



DOCUMENT VERIFICATION USING BLOCKCHAIN TECHNOLOGY

Kiran kadu¹, Dr. S.A. Shaikh^{*1}, Prof. Vishal A. Aher^{*2}, Dr.S.M. Turkane^{*3},

¹ Student of Master of Engineering (E&TC) PREC, Loni, Ahilya Nagar, Maharashtra, India

^{*}Dr. (E&TC) Engineering PREC, Loni, Ahilya Nagar, Maharashtra, India

ABSTRACT

Blockchain acts as a shared, public, and transparent database, where the information is replicated and stored across a network of computers, rather than being controlled by a single entity. Blockchain has a strong capacity to monitor and retain educational records. Blockchain is a decentralized, distributed ledger that records transactions across multiple computers, ensuring transparency, immutability, and security without the need for intermediaries. Its consensus mechanisms, such as Proof of Work (PoW) and Proof of Stake (PoS), enable trust and verification in a trustless environment. Blockchain technology offers a secure and efficient solution for document verification by leveraging a decentralized, tamper-proof ledger, enhancing transparency and reducing the risk of fraud. Throughout the course of their studies, students—whether they are in high school, college, or even after receiving their degree—produce numerous certificates, including transcripts, diplomas, and outcomes. Students must present these certificates to universities and employers in order to be admitted. Blockchain technology provides a common shared platform from where to store, retrieve and access documents. Once the documents are stored in blockchain then it becomes impossible to change the information and hence it helps from counterfeiting of the documents.

Keywords: Blockchain, Hyperledger, Document Verification, Counterfeiting, Secure Hash Algorithm(SHA-256)

I. INTRODUCTION

Blockchain technology is a system that acts as a decentralised database which is a digital ledger that stores data and information throughout the entire network of a computer systems. Blockchain technology were introduced in 2006 with the existents of Bitcoin where it involves cryptocurrency. A cryptocurrency is a digitized currency that can be used to do a transaction and buy stuffs through online. Blockchain technology is an advanced database mechanism that allows transparent information sharing within a business network. A blockchain database stores data in blocks that are linked together in a chain. Each corporation has critical information that demands protection. The current centralized storage system is the one that requires preservation of the information residing on the single system. Alternately, unless the content changed in the system the revised file is obtained by anyone who has to be stopped from doing so. Blockchain technology lets enterprises save the contents in every network-connected device. With such an approach a file can never be easily changed to store information. Blockchain technology has been helpful in implementing a system that will keep the transactions and storing the data in a safe manner and it is easier to track down the attacker with the implementation of blockchain technology. A document verification system will be able to increase its security feature with the help of blockchain technology.

II. LITERATURE REVIEW

.Aida Kamiali, Kristjan Koi and Marjan Heriko."Eductx: A blockchain-based higher education credit platform". IEEE ACCESS (2018). [1] Blockchain verification ensures that credentials are authentic and tamper-proof. It offers a transformative solution to a variety of use cases to the common challenges of verifying credentials with traditional processes including being time-consuming, expensive, and vulnerable to fraud. Student Management System allows the students to validate the international or new university certificates. Blockchain technology provides a distributed, tamper-proof ledger for storing and verifying documents, eliminating the need for a central authority. Privacy: All types of data can be stored in the blockchain. The privacy rules are applicable if sensitive data is processing-e.g. health data or citizen service.

O Nathan and P Alex Sandy. "Decentralizing privacy using blockchain to protect personal data". SPW 2015 IEEE (2015). [2] Once the student is about to enter a university of higher education, the institution will join the network and will validate the

student's certificates. The 2-2 multi authentication protocol is used for verification process. The paper addresses the existing information disparity between the colleges and employer companies, an inadequate student credit scheme. Blockchain technology can help ensure accountability, validity and applicability of knowledge. Smooth collaboration between students, academic institutions and employer organizations is achieved, enhancing the use and accountability of educational and job organisations. The paper explains an implementation of blockchain technology which is a trust-free framework called Bitcoin. A Peer-to-Peer network framework is suggested for money exchange. There is no need to identify peers because, in their interest, they can still quit and join the network. Blocks that are a transaction record are formally accepted or confirmed by casting a vote with the peer's CPU. The consensus mechanism will implement any rules and incentives the are required.

A Permissioned Blockchain- Based system "https://ieeexplore.ieee.org/document/8763831"[3] Proposing a Blockchain-based Solution A document verification system must be made with a high efficiency to prevent the problems that has been mentioned before. In this paper, they have used private permissioned blockchain instead of public blockchain as private permissioned blockchain gives higher performance, cost effectiveness as well as privacy.

Proposing a Blockchain-based Solution to verify the integrity "https://ieeexplore.ieee.org/document/8601200".[10] There is no need to identify peers because, in their interest, they can still quit and join the network. Blocks that are a transaction record are formally accepted or confirmed by casting a vote with the peer's CPU. The consensus mechanism will implement any rules and incentives the are required The main advantage of this paper is that in this the system is open and can be extended to any record type according to the specifics requirements of individual institutes.

M. Nakasumi. "Information sharing for supply chain management based on block chain technology". IEEE CBS 2017 .[11] Smart contracts are self-executing contracts with the terms of the agreement directly written into code. These contracts automatically execute actions when predefined conditions are met. They play a crucial role in automating document verification by ensuring that certain actions, such as validation of identity or checking document integrity, happen automatically. Many blockchain networks face governance challenges, such as disputes over protocol upgrades or how decisions are made within the network. In decentralized systems, the lack of a central authority can lead to disagreements and conflicts between stakeholders, which can hinder progress or even split the blockchain community (e.g., Bitcoin vs. Bitcoin Cash).

III. PROBLEM STATEMENT

Centers on addressing the limitations of traditional methods, such as the risk of fraud, errors, and inefficiencies, by leveraging blockchain's inherent security, transparency, and immutability to create a more reliable and secure system for verifying documents. Presently the Student Management System is not secure against the document forgery. Fake documents as well as certificates are still being used at various levels. Hence we need a system which n rtraditional document verification processes are often manual, time-consuming, prone to forgery, and reliant on centralized authorities. ot only ensures the integrity of the documents but also maintains the authenticity.

Blockchain technology, while offering significant benefits such as decentralization, transparency, and security, faces a number of challenges that hinder its widespread adoption and efficiency in real-world applications. These challenges need to be understood and addressed before blockchain can reach its full potential in various sectors including finance, healthcare, supply chain management, legal systems, and more.

-Current Challenges in Document Verification-

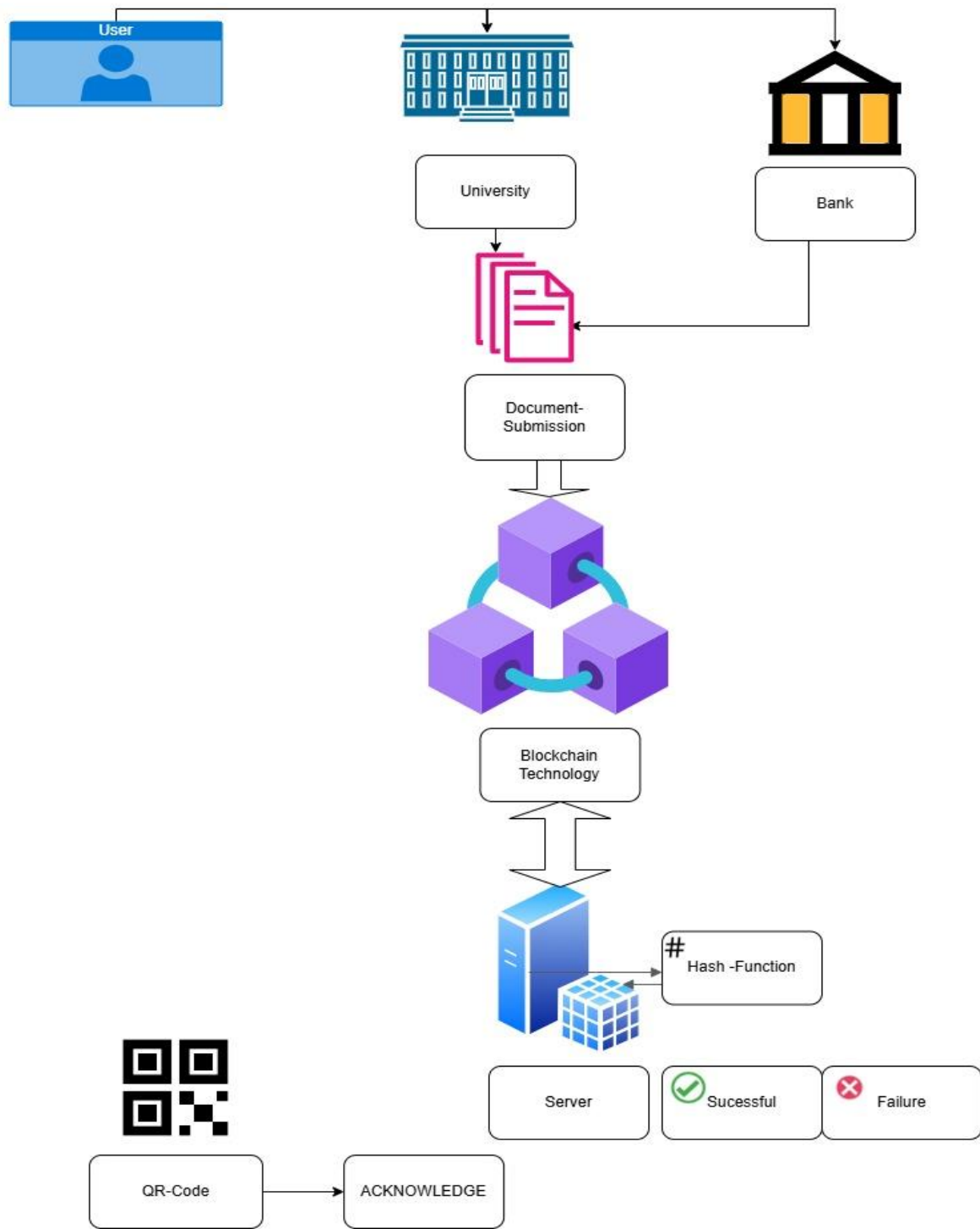
Fraud & Forgery – Fake or tampered certificates are difficult to detect.

Centralized Control – Universities and banks store data in centralized systems, making them vulnerable to hacking.

Time-Consuming Process – Manual verification requires significant time and effort.

Lack of Transparency – Users cannot independently verify document authenticity.

Risk of Data Loss – Paper-based and centralized digital records can be lost or corrupted.



(Figure 1- System Architecture Block chain Technology.)

1. User Interaction-The process begins with the **user** (student or applicant) who needs to submit documents for verification. These documents could include academic certificates, identity proofs, or financial records.

2. Document Submission to University & Bank-The university receives documents from the user for verification (e.g., degree certificates).The **bank** may also be involved (e.g., for financial documents related to education loans).The university collects and processes the documents before submission.

3. Document Submission to Blockchain-After verification by the university, the documents are submitted to the blockchain system.The blockchain ensures secure and tamper-proof storage of document records.

4. Blockchain Technology Implementation-The blockchain records a unique hash of the submitted document instead of storing the document itself.This ensures that the document remains immutable and verifiable while protecting privacy.

5. Hash Function Generation A hash function -converts the document into a unique digital fingerprint.Any modification to the document will generate a completely different hash, ensuring security.

6. Server Processing & VerificationA server -handles requests for document verification by checking the hash stored on the blockchain.If the document’s hash matches the stored record, it is verified successfully; otherwise, verification fails.

7. QR Code Generation for AuthenticationA QR Code- is generated for each verified document.Users, universities, and banks can scan this QR code to validate the document’s authenticity.

8. Acknowledgment & Final Verification-The system provides an acknowledgment of the verification status.If successful, the document is accepted; if not, the user may need to resubmit or correct it.

Benefits of Blockchain in Document Verification:

- Security**-Tamper- Proof record storage.
- Efficiency**- Any one can Verify the Document without intermediaries.
- Immutability**-Eliminates manual verification delays. Once recorded, data can not be altered.

v. IMPLEMENTATIO AND RESULTS

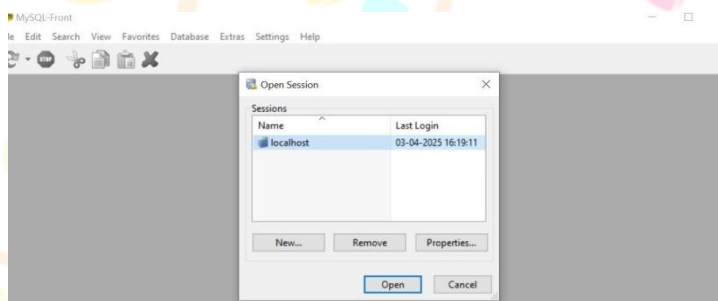


Figure-2 (SQL- Data Base Registration)

Documents Management System is design the Secure Documents Handling. Documents is Saved on the help of Blockchain Netork.

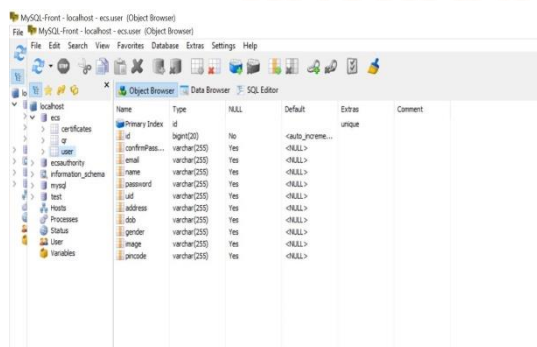


Figure-3 (QR- Code Scanner)

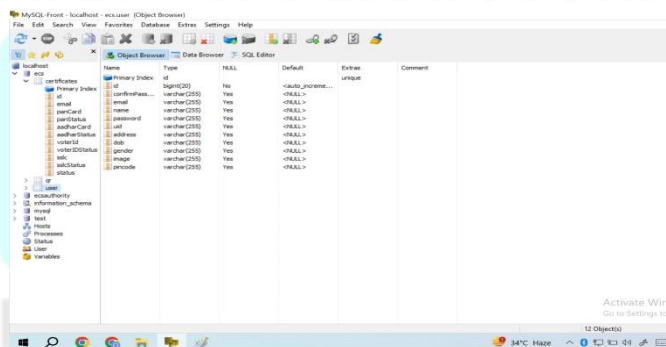


Figure-4 ()

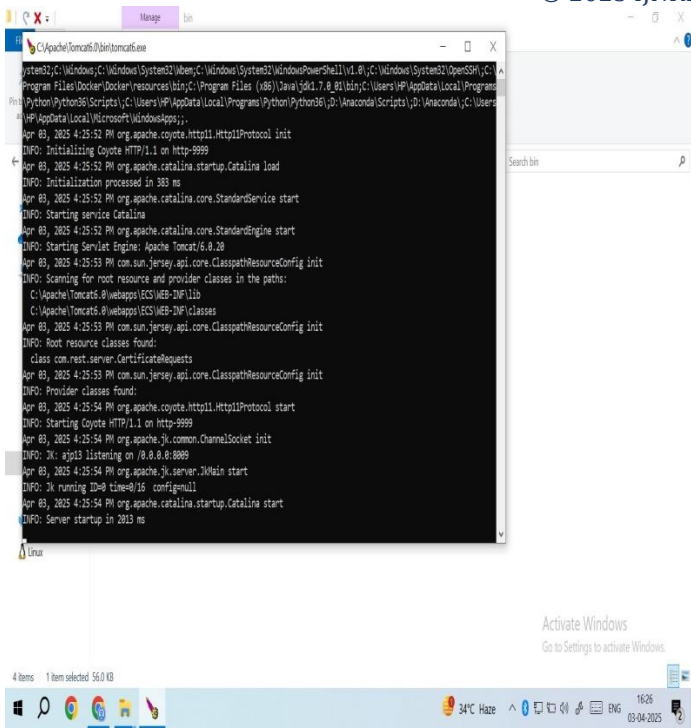


Figure-5 APACHE-(Server)

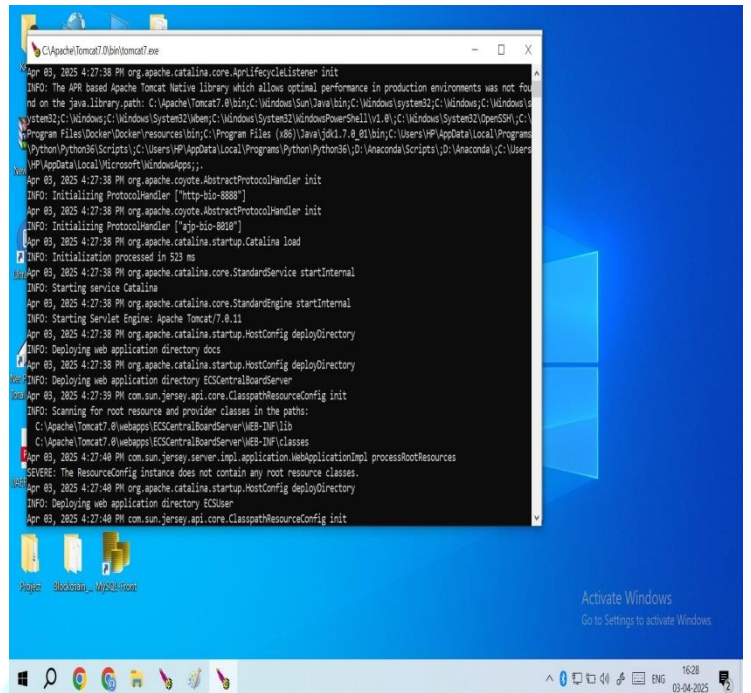


Figure-6 APACHE



Figure-7 QR Code -(Admin Login)

Admin login:- 1) User Approval 2) QR-Code Generation. User login- 1) User Registration is email-ID, 2) User login 3) Document Generation. 4) Document Upload. QR-Code Generation (Document encryption with Hash key) Authority will Scan the Generated QR-Code by using Bar-code Scanner then it will Describe The encrypted Document message. Recognition Finally Document Verified.

VI. CONCLUSION

In this idea The use of blockchain for document verification has benefits for security, effectiveness, and transparency. With blockchain technology, papers may be verified quickly and easily without the need for middlemen. Blockchain technology has the potential to revolutionize the way we verify and authenticate documents across various sectors. By leveraging its core features of decentralization, immutability, and transparency, blockchain offers a robust solution to the growing concerns over document fraud, inefficiency in verification processes, and reliance on intermediaries.

VII. REFERENCES

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