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Blockchain Based E-voting System

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Abstract: *An electronic voting (e-voting) system must prioritize security to prevent duplicate votes and ensure full transparency, participants. unreliability, all while safeguarding the privacy of Traditional voting systems suffer from lacking assurance that cast votes remain unaltered before being counted. Additionally, there is a lack of transparency between voters and the system. In response to these challenges, we propose leveraging blockchain technology as a foundational element in the voting system. The primary goal is to establish a decentralized architecture that supports an open, fair, and independently verifiable voting scheme. Within this framework, we introduce a novel e-voting protocol that harnesses blockchain as a transparent ballot box.*

Keywords: Reliability, transparency, e-voting system, decentralized

I. INTRODUCTION

An e-voting system using blockchain is a digital voting platform that leverages the decentralized and transparent nature of blockchain technology. It aims to enhance the security, transparency, and efficiency of the voting process. With blockchain, each vote is recorded as a transaction on the distributed ledger, making it nearly impossible to alter or tamper with the results. By using cryptography and consensus algorithms, blockchain-based e-voting systems ensure the integrity and confidentiality of votes.

This technology eliminates the need for intermediaries, reduces the risk of fraud, and provides a verifiable and auditable record of the entire voting process. Overall, the introduction of an e-voting system using blockchain has the potential to revolutionize the way we conduct elections, making them more secure, accessible, and trustworthy-voting systems based on blockchain technology decentralize the voting process, eliminating the need for intermediaries such as election officials or supervisors. Each vote is recorded as a block on the blockchain, making it highly secure and tamper proof. Blockchain's decentralized nature ensures that no single entity can manipulate or alter the voting records, enhancing the trustworthiness of the entire process

II. LITERATUREOVERVIEW

1) 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 work-in-progress paper, we evaluate an application of blockchain as a service to implement distributed electronic voting systems. The paper proposes a novel electronic voting system based on blockchain that addresses some of the limitations in existing systems and evaluates some of the popular blockchain frameworks for the purpose of constructing a blockchain-based e-voting system.

2)The process of voting is the preferred approach for reaching democratic decisions across numerous groups of individuals on a wide array of matters. Irrespective of whether the approach is applied in formal or informal settings, it offers an equitable and effective means to arrive at decisions guided by the majority. Managing and recording decisions in smaller groups pose minimal challenges. However, in situations involving a substantial number of voters, maintaining accurate records of individual decisions becomes both crucial and more complex.

3)In the contemporary digital landscape, the transition from paper-based to digital voting systems is evident. Digital e voting systems encompass various attributes, including transparency, decentralization, irreversibility, and non repudiation. However, the expansion of digital e-voting systems introduces a host of security and transparency

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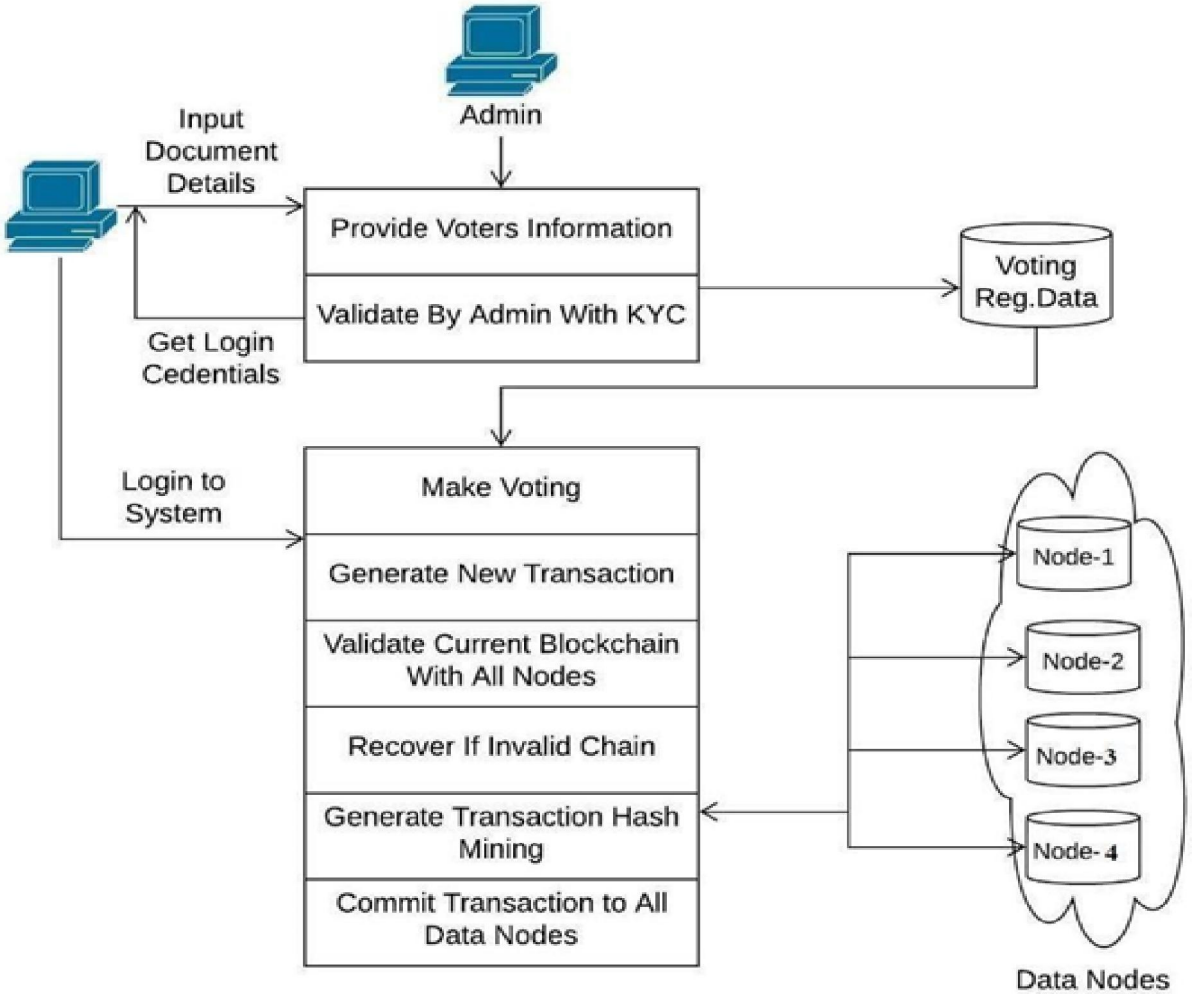
concerns. This paper explores the integration of blockchain technology into digital e-voting systems as a solution to address security issues and meet system requirements. This approach presents novel possibilities for implementing a secure e-voting system within diverse organizational or national contexts.

4)Electronic voting, or e-voting, presents an alternative to traditional paper-based ballots in the election process. Implementing e-voting on a large scale necessitates addressing concerns related to the security and reliability of the system. The emergence of Blockchain technology, introduced by Satoshi Nakamoto through the cryptocurrencyBitcoin in 2008, provides an avenue for creating a secure, transparent, and decentralized system without the need for third-party access and control in the voting process of casting and tallying votes.

5)The electronic voting system in Estonia, recognized as a forefront electronic voting system, faces challenges related to universal verifiability and potential enhancements in availability. This paper introduces a solution to these issues by proposing a blockchain-based electronic voting system. Inherent to a blockchain is its distributed database, sharing complete data across all network participants. The decentralized architecture of a blockchain imparts numerous advantages suitable for an electronic voting system, ensuring high system availability without dependence on a centralized server.

III. FIGURE (SYSTEM ARCHITECTURE)



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The system contains following modules:
1. Admin, User, Candidates
2.Voting
3. Block Generation and blockchain validation
4. Consensus Algorithm validation and block chain
5.Results Generation

System Overview

This system emphasizes the practical implementation of an e-voting system utilizing blockchain. The focus extends to the development, deployment, and usage aspects of this proposal. In conclusion, this work outlines a prospective roadmap illustrating the capability of blockchain technology to sustain intricate applications. In this system, a voting process is facilitated for online users, allowing end-users to effortlessly engage with the system and cast their votes without the need for any third party validation.

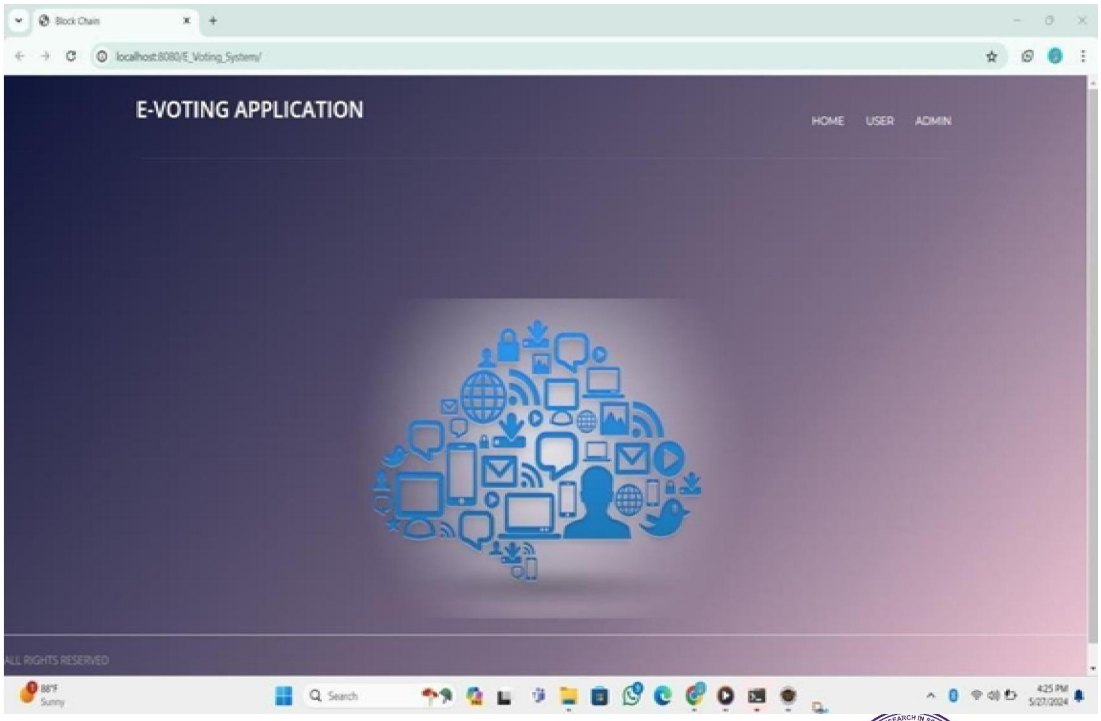
The system does not necessitate high-level hardware configurations; it allows voting using conventional configurations, ensuring accessibility and inclusivity. The system enables voting without reliance on any specific hardware device, ensuring a robust and secure process.

This addresses concerns related to quality of service and time constraints. The system functions as middleware, employing a processing environment where the load is efficiently balanced through the utilization of threads..The generated requests will be concurrently stored on all nodes in a manner similar to how data is recorded in a blockchain.

We employ a hash generation algorithm , generating a hash for the provided string. Prior to carrying out any transaction, we employ peer-to peer verification to authenticate the data.. In the event of an invalid chain, the system will initiate recovery or update procedures for the current server's blockchain.

This validation process continues until all nodes are verified, at which point the query is committed. A mining algorithm is applies to verify the has generated for the query until a valid hash is produced.

IV. RESULT



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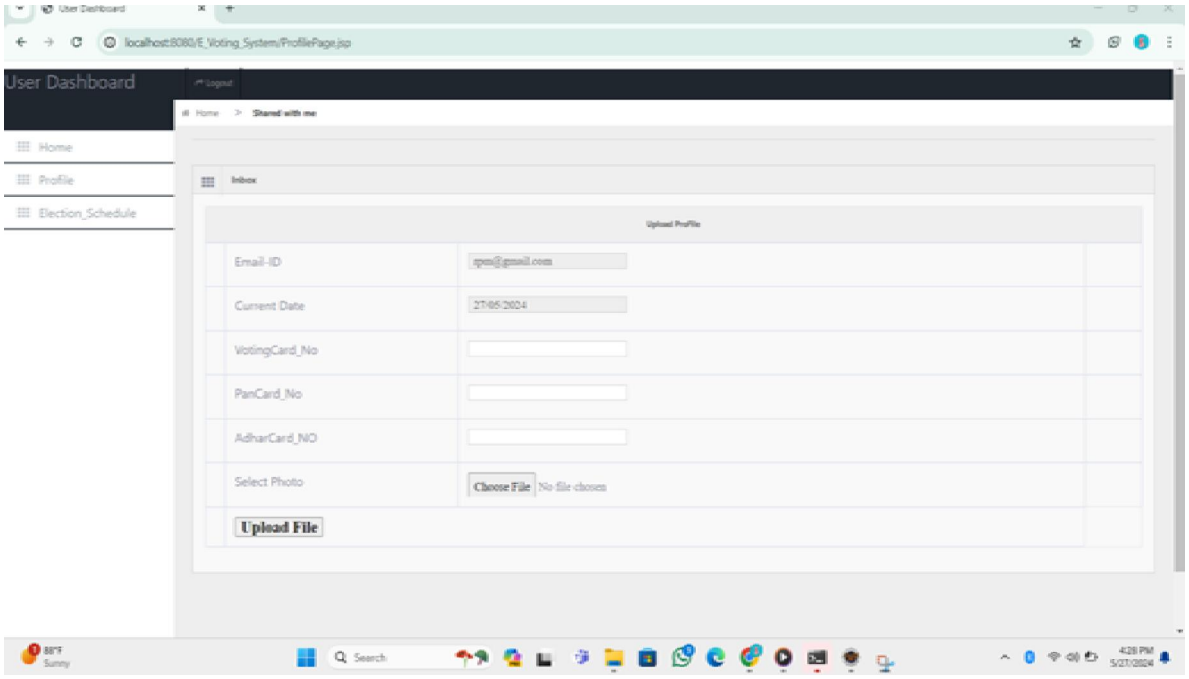

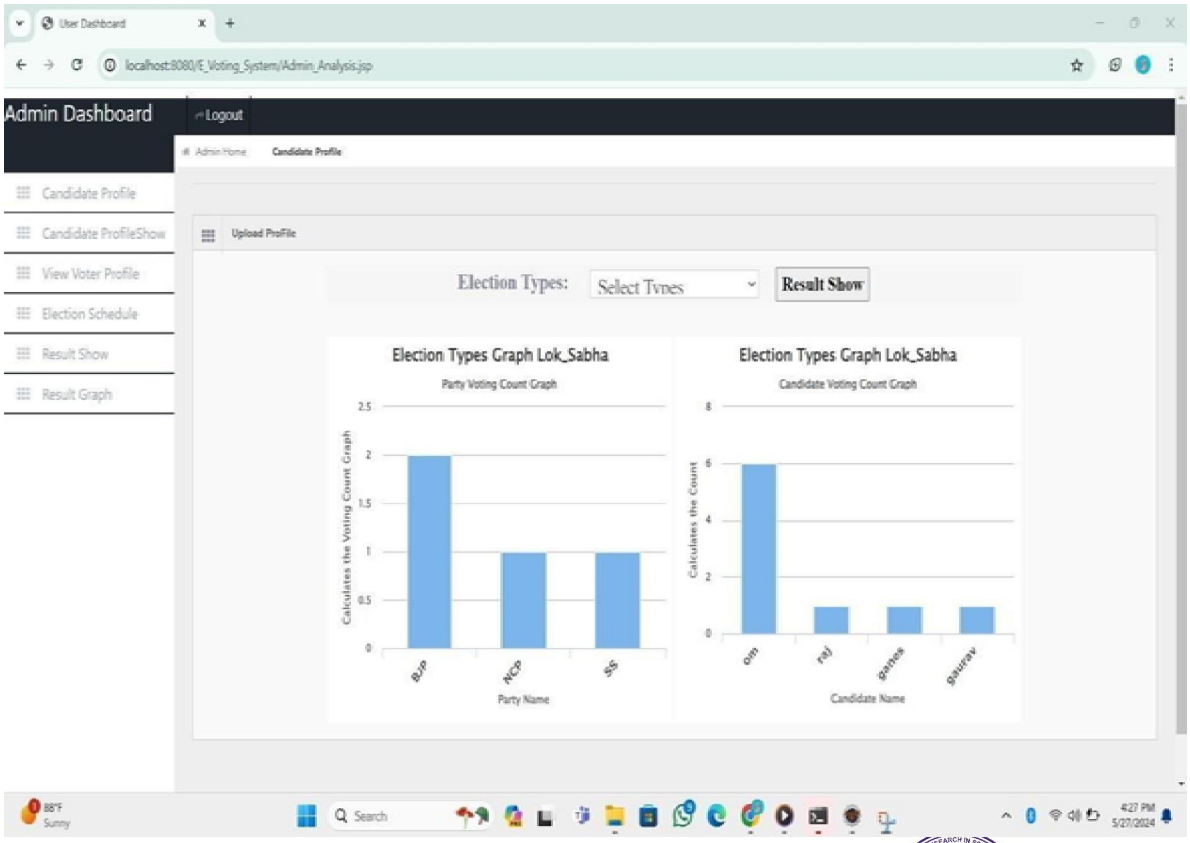

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