IJFEAT

INTERNATIONAL JOURNAL FOR ENGINEERING APPLICATIONS AND TECHNOLOGY

TITLE: ONLINE VOTING SYSTEM USING BLOCKCHAIN CONCEPT

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Abstract

The exponential growth in the newer technologies like electronic gadgets and internet connectivity has led to many advancements in the existing systems and has provided a scope of many more such possible advancements. This research paper provides a detailed idea of the possible implementation of an efficient voting system by using concept of block chain .This voting system promises the safest possible way to cast a vote and the best possible algorithm for calculation of the results. This paper provides the idea of the proposed system in terms of the specifications and requirements of the system. This voting system basically means the process of voting done through a using block chain concept. In the starting, an introduction and brief idea is provided about the proposed system through a general diagram. This section is followed by the concepts, surveys, design and implementation details that would be made use of in the work.

Index Terms: online voting system, blockchain voting, secure voting, future voting, i-voting, e-voting.

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1. INTRODUCTION

Voting System using concept of "Blockchain" is a voting technique. In every democracy, the security of an election is a matter of national security. Currently most of the democracies in the world either uses ballot paper or EVM's or Online Voting for elections, since each of these methods has some disadvantages. Replacing these traditional methods with more secure and cost effective method is a need of time. The Voting System using concept of Blockchain can change the scenario of voting in elections. Blockchain with its inherent features and in numerable application can be used as multiple stages of voting and election [1].

After registration, the voter is assigned a secret Voter ID (e.g. UID Number) with which he/she can use to log into the system and enjoy services provided by the system such as voting. If invalid/wrong details are submitted, then the citizen is not registered to vote.
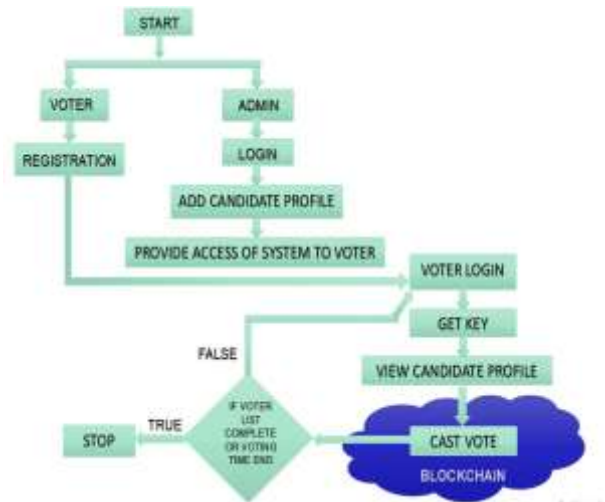

Fig: Architecture of voting system by using Blockchain concept.

2. PROBLEM WITH CURRENT PROCESS OF VOTING

The current election voting process can be more elaborated as a drawback to the efficient voting process. The existing process has more loopholes and more disadvantages than advantages. Though the current voting process promises transparency and reliability, the following observations can be

made to support the explanation on why there is a very need to have changes in the current voting system.

    a. Low voter participation.
    b. Tendency to enjoy voting day as holiday rather than attending the voting process just because of the lengthy queues and time consuming process.
    c. Vote counting procedure very slow due to manual process.
    d. Human errors possible.
    e. Vote manipulation possible.
    f. Conventional voting results declaration takes time.
    g. Poorer ballot.
    h. Voter fraud.
    i. Unsecure voting platform.

The problems listed above reduce the active participation of the voters. So, all the problems listed above must be taken into consideration and an efficient voting system must be developed. Hence, an efficient voting system by using concept of blockchain is proposed.

3. LITERATURE SURVEY

An electronic voting system was implemented for the first time in Brazil [1] in 1996. In 1985, an automated electoral register was used by Brazil. The electronic ballot was developed in 1995. The system was made use of for the first time in the municipal elections of 1996. The first voting experience through micro-computers was realised in the city of Brusque, Brazil. Initially the electronic ballet box was called as the EVC - Electronic Vote Collector.

In "Trustworthy Electronic Voting using Adjusted Blockchain Technology" IEEE paper authors Basit Shahzad and Jon Crocroft [2] states that the online voting system using Blockchain has emerged over time as a replacement to the paper based voting to reduce the redundancies and inconsistencies. The historical perspective presented in the last two decades suggests that it has not been so successful due to the security and privacy was observed over time. Online voting system using Blockchain suggests a framework by using effective hashing techniques to ensure the security of the data. The concept of block creation and block sealing is introduced in online voting system using Blockchain.

Existing System consist of methods like paper based voting, Lever voting machine, Punch card and Optical voting machine. The main problem with existing system was time consuming which used to take lot of time for voting. Paper based voting method where used in existing system which also gave the results of fake voting.

The problems of the existing manual system of voting including among others the following:

- Too much paper work

- Expensive and time consuming
- Error during the entry
- Loss of registration form.
- Errors while counting the votes.
- Booth capturing cases. (In west-Bengal)

We assume that voters will use a secure device to cast their vote. Even while our system is secure, hackers have the ability to cast or alter a vote using malicious activity but in our system there is provision to identify such activities and recovers original data. One of the drawbacks/feature of our system is inability to change a vote in case of a user mistake. The user will be able to cast its vote only once.

As discussed in [5], Although India makes use of electronic voting machines, but still there is no adoption of online voting done. The online voting system is not implemented in India on a national level till now. A foundation is being laid for implementation of such system. Unique Identity cards are being provided to the citizens of India as a base work for the unique authentication of the citizens in India. This unique authentication ID card number is being planned to be made use of in the national level online voting system implementation.

The other implementations being carried out globally include the locations of Canada, Europe, United States and Australia. Municipal elections of Halifax and three Nova Scotia towns made use of the online voting system. The European countries are the most experienced ones in the online voting system. They have the most advanced online voting systems developed for the purpose of elections. The United Kingdom, the Netherlands, Spain, Germany, France, Switzerland [3] and Estonia, all these countries have trialled the online voting system. United States is being very cautious when it comes to online voting system. They have implemented the online voting system and trialled four times including the presidential elections in 2000 in Alaska and Arizona. The 2007 federal elections in Australia were through online voting system. The overseas defence personnel were issued a unique personal identification number to login to the online voting portal application via a secure internet. The other systems implemented earlier included usage of [4] thumb impression, the security provided was using steganography and cryptography. Face recognition system was also used for authentication system. The Caltech/MIT Voting Technology Project was used to develop a new voting technology to prevent a recurrence of the problems. [2] These problems had threatened the 2000 US Presidential Elections.

4. FEATURES OF PROPOSED SYSTEM

A. Voting and Vote storing:

This sorts all the votes and checks for invalid votes that are created during elections such as multiple votes, online voting

system using Blockchain, spoiled ballots and participation in advance polls.

B. Security:

This system is more secure than any other because of the use of the concept of blockchain technique the vote are store in the form of blocks in database linearly.

C. Counting votes:

In this stage, votes are counted automatically by the System and shows the results.

D. Audit Application Possibilities:

Auditing the system during the voting processes is always present were the system work properly or not.

E. Accessibility:

Online voting system using Blockchain if designed well, can be accessible in large networks so that people from far places can still cast their votes. This advantage saves time and effort for both voters and administration. Another way is the system is it can use the power of having multiple languages to assist the users to use the system through head phones. It will be a lot easier for voters to understand the system better by listening to the system's voice and reading it at the same time. It makes the system more accessible and user friendly in helping illiterate people to cast a vote without the help of election volunteers.

F. Speed:

No one can deny that computers can do much work compared to humans. Using this advantage can surely lessen the waiting time of people to get the election result. For some countries, election result is expected to finalize after a couple of months. With this voting system using Blockchain concept, people can have the result in a matter of days.

G. Working Approach:

The complete process of working of the voting system shall be systematic. The data shall be properly stored and maintained in the database server, which will help in faster retrieval of records upon need. Also it will make the storing of information process efficient and faster.

H. Accuracy in the System:

The accuracy shall be maintained in the proposed system and the level of the accuracy shall be high. All operations done correctly shall be again verified to ensure accuracy of the system working process. This will lead to maintain the accuracy quality factor.

I. Increased Reliability:

The system shall be highly reliable due to the reasons stated above. The reasons above make sure that the system becomes reliable and very much efficient. The proper storage of necessary data and information is the main reason behind the increase in the reliability of the system. The system shall be made sure of resisting any sort of system failures so that there is no loss of data collected from the voters.

J. Redundancy Removed:

Utmost care is taken in this proposer voting system that no information is duplicated or manipulated in the storage or otherwise. This would make sure of the economic use of storage space and consistency in the existing data and newly fed data. A single unique voter would not be able to cast a vote more than once. This makes sure that there is no duplication of votes.

5. PROPOSED SYSTEM

The system is to be developed with high security and user friendly. In propose system remote and users can exercise. In the proposed system we can get the result without manually counting. The computerized counting is simple. The product has a server back-end which takes care of authenticating the users and maintaining necessary data structures.

The project maintains two levels of users:
1. Administrator Level.
2. Voter Level

Main facilities available in this project are:

- Maintaining voter's Identification.
- Providing updating of voter's information.
- Provide voter information to election commission of India
- Voter can give higher vote from any part of India with secure voting.

6. CONCLUSION

This paper has successfully made an introduction to a new and efficient design of voting application for the process of voting using the Desktop-based platform along with its desktop application. This system is more reliable for the voting process as the system will provide the desired comfort for voting process along with the security factor to the voters. The system easily bypasses the current lengthy process of voting which makes the voter spend un-necessary money and extra time for the process. It can efficiently handle the post-voting procedures like accuracy in counting the votes, generating proper and accurate results of the elections, displaying the results within a couple of hours post the election process and to make sure there is no compromise in the system.

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