Blockchain in Student Registration System

Shriya Joshi, Rishika Sharma, Suman Sharma, Prof. Amarja Adgaonkar

[1]Shriya Joshi, Information Technology, KC College of Engineering and Management Studies and Research, Thane, India

[2]Rishika Sharma, Information Technology, KC College of Engineering and Management Studies and Research, Thane, India

[3]Suman Sharma, Information Technology, KC College of Engineering and Management Studies and Research, Thane, India

[4]Prof. Amarja Adgaonkar, Information Technology, KC College of Engineering and Management Studies and Research, Thane, India

---***---

Abstract - *Blockchain allows us the creation of an environment which is decentralized, where-in no third-party organization interferes. Every transaction which is completed is stored in a public ledger in a permanently verified way. Based on blockchain technology, we propose a global student data management and attendance management platform. It constitutes a globally trusted, decentralized student data management, attendance management platform and file sharing system which can offer security on a school level or higher institution level.*

Key Words: Student Registration System, Blockchain in Student Management System, Blockchain

1.INTRODUCTION

The existing system which manages student data can be pretty handful and have a probability of the data getting stolen or violated. The present faculty structure is not effective with a unified methodology for swinging away the knowledge. To forestall sterilisation of understudy info that is most important blockchain innovation are often actualised in SMS. The record innovation or blockchain innovation lays a good asphalt for the execution of SMS with the help of its highlights like straightforwardness, changelessness and sent methodology for swinging away the records. Each association has important info that ought to be secured. The Blockchain technology lets us create an allotted setting, where the transactions and other data are not under the authority of any other third-party organization. Any transaction that has been completed is stored and recorded into the public ledger with the help of a permanent and unique address for every transaction. The projected system can exploit the advantages of the blockchain, as a redistributed design, offering security, anonymity, longevity, integrity, transparency, unchangingness and international ecosystem simplification, so as to make a globally trustworthy student registration and management system. academic records are a unit used worldwide and from the user purpose of reading, is a crucial asset for people pledging for scholarships, jobs and skilled and tutorial visibility in general. Currently, our academic records management systems are principally physically localized, require specific

and non-trivial procedures to access info, are in several cases unreliable and, finally, don't follow or have any academic standards.

With the blockchain capabilities and citizen's international visibility perspective in mind this report presents a Blockchain-based Student Registration System. it's meant to permit any person to be ready to store academic records and access multiple sorts of academic records with credibleness on a worldwide basis. It is a system to confirm student group action and academic records distributed management and access with inherent additional security like credibleness and privacy. Students will make the most of getting their documents during a single and clear read, as well as the teacher can have the group action knowledge accessible and up so far.

1.1 PROPOSED SYSTEM

In the faculty admission house, one in all the toughest challenges is that the verifications of the certifications, credentials (credits), attending and alternative documents like personal essays, letters of recommendations, project reports, dissertations etc. Here are the ways that blockchain will disrupt the traditional faculty admissions method, Sharing and Validation of Certifications. The third parties would like further effort to verify paper certificates. Verification is sometimes achieved by asking the issuance certification authority, i.e. certification authorities to maintain a long-run archive. Sometimes, causing results physically will take an extended time, leading to the lack of the scholars to meet set deadlines for school admissions. While applying for postgraduate programs abroad, a student must get official transcripts from the house university (college of graduation). Additionally, typically than not, the scholars got to prepare multiple copies in sealed envelopes with the signed or sealed seals/flaps. Then there are further verifications of credentials that cause a great deal of issues for the scholar. Teacher's even have to keep up physical copies of students attending. Blockchain technology might support the digital transformation of certification processes by overcoming the paper bases system. The certificates or mark sheet provided by any institutions can be secured permanently and dependably using blockchain technology. It

also allows the users to verify their identity and validity of certificates that will be uploaded, and will not be needed to re verify it from the certificate provider. Thus, it'll surely needless for the colleges/universities to validate the user credentials
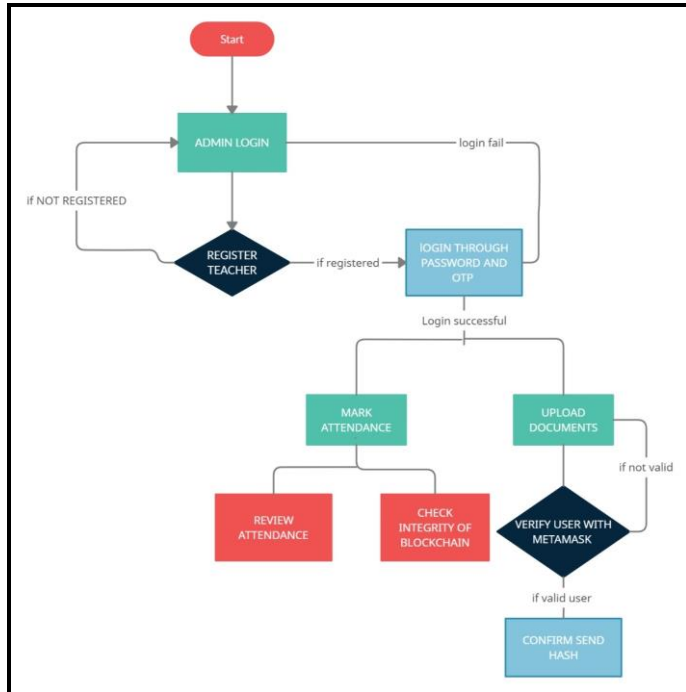

Fig 1: Flowchart

1.2 TECHNOLOGIES

Platform:
Meta mask- We have used Meta Mask as a transaction wallet used to interface with the Ethereum blockchain. It permits teachers to get to their Ethereum wallet, which would then be able to be utilized to communicate with the application.

Remix- Remix is a Solidity IDE therefore it is used in our project to run our code before saving it to our system and use it finally in our project.

Ropsten Test Network- The Ethereum network works with valid ETH so after we get the ETH we use Ropsten Test Network to connect our file uploading via metamask.

Programming Languages:
Solidity-Solidity we used in our project to build high-level language for implementing smart contracts and it is an object-oriented language.

JavaScript- JavaScript was included in our project to give the teacher login page to make it interactive and attractive.

React Js-React in our project is used to build the IPFS interface for uploading documents.

Python-Python is used to develop blockchain from scratch using flask, its framework and jinja2.
HTML 5 & CSS 3- Html CSS is used to create user interface for the admin and teacher login.

Database:
MySQL- MySQL is used to store the admin and teacher database.

Technologies:
Jinja 2- Jinja2 is a template engine written in Python that is used in our teacher attendance system.

Flask- Flask is the web framework that we have used in our attendance system.

Node Js - Node.js is used for connecting back-end JavaScript runtime environments in our attendance system.

IPFS- The Inter Planetary File System is a protocol and peer-to-peer network for storing and sharing data in a distributed file system. This is used for uploading documents.

2. PROJECT DESIGN

A. Figures 2
a) This system contains two users who are admin and teacher.
1. Admin module: The admin module has the main function in the whole system. Only the administrator has the power to add different participants to the System. Admin checks all the legalization work. In the above use case diagram, the main actor is the admin. The registering system for the admin can support the teachers
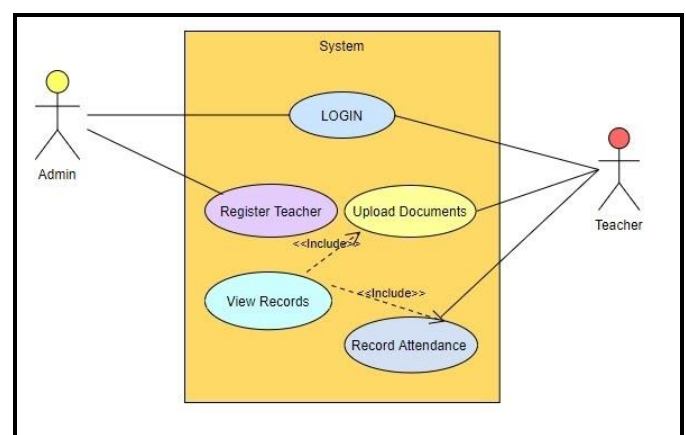

Fig 2: Use Case Diagram

   2. Teacher module: This module contains all the activities of the students. They will be able to upload their certificates and documents respectively.

   The teacher module consists of teachers and other staff that can manage the attendance of students and view it for future use.

For attendance management, we used python for attendance management part which is designed for the teachers to maintain the records of student's attendance.

In this we used Jinja 2 which is a template engine written in Python. Flask is the web framework that we have used in our attendance system. We were suggested by our teacher to make one single button to mark present and absent in case of situations where all students are either present in class or absent altogether. So, we took that into consideration and build the attendance system. The teachers are able to mark the attendance, view it and check the integrity of the records in this part.
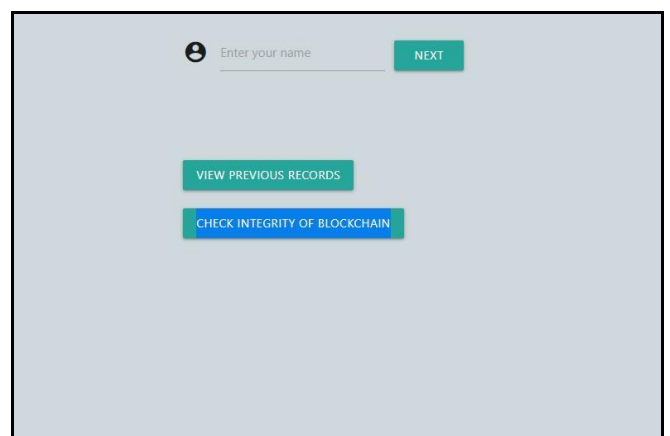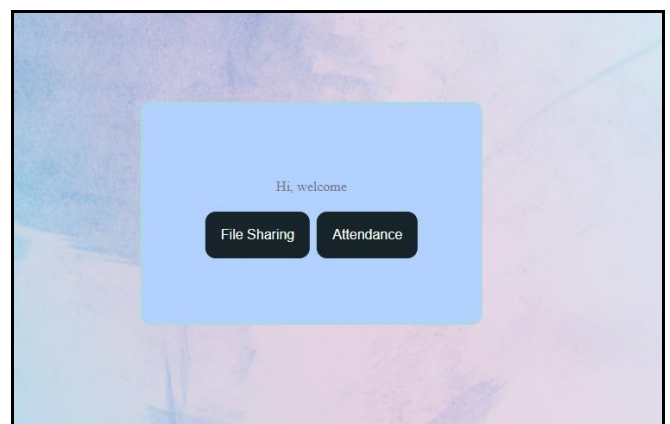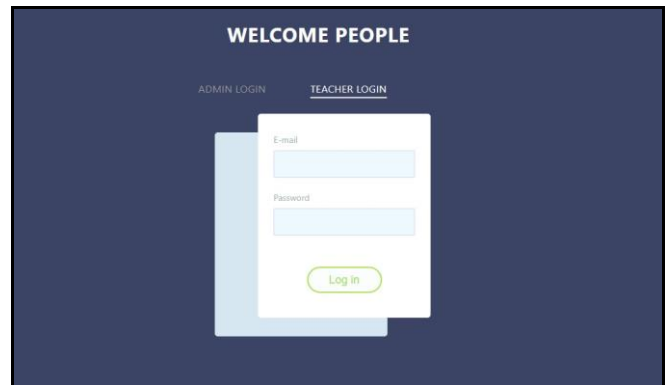
For file storage, IPFS works along with blockchain and helps in storage of data. When the documents are uploaded over IPFS, using the ropsten network, we store the transaction made while uploading.

The Ropsten network which is available on metamask is what we used for deploying smart contracts.

After every upload we get the IPFS hash of the file uploaded which can be used later to retrieve it,we also get the Ethereum hash and transaction id of the upload.

For all the above process, we had to study first about metamask and how it actually works and the setting up of accounts on metamask for carrying out the transaction. Then we studied about different networks available on metamask and how ether can be achieved. Then the metamask accounts were setup and using ropsten network smart contract was deployed and connection was made to our site.

b) All the modules are ensured with security through the help of blockchain and other cryptographic algorithms. Smart contact, Proof of work other such things are used to make it a more secure and least vulnerable system.
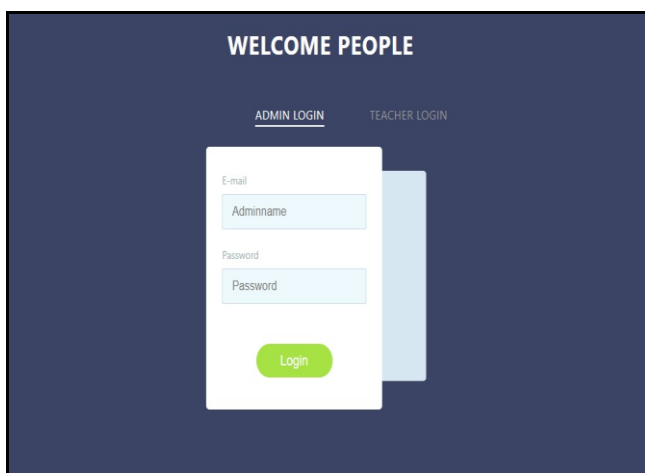
Choose file to send to IPFS

Choose File | Screenshot (1).png | **Send it**

Get Transaction Receipt

KX59cy635ccT3vVJYny1U

Tx Receipt Category	Values
IPFS Hash stored on Ethereum	: Qmf7xzL6hwm2Am9BaP8YbQ91AKX59cy635ccT3vVJYny1U
Ethereum Contract Address	: 0x6343d6f918178ca1f6F55eC11c8d2F45c581AF4A
Tx #	: 0x77e26d3c34de54899e0f32c43ec8be1b58021467456b589693d62a16c402cc3d

1) The admin registers the participants of the blockchain.

2) After registration, the teachers are able to access the attendance record system where teachers can maintain attendance records of the students.

3) The teachers can view and access the previously recorded attendance which is maintained in the blockchain.

4) Teachers will be able to upload Student' s documents and files using ipfs.

5) Using this, all the student files can be stored and the transaction is recorded on the blockchain.

3. CONCLUSIONS

The conclusion of this report is that blockchain technology can change the way of recordkeeping and record maintenance. Innovation of Blockchain is a trusted invention. Blockchain helps in maintaining the records and data in a decentralized and immutable way. It also maintains transparency and efficiency of the records. It could change our thoughts for trusting records; rather than using third party organizations. It will also reduce the paperwork.

This report proposes a way to develop a fully functional student management and registration system which includes attendance keeping and student documents storing system.

REFERENCES

[1] B. Duan, Y. Zhong and D. Liu, "Education Application of Blockchain Technology: Learning Outcome and Meta-Diploma," 2017 IEEE 23rd International Conference on Parallel and Distributed Systems (ICPADS), 2017, pp. 814-817, doi: 10.1109/ICPADS.2017.00114 .

[2] M. Turkanović, M. Hölbl, K. Košič, M. Heričko and A. Kamišalić, "EduCTX: A Blockchain-Based Higher Education Credit Platform," in IEEE Access, vol. 6, pp. 5112-5127, 2018, doi: 10.1109/ACCESS.2018.2789929.

[3] Alammary, A.; Alhazmi, S.; Almasri, M.; Gillani, S. "Blockchain-Based Applications in Education: A Systematic Review. Appl. Sci". 2019, 9, 2400.

[4] V. Juričić, M. Radošević and E. Fuzul, "Creating student's profile using blockchain technology," 2019 42nd International Convention on Information and Communication Technology, Electronics and Microelectronics (MIPRO), 2019, pp. 521-525, doi: 10.23919/MIPRO.2019.8756687.

[5] S. Gilda and M. Mehrotra, "Blockchain for Student Data Privacy and Consent," 2018 International Conference on Computer Communication and Informatics (ICCCI), 2018, pp. 1-5, doi: 10.1109/ICCCI.2018.8441445.

[6] Chen, Guang & Xu, Bing & Lu, Manli & Chen, Nian-Shing. (2018). Exploring blockchain technology and its potential applications for education. Smart Learning Environments. 5. 10.1186/s40561-017-0050-x.

[7] Mike Sharples, John Domingue (2016). The Blockchain and Kudos:" A Distributed System for Educational Record, Reputation and Reward" DOI:10.1007/978-3-319-45153-4_48

[8] Patrick Ocheja, Brendan Flanagan, Hiroaki Ogata (2018). "Connecting decentralized learning records: a blockchain based learning analytics platform." DOI:10.1145/3170358.3170365

[9] Conference: Learning Analytics and KnowledgeAt: Sydney, NSW, Australia

[10] John Rooksby, Kristiyan Dimitrov (2019). Trustless education? A blockchain system for university grades 1 November 2019Ubiquity The Journal of Pervasive Media 6(1):83-88 DOI:10.1386/ubiq_00010_1

[11] Introducing ethereum and solidity: https://tinyurl.com/tmn9stp5

[12] Data sharing using IPFS: https://tinyurl.com/2ax5wcjm