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Blockchain Solution for Educational Sector

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ABSTRACT: Blockchain technology has the potential to revolutionize the educational sector by enabling secure, transparent, and efficient systems for credentialing, learning management, and student record-keeping. This paper explores the potential applications of blockchain in education, including secure credentialing, micro-credentials, transparent learning records, and decentralized learning platforms. We discuss the challenges and opportunities of implementing blockchain solutions in the educational sector, including issues of scalability, interoperability, and privacy. We also highlight the potential benefits of blockchain technology for students, educational institutions, and employers, including increased transparency, reduced fraud, and more efficient credentialing and hiring processes. While there are still many challenges to be addressed, the potential benefits of blockchain in education are significant and could help to transform the way we learn and work in the future.

KEYWORDS: Blockchain, decentralized, secure, privacy.

I. INTRODUCTION

Blockchain is a distributed ledger technology that enables the secure and transparent recording of transactions and data. It is a decentralized system that allows for creating a tamper-proof record of transactions and information, which is stored on a network of computers. The blockchain consists of a series of blocks, and each set contains transactions. Each block is connected to the previous block by having the hash value of the previous block, forming a chain of blocks, hence the name "blockchain." The data on the blockchain is stored in a transparent and secure manner, making it ideal for use in industries such as finance, healthcare, and logistics.

One of the features of blockchain is immutability. Once a transaction is proceeding on the blockchain, it cannot be altered. This makes the blockchain a tamper-proof and reliable source of information. Another advantage of blockchain is its decentralized nature. There is no central authority controlling the blockchain, which makes it resistant to censorship and hacking. This also means that transactions on the blockchain can be processed more quickly and efficiently than traditional systems. Furthermore, blockchain technology offers increased transparency. Anyone on the network can view

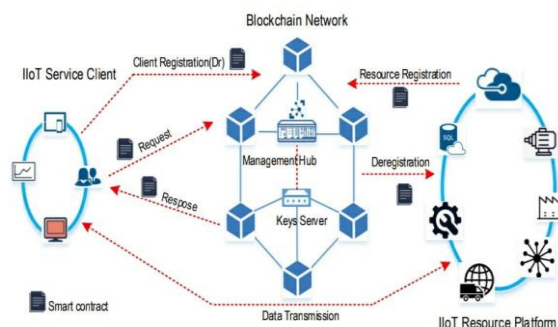
the transactions and data stored on the blockchain, making verifying the authenticity of information easier. The system will leverage blockchain technology to create a decentralized and tamper-proof platform for managing student records and information. The system will enable educational institutions to store student records on the blockchain, which can be accessed securely and efficiently by authorized parties. One of the key advantages of this system is that it provides enhanced security. Since the blockchain is stored on a distributed network of computers, it is nearly impossible for hackers to tamper with or steal the data. Additionally, blockchain uses advanced cryptographic techniques to ensure that data is secure and tamper-proof.

In summary, blockchain is a distributed ledger technology enabling secure and transparent recording of transactions and data. Its key features include immutability, decentralization, and transparency, making it a promising technology for various industries. The use of blockchain technology in the educational sector has the potential to revolutionize the way we manage and store academic records, certifications, and student information. Here is an exciting system for blockchain in the educational sector:

II. RELATED WORK

International Journal of rearmost Technology in Engineering, Management & Applied Science (IJLTEMAS) Volume VIII, Issue II, February 2019 | ISSN 2278- 2540 www.ijltemas.in runner 124 Blockchain Architecture to Higher Education Systems K. Palanivel Computer Centre, Pondicherry University, India. The blockchain is an arising technology that serves as an inflexible tally, which allows deals to take place in a decentralized manner. It has come a intimately available structure for erecting decentralized operations and achieving interoperability. Blockchain-grounded operations insure translucency and trust between all parties involved in the commerce. The blockchain also makes blockchain technology grounded services interest to the education sector. currently, educational associations concentrate on online education and propose to produce a system grounded on educational smart contracts in a public tally. This public tally will be participated between major offline educational institutes around the world. From a software armature perspective, blockchain enables new forms of distributed software infrastructures across a large network of untrusted actors. The ideal of this composition is to apply blockchain technology in learning results and to propose a blockchain armature toe-Learning results in Advanced Education Systems. The proposed armature exploits the benefits of the blockchain and immolation security, obscurity, life, integrity, translucency, invariability and global ecosystem simplification, in order to produce a encyclopedically trusted advanced education credit system

III. METHODOLOGY



The blockchain can enable systems to connect untrusted devices in a distributed and verifiable manner. Figure shows an example of the architecture of a blockchain-enabled system, which contains the following six main components:

- 1) resource networks, including the resources that can be provided
- 2) The Blockchain network records all information in the systems onto a decentralized private network
- 3) Management hub, which mainly focuses on the management and maintenance of the whole system.
- 4) Key servers, generate the necessary unique keys for node authentications and data encryption.
- 5) the users that request access to the resources.

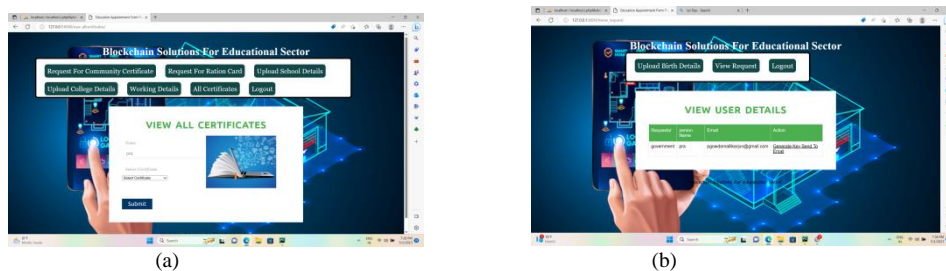
6) Smart contract, provides system interfaces between components in the network and blockchain.

III. EXPERIMENTAL RESULTS

Figures shows the results of blockchain solution for educational sector. Fig 1 (a) shows the login page for user. (b) shows the registration page for the user. (c) shows the page for uploading school details. (d) show the page for generating secret key . (e) shows the page for accessing the certificate.



Fig. 2 (a) shows the page displaying the certificates.(b) shows the block contains previous hash, net hash, value timestamp and actual data



VI. CONCLUSION

Blockchains enable services to grow to a large size through their decentralized design as well as cryptographic properties. In a blockchain-based system, all transactions are recorded on a ledger by a set of miners. Existing mining disciplines are geared towards financially-driven blockchain applications, such as cryptocurrencies, and therefore are

not suitable for industrial blockchain-based services. In this paper, a novel fee-less mining discipline scheme is designed to help miners generate transaction blocks efficiently. The proposed scheme is designed to achieve desired throughput values as well as overcoming low priority transaction starvation using a given utility function formulated to select transactions from a transaction pool to be published in future blocks. The utility functions minimize the overall priority of transactions within the block while making sure that the operational value added by said block is sufficient for the sourcing process. A real-time process is given to overcome the computational complexity of the aforementioned utility function. The real-time process utilizes aging to increase the priority of a transaction previously residing in mining pools. Furthermore, a transaction block is sliced into compartments to hold a number of transactions from a received priority class. Subsequent to determining the size of slices, transactions are selected from the mining pool with selection priority given to aged transactions first. Elaborate simulations are conducted to demonstrate the performance of the proposed project. The simulations focus on preventing low priority transaction prevention and are subsequently used to determine the publishing throughput of transactions from different priority classes. Furthermore, a proof-of-concept implementation is completed where IIoT nodes are built and used to sense the temperatures of office spaces. Each IIoT node was given a priority level and generated transactions with data regarding the sensed temperature. To reproduce low-priority transaction starvation, Linux Containers (LXC) virtual machines are used to simulate IIoT nodes. The LXC containers are connected to the miner over simulated wireless channels

VII. FEATURE

The future of blockchain in the educational sector is promising, with many potential applications and benefits. Here are a few possibilities:

Secure Credentialing: One of the most promising applications of blockchain in education is secure credentialing. By using blockchain technology, educational institutions can create tamper-proof digital records of student achievements, such as degrees, diplomas, and certificates. This would make it easier for students to prove their credentials to potential employers, and reduce the risk of credential fraud.

Micro-Credentials: In addition to traditional degrees and certificates, blockchain technology can also be used to create micro-credentials, which are smaller, more specific certifications that demonstrate mastery of a particular skill or knowledge area. This could be particularly valuable in industries that require ongoing training and professional development.

Transparent Learning Records: Another potential application of blockchain in education is the creation of transparent learning records. By using blockchain technology, educational institutions can create a secure, decentralized record of a student's learning journey, including courses taken, grades achieved, and other learning achievements. This could help students to better understand their own learning progress, and make it easier for employers to evaluate candidates based on their skills and knowledge.

Decentralized Learning Platforms: Blockchain technology could also be used to create decentralized learning platforms that are more secure, transparent, and efficient than traditional learning management systems. By using blockchain-based smart contracts, educational institutions could create decentralized systems for managing course enrollments, assessments, and other administrative tasks.

Overall, the future of blockchain in education is likely to be shaped by the ongoing development of the technology, as well as the growing demand for more secure, transparent, and efficient educational systems. While there are still many challenges to be addressed, such as scalability and interoperability, the potential benefits of blockchain in education are significant, and could help to transform the way we learn and work.

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