Project Report
On

TRANSPARENT EDUCATION DATA MANAGEMENT

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1. INTRODUCTION

1.1 PROJECT OVERVIEW

The Transparent Education Data Management project aims to revolutionize the education sector by implementing blockchain technology for secure, transparent, and tamper-proof management of educational data. Traditional methods of storing and managing educational records are often cumbersome and susceptible to fraud. By leveraging blockchain, the project ensures data integrity, security, and accessibility, enhancing the overall efficiency of education data management. Student Records on the Blockchain Each student's educational records, including transcripts, diplomas, and certifications, are stored on a blockchain. This ensures the authenticity of their qualifications.

1.2 PUPROSE

The purpose of transparent education data management using blockchain is to enhance the security, trust, and integrity of educational records and information. Here are some key objectives and Blockchain technology ensures that educational data is stored in a tamper-proof and encrypted manner, reducing the risk of unauthorized access or data breaches. Data Integrity It provides a transparent and immutable ledger where educational records can be verified and trusted, preventing the falsification of credentials. Students can have more control over their educational data, granting access to institutions, employers, or other entities as they see fit, thus protecting their privacy Streamlined Verification Educational institutions and employers can quickly verify the authenticity of degrees and certifications, reducing administrative overhead.

2. LITERATURE SURVEY

2.1 EXISTING PROBLEM

While transparent education data management using blockchain has the potential to address several issues in the education sector, it also faces some challenges and integrating blockchain into existing education systems can be complex and costly. Educational institutions may be resistant to change and may lack the necessary technical expertise.The process of migrating existing educational data onto the blockchain can be time-consuming and resource-intensive.There's a lack of standardized formats and protocols for educational data on the blockchain, making it challenging to achieve interoperability across institutions and countries.While blockchain offers transparency, it may conflict with data privacy regulations, such as GDPR, as it's not easy to reconcile transparency with the need to protect personal information. Implementing blockchain technology may leave out marginalized communities and individuals who lack access to the necessary technology or digital literacy Scalability remains an issue for some blockchain platforms, which may not be able to handle the volume of educational data generated by large institution. Determining who manages and maintains the blockchain network and its rules can be contentious, and decisions may not always align with the interests of all stakeholders. While smart contracts can automate various processes, coding errors or vulnerabilities in smart contracts can lead to unintended consequences or security breaches.

"2.2 PROBLEM STATEMENT DEFINITION

In the current education system, there is a lack of transparency and security in managing student records and credentials. Instances of data manipulation, fraudulent degrees, and difficulty in verifying qualifications have become increasingly prevalent. The existing centralized databases are susceptible to hacking and unauthorized alterations, leading to a loss of trust in the education system.To address this issue, we aim to develop a blockchain-based solution that ensures the transparent and immutable management of education data. This system will enable educational institutions to securely record and verify student records, degrees, certifications, and other educational achievements. By leveraging blockchain technology, we seek to establish a tamper-proof, decentralized ledger that can be easily accessed and verified by relevant stakeholders, such as employers and academic institutions, ensuring the authenticity and integrity of educational data.

3.IDEATION AND PROPOSED SOLUTION

3.1 EMPATHY MAP

An empathy map is created with a sample consumer and is attached below

Figure 1: Empathy Map

3.2 BRAINSTORMING AND IDEATION

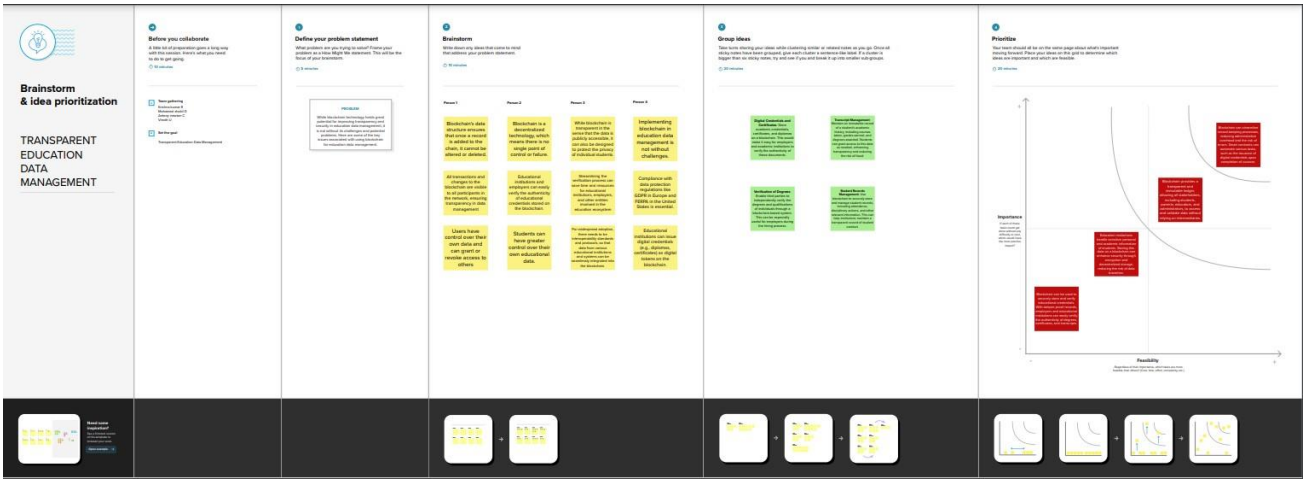
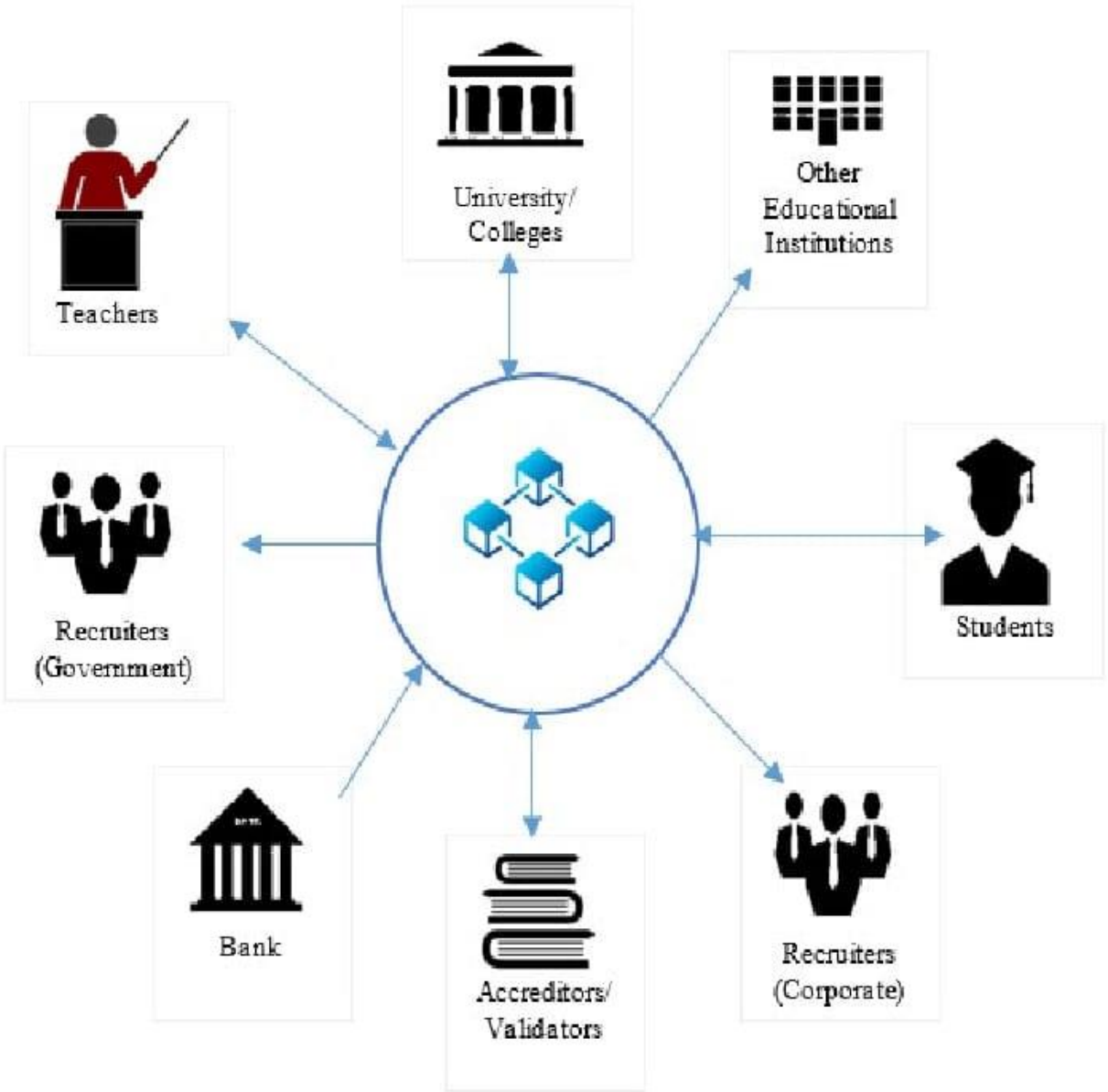


Figure 2: Brainstorming and Ideation Map

4. PROJECT DESIGN

4.1 SOLUTION ARCHITECTURE

Figure 3: Solution Architecture for the problem



4.2 DATA FLOW DIAGRAM

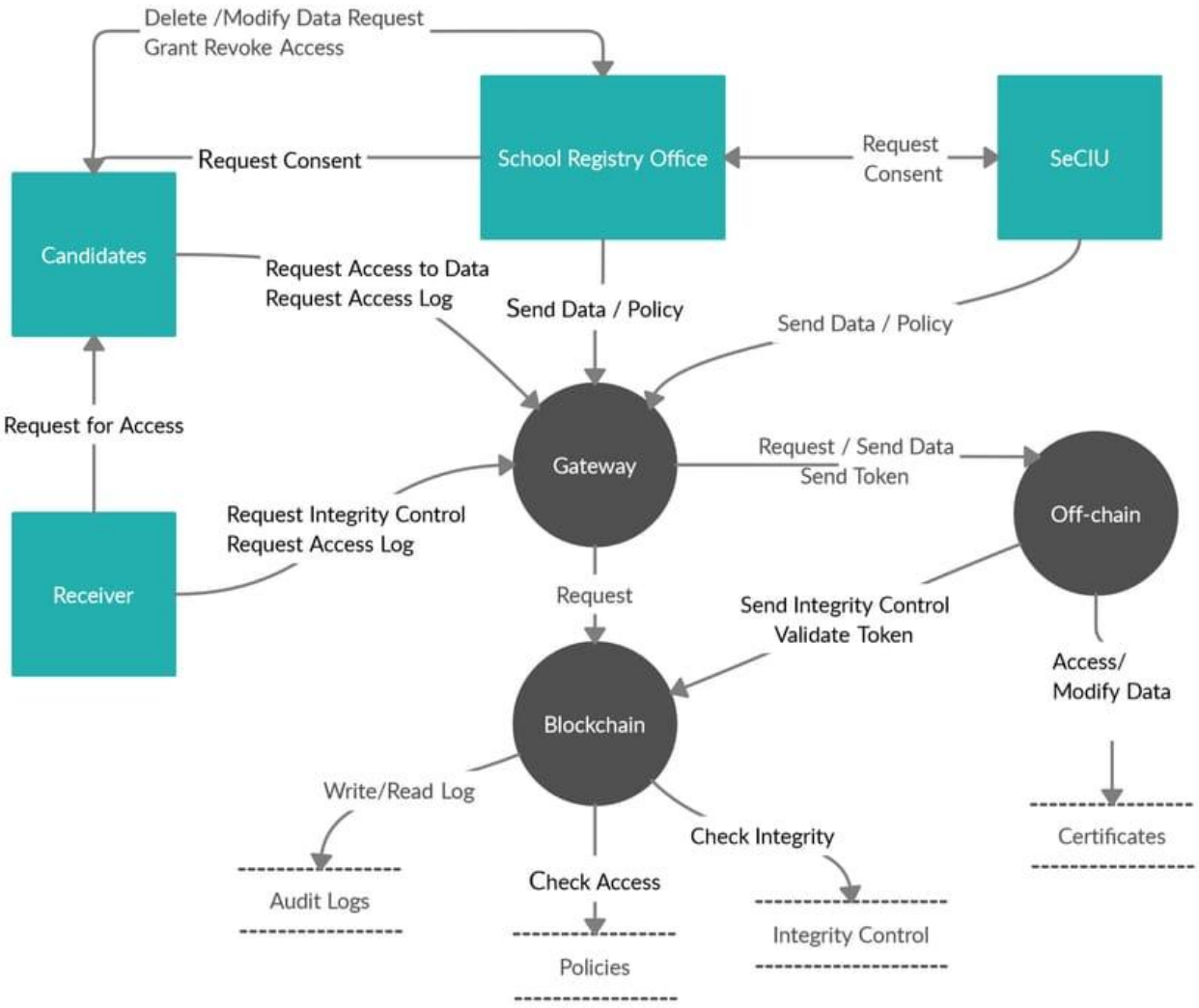


Figure 4: Data Flow Diagram

5. CODING AND SOLUTIONING

5.1 CODE

Home | transparentedu.sol

```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.0;

contract collegeCertificate {
    address public owner;

    struct Certificate {
        string studentName;
        string courseName;
        uint256 DateOfGraduation;
        uint256 issueDate;
        address issuer;
    }

    uint256 public totalCertificates;
    mapping(uint256 => Certificate) public certificates;

    event CertificateIssued(
        uint256 indexed certificateId,
        string studentName,
        string courseName,
        uint256 issueDate,
        address indexed issuer
    );

    constructor() {    766439 gas 741400 gas
        owner = msg.sender;
    }
```

Figure 5: Solidity Code 1

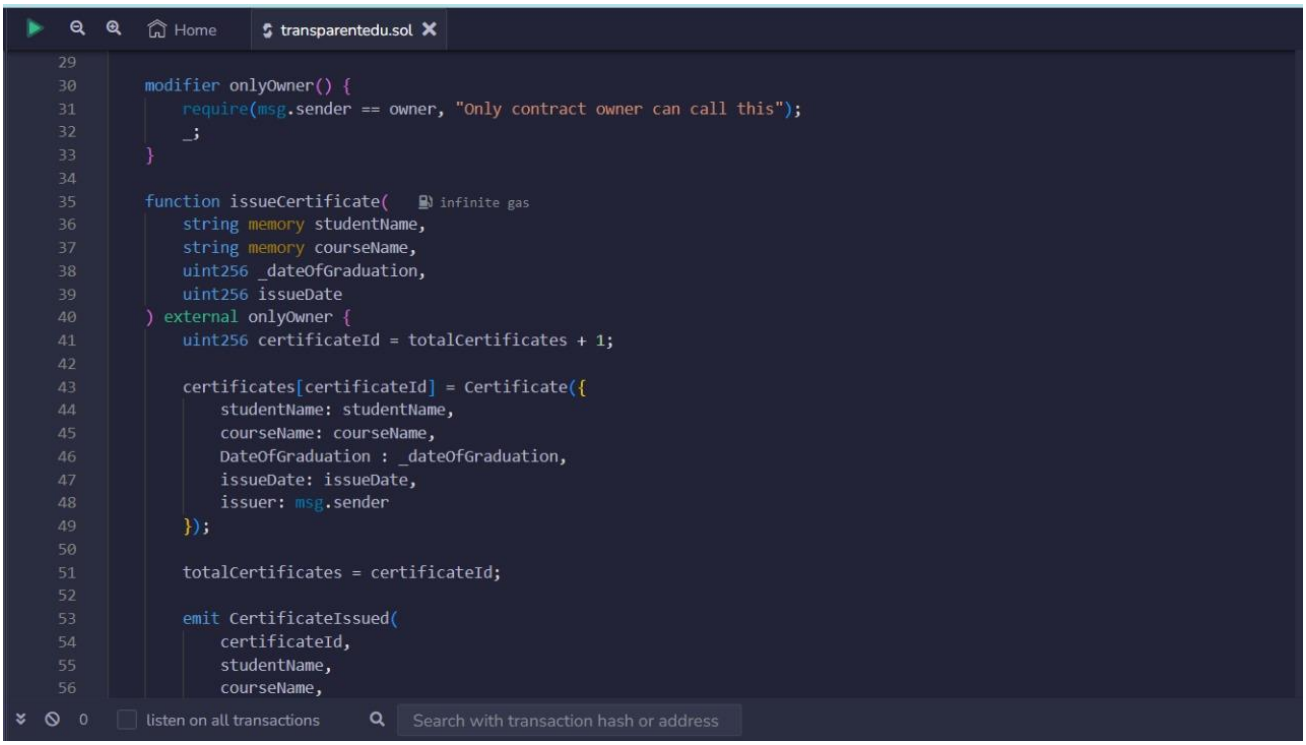


Figure 6: Solidity Code 2

Figure 7: Solidity Code 3

6. RESULT

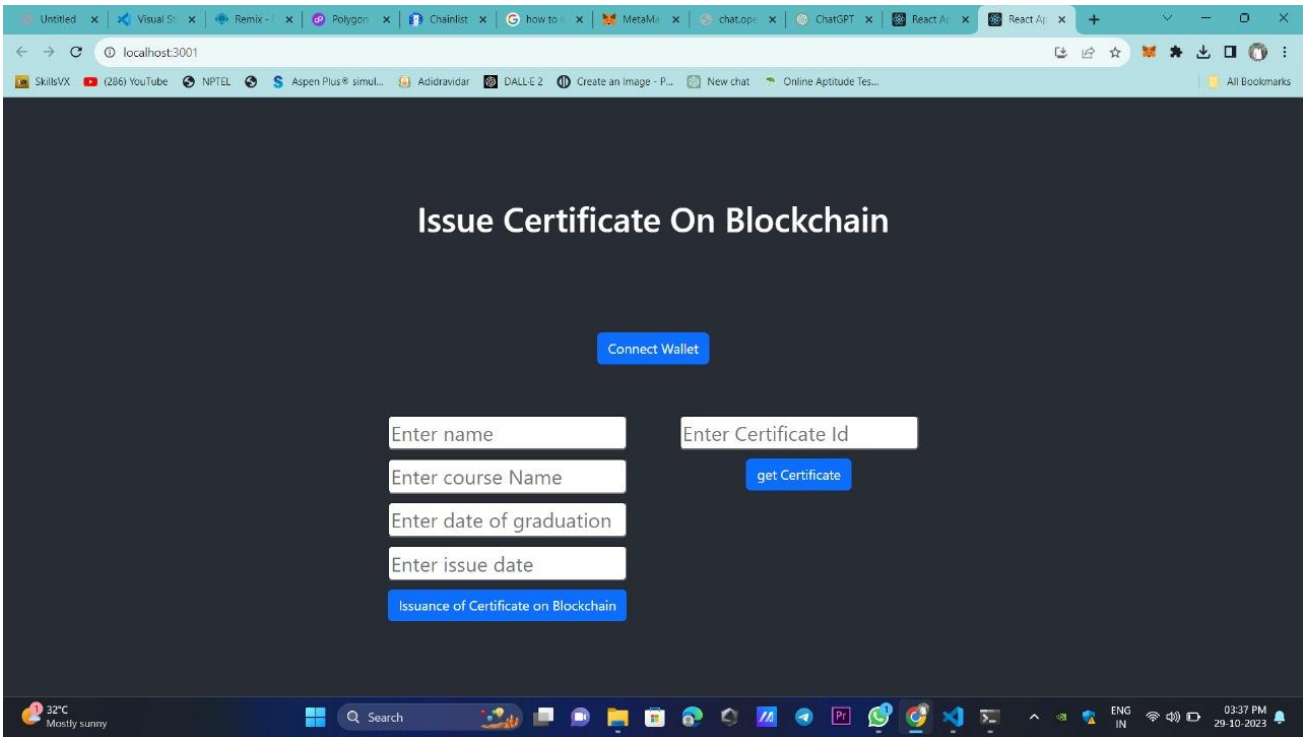


Figure 8: Project Frontend

7. ADVANTAGES AND DISADVANTAGES

7.1 ADVANTAGES

1. Data Security
2. Data Integrity
3. Verification and Authentication
4. Global Accessiblity

7.2 DISADVANTAGES

1. Privacy Concerns
2. Misinterpretation
3. Data Overload
4. Compliance and Legal Issues

8. CONCLUSION

In conclusion, transparent education data management using blockchain technology offers several advantages. It provides a secure and immutable ledger for academic records, making it difficult for unauthorized parties to tamper with or falsify data. This can enhance trust in educational institutions and streamline processes such as credential verification. Additionally, blockchain can empower students to have more control over their own academic records and share them with relevant parties when needed.