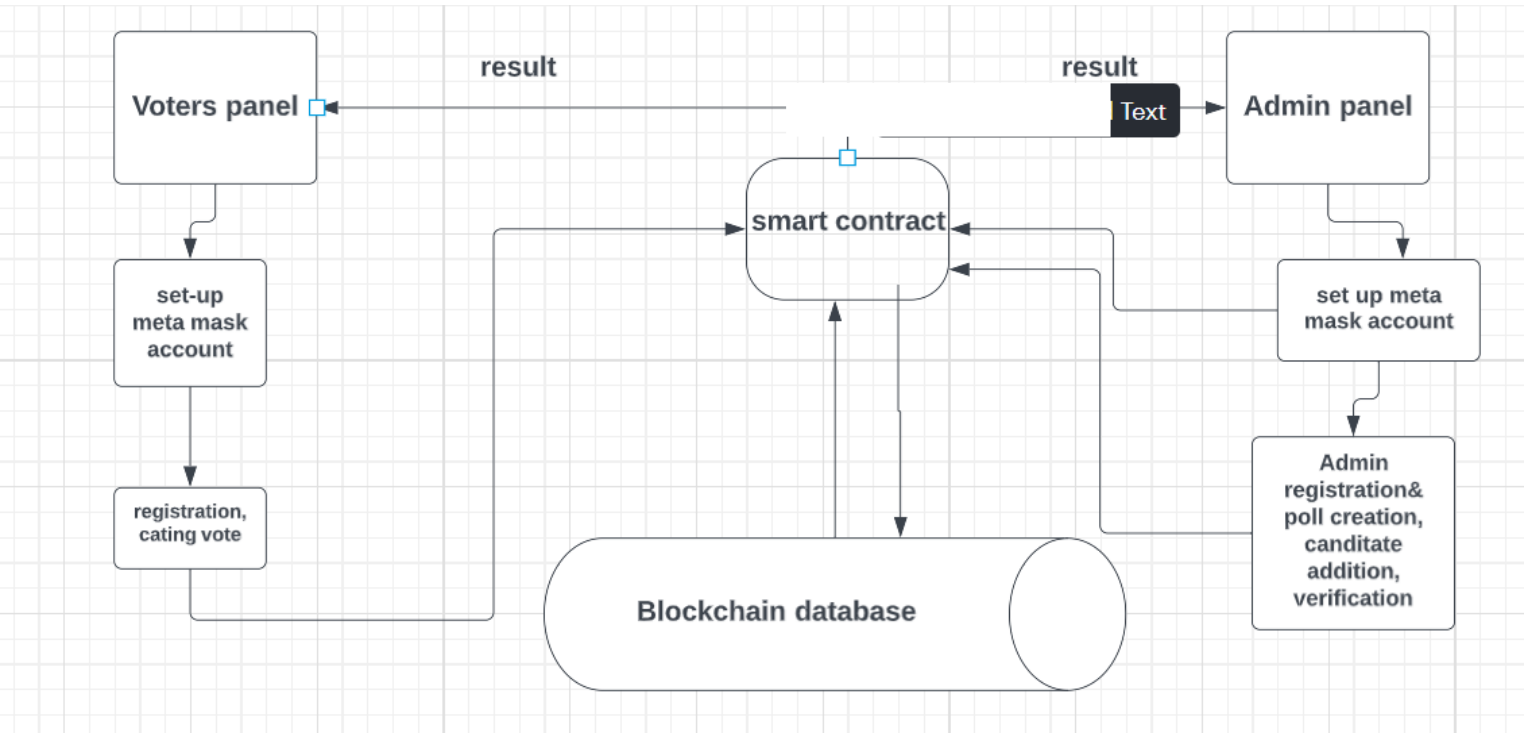


Fig.4 Level 1 DFD

Level 1 DFD: -

In level 1 DFD, we have showed the main functionality of our digital polling system with flow of data. Here, all the data flows between voters and admin but with certain functionality. As we can see in DFD our system is associated with external entities with certain functions i.e. signup, login setting up poll, smart contract, Decentralized Database.



Level 2 DFD:-

Fig.5 Level 2 DFD

This level of data flow diagram explains detailed view of level 1 data flow diagram. Here, We have shown processes involved in all functionality.

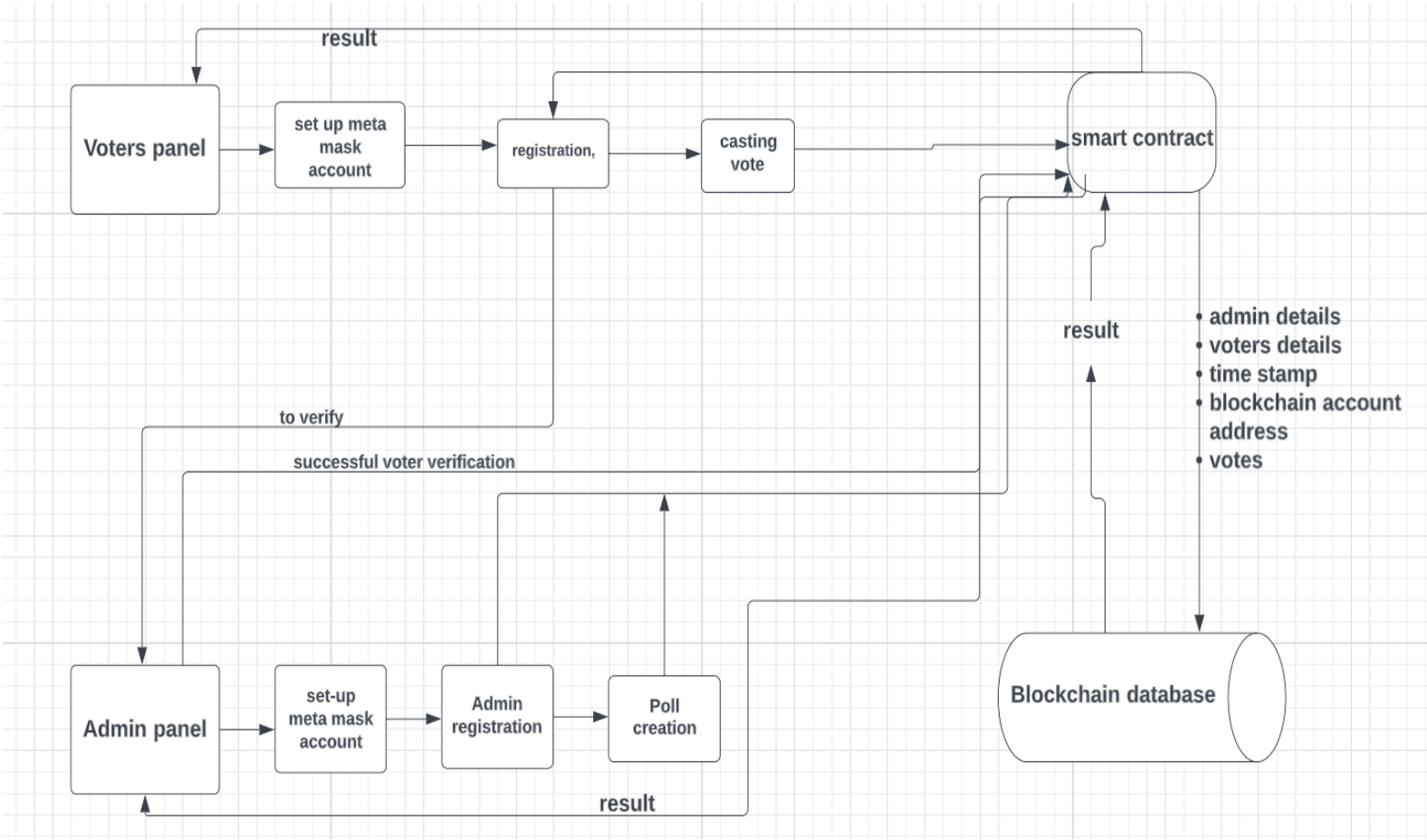


Fig.6 Level 3 DFD

Level 3 DFD: -

Since, we are using blockchain technology which is a distributive ledger. So that, it's important to focus on how data flows through database. Therefore, this level of diagram gives detailed view of data flow's and stored in decentralized database.

IV. LITERATURE REVIEW

1. In this paper author has tried to make a system that is based on homomorphic property and a blind signature scheme. The proposed system is implemented on an embedded system that serves as a voting machine. The system employs RFID to store all conditions that comply with the rule of the government to check voter eligibility.
   Hanady Hussein, Hussein Aboelnaga.
   Design of a Secured E-voting System.
   Electronics and Communication Department. AAST Cairo, Egypt.
   2013 International Conference on Computer Applications Technology (ICCAT) IEEE 2013.
2. This paper presents a model where an election can be conducted on any multi-platform such as a smartphone, or any operating system. This model uses Aadhar number as unique id and voters can give only by using Aadhar number & verification is done by OTP. They have embedded the OTP & QR code functionality for verification

purpose. This system is uses centralized where as our model i.e., Digital polling system (Digi Poll) uses a decentralized model to conduct polling.
Dr. Z.A. Usmani, Kaif Patan Wala, Mukesh Panigrahi, Ajay Nair.
Multi-purpose platform independent online Voting system.
Computer Engineering Department M. H. Sabo Siddik College of Engineering Mumbai, India. 2017 International Conference on innovation in Information, embedded and communication System and Engineering (ICIIECS) IEEE 2017.

3. This paper is based on blockchain technology, that proposes a decentralized e voting protocol, without the existence of trusted third party. They have used Blind Signature technique, Blockchain technology and notations is the protocol of this system. Their improvement and extensions are Privacy of data transmission in which they recommended to use TOR or proxies in order to unexposed of IP address to maintain the anonymity.
Liu, Y. and Wang, Q., 2017.
An E-voting Protocol Based on Blockchain.
IACR Cryptol. ePrint Arch., 2017, p.1043 2017.
4. This online voting system is also based on Aadhar authentication. In this model users can login by Aadhar number & in order to cast a vote they have to give finger print and then will be matched by finger print of Aadhar card's database which is maintained by Election Commission of India.
Rajesh M. Ghadi1, Priyanka S. Shelar.
Online voting system.
Dept. of Computer Engineering, Ideal Institute of Technology, Posheri, Wada, Palghar, India-421303.
International Research Journal of Engineering and Technology (IRJET) 2017.
5. Their system proposed a design for an electronic voting system that could be used in local or national elections. The method of this proposed paper is based on blockchain technology, in which a block is added whenever a transaction takes place. A transaction represents the candidate. Their method goes through four phases i.e., request to vote, casting a vote, encrypting vote using SHA-256 oone-wayhash function & then finally a block is added to the blockchain. no. 3 (n.d.): 01–09. doi:10.5121/IJNSA. 2017. 9301 (2017).
Ayed, Ahmed Ben. "A Conceptual Secure Blockchain Based Electronic Voting System."
International Journal of Network Security & Its Applications 9, 2017.
6. They have presented a cryptographic technique for an authenticated end-to-end end verifiable and secret voting system. Their system is based on DRE-Ip System. In the voting registration phase, they take fingerprint pulse at a sensor. A biometric based encryption algorithm with enhanced privacy and security to transformed fingerprint image to feature based encrypted data They have used a blockchain combined with Merkle Hash tree to store the registration information.
And Roy, B.K., 2018.
A secure end-to-end verifiable e-voting system using knowledge-based blockchain IACR Cryptol. Eprint Arch., 2018, p.466.(2018).
7. They have introduced Crypto-voting. It is a blockchain technology-based system, that represents a valid/useful mean for simplifying the decision process of companies and to support the government of business associations. It could represent an easy solution in all of situations related to the real involvement of all stakeholders interested in the decision-making process.
Fusco, F., Lunesu, M.I., Pani, F.E. and Pinna, A., 2018, September.
Crypto-voting, a Blockchain based e-Voting System.
In KMIS (pp. 221-22) (2018).
8. This paper presents a technique to exploits blockchain in P2P network to improve the security of e-voting. They have designed a synchronized model of voting records based on distributed ledger technology (DLT) to avoid forgery of votes. By integrating the above designs, a blockchain-based e-voting scheme in P2P network is proposed for essential requirements of e-voting process. To prove and verify the scheme, a blockchain-based e-voting system for multiple candidates has been designed on Linux platforms in P2P network.
Yi, H,2019. Securing e-voting based on blockchain in P2P network.
EURASIP Journal on Wireless Communications and Networking, 2019(1), pp.1-9(2019).
9. The author of this paper has proposed a system to make a simple voting system which is based on cloud. Here voters can register itself in order to cast a vote. Since, their system very simple and very straight forward. Therefore, this system can face a lot of problem in maintaining the malfunctions or any fraud. In this system voters can simply login by user name and a secret key which will be provided. They have used Microsoft azure as a cloud and c# as a programming language.

Ramya Govindaraj, Kumaresan P, K. Sree harshitha, School of Information Technology and Engineering, VIT, Vellore-632014, Tamil Nadu, India. Online voting system using cloud. 2020 International Conference on Emerging Trends in Information Technology and Engineering (ic-ETITE). IEEE (2020).

10. The author of this research paper has made a system which allows online as well as offline election. They authenticate votes by OTP and face recognition. The offline voting process is system is improvised with the help of RFID tags instead of voter id. This system also enables the user the citizens to see the results anytime which can avoid situations that pave way to vote tampering. For this system no requirement of an election officer, paper ballot or any electronic voting machine only the internet connection and Face scanners are required one can vote from anywhere secure.
Ganesh Prabhu S, Nizarahammed. A, Prabu.S, Raghul.S, R.R. Thirrunavukkarasu, P. Jayarajan, Department of Electronics and Communication Engineering Sri Krishna College of Technology Coimbatore, India. Smart online voting system. 2021 7th International Conference on Advanced Computing and Communication Systems (ICACCS) IEEE (2021).

V. CONCLUSIONS

In this paper, we introduced a blockchain-based polling system that utilizes smart contracts to enable secure and cost-efficient polling while guaranteeing voters' privacy. We have shown that blockchain technology offers a new possibility to overcome the limitations and adoption barriers of polling systems which ensures the polling security and integrity and lays the ground for transparency. The transparency of the blockchain enables more auditing and understanding of polling These attributes are some of the requirements of a voting system. These characteristics come from decentralized networks and can bring more processes to polling, especially to direct polling systems.

VI. FUTURE SCOPE

In a unique way, blockchain mixes cryptography with software. It produces a tamper-proof record that can be easily reviewed to guarantee that votes are recorded correctly. Because of the safe and unchangeable nature of blockchain, voters can cast their ballots via computer or mobile device rather than going to a local polling station or sending in a mail-in ballot to be manually processed by election officials. Votes tracked on a blockchain can be counted faster and more securely, perhaps leading to increased voter engagement, improved ballot security, and lower costs. we can enhance this project by adding multiple election functionality so that we can conduct multiple election at once. This project can also be enhanced by adding Adhaar number or voter id functionality in which we can all an api provided by government of india to verify the users. Email verification, otp verification can also be add in future to make this more secure and user friendly.

VII. REFERENCES

[1] Ganesh Prabhu S Nizarahammed, A Prabu.S, Raghul.S, R.R. Thirrunavukkarasu, P. Jayarajan,

'Smart Online Voting System',

7th International Conference on Advanced Computing and Communication Systems (ICACCS) IEEE. 2021

[2] Ramya, Govindaraj, Kumaresan P, K. Sree Harshika,

'Online Voting System using Cloud',

International Conference on Emerging Trends in Information Technology and Engineering (ic-ETITE). 2020

[3] Yi, H.

'Securing e-voting based on blockchain in a P2P network',

EURASIP Journal on Wireless Communications and Networking. 2019

[4] Fusco, F., Lunesu, M.I., Pani, F.E. and Pinna, A.,

'Crypto-voting, a Blockchain-based e-Voting System.'

In KMIS 2018.

[5] Panja, S. and Roy, B.K.,

'A secure end-to-end verifiable e-voting system using zero knowledge-based blockchain',

IACR Cryptol. Eprint Arch. 2018

[6] Ayed, Ahmed Ben,

'A conceptual secure blockchain-based electronic voting system',

International Journal of Network Security & Its Applications (IJNSA) 2017

[7] Rajesh M. Ghadi1, Priyanka S. Shelar2,

'Online voting system'

International Research Journal of Engineering and Technology (IRJE) 2017

[8] Liu, Y. and Wang, Q.,

'An E-voting Protocol Based on Blockchain'.

IACR Cryptol. eprint 2017

[9] Dr. Z.A. Usmani, Kaif Patan Wala, Mukesh Panigrahi, Ajay Nair,

'Multi-purpose platform independent online'.

International Conference on innovation in Information, embedded and communication Systems and Engineering (ICIIECS). IEEE 2017

[10] Hanady Hussien, Hussien

Design of a Secured E-voting System

International Conference on Computer Applications Technology (ICCAT) IEEE 2013