EDUCATIONAL FRAMEWORK BASED ON BLOCKCHAIN TECHNOLOGY

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Abstract: Blockchain adoption in education could assist increase the efficiency of the school ecosystem and optimize the utilization of people and physical resources. Blockchain provides learners authority over their educational identities by giving them ownership of their personal records. For learners who are job seeking, for example, this makes confirming the accuracy of their credentials on their resumes much easy and provides them more flexibility that their employer organization can access at any place and at any time. The objective of this research is to see how Blockchain technology can keep educational institutions safe. This paper will look into the use of Blockchain in the sphere of education, focusing on the concerns and obstacles that Blockchain technology poses in an educational environment using Meta Mask, Ganache and Truffle.

Index terms: Block chain, Meta Mask, Ganache, Truffle

I. INTRODUCTION

Blockchain is the key idea utilized to create digital currencies like bit coins. Since the invention of the steam engine, the creation of electricity, and the growth of digital innovation, the blockchain revolution has impacted many industries, including finance, law, and business. This represents the fourth contemporary upheaval. The current study examined how blockchain technology can be used to address specific training challenges with a focus on its possible educational uses. This analysis first covered the main ideas and benefits of the blockchain technology before looking into a many of the educational implementations now available. Some innovative uses of blockchain technology were proposed, and the advantages and difficulties of employing blockchain technology in education were also highlighted.

The utilization of Blockchain to instruction is incredibly new – with little companion surveyed distributed writing in the territory. This examination speaks to an exploratory survey of blockchain for instruction, concentrating on the cutting edge of the field in Europe. It's essential objective crowd is strategy producers, instructors, strategists and scientists with an enthusiasm for verifying.

Blockchain enables students to take control of their academic identities by giving users ownership of their personal information. For graduates looking for work, for instance, this makes verifying the integrity of the credentials listed on their resumes much easier and offers them complete leverage to what an organization can only obtain. The distributed consensus protocol is used to accomplish this. This protocol's objective is to verify the generated data's chronology. We suggest a consortium blockchain method because some of the academic data must be publicly certifiable, demanding a permission-less approach, while some student record data must be encrypted to ensure anonymity, necessitating a cloistered and permissioned blockchain. Thus, the distributed consensus protocol ensures the same by allowing a subset of peer nodes that are selected to transact through the platform.

Blockchain innovation was first implemented by University of Nicosia to deal with understudies' certifications got from MOOC stages (Sharples et.al. 2016). Sony Global Education likewise utilized the Blockchain innovation to make a worldwide appraisal stage to give administrations to putting away and overseeing degree data (Hoy 2017). Massachusetts Institute of Technology (MIT) and the Learning Machine organization collaborated to plan an advanced identification for web based learning dependent on Blockchain innovation. The Blockchain record can coordinate a wide range of instructive data with the student's extraordinary ID. It incorporates learning conduct in class, smaller scale scholastic venture understanding, and full scale instructive foundation, and so forth.

Blockchain innovation adds to decreasing degree blackmail. Beforehand, there were different examples of degree blackmail. In any case, it will in general be kept up a key good ways from by using square chain in surrendering and managing understudy's capability now. The data that is supported by customer ID and stored in square chain is verified, approved, and maintained by the excavators from everywhere in the world. A blockchain-based appropriated record is dependable and long-lasting. As a result, the pro and steadiness are both guaranteed, which will essentially reduce degree distortion.

As a limit cash change bank, blockchain can be utilized. In particular, the square chain learning record keeps track of the requested information regarding the customers' learning base and tracks the development of their knowledge and skills. According to a progression of broad benchmarks, each one of them can be transformed into a form of cutting-edge currency and stored on a Blockchain platform. Students will get paid through their academic work, which is categorized under the heading "learning is securing" (Sharples and Domingue 2016).

Importance of Certification in Education

Authentications are utilized generally all through training program, for an assortment of purposes. Students frequently receive certificates to understand:

- The conclusion of a certain learning experience. Examples of this include a certificate of completion of formal education, a statement endorsing participation or cooperation in non-formal training, or a declaration containing evidence of the person's experience in a certain subject.
- The evaluation of knowledge gained in a particular topic, used as a template for a statement confirming the honour of a degree, distinct units of learning through the achievement of specified learning objectives, such as through the award of ECTS credits in higher education, precise declarations verifying the completion of an internship, or of another type of work-involvement.
- The acquisition of explicit aptitudes, such as through authorizations issued through methods for recognizing prior learning
- The attainment of specific goals, such as graduating "with distinction" or receiving specified awards for excellence.
- The precise level of proficiency attained in precise areas, as evidenced by the issuance of assessment endorsements or evaluation cards.

II. OBJECTIVES OF THE STUDY

Blockchain adoption in education could assist increase the efficiency of the school ecosystem and optimize the utilization of people and physical resources. Blockchain provides learners authority over their educational identities by giving them ownership of their personal records. For learners who are job seeking, for example, this makes confirming the accuracy of their credentials on their resumes much easy and provides them more flexibility that their employer organization can access at any place and at any time.

The objective of this research is to see how Blockchain technology can keep educational institutions safe. This research will look into the use of Blockchain in the sphere of education, focusing on the concerns and obstacles that Blockchain technology poses in an educational environment.

Blockchain in the Education Sector

A portion of the region in the education business where Blockchain could affect how things are done include:

1. In the Field of University Research

Advanced education has two objectives: to give information to people in the future of understudies and to grow present information through new exploration.

Teachers dedicatedly prepare their lectures to teach the students, they also publish their materials for them to lead unique researches and distribute their innovations.

Critically, the span and effect of those papers can affect scholastics' ability to obtain significant financing to help future exploration. Creators have a personal stake in monitoring how their work is secure and will not go in the wrong hand who will misuse their content and become its author

2. To award students by distributing Bitcoins

Tokenization has turned into a foundation of blockchain innovation. Scholastic establishments can soon boost understudies to take care of their understudy obligations on time, and teachers will actually want to award students by compensating them with digital forms of money assuming that they perform well or complete a particular major.

3. Increased permeability

The unchanging record innovation of blockchain produces a sequential record of constant occasions. This is magnificent for really taking a look at records, showing a total report card, and staying up with the latest on their academic achievements. Whenever a student presents their task through blockchain, they can't "lose" it or guarantee it was lost by the instructor.

4. Accountability with smart contracts

Instructors, college authorities, and students can access smart contracts. Students and educators, for instance, could consent to an advanced arrangement illustrating the restrictions of a task, as well as the due date and evaluating cutoff time. Shrewd agreements might possibly be utilized to take care of educational loans.

5. Lowering the Cost of Education

Blockchain innovation may be utilized to empower all inclusive admittance to open educational assets, like books, web recordings, and movies, which are accessible in the public area and are allowed to utilize reallocate. In a public organization, blockchain permits these assets to be shared modestly and safely.

III. SCOPE OF RESEARCH

The strategy uses blockchain technology to build a decentralized framework for credit transfer in order to establish a global trust foundation in educational systems. In contrast to conventional centralized databases, the suggested approach facilitates pervasive and simpler computing. The technology makes it simple for students to transfer their credits between universities and to evaluate their credit history with possible business partners. Therefore, without limitations due to demographics or language barriers, all colleges constitute a homogenous network.

Also we want to talk about the architecture of homogenous grading systems. With only minor changes to the architecture, there could be integration into any existing educational and certification system. Such an approach would significantly reduce system complexity as a whole. On a larger scale, there would be no administrative roadblocks in the system, which would be transparent in nature. The aforementioned architecture could be extended to include certificates obtained through Massive Open Online Courses (MOOCs) provided via online platforms without the time-consuming mailing of paper certificates to students' addresses.

IV. METHODOLOGY AND MATERIAL USED

Software Requirements

1. Truffle Framework
2. Ganache
3. Solodity
4. Meta mask
5. ReactJS and Web3
6. Browser

The following steps are required to run the application:

1. Metamaskis installed in the browser. For this proposed work, Metamask is installed in Google Chrome and configured to connect to Ganache for deploying application;
2. Get some Testnet R-BTCs at faucet;
3. Install Truffle libraries in the Terminal of Visual Studio Code.
4. Create a Truffle Project. Unbox it using NodeJs.
5. Create a smart contract using Solidity
6. Compile it;
7. Create ReactJs App
8. Design App.js, to get Graphical User Interface
9. Interact with the smart contract, with each interaction some of the Ethereums are exhausted;
10. Check the transactions and balance in Metamask.

V. CONCLUSION

This study inferred that Blockchain can be utilized to build an equalization to determine learning procedure and results. Blockchain innovation can possibly quicken the finish of a paper based framework to generate certificates. So it can take care of the issues of data asymmetry and trust among outsiders in view of its decentralization and unchanging nature. Blockchain innovation expels the requirement for instructive associations to approve accreditation and can possibly discharge a flood of advancement around students' information.

REFERENCES

[1]Nakamoto, S.: Bitcoin: A peer-to-peer electronic cash system (2008), https://bitcoin.org/bitcoin.pdf.(Accessed on November 2018).

[2] Foroglou, G., Tsilidou, A.L.: Further applications of the blockchain (2015)

[3]3 Peters, G.W., Panayi, E., Chapelle, A.: Trends in crypto-currencies and blockchain technologies: A monetary theory and regulation perspective (2015), http://dx.doi.org/10.2139/ssrn.2646618

[4] Christidis, K., Devetsikiotis, M., "Blockchains and Smart Contracts for the Internet of Things", in IEEE Access, vol. 4, pp. 2292-2303, May 2016.

[5]Zhang, Y., Wen, J.: An iot electric business model based on the protocol of bitcoin. In: Proceedings of 18th International Conference on Intelligence in Next Generation Networks (ICIN). pp. 184–191. Paris, France (2015).

[6] Kosba, A., Miller, A., Shi, E., Wen, Z., Papamanthou, C.: Hawk: The blockchain model of cryptography and privacy-preserving smart contracts. In: Proceedings of IEEE Symposium on Security and Privacy (SP). pp. 839–858. San Jose, CA, USA(2016)

[7] Peterson, K., Deeduvanu, R., Kanjamala, P., & Mayo, K.B. (2016). A Blockchain-Based Approach to Health Information Exchange Networks.

[8] L. Wang, W. Liu and X. Han, "Blockchain-Based Government Information Resource Sharing," 2017 IEEE 23rd International Conference on Parallel and Distributed Systems (ICPADS), Shenzhen, 2017, pp. 804-809.doi: 10.1109/ICPADS.2017.00112

[9] Srivastava A., Bhattacharya P., Singh A., Mathur A., Prakash O., Pradhan R. " A Distributed Credit Transfer Educational Framework based on Blockchain" In: IEEE 2018 2nd International Conference on Advances in Computing, Control and Communication Technology(IA3CT 2018), Allahabad, Uttar Pradesh, India, 2018(*Article in Press*).

[10] Popovic, Kresimir&Hocenski, Zeljko. (2010). Cloud computing security issues and challenges. 344 - 349.

[11] F. Amati, "First Oficial Career Diplomas on Bitcoin's Blockchain", https://blog.signatura.co/_rst-of_cial-careerdiplomas-on-bitcoin-s-blockchain-69311acb544d , 2018.