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Blockchain Technology Application for Information System Security in Education

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Abstract

All entered data cannot be readily falsified, lost, or damaged while employing blockchain technology for information system security in the field of education. With blockchain, one can also be decentralized and independent of third parties while exchanging data and information instantly. Blockchain is a distributed ledger that efficiently and effectively keeps a permanent record of all transactions between two parties. Despite this, researchers attempt to evaluate the security of information systems in education using fingerprints by integrating cryptographic hash security sensors in order to meet the objectives of this study and produce results that are applicable to the field of education. We'll examine these subjects as well as the SWOT analysis applied to this study strategy.

Keywords: *Blockchain Technology, Education, Swot Method, Information System Security.*

1. Introduction

a. Background

Blockchain is a type of ledger that effectively and efficiently logs business dealings between two parties and may be disseminated in a verifiable and long-lasting way [1]. Satoshi Nakamoto initially suggested it in 2008. With the use of blockchain technology, Bitcoin has emerged as the first digital currency that can prevent double spending on computer networks, authenticate transactions without the need for reliable third parties, and facilitate the development of new applications. Why is the ledger itself necessary? by ensuring that it is properly recorded [2]. What is the purpose of a ledger? Each computer that contains the ledger announces every transaction that was logged. The leveraged transactions are then stored in encrypted blocks, which are irrevocably connected to the leveraged transactions that came before and after them. This system is known as a "blockchain" because of this relationship. Blockchain technology aims to network transactions between all parties that are open and decentralized [3].

b. Creation of the Issue

The value of education has increased with the passage of time, and as a result, more people are vying to finish their education [4]. As a result of the technology industry's current rapid expansion, blockchain technology is now being used in a variety of sectors, including banking, trade, industry, and finance [5]. Researchers will now create innovations by implementing blockchain technology in education, not just in one discipline. Several educational institutions in Indonesia embrace blockchain technology as a tool to boost performance in addition to the increasingly fierce competition in the field of education [6]. Even

said, blockchain technology will be used in education for information system security, despite the fact that this application has not yet been adopted globally [7].

c. Research Objectives

Because of blockchain technology's high security, dependability, and decentralization, researchers want to ensure that the educational sector experiences the advantages of such a significant positive influence [8]. However, there are many more advantages to employing blockchain technology in education, as this study will demonstrate, such as the provision of information data security via fingerprints that can be supported by blockchain technology [9].

d. Advantages of Research

Why should you use blockchain technology to do it? because all recorded data cannot be easily faked, lost, or damaged while using the security of blockchain technology in the education information system [10]. Also, using blockchain, one may communicate data and information immediately and be decentralized without depending on third parties [11].

2. Method

The analysis approach (SWOT) "strengths, weaknesses, opportunities, and threats" will be used in the discussion of blockchain technology-based education information system security [12].

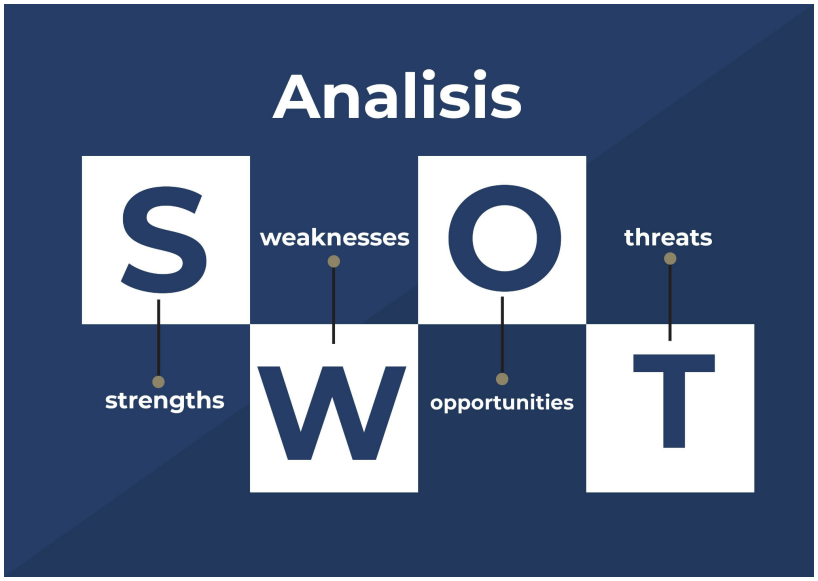

Figure 1. Analysis SWOT

a. Strengths

In the context of a blockchain, immutability means that once something has been put to the blockchain, it cannot be changed [13]. What advantages would this have for the information security measures in educational institutions, do you think? The blockchain's immutability is caused by the cryptographic hash function [14]. In summary, hashing guarantees that the output will always be constant and consistent, regardless of the length of the input text. an example of a hacker hitting block 3 in an effort to change data [15]. Since the hash algorithm will dramatically identify even the smallest change in data, every minor change in block 3 will impact the hash in block 2. If modifying data in block 2 were to be discovered and changed the data in block 1, the chain would be completely altered, which is not practical. This is the ideal illustration of how blockchain immortality works [16].

b. Weaknesses

Because it is challenging to modify data once it has been recorded into the blockchain, the blockchain system has this flaw [17]. When changing data or blockchain code, it is frequently necessary to perform a hard fork, which is a significant system change that necessitates sacrificing one chain and adopting a new chain [18].

c. Opportunities

Technology-wise, the opportunity is greater technological security. Blockchain technology is extremely reliable and secure. While using the blockchain for transactions, users' transactions can be verified in real-time [19]. Also, because it does away with third parties, this inexpensive blockchain technology can be said to be free [20].

3. Result and Discussion

Result

A website analysis sketch on the application of blockchain technology in implementing information system security in education will be produced to carry out this research [21].

A. First view Alphabet Blockchain

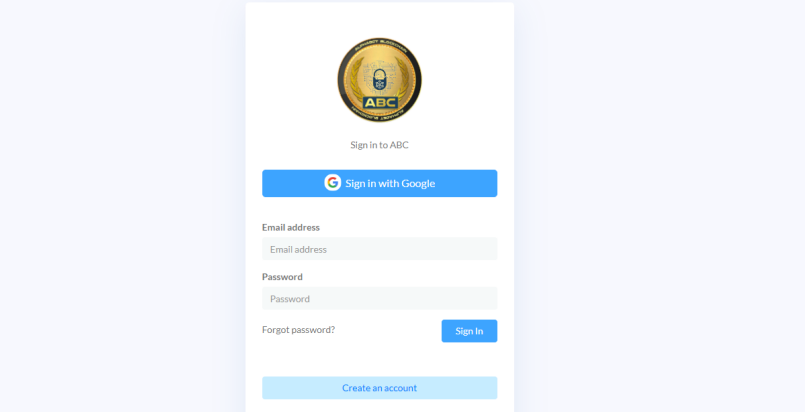

Fig.2 Blockchain Alphabet Login Menu

Verify that the user has supplied the proper username and password before proceeding to enter the website for Alphabet Blockchain [22].

B. Register Menu

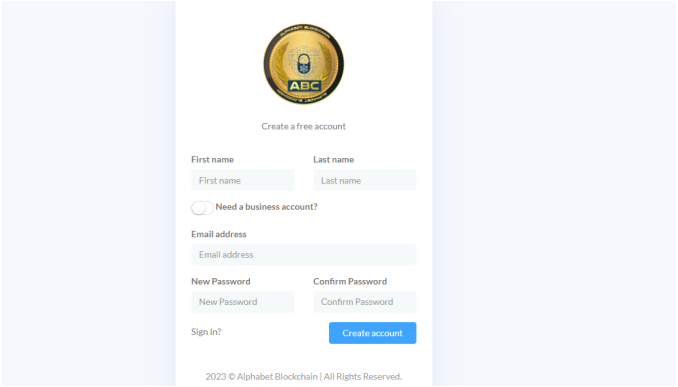

Fig.3 Register Menu

To register on the Alphabet Blockchain website, utilize the register menu. Users should keep in mind that they can only register under one name and email once [23]. Once they have done so, they should double-check their data to ensure that there are no mistakes when they log in [24].

C. Menu on the Website

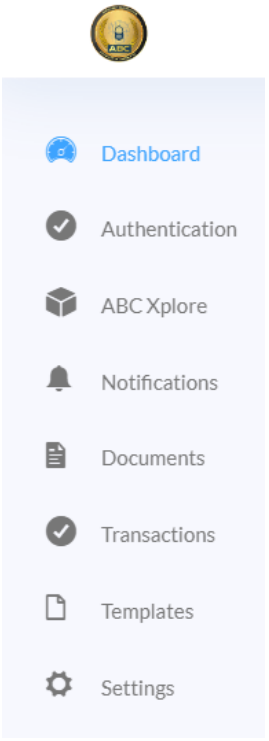

Fig.3 Menu on the Website

When it comes to data archiving, data authentication, and providing quantitative and accurate quality information using blockchain technology, Alphabet Blockchain (ABC) can offer ease, speed, and integrity [25].

5. Conclusion

Blockchain is a type of ledger that effectively and efficiently records business dealings between two parties that have been shared in a verifiable and long-lasting manner. blockchain technology implementation in the classroom. Several educational institutions in Indonesia embrace blockchain technology as a tool to boost performance in addition to the increasingly fierce competition in the field of education. Despite this, not all across the world has blockchain technology been applied to education. Then, information system security in education will use blockchain technology. Why should you use blockchain technology to do it? Because all data entered into the education information system using blockchain technology's security cannot be easily faked, lost, or damaged, and because using blockchain technology, one may communicate data and information immediately and be decentralized without depending on third parties. The cryptographic hash blockchain technology combined with fingerprints can improve the security of information systems in education, according to this research approach, which uses the SWOT analysis.

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