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BlockVote: Decentralized Voting Application Using Blockchain Technology

Ujwal Nikam, Arati Sutar, Prutha Mane, Jaydeep Yadav, Surabhi Gaikwad

B.Tech Student, Dept. of CSE, Sanjay Ghodawat University, Kolhapur, India

B.Tech Student, Dept. of CSE, Sanjay Ghodawat University, Kolhapur, India

B.Tech Student, Dept. of CSE, Sanjay Ghodawat University, Kolhapur, India

B.Tech Student, Dept. of CSE, Sanjay Ghodawat University, Kolhapur, India

Assistant Professor, Dept. of CSE, Sanjay Ghodawat University, Kolhapur, India

ABSTRACT: BlockVote is a decentralized voting programme that uses blockchain technology to give elections and other voting procedures a safe, trustworthy, and transparent platform. BlockVote's architecture, features, advantages, and prospective applications are all presented in this article. Along with presenting the outcomes of our testing and assessment, we also go into the research methods employed in the creation of BlockVote. BlockVote is a great option for democratic processes since it is intended to be safe, open, and accessible to all users. The major objective of this analysis was to assess the present state of online voting and blockchain based voting research, as well as any associated challenges, in order to forecast future advances. This serves as both an introduction and a conceptual explanation of the anticipated blockchain-based electronic voting application.

KEYWORDS: Distributed security, blockchain, smart contracts, electronic voting.

I. INTRODUCTION

Conventional voting methods have a number of drawbacks, including high costs, fraud vulnerability, and a lack of transparency. Blockchain innovation has the ability to solve these problems by offering a decentralized, transparent, and secure voting platform. The existing process, whether it be computerized or not, has shown to be ineffective in terms of openness.It may be quite challenging for voters to feel confident that their vote has an impact on the outcome of the election. Direct Recording for electronic voting Electronic voting does not produce a receipt when a successful vote is cast. The government does not provide any election records other than the vote totals, thus voters cannot be convinced that there won't be any outside involvement if the government is running an election.

II. LITERATURE REVIEW

Following a research of the literature on current blockchain-based voting systems, we pinpointed the crucial components that would make BlockVote a reliable and safe application. We discovered that voting systems built on blockchains offer security, transparency, and immutability, which makes them perfect for democratic processes. However, the scalability, usability, and governance of current solutions are constrained.

III. METHODOLOGY

BlockVote was created through a process that included phases for testing, design, and research. We considered the needs of a decentralized voting system when designing BlockVote's architecture and functionalities. To assure the programme's security, transparency, and dependability, numerous iterations of testing and assessment were carried out. The application was created utilizing open-source blockchain technology

IV. BACKGROUND

A. Problem Statement : BlockVote was created through a process that included phases for testing, design, and research. We considered the needs of a decentralized voting system when designing BlockVote's architecture and functionalities. To assure the programme's security, transparency, and dependability, numerous iterations of testing and assessment were carried out. The application was created utilizing open-source blockchain technology.

B. Proposed System: The use of computer technology to enhance elections has been the subject of several studies.These studies discuss the hazards associated with using an electronic voting system due to software issues, threats from insiders, network vulnerabilities, and auditing difficulties. We have suggested redesigning the current online voting system such that it incorporates Blockchain technology. Comparing the proposed system to the current one, the following benefits are present:

- Users are allowed to cast ballots from any part of the globe until they become citizens of the country.
- The voting is protected against tampering since it is kept on the Blockchain.
- There is no need to wait in queue to cast a ballot, which will save time and lighten the effort.
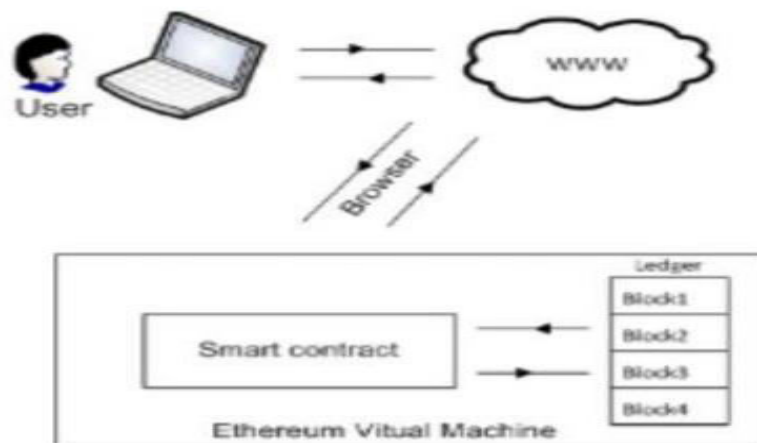

Fig.Fully decentralized application node

V. SYSTEM DESIGN

We define terms, make certain assumptions, and then discuss the BlockVote paradigm.

The following terminology, as they are used in this debate, are defined as follows:

- **Voters:** This is a list of those who are qualified to cast ballots.
- **Contestants:** This is the roster of participants.
- The election authority is referred to by the term **"Electoral Commission" (EC).**
- EC systems administrators are the **blockchain admins.**
- **Blockchain** is a technology A digital record that securely and impenetrably records transactions. The method of voting is safe and transparent because to BlockVote's usage of blockchain-based technology.
- **Decentralized:** Because BlockVote is a decentralized programme, there is no single entity in charge of managing the voting process. Instead, the network of people taking part in the process of voting is in charge of it.
- **Smart contracts:** Self-executing contracts that are designed to carry out automatically when specific criteria are satisfied are known as smart contracts. Immutable: When a transaction is immutable, it cannot be altered or removed once it has been added to the blockchain.

VI .ASSUMPTIONS

- BlockVote makes the supposition that voters will have the ability to use the internet and an electronic device to cast their ballots.
- BlockVote makes an assumption that the blockchain technology utilized in the application is trustworthy and safe, and that there are no flaws that may be leveraged by bad actors to their advantage.
- BlockVote makes the assumption that all users who participate in the process of voting are genuine, have the right to vote, and are not acting fraudulently.
- BlockVote makes the supposition that the method of voting is fair and that no outside forces might affect the result of the vote.

VII. APPLICATIONS

The following are some possible uses for BlockVote:

- Elections held at the national level may be conducted using BlockVote. The platform may offer transparent voting, guaranteeing trustworthy election outcomes.
- **Elections:** BlockVote may be used to conduct elections for board members and other important positions within corporations. The platform can guarantee a free and open voting process.
- **Referendums:** BlockVote may be used to hold referendums on a range of topics, including passing fresh laws or amending the constitution. In order to ensure that the outcomes are correct and represent the opinions of the people, a platform can offer a safe and transparent method of voting.
- Online voting is possible using BlockVote for a variety of events, including elections for student governments, nonprofit organizations, and other community organizations. The platform can offer a convenient voting method that enables users to cast their ballots from any part of the world. Overall, BlockVote has the potential to revolutionize the way we conduct elections and voting processes, making them more secure, transparent, and accessible for everyone.

VIII. RESULTS

BlockVote provides a secure and reliable platform for elections and other voting processes. The application is scalable, customizable, and easy to use, making it suitable for use in a range of contexts. BlockVote provides a range of features, including secure identity verification, ballot secrecy, and real-time vote counting. The application is designed to be transparent, with all transactions recorded on the blockchain and auditable at any time.

IX. CONCLUSION

BlockVote is a decentralized voting initiative that makes use of blockchain technology's advantages to offer an efficient, trustworthy, and safe platform for voting in elections and other types of operations. The programme has the ability to transform democratic processes by addressing the limitations associated with traditional voting systems. To overcome the adoption, governance, and safety issues and assure the broad deployment of blockchain-based voting systems, more study is required.

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9940 572 462   6381 907 438   ijircce@gmail.com

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