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MODELING AND SIMULATION FOR DIGITAL DOCUMENT VERIFICATION SCHEME USING BLOCKCHAIN IN P2P NETWORK

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Abstract: Blockchain is very emerging trend in recent years; it is basically decentralized approach which provides transparency to transactional data. Various researchers already introduces blockchain and its state of art, it is too much effective in a large data processing as well as global transactional systems. In this paper we introduce blockchain base E-certificate generation using cloud environment. Basically in real time environment it is hard to carry educational or other important documentaries. Some confidential information should be leak from various centralized systems when any resource has compromised with attackers. In this system we provide drastic supervision base blockchain technique to generate e certificate according to submitted documentary by respective student as well as user. The system illustrates into four different sections. First we defines user can upload his documentary or educational certificates, similarly the middleware authority known as Third Party Auditor (TPA) will verify such documents from authenticated organization. If the entire documents have authorized then it dynamically generate e-certificate with QR code and unique serial identification number. Once this process has done whole information has stored into various data nodes and it returns QR code as well as UID to student. Moreover when any organization wants to verification documentary of respect to student he can submit the QR code or are given Unique Identification number to respective organization. When such organizations will verify the student's data the blockchain will provide consistent information after the secure authentication. In entire execution we have written open Smart contract, had generation approach using SHA family algorithm, mining algorithm to generator valid hash, in consensus algorithm to evaluate the proof of work.

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I INTRODUCTION

The document certificate and privacy is a very essential to provide security to private information, various platform has already exist to store such a kind of large data in a secure manner. Some centralized cloud storage provides data Encryption strategies for achieve highest security for a documentation. In real time large document verification is very tedious process which required much resources as well as time also. Where are manual systems has been followed by different organization since couple of years, for employee verification, student document verification as well as any other government document verification by particular agencies. Sometime industrial organizations and colleges should be verify the students and employees documentation. This research basically eliminate such time consuming process introduce the cost of traditional existing systems.

System proposed a new dynamic certificate generation approach using own custom 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 MiM etc.

Digital Certificate

Digital Certificate is a one kind of document which illustrate the data into to soft format. In today's era various sections in computer science is E-certificate has used fore end uses of indication as well as private data transmission. In this work who proposed E- certificate generation for educational documents using blockchain Technology. Basically this certificate has generated by system based on automatic methodology using various secure algorithms..

Blockchain

Basically blockchain is the technique which provides decentralized approach data storage for different transactional systems. Basically it is introduced to achieve the highest data security during the data transactions and eliminate various network as well as data attack from malicious requests. Cryptocurrency is the base framework for blockchain technology, Bitcoin is the master currency introduced in cryptocurrency market. There are various cryptocurrencies which is already introduced different cryptocurrency platforms like ethereum, ripple, cordono etc. Which platform provides different kind of security aspects during the performance of transactional data. The smart contract is another concept which is introduced by prospective blockchain transaction. Hash generation and mining strategy is too much important to create a runtime block. Different consensus algorithm also provides the proof of validation for different page in peer to peer network. Basically this system proposed decentralized approach which provides automatic data recovery in a distributed environment. The system also carried out Automatic load rebalancing and data validation protocol in entire execution.

II LITERATURE SURVEY

Hao Wang et Mate Al [1] They offer a secure electronic health record (EHR) system based on special-based Cryptococcus and blockchain technology. This system carried out the ABE as well as IBE to encrypt medical data and to use IBS to apply digital signatures. . In order to obtain various functions of ABI, IBE and IBS in crypto, we present a new cryptographic original; it is called a joint identity-based encryption as well as signature. It simplifies system maintenance and don't require the installation of separate cryptographic system for various security requirements. In addition, we use blockchain techniques to ensure the integrity and inspection of medical data. Finally, we offer a demonstration application for medical insurance business.

According to Yan Michalevskyet. Al [2] system introduces the first practical decentralized ABE scheme with proof of policy-hiding. Our creation is based on the basic encryption of decentralized internal product, which is an encryption strategy launched in this paper. This ABB scheme supports results, disputes, and threshold policies, which protect the access policies of those parties that are not authorized to decrypt content. In addition, we handle the receiver's privacy issue.

Using our plan with Vector Commitment, we hide a complete set of attributes presented by the individual with the recipient; just disclose the feature that regulates the authority. Finally, we propose random-polynomial encoding that immerses this scheme in the presence of corrupt officials. Al [3] they successfully address these issues by offering a cleared policy feature-based data sharing plan with direct cancellation and keyword search. In the proposed scheme, the non-terminated users' private key is not required to be updated during the cancellation of direct revocation of features. In addition, a keyword search has been realized in our plan, and the search is stable with the increase in time features. Specifically, the policy is hidden in our plan, and therefore, the privacy of users is preserved. Our security and performance analysis show that the proposed plan can deal with security and efficiency concerns in cloud computing.

According to Sarmadullah Khanet. Al [4] embedded power transactions in blockchain are based on their defined characteristics through the signature of many manufacturers. These signatures have been verified and customers are satisfied with the features that do not open any information that meet those features. The public and private key manufacturers have been created for these customers and using this key ensures that the support process is authorized by customers. There is no central authority required in this perspective. To protest against collision attacks, the makers are given secret pseudo-functional work seeds. Comparative analysis shows the efficiency of the proposed approach to existing people.

According to Ruuguet. Al [5] To guarantee the validity of the EHR surrounding the block channel, he has submitted a special-based signature scheme with multiple officials, in which the patient supports the message according to the specifications, but there is no evidence that he prepares any other information. In addition, there are many officers without generating a reliable individual or a central person in order to generate and deliver a public / private key, which avoids the escrow problem and adapt to the mode of data storage distributed in the Block. By sharing the secrecy of the secret pseudo-festive festivals in the authorities, this protocol opposed the attack of N-1 affiliated with officials. Under the computational Billine Diffie-Hellman concept, we also formally demonstrate that, in relation to the specialty-signatory's enforceability and complete privacy, this specialty-based signature scheme is safe in random decorative models. Comparison shows the efficiency and

qualities among the proposed methods and methods in other studies.

Smart Contracts [6] Also called crypto-contract, it is a computer program used for transferring / controlling the property or digital currents in specific parties. It does not only determine the terms and conditions but may also implement that policy / agreement. These smart contracts are stored on block-chain and BC is an ideal technology to store these contracts due to the ambiguity and security. Whenever a transaction is considered, the smart-contract determines where the transaction should be transferred / returned or since the transaction actually happened.

Currently CSIRRO team has proposed a new approach to integrate Block on IOT with [7]. In its initial endeavor, he uses smart-home technology to understand how IOT can be blocked. Block wheels are especially used to provide access control system for Smart-Devices Transactions located on Smart-Home. Introducing BC technology in IOT, this search again provides some additional security features; however, every mainstream BC technology must have a concept that does not include the concept of comprehensive algorithms. Moreover, this technology cannot provide a general form of block-chain solution in case of IOT usage.

According to Ilya Sukhodolski. The Al [8] system presents a prototype of multi-user system for access control over datasets stored in incredible cloud environments. Like other unreliable environments, cloud storage requires the ability to share information securely. Our approach provides access control over data stored in the cloud without the provider's investment. Access Control Mechanism The main tool is the dynamic feature-based encryption scheme, which has dynamic features. Using Blockchain based decentralized badgers; our systems provide an irrevocable log for accessibility requests for all meaningful security incidents like large financing, access policy assignment, alteration or cancellation. We offer a set of cryptographic protocols that make the secret or secret key of cryptographic operation confidential. The hash code of the sifter text is only transmitted by the block on laser. Our system has been tested on prototype smart contracts and tested on Ethereum Blockchain platforms.

According to Huehuangenet. Al [9] they offer a blockchain and a MedRec-based approach by enabling encryption and attribute based authentication to enable secure sharing of healthcare data. By applying this approach: The fragmented EHR fragment of all patients can be seen as a complete record and can be safely stored against tampering; The authenticity of patients' EHR can be verified; Flexible and finer access control can be provided and 4) it is possible to maintain a cleared audit trail.

According to VipulGoyalet.Al [10] develops new cryptosystems to share encrypted data properly, which we call key-policy attribute-based encryption (KPABE).In our cryptosystem, cipher labeled with a set of properties and controls that it connects to private key access configurations that a user can decrypt the encryption. We display the utility of our product to share audit log information and broadcast encryption. Our creation supports private key providers, which subscribe to categorized identification-based encryption (HIBE).

III PROBLEM STATEMENT

In this research to design and develop a system for dynamic and secure e certificate generation system using smart contract in blockchain environment. In this work we also illustrates own blockchain in open source environment with custom mining strategy as well as smart contract. Finally validate and explore system performance using consensus algorithm for proof of validation.

IV SYSTEM OVERVIEW

In this research to design and develop a system for dynamic and secure e certificate generation system using smart contract in blockchain environment. In this work we also illustrates own blockchain in open source environment with custom mining strategy as well as smart contract. Finally validate and explore system performance using consensus algorithm for proof of validation.Educational documents verification is very tedious and time consuming process in real time environment. E- Certificate generation for entire educational history is easy process to eliminate such consuming tasks. Dynamic QR-code and unique certificate generation for each students document in proposed system.

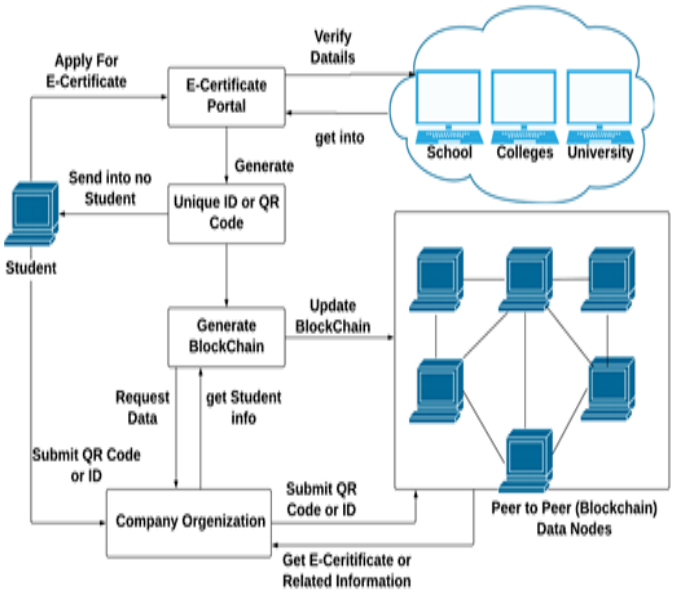

Figure 1 : System Architecture

System proposed a new dynamic certificate generation approach using own custom blockchain. First student apply for e-certificate on web portal with upload all educational documents. Web portal is authenticate 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 MiM etc.

V RESULTS AND DISCUSSIONS

The system performance evaluation, the system calculates the matrices for accuracy. The system is executed on java 3-tier architecture framework with INTEL 2.8 GHz i3 processor and 4 GB RAM with a distributed environment. The below figure (b) shows the time required for a consensus algorithm to validate the blockchain in 4 nodes. The x-axis shows the size of blockchain and Y shows the time required in milliseconds for validation.

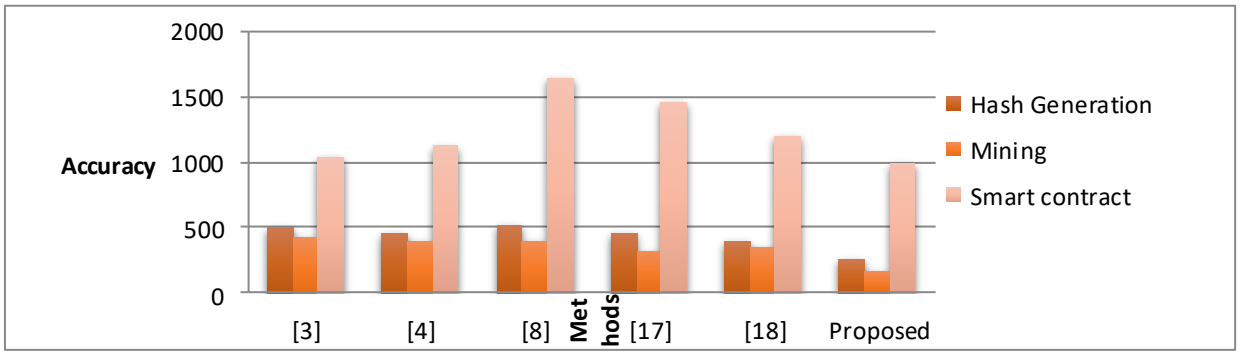

Figure 2 : Time computation for execution with number of transactions

In another test case we evaluate the proposed system with smart contract validation by consensus algorithm in different number of peer to peer node.

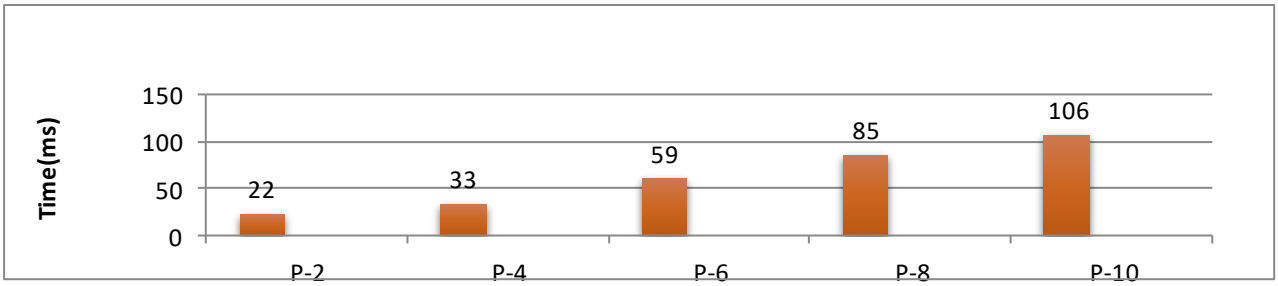

Figure 3: Time required for smart contract validation with different no. of P2P network in blockchain.

The number of variations taken by algorithm from propose SHA value are evaluated in the third test case. Basically, this has been done to evaluate the propose hash string is valid or not according to given mining policy. In many times when system generates SHA code for given transactional data it's never fulfills the mining policy. To fulfill the propose mining policy according to given scenario mining to generate the multiple variation on given string. The below figure (d) shows the time required to generate the valid SHA string for specific transaction.

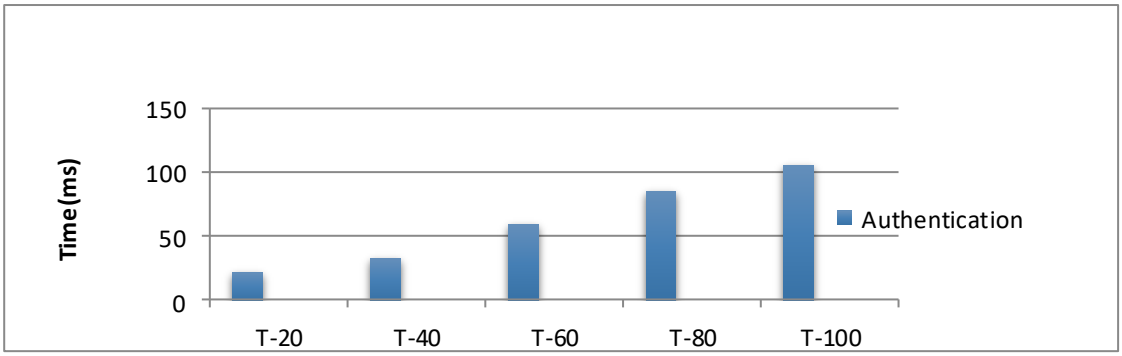

Figure 4: Time required for mining for number of transactions in milliseconds

VI CONCLUSION

The proposed work basically introduced blockchain based data security for a sensitive information as well as educational documents. In real time scenario when any organization required validating any employee or students data, then it should be follow very time consuming as well as tedious process. This research basically introduces such a kind of identity generation and QR code generation for educational documentaries. Once a single certification has a generated for entire documentation it gives assurance to secure storage into the blockchain based decentralized architecture. The different security algorithms like hash generation, secure mining, smart contract as well as various consensus algorithms provides assurance to achieve the highest data security. This work also provides data integrity to end-user continuously. Where is data nodes have used to collaboration between the multiple data node during the each transactions. To work with large data set and multiple data nodes with custom blockchain will be the interesting work in future direction.

REFERENCES

[1] Wang, Hao, and Yujiao Song. "Secure cloud-based EHR system using attribute-based cryptosystem and blockchain." Journal of medical systems 42.8 (2018): 152.

[2] Michalevsky Y, Joye M. Decentralized Policy-Hiding Attribute-Based Encryption with Receiver Privacy.

[3] Wu, Axin, et al. "Hidden policy attribute-based data sharing with direct revocation and keyword search in cloud computing." Sensors 18.7 (2018): 2158.

[4] Khan S, Khan R. Multiple authorities attribute-based verification mechanism for Blockchain mircogrid transactions. Energies. 2018 May;11(5):1154.

[5] Guo, Rui, et al. "Secure attribute-based signature scheme with multiple authorities for Blockchain in electronic health records systems." IEEE Access 776.99 (2018): 1-12.

[6] "Smart Contracts," http://searchcompliance. techtarget.com /definition/ smart-contract, 2017, [Online; accessed 4-Dec- 2017]

[7] A. Dorri, S. S. Kanhere, and R. Jurdak, "Blockchainin internet of things: Challenges and Solutions," arXiv:1608.05187 [cs], 2016. [Online].Available: http://arxiv.org/abs/1608.05187%5Cn http://www.arxiv.org /pdf/1608.05187.pd

[8] Sukhodolskiy, Ilya, and Sergey Zapechnikov. "A blockchain-based access control system for cloud storage." Young Researchers in Electrical and Electronic Engineering (EIConRus), 2018 IEEE Conference of Russian.IEEE, 2018.

[9] Yang, Huihui, and Bian Yang. "A Blockchain-based Approach to the Secure Sharing of Healthcare Data."Proceedings of the Norwegian Information Security Conference. 2017.

[10] Goyal, Vipul, et al. "Attribute-based encryption for fine-grained access control of encrypted data." Proceedings of the 13th ACM conference on Computer and communications security. Acm, 2006.