



Archives available at journals.mriindia.com

International Journal of Recent Advances in Engineering and Technology

ISSN: 2347 - 2812
Volume 14 Issue 01s, 2025

Cloud Based Online Certificate Verification System Using Block Chain

¹Pooja Kale, ²Dr. Khatri A.A. , ³Prof. Bhosale S.B, ⁴Prof. Dere K.D

^{1 2 3 4} Computer Engineering, Jaihind College of Engineering, Kuran Pune,

Email: poojakale192@gmail.com¹, khatrianand@gmail.com², ssachinbhosale@gmail.com³,

kapilddere@gmail.com⁴

Peer Review Information	Abstract
<p><i>Submission: 1 Sept 2025</i></p> <p><i>Revision: 28 Sept 2025</i></p> <p><i>Acceptance: 12 Oct 2025</i></p> <p>Keywords</p> <p><i>Blockchain, digital certificate, hashing, Proof of Stake, Proof of work</i></p>	<p>The proposal for a blockchain-based digital certificate system in India’s education sector aims to combat the prevalent issue of certificate forgery, providing a robust and secure solution. The immutability and transparency of blockchain technology provide a strong basis for improving the security and dependability of certifications in education. The creation and archiving of an electronic file containing pertinent data in a specialized database serves as the foundation for the system’s operational flow. The system simultaneously computes a unique hash value for the electronic file, acting as an exclusive identifier. We securely store this hash value within a blockchain block, utilizing the technology’s inherent resistance to tampering. To facilitate verification, the system attaches an inquiry string code and QR code to the actual certificate.</p>

INTRODUCTION

Block chain is an unalterable mechanism for recording and safeguarding information, making it exceptionally resistant to tampering, hacking, or fraudulent activities. network of computer systems replicates and disseminates a block chain, which is a decentralized digital record without a central authority. Blockchain technology may significantly diminish the role of central authority and enable the adoption of decentralized solutions. Other sectors, including supply chain management, voting systems, and self-sovereign identity (SSI) systems for personal information management, have utilized blockchain technology. The notion of digital identity utilizes a decentralized, open source database, such as blockchain, to enhance transparency and strengthen security. It is important to safe guard the user’s personal data privacy. The database should save just cryptographic proof of identity instead of the actual contents. Ownership of personal data should only be with the user. Education and

Employment is significant in deciding one’s work. Lack of employment leads a person to a life of severe difficulty. This could occur due to the absence of the appropriate qualifications. To avoid this issue, people alter with existing records or prepare fake official documentation and other institutional certificates or resumes. Document fraud and creating fake documents has become a very frequently faced issue in the last few years. The most commonly changed documents are academic certificates [1]. His is a typical obstacle experienced by staff in agents when hiring.. The government and other organizations lack effective verification procedures, and as a result, it is difficult to get valid details, which reduces the trust between the two. This problem can be handled by issuing documents on a safe platform. Obtaining this kind of answer can be made possible with the help of blockchain technology. There are few projects, which have been implemented to rebut this problem, using block chain technology. Few of such projects are Blockcerts, BTcerts,

TrueRec, etc.

On the other hand, other organizations would obtain the issued certificates in their respective registries using decentralized ledger(DLT) technology. This as sure that the information provided is trust worthy and maintains integrity. With this solution, equal opportunities are provided to everyone. It empowers companies, educational institutions, and government entities to invest in skilled and deserving candidates. Since only reliable participants are issuing certificates on a secure platform, authenticity is ensured.

METHODOLOGY

System Architecture-

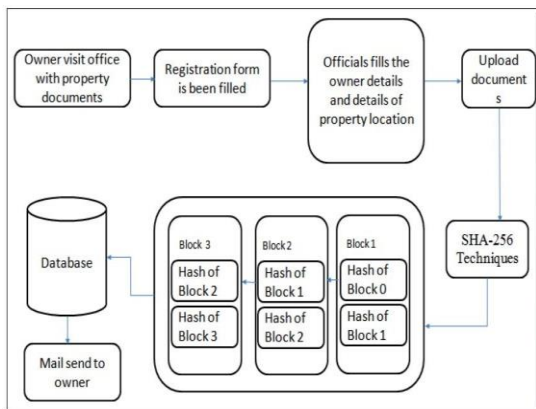


Fig.1 Block Diagram

System proposed a new dynamic documents verification generation approach using own custom blockchain. First student apply for documents on web portal with upload all personal documents. Web portal is authenticating trusted third party which validate all documents from government staff etc. Once successfully verification has done from government staff it will store data into blockchain and same time it generates the unique id or QR code and returns to User. User can submit the received QR code or id to organization instead of physical hard copy of documents. Organization can submit QR code or id to portal and pool the documents verification of respective user and make the validation. The entire process has performed into the blockchain manner with smart contract which is written by us.

1. *Student:* The initial student submits an application for an electronic certificate on the online platform and uploads all academic documentation. Instead of providing tangible hard copies of documents, students have the option to send the QR code or certificate ID they received to the organization.

2. *University, School and Colleges:* The web platform verifies the credentials of reliable third parties who authenticate all documents from universities, schools, colleges, and other educational institutions. After the university, school, or college has confirmed the authenticity of the documents, it securely saves the information in the blockchain, creates a distinct certificate identification or QR code, and gives I tback to the student.

3. *Organization:* The organization has the option to send either a QR code or an ID to the portal. By doing so, they can retrieve the e-certificate of the corresponding student and perform the validation process. We have fully integrated the entire procedure onto the blockchain using a smart contract. To implement the system in a susceptible setting and to investigate and verify the effectiveness of the proposed system in mitigating various network assaults such as Denial of Service (DoS) and Man-in-the-Middle (MiM).

Distributed Block chain: The distributed ledger known as the blockchain serves as a representation of the current state of delegated access rights within the system. The root authority and attribute authorities manage permissions for interacting with the blockchain. In essence, blockchain is a technique that enables decentralized data storage for various transactional systems.

Hash Generation-

Input:Genesisblock,previoushash,datad,
 Output:GeneratedhashHaccordingtogivendata
 Step1:Input dataasad
 Step 2:ApplySHA256 fromSHAFamily
 Step3:CurrentHash=SHA256(d)
 Step4:ReturnCurrent-Hash

ProtocolforPeerVerification-

Input:UsergetsIPaddress,UserTransactionTID,
 Output:Enable IPaddressorcurrentqueryifany connection is valid
 Step 1: User generate the any transactionDDL,DMLorDCLquery
 Step 2:Get current IP address For each(readIP into IP address)
 If(connection(IP)equals(true)) Flag true
 Else
 Flagfalse End for
 Step3:if(Flag== true)
 PeertoPeerVerificationvalid Else
 PeertoPeerVerificationInvalid End if
 Endfor

CONCLUSION

There are many research topic in applying Blockchain technology to the online certificate transaction due to the challenges in this area and the need for more robust and effective information technology systems. An unified system architecture would certainly play a significant role throughout many online certificate transaction use cases that face similar data sharing and communication challenges. From the more technical aspect, much research is needed to locate the most practical design process in creating an interoperable ecological system using the Block chain technology while balancing critical security and confidentiality concerns in E-certificate transaction. Whether to create a decentralized application leveraging an existing Blockchain, additional research on secure and efficient software practice for applying the Blockchain technology in E-certificate transaction is also needed to educate software engineers and domain experts on the potential and also limitations of this new technology. Likewise, validation and testing approaches to gauge the efficacy of Blockchain-based health care architectures compared to existing systems are also important (e.g., via performance criteria related to time and processing cost or analysis metrics related to its feasibility).

REFERENCES

- Meghali Nandi, RajatKantiBhattacharjee, AmritJha, Ferdous A. Barbhuiya "A secured land registration framework on Blockcha in", Third ISEA Conference on Security and Privacy 2020
- Ashwin Sekhar, Rishav Chatterjee, Ras Dwivedi, Rohit Negi, Sandeep Shukla. Entangled Block chains in Land Registry Management.
- Harry Halpin, Marta Piekarska "Introduction to Security and Privacy on the Blockchain", 2017 IEEE European Symposium on Security and Privacy Workshops (EuroS&PW)
- Yining Hu, MadhusankaLiyanage, Ahsan Manzoor, KanchanaThilakarathna, ArunaSeneviratne " Blockchain-based Smart Contracts Applications and Challenges," 8 Jun 2019
- XiaolongLiu, Riqing Chen, Yu-WenChen, Shyan-Ming Yuan "Off-chain Data Fetching Architecture for Ethereum Smart Contract", Digital Object Identifier , 2018
- AmeyaThosar and MayurHame "Land Registry Management using Block chain", IJERT 2018

Mahbub_Alam_Majumdar&Mobasir Monim "Blockchain based Land Registry with Delegated Proof of Stake (DPoS) Consensus in Bangladesh" IJERT 2021

A.Ponmalar, M.Poovarasam, T.Vasumathi, G.M.Keert hana, A.Yogesh", Efficient Registration Of Land Using Block Chain Technology", IJERT 2018

Susmeta Adak, Radha Kamka, "landREgisrty using block chain, IJSRD 2019