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Digital Certificate System for Verification of Educational Certificates Using Blockchain

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Abstract:In the India Ministry of Education statistics, about one million graduates each year,some of them will go to countries, high schools, or tertiary institutions to continue to attendand some will be ready to enter the workplace employment. During the course of study, thestudents' all kinds of excellent performance certificates, score transcripts, diplomas, etc., willbecome an important reference for admitting new schools or new works. As schools make variousawards or diplomas, only the names of the schools and the students are input. Due to thelack of effective anti-forge mechanism, events that cause the graduation certificate to be forgedoften get noticed. In order to solve the problem of counterfeiting certificates, the digital certificatesystem based on blockchain technology would be proposed. By the modifiable propertyof blockchain, the digital certificate with anti-counterfeit and verifiability could be made. Theprocedure of issuing the digital certificate in this system is as follows. First, generate the electronicfile of a paper certificate accompanying other related data into the database, meanwhile;calculate the electronic file for its hash value. Finally, store the hash value into the block in thechain system. The system will create a related QR-code and inquiry string code to affix to thepaper certificate. It will provide the demand unit to verify the authenticity of the paper certificatethrough mobile phone scanning or website inquiries. Through the modifiable properties ofthe blockchain, the system not only enhances the credibility of various paper-based certificates,but also electronically reduces the loss risks of various types of certificates.

Index Terms - Blockchain (Custom Blockchain), Document Verification, Distributed System, Preprocessing, Consensus algorithm, SHA family algorithm, Digital Certificate, Authentication, Verification, etc.

I. INTRODUCTION

The blockchain era grow to be these day's possibilities to deliver new business models on quite consolidated markets. Using blockchain inside the schooling zone is one of the maximum challenging regions in which outcomes within the mid and long term can be carried out. The verification of educational documents can hard for manual way and hence these fraud peoples or candidates can take a chance to enter in this way at company. That's why we design and develop a custom blockchain based system to make a digital certificates and store in different blocks with cipher-text (encrypted) format using AES encryption technique. By using this way our system can store

maximum amount of data in different block and any one can change data blocks that time our system can restore those data by using proxy server and hold original data in data blocks and to avoid fake data.

In this proposed system first take students data like educational details and educational certificates and generate Quick Response code and serial number of that data and it will authenticate by server system. When student or candidate can enter the company that time company verify these data by scanning the quick response code and secret key. If any data block generate wrong value that time it will show fake candidate or fake data. And it will recovered those data block and show original data by company and in this way to avoid fake certificates and fake candidates.

II. RELATED WORK

Nowadays the students achieve various educational certificates. Student produces these certificates while applying for jobs at public or private sectors, where all these certificates are needed to be verified manually. There can be incidents where students may produce the fake certificate and it is difficult to identify them. This problem of fake academic certificates has been a longstanding issue in the academic community. Because it is possible to create such certificates at low cost and the process to verify them is very complex, as they are manually needed to be verified. This problem can be solved by storing the digital certificates on the Blockchain.

To create the blockchain based un-modifiable certificates, initially the university needs to get registered. Any transaction can be sent through the wallet address of the registered university. Only the owner of the smart contract has the authority to add the universities. Once added the university, will be able to access the system and can create certificates with data fields. Each created certificate will be stored in the Inter planetary file system (IPFS). It will then return the unique hash generated using SHA-256 algorithm. This will serve as unique identity for each document. This generated hash and detail of certificates will be stored in the blockchain and the student will be provided with the resultant transaction id. Anyone can use this transaction id to verify the certificate details and can view the original copy of certificate using IPFS hash stored along with data. And it is not possible to modify this certificate or to create fake certificate using the same data. Hence with this we can solve the problem of certificate forgery.

III. PROPOSED SYSTEM

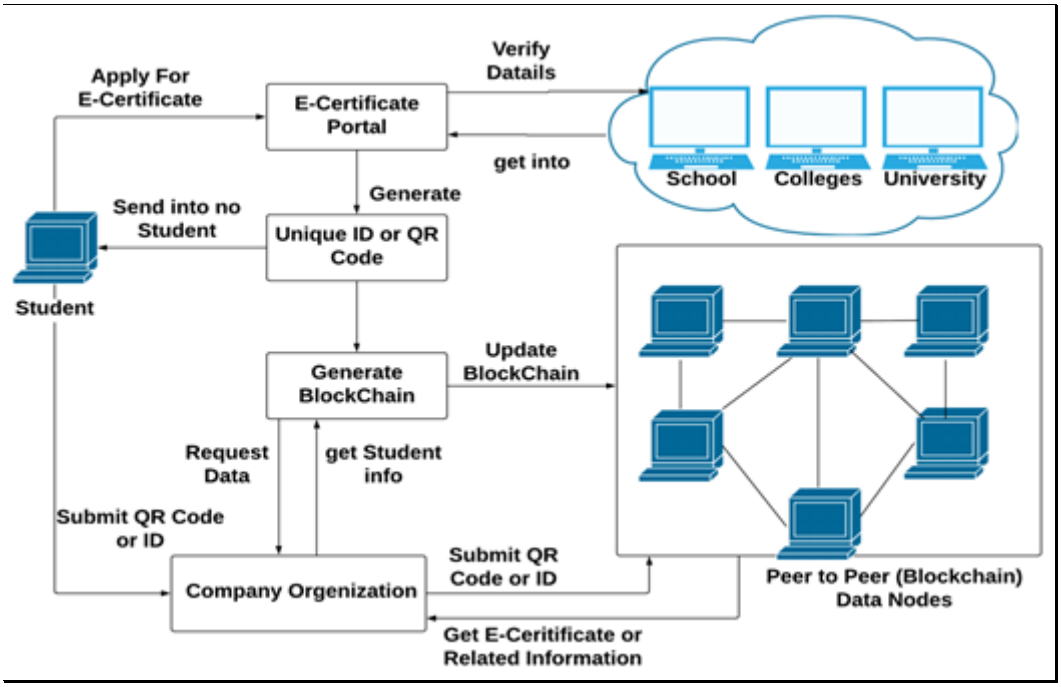

Fig.1: Proposed System Architecture

Blockchain technology or system is invented through bit coins and it is converted in technology because is a secure system. Blockchain is secure ledger because it holds the maximum amount of data in blocks or in chunks. And these data blocks or chunks are connected each other by using peer-to-peer network. Blockchain system can holds maximum amount of data in different blocks and data are in cipher-text (encrypted) format by using encryption techniques like AES and generate hash function using SHA that's why data are more secured in this system.

IV. PROPOSED METHODOLOGY

TheSystem proposed a new dynamic certificate generation approach using owncustom blockchain.

- First student apply for e-certificate on web portal with upload all educational documents.
- Web portal is authenticating trusted third party which validate all documents from university, school, colleges etc.
- Once successfully verification has done from university, school, colleges it will store data into blockchain and same time it generates the unique certificate id or QR code and returns to student.
- Student can submit the received QR code or certificate id to organization instead of physical hard copy of documents.
- Organization can submit QR code or id to portal and pool the e-certificate of respective student and make the validation.
- The entire process has performed into the blockchain manner with smart contract which is written by us.
- To execute the system in vulnerable environment and to explore and validate how proposed system eliminate different network attacks like DOS and MiMetc.

IV. RESULTS AND DISCUSSION

Results and Analysis

The system can provide the below outcomes once successfully executed training as well astesting phase

- To implement a decentralized application and designed a certificate system basedon Custom blockchain.
- To address the feature of this technology which is it is incorruptible, encrypted, andtraceable and permits data synchronization.
- To improves the efficiency operations at each stage. Proposed system address the system saves on paper, cuts management costs, prevents document forgery, andprovides accurate and reliable information on digital certificates.

V. CONCLUSION

In this paper we proposed digital certification system for validating educational documents and its de-duplications as well as fraud related to educational certificates. Now a days number of university and colleges are passing or to complete degree program maximum number of students with highest and lowest scores; but the problem is that lowest score students doesn't get job that's why they cheating the degree certificates as well as scores. In this way they get job and company can't identify these fraud candidates; hence we design and develop such blockchain based system which is to identify fraud candidates and if candidate alter his/her educational data that time blockchain based system (custom blockchain and consensus algorithm) can recovered those block and provide valid data to company.

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REFERENCES

[1] *Jiin-Chiou Chen, Narn-Yih Lee, Chien Chi, and Yi-Hua Chen "Blockchain and Smart Contract for Digital Certificate" Proceedings of IEEE International Conference on Applied System Innovation 2018 IEEE ICASI 2018.*

[2] *Austin Draper, Aryan Familrouhani, Devin Cao, TevisopheaHeng, Wenlin Han "Security Applications and Challenges in Blockchain" Published in IEEE International Conference on Consumer Electronics (ICCE) 2019*

[3] *Marco Baldi, Franco Chiaraluce, EmanueleFrontoni, Giuseppe Gottardi, Daniele Sciarroni and Luca Spalazzi Certificate "Validation through Public Ledgers and Blockchains" In Proceedings of the First Italian Conference on Cyber security (ITASEC17) 2017.*

[4] *Santosh Pandey, Gopalojha, Rohit Kumar andBikeshShresha, "BlockSIM: A practical simulation tool for optimal network design, stability and planning" 2019 IEEE International Conference on Blockchain and Cryptocurrency (ICBC)*

[5] *Christopher Ehmke, Florian Wessling andChristoph M. Friedrich "Proof-of-Property - A Lightweight and Scalable Blockchain Protocol" 2018 IEEE/ACM 1st International Workshop on Emerging Trends in Software Engineering for Blockchain (WETSEB)*

[6] *S. Sunitha kumara, D. Saveetha,"Blockchain and Smart Contract for Digital Document Verification". International Journal of Engineering & Technology 2018*

[7] *ArvindRamachandran, Dr. Murat Kantarcioglu"Using Blockchain and smart contracts for secure data provenance management".*

[8] *Ahmed Ben Ayed "Secure storage service of electronic ballot system based on block chain algorithm"International Journal of Network Security & Its Applications (IJNSA) 2017*

[9] *Kaidong Wu "An Empirical Study of Blockchain-based Decentralized Applications" International Research Journal of Engineering and Technology (IRJET) Nov 2018*

[10]*Jialiang Chang, Bo Gao, Hao Xiao, Jun Sun and Zijiang Yang "sCompile: Critical Path Identification and Analysis for Smart Contracts".*