BLOCKCHAIN CONCEPT AND ITS SCOPE IN E-VOTING

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Abstract : Building a secure electronic voting system that offers the fairness and privacy of current voting schemes, while providing the transparency and flexibility offered by electronic systems has been a challenge for a long time. In this paper, we evaluate an application of blockchain as a service to implement distributed electronic voting systems. we have implemented Blockchain E- voting system using Ethereum smart contract, which can conduct secure, quick and Tampered proof Election**.**

Index Terms - blockchain, election, E-voting, Smart Contract.

I. INTRODUCTION

A. *Blockchain*

Blockchain technology simply defined as a decentralized, distributed journal of all transactions and events that have been occurred and shared between engaged parties from the network.
it is like a bank passbook that holds records the transactions but in blockchain, these transactions are publicly available in encrypted format. Blockchain is a principally chain of blocks in which blocks are connected to each other to form a chain of blocks which holds data and information about occurring affairs.

B. *E-voting*

In democracy, main objective is to secure the election measure for national security and development of nation. in traditional democracy to elect a candidate ballot paper and pen are required and then result was counted manually and announced. this ballot and pen process takes huge amount of time ,manpower and cost ,to overcome these drawbacks Electronic voting can be a convenient option . In India Elec- tronic voting machine (EVM) is been in use since 1982. but after implementing elections in electronic way high usage of manpower and money needs to conduct elections with voters has to be in queue for long time to elect their vote

II. LITERATURE REVIEW

Kazi Sadia, Md Masuduzzaman, Rajib Kumar Paul, Anik Islam Abhi In [1] paper key features of smart contracts for Evoting are illustrated like pre-voting phases, voting phase and specifications of biometric authentication. In end result they found that with the use of smart contracts we can build a distributed system which is nearly impossible to hack.

In [2] Fririk . Hjálmarsson, Gunnlaugur K. Hreiarsson have gien full information about how the evoting blockchain model could be implemented, how can we provide securities to project. They have given how the registration, vote validation, and tallying results will occur with relevant code.

In [3] Ahmed, Md Shamrat, F.M. Ali and their team have worked on evoting system using blockchain concept,have used PyCharm and Django. they implemented Ballot like voting system using public and private keys.

In research paper [4] SHIYAO GAO, DONG ZHENG and their team solves the problem of verifying public key certificates s in traditional public key crypto-system by introducing certificateless traceable ring signature algorithm. they adopt the code-based public key cryptographic algorithm, which makes the e-voting protocol can resist the quantum attack.

III. PROBLEM STATEMENT

In traditional voting arrangement, there are few drawbacks in terms of fairness, cost requirement, needed manpower and security of whole system. Conventional voting system gives many opportunities to breach through its security in many different levels. There are also some flaws in conventional voting system like

- Registering voter details in database is time consuming and might contain human errors.
- Large amount of time, human power and cost is required to tally the results.
- Hardware elements in voting system can cause measure errors.

since the dawn of democracy, voting has been accused for lack of openness and security. countries around the world are adopting technology across all aspects of society, a de- centralized democratic voting system might just be the next evolutionary step towards transparent and reliable E-voting system.

IV. PROPOSED SYSTEM

Proposed system will help to maintain the immutable record of the voter list and voting process.it will also store the record of the candidates which were given by Admin. proposed system will also help to conduct secure online election so that voters can cast their votes from any location of the world securely. At the time of election, the main person or organization (Admin) will add candidates and their details and after filling details of all candidates, admin will start Election. after election period started voters can register themselves and they should wait till admin approves their registration after approval from admin they can cast their vote. Until admin ends the election no one can see the results not even admin, after election ends all can see the vote counts and winner in result section. proposed system has potential to conduct small college level election and wide range of elections with some modifications.

A. Advantages of Blockchain E-voting

- physical presence at a given location is absolutely not necessary.
- results are available instantly.
- voters can easily access website and cast their vote.
- It can tally everything precisely, to give error free results.
- It is user friendly, convenient, secure and faster.

V. METHODOLOGY

A. A.Administration Aspect

1) Deploying smart contract using truffle.
2) Adding candidates for election with other details.
3) Starting Election.
4) Verifying voters request to vote.
5) Ending the Election at Specific predefined time.

B. Voters Aspect

1) Registering for casting vote after election started.
2) Casting vote after approved by admin.
3) See the result after end of election

C. Voting Process

1) Give blockchain account public key, name and mobile number for validation.
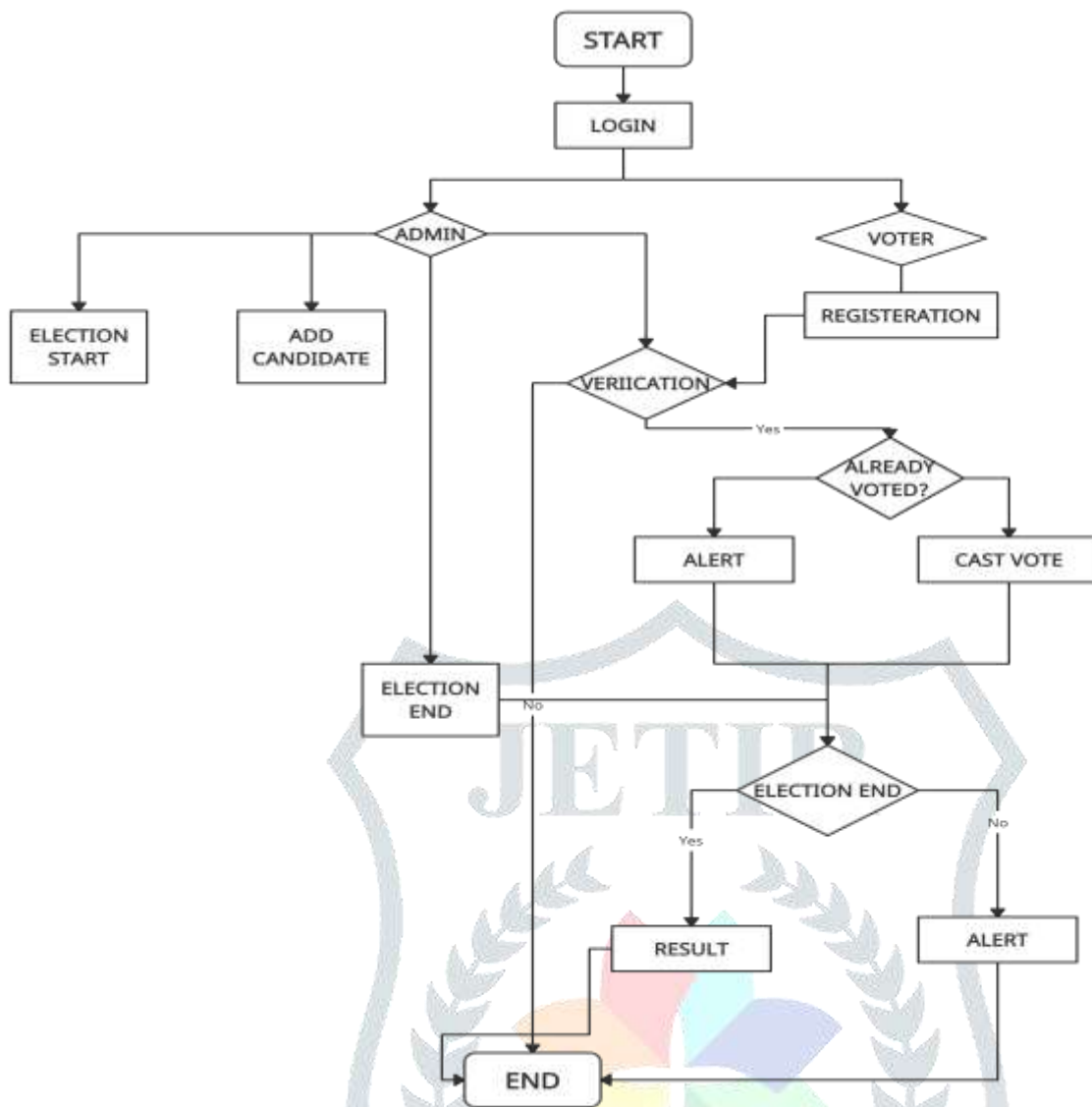2) After approval go to vote section choose your candidate from drop down menu and cast your vote.

Fig. 1. Flowchart of Blockchain voting system

VI. IMPLEMENTATION

There will be React application which will have front end. containing HTML and CSS for design of web-page. React is used to make responsive page design, routing between pages and to use different State functions using React DOM. For blockchain smart contract we used Ethereum coding language Solidity in backend with JavaScript. we used Web3 (NPM) Node Package Manager module as a middleware to connect solidity contract to projects front-end. Truffle is used to deploy smart contract and Ganache is used to test the project with dummy accounts. To interact with blockchain we need to give some amount of charges in ether, ganache dummy accounts gives us 100 ethers but to grant permission to spends ethers via account we need crypto wallets. Metamask is used as crypto wallet in this project.

A. Front End (React)

The Front end consist of React js which provides user friendly experience to voters. After login from Metamask wallets, it checks if you are admin or voter and relevant type of access will be provided after checking who has logged in. React re-renders only specific component that has changed with specific state, which provides power to refresh web-page in much faster way.

B. Back End

Back end is consisting of solidity language, which takes all the hard work of making smart contract on blockchain, requesting and responding to crypto wallets also providing blockchain functionality.Solidity uses SHA256 to encrypt the information which makes it very secure.

VII. CONCLUSION AND FUTURE SCOPE

The paper conclude that the proposed Blockchain E-voting system will be computerized system to do all election-oriented tasks. The System is made with exceptionally efficient GUI based language so it very convenient to use. Software will meet all the prerequisite of voting system and can able to provide fast, secure and transparent voting system. The main aim of this project is to provide secure and fast voting system with reduction of man power consumption. drawback of the system is that admin have to validate every voter for casting vote which is time consuming. this problem can be solved   by giving something like Aadhaar API, which will auto check voters validity.

This system can be implemented in college elections, small society elections and can be used for big area elections as well. In future we will use Aadhaar details to directly validate the user to make it less time consuming. Mobile OTP or Biometric authentication can be implemented for 2-step validation.

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