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Research Article

ELECTRONIC VOTING SYSTEM USING BLOCKCHAIN TECHNOLOGY

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ABSTRACT
Voting system is very essential for electing leaders to lead our nation. Nowadays, e-voting is developed to make easy for citizens of India to vote through online without visiting polling booth. E-voting would be the security risk that can be potentially undermine the election process. It may susceptible to a range of threats such as hacking by domestic and foreign saboteurs. In order to address this issues , our proposed system uses QR code for safe voting and block chain technologies for database security and also to track the whole voting process.

Keywords: *Voting system, security risk, hacking, QR code*

INTRODUCTION
In every democracy, the security of an election is a matter of national security. The computer security field has for a decade studied the possibilities of electronic voting systems , with the goal of minimizing the cost of having a national election, while fulfilling and increasing the security conditions of an election. From the dawn of democratically electing candidates, the voting system has been based on pen and paper. Replacing the traditional pen and paper scheme with a new election system is critical to limit fraud and having the voting process traceable and verifiable. Electronic voting machines have been viewed as flawed, by the security community, primarily based on physical security concerns. Anyone with physical access to such machine can sabotage the machine, thereby affecting all votes cast on the aforementioned machine. Enter blockchain technology. A blockchain is a distributed, immutable, incontrovertible, public ledger. This new technology works through four main features: (i) The ledger exists in many different locations: No single point of failure in the maintenance of the distributed ledger. (ii) There is distributed control over who can append new transactions to the ledger. (iii) Any proposed “new block” to the ledger must reference the previous version of the ledger, creating an immutable chain from where the blockchain gets its name, and thus preventing tampering with the integrity of previous entries. (iv) A majority of the network nodes must reach a consensus before a proposed new block of entries becomes a permanent part of the ledger. These technological features operate through advanced cryptography, providing a security level equal and/or greater than any previously known database. The blockchain technology is therefore considered by many, including us, to be the ideal tool, to be used to create the new modern democratic voting process. This paper evaluates the use of blockchain as a service to implement an electronic voting (e-voting) system. The paper makes the following original contributions: (i) research existing blockchain frameworks suited for constructing blockchain based e-voting system, (ii) propose a blockchain-based evoting system that uses “permissioned blockchain” to enable liquid democracy. The system present our blockchain based e-voting system and evaluate some of the popular blockchain frameworks for realizing the system some of the security and legal considerations and limitations regarding designing an electronic voting system for national elections.

Literature survey

A. Mutual Authentication in Electronic Voting Scheme
Voke Augoye and Allan Tomlinson suggested Eligibility of the voter is a pivotal security requirement of any e-voting scheme. If the scheme cannot correctly identify voters, then it cannot prevent voter

impersonation or double voting. In many in-person e-voting schemes, such as prêt-avoter , traditional means such as those used in paper based elections are used to authenticate voters and prevent ballot stuffing.

B.Electronic Voting: A Review and Taxonomy

Feng Yumeng and Tian Liye suggested Electronic voting has the potential to be the most reliable, secure and trustworthy voting approach. Digital technology including error correction, robust storage and cryptographic security offers the possibility to record, transmit, store and count votes far more reliably than paper.

C.Efficient Privacy-Preserving Electronic Voting Scheme Based on Blockchain

Sanxing Cao and Ze Xu suggested In the Internet era, electronic voting has replaced traditional paper voting forms with advantages of low cost, high work efficiency, and low errors. A blockchain as a trustworthy and secure decentralized and distributed network provides new ideas for electronic voting schemes. The paper proposes an electronic voting scheme based on a distributed SM2 encryption scheme with differential privacy mechanism.

D.An Efficient Implementation of Electronic Election System

Naznin Fauzia suggested Voting is usually recognized as one of the main characteristics of Democracy. Electronic election is a very recent idea regarding voting. Voter, once given his vote, has to rely upon the election system's honesty and security. Free and fairness of an election is desired by almost everyone associated with it.

E.The Design of a Trustworthy Voting System

Nathanael Paul and Andrew S. Tanenbaum suggested After the voting debacle in the Florida Presidential election of 2000 with its now-fabled hanging chads and pregnant chads, many voting jurisdictions turned to electronic voting machines. This transition has had at least as many problems as punch-card systems and added the additional one of making recounts impossible.

III.EXISTINGSYSTEM

Vulnerability to hacking.One of the main problems is that in most countries voting is anonymous. It's hard to find a way that people can vote online, without authentication (because anyone can only vote 1 time) and assure that the vote is not bound to an identity. Anonymity has multiple underlying problems that relate to preventing people from voting more than once. The latter is easy enough in theory: maintain a list of people who already voted, and prevent them from voting twice.Electronic voting system which is web application using facial recognition. User can place their vote in our remote location. Easy to access any person to place their vote another voter id with online voting system.

IV.Disadvantages

Facial recognition is able to vote unauthorized person, so security of voting is not possible. Voting can be modified by the hackers or accessed by unauthorized user in database. Trustability failure is occur.

V.Proposed System

Secured Login makes our application Secure and Safe. QR OTP code generation replaces traditional Login format. Database Encryption and Decryption to protect the data owner's Privacy and File manager using Base64 Crypto Algorithm**.**Block chain technology is used for database security and safe voting process. To overcome that issues, we implement combination of technology and human concept..Block chain technology is used which contains multiple block. each block perform verification. one block link to another vice versa. Voters collect all details from user then admin share crypted data. Next secure authentication is preformed.then user put their vote it will be stored in database after encryption.

VI. Algorithm

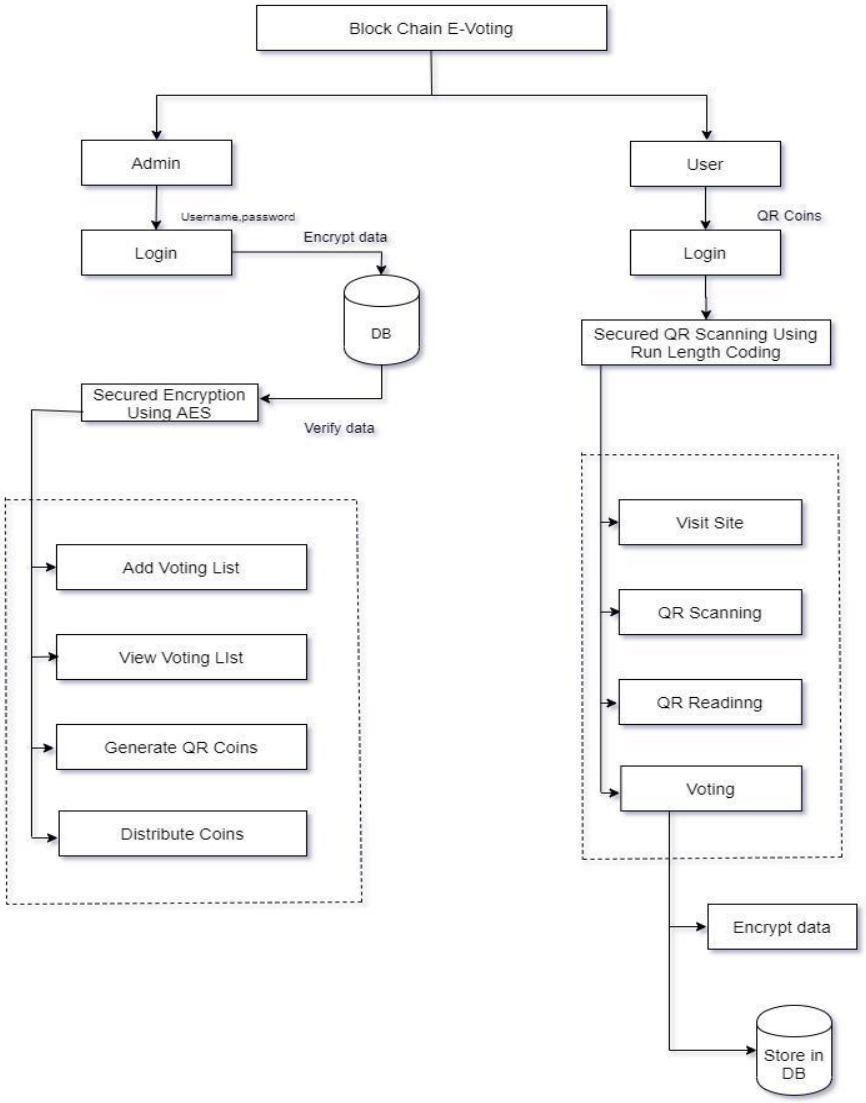
- **Run Length coding Algorithm:**
  It is used for generating a QR coin.
- **AES Algorithm:**
  It is used for storing Data in Database with Encryption.
- **Base 64 Crypto Algorithm:**

It is used for protects the owners privacy & file Management.

VII. Advantages

Not possible of unauthorised person access. More secure when compared to E voting system. Database is not possible to access unauthorized person.

VIII. Architectural Design



IX. Modules

USER MODULES

- Visit Site
- Apply Candidate
- QR Scanning
- QR Reading
- Polling
- Database cryptography

Visit Site

The user first visits the site where they have to cast the vote.

Apply Candidate

In this module, public users who are willing to apply for candidate can apply here by providing required details. All applied candidate can be elected as candidate. Admin only approve candidate.

QR Scanning

After the QR Coin is generated, the user can view the site only at the particular date and time and only at this time the user can view and access the sitand the user can scan QR .

QR Reading

In this project we can read our QR code by browsing and add QR image into our QR reader. We have alternative QR reading technology by using the scanner. Once we scan the QR and submit it into the QR reader the scanned image will be retrieved and the user can see the information provided in the decrypted QR.

Polling

After the QR is scanned, the user can poll votes. The user can view to whom they want to vote and poll accordingly and the voting details are viewed with database security using Encryption process. The voting process is now more secured.

Database cryptography

In this module, when all the votes are collected, they are stored in database after QR scanning. Each votes are scanned and stored in database after encryption so that authentication becomes even more secure. For this database security, Blockchain technology is used.

ADMIN MODULES

- Manage Voter Details
- Generate QR Coin
- Manage Candidate details

Manage Voter Details

In this module, the user can add voter list and the admin only can access voter details and can update the voter details as and when necessary.

Generate QR Coin

After adding the details, QR Coin is generated and distributed to the particular user. Only that particular user can view the details and at particular date and time. Only with that QR Coin only the user can cast votes.

Manage Candidate details

In this modules, all applied candidate details will be managed. Admin can approve only particular candidate. And Party symbols will be allocated by admin to approved candidates.

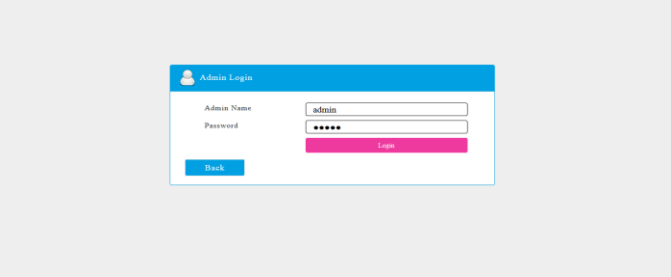
IX. Implementation

A. Home page:

This is the Home page of our project.

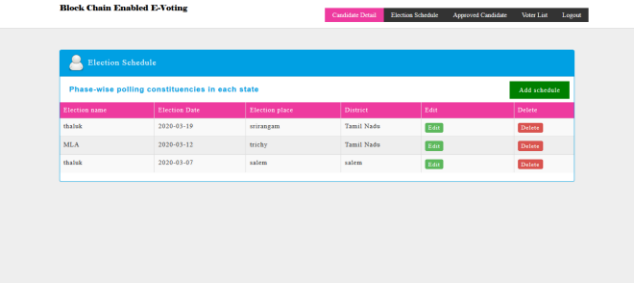
B. Admin Login

Admin have specific username & Password to login into the website. The role of admin is to Manage & Maintain the Voter list. They have the power to give approval to the candidates according to their eligibility.



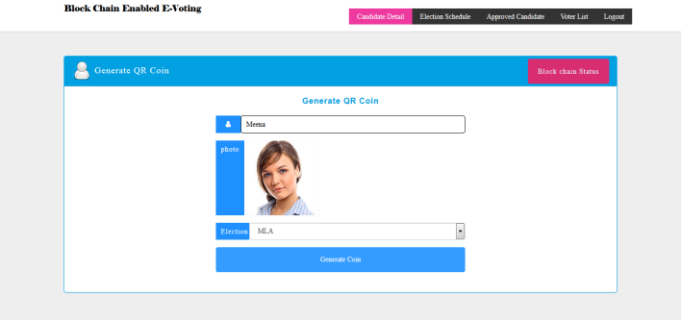
C. Election Schedule

Users can view the all kinds of elections such as PM election,CM election,MLA election etc with date and time.It will get updated everytime when a particular election is scheduled by the government.



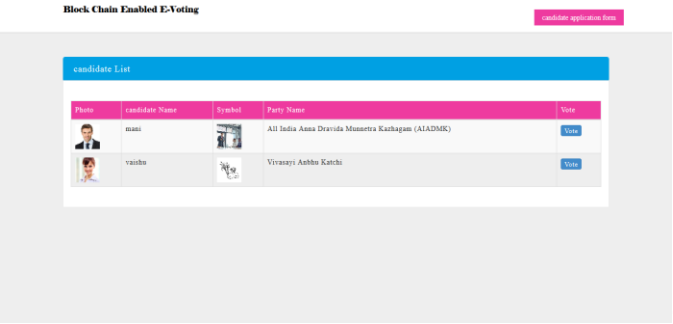
D. Generate QR Coin

At the election,after getting approved by the Admin,user will get a QR Code .Users can scan the QR Code to put their vote to their willing party.



E. Candidates To Vote

At last,after scanning the QR Code User can confirm their vote .if the vote was successfully polled,vote will be double encrypted and stored in the database.



C

Conclusion

E-Voting system is efficient adheres to voting protocol, simple & easy to maintain. It maintains details of voting, voters, candidate & election. It decreased false voting & it has increased voting percentage. Since E-Voting relates to the Internet, there is a possibility of more attackers. Another issue with E-voting is educating the voters. We cannot consider that all the users are having computer knowledge and they will use the E-voting systems easily. Designed E-Voting System must be easy to use. We should consider the fact that a large portion of the voting public has a very little knowledge about the computers. Voting through QR Coin Scanning has been implemented successfully. All votes have been implemented in encryption format. To avoid issues like hacking, we used block chain technology.

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