A Review on E-Stamping in Digital Voting System Using Block Chain and Cloud Server

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***Abstract*—We propose a e-stamping technique in Digital voting System which allows the voter to cast only one vote.Here we are implementing the Android Application for E-voting system using Blockchain and Cloud Server.usage of Decentralized system eliminates the Single point failure and gives more transparency,anonymity for the voters.Hence,Ensures the Trust by the voters.Voters can cast the vote remotely from anywhere with the help of Android Device And Voting Application On the Device.We are using Two Stage Authentication system for the application.i.e,Facial recognition and One time Password.Facial image of the Voter is stored in the database along with voter id ,this will be verified by the application server and followed by OTP authentication System with voter registered mobile number.after Successful login the voter can cast vote.During each vote castes, timestamp of the vote is recorded.Usage of E-stamping will ensure that voter can only vote once for the particular election.at the end Result of election is updated in the Application and notified to each voter.**

***Index Terms*—Blockchain,E-stamping,Facial Recognition,OTP.**

I. Introduction

E-voting also known as Electronic voting is a concept that has evolved recently due to the explosion in internet popularity over the last three decades providing a large number of citizens access to the internet. Unlike traditional voting which involves going to a designated polling booth to cast a vote, e-voting uses electronic means to aid casting and counting of ballots. It can be implemented either through an EVM (Electronic voting machines) or by taking votes from computers on the internet which is known as Online voting. EVMs can include machines such as voting kiosks, punched cards or optical scan systems. These systems can perform a wide variety of tasks depending on the amount of automation required such as marking a paper ballot, vote recording, data encryption and consolidation and tabulation of an elections results.

An e-voting systems positives far outweigh the negatives. It solves various problems that plague the traditional systems such as voter intimidation and voter fraud by utilizing various technologies and algorithms to overcome them. It encourages more voter participation by allowing voters to cast their vote conveniently from their homes and in turn also is more environmental friendly as voters do not need to travel long distances to cast their vote. The vote results can also be counted in a more accurate, cheap and rapid manner by using automated systems instead of manually counting them by hiring workers which is more expensive. The voters who are disabled or live in a remote location reap the most benefits from such a system. But it also introduces some downsides which include being vulnerable to Cyber Attacks and a lack of transparency. Cyber Attacks can be prevented by using a more secure encryption standard such as 256-bit encryption. An e-voting system can be implemented by several methods which include Public network DRE voting system, Direct-recording electronic voting system, Paper-based electronic voting system, Online voting or it can be a combination of the aforementioned models leading to a Hybrid system.

DRE voting systems involves recording votes by utilizing a ballot display which contains electro-optical or mechanical components that can be operated on by the voter (such as a touchscreen, buttons or biometrics). It then processes the data inputs using software and records it on to a safe and secure memory component which can be removable in order to transport the votes to a central location for consolidation and announcement of results. To maintain the integrity of the votes we can utilize various algorithms such as RSA and MD5 for encryption and decryption of votes.

II. Literature Survey

A.

Chang-Hyun Roh and Im-Yeong Lee [1] Chang-Hyun Roh and Im-Yeong Lee has proposed e-voting system to solve the problem of single point failure since the administrator is given full authority. the contents of the ballot could be forged or tampered by a single point of failure.it uses algorithms like

proof-of-work, proof-of-stake, and delegated proof-of-stake (DPoS).the main advantage of this e voting system is that it uses algorithm that provides more security by encrypting the transaction.

B.

Tasmia Alvi et. al. [2] Tasmia Alvi, Mohammed Nasir Uddin and Linta Islam has proposed the e-voting using bio-hash and smart contract.A fascinating topic in the current voting system is the modification of voting globally the advantage is that it uses smart contract where it performs the authentication process of voter and plays a role in selecting a Miner in the Blockchain to reduce the computational cost.the disadvantage of the it lacks the encryption technique.

C.

Mahender Kumar et. al. [3] Mahender Kumar, Satish Chand and C. P. Katti has proposed the voting system using Identity-Based Blind Signature the advantage of using this is that it ensures end to end security,mobility to a voter The privacy of the system is achieved using elliptic curve discrete logarithm and gap Diffie–Hellman assumptions.

D.

Garg et. al. [4] garg and her team has proposed Decentralized System, drifting towards making Voting Process simple, secure and anonymity.the proposed system have simple authentication based on id and disadvantage is that it is not practically implemented.

E.

Ahmed Ben Ayed [5] ahmed ben has proposed a conceptual secure blockchain based e-voting system focused on the technical and legal issues but there are many limitations like they assumed that all voters will use secured service. but still the security vulnerabilities exists.its advantage is that it uses decentralized system which can we voted by connecting through internet.

F.

Cosmas Krisna Adiputra et. al. [6] The decentralised blockchain-based electronic voting system that Cosmas Krishna Adiputra and his team presented has excellent availability thanks to it's distributed architecture.Here, they used an electronic voting method that used double envelope encryption.Both user anonymity and work proof are missing from this research.

G.

Jambhulkar et. al. [7] Prof. S.M. Jambhulkar and his team has proposed Web Based Internet Voting System using Multiple Encryption. it uses mainly the concept of multiple encryption and decryption. provide security from attacks, when vote is travelling from include security threats from passive as well as active intruder. disadvantage is that there is no bio metric authentication in the system they use id based login.

H.

Mohib Ullah et. al. [8] ullah and his team has proposed an e-voting system based on hybrid cryptosystem. the advantage of this system is use of SMS of verification of vote.which gives added security feature for the voting system.

I.

Poman Sharad and Dr. G. M Bhandari2 [9] they proposed a system for eliminating the centralized voting and bring decentralized voting through BCT. Unlike Bitcoin with its Proof of Work its a method based on a predetermined turn on the system for each node in the built of block chain.this system aims to decentralize, transparency and trust in voting authority.

J.

srinivas et. al. [10] srinivas and his team have proposed e-voting using bct and proof of vote consensus algorithm. they used smart contract and proof of vote consensus algorithm to secure vote and maintain anonymity of the voter.other features like byzantine failure also used to make prov more efficient.

K.

Palekha et. al. [11] Palekha et. al.had proposed the practical implementation of the electronic voting Web–system.This is a client-server web application, which provides best usage under different operating systems. This applications makes sure that voting system is simple and transparent.this web application lacks proficient security measures.

L.

Baoyuan Kang [12] Baoyuan Kang had proposed electronic voting system to cast their votes over a computer network which would be anonymous and safe.This paper indicates the drawbacks and advantages of the different research papers proposed by different authors.This paper mainly shows weakness in voting scheme i.e, Authentication Server is able to find out who cast the votes on the tickets.

M.

Djanali et. al. [13] Djanali had proposed e-voting system using algorithm like sha-256 digital signature, and rsa asymmetric encryption applied to database the main advantage of this system is that it provides high security but lacks practical application of system.

N.

Mohammad Kamel Alomari [14] Mohammad Kamel Alomari had proposed an e-voting system that ensures a high level of participation from voters and give them a high sense of trust in the election system by calculating factors such as age, education and income which would in turn influence voter's intention to use an e-voting system. This is done by introducing a proposed framework for e-voting digital divide factors.

O.

Roopak TM et. al. [15] Roopak T M proposed an e-voting system that reduced the percentage of abstention and provided extended security against vote tampering. This is done by introducing Aadhar integration in to the e-voting system to overcome the replication of votes and by using the bio-metric and VID of the voters obtained from the Aadhar database.

P.

Himanshu Vinod Purandare et. al. [16] Himanshu Vinod Purandare had proposed a way to improve the current e-voting system by introducing an application that allows online voting using android applications that will allow security and allows casting votes to be less time consuming and in turn provide better results. It ensures that voters can cast their vote from anywhere in the country but requires an internet connection and an android phone. It provides security by introducing facial recognition and an OTP.

Q.

Hamoud Alshammari et. al. [17] Homoud Alshammari has proposed an E-voting system that uses Quantum computing applications in order to solve various cybersecurity issues that current voting systems face such as eavesdropping, replay attack and man-in-the-middle attack by introducing an entanglement concept. This concept applies between two parties randomly, that is, one person who is verifying ballots will create the entangled state and keep it in the database to use for in the future if any non-repudiation occurs between two voters.

R.

Tulasi Menon et. al. [18] Tulasi Menon has proposed an e-voting system which utilizes ID-Based Signatures in order to prevent the various issues that exist in other systems such as malicious users tampering with votes. It uses a Designated Versifier Ring signature that ensures both security of the vote and provides anonymity. It also provides a receipt to the voter to check if his vote has been taken into account and it won't allow the voter to reveal their vote to another person.

S.

Harshsa V Patil et. al. [19] Harsha V Patil has proposed an E-voting system that aims to solve the common problems of the traditional voting system such as vote rigging, election manipulation and polling booth capturing by utilizing blockchain technology that solves these issues.It also provides anonymity to the voters while being open for public inspection. It mainly takes advantage of the decentralized nature of blockchain to provide transparency and audit-able.

T.

Ashish Singh et. al. [20] Ashish Singh and his team had proposed digital voting system with the help of Block chain and using the Block chain to solve the security issues arises in the voting system.In this paper the they discussed all the possible threats and it's solution towards voting system and the it ensures only registered users can vote and only one time they can vote.

U.

Sudharsan B et. al. [21] Sudharsan B and his team showed the vulnerabilities in Electronic Voting Machines(EVM) and the possible problems that can arises from EVM's in this paper.here they given solution for the problems of EVM's by storing the votes in the decentralized network and securing the data using Block-chain.This paper lacks the Security options like encryption methods and the proposed system can't handle large number of connected devices and consistency.

V.

Ali Kaan et. al. [22] Ali Kaan and his team outline the concepts of usage smart contracts in ethereum platform for the e-voting system.Using the Ethereum platform the authors showed the great consistency and usage of smart contracts in the voting system.here the authors didn't discussed about the most of security risks and authentication of voters.

W.

Zhao Yuehua et. al. [23] Zhaeo Yuehua had proposed an e-voting system that utilizes testing information and historical records to solve the problems which regular voting systems suffer from such as no output and no high accuracy. The algorithm proposed can extract services run time error messages from the disk and ALU to improve voting accuracy. It also improves the integrity of the system and makes it intrusion-tolerant.

X.

Ramya Govindaraj et. al. [24] Ramya Govindaraj had proposed an e-voting system designed in cloud in order to prevent several issues that occurs in a manual voting system such as voter intimidation and exploitation. They had implemented a voting system with features such as schemes that a specific party has implemented. The system uses tickets to solve many issues and prevents voters from casting invalid votes by using a polling system used by the heads and also allows voter anonymity.

Y.

G.Shanmugasundaram et. al. [25] G.Shanmugasundaram and his team proposed an E-voting system designed to tackle the various issues that plague the current model of e-voting system such as fake votes and to improve the overall reliability of the electoral process. It explores ways to detect fake votes and to maintain the integrity of the votes. It achieves this by using various technologies such as blockchain to improve the reliability and security of the elections polls by integrating block chain with a bio-metric device. It also results in more accurate voting results and leads to better voter participation.

Z.

Deepali Raika and Avimanyou Vatsa [13] they have proposed bct based e voting system.nomination of candidates, secure voter Identity, vote tampering, a donation to electoral parties or candidates, and counting of votes and winner announcement are main features of their system all these are verified by consensus mechanism. they have also implemented GUI for users.they can further enhance the system by using crypto phrase for the public key (users' identity) and transaction hash such that searching sorting using Ethereum Query Language.

III. Summary on Literature Survey

To summarize, after going through several research papers which specifically uses blockchain in an e-voting system, we find out that the decentralized and peer-to-peer nature of blockchain offers various advantages over other platforms for an e-voting system such as transparency, prevention of duplicate votes and thereby preserves the authenticity and integrity of the voting system. We are therefore going forward with the proposal of implementing an e-voting system which will be deployed on the Ethereum blockchain network and utilize techniques such as E-Stamping and Facial recognition in order to prevent voter fraud. This system will be accessible to every citizen as long as they have an internet connection irrespective of whether they live in an urban or rural area as the proposed application will be created on Android and will be accessible in various languages.

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