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blockchain

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Authors:

**Amal Krishna V S**

Sree Saraswathi Thyagaraja College

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Abstract

Many sectors, like finance, medicine, manufacturing, and education, use blockchain applications to profit from the unique bundle of characteristics of this technology. Blockchain technology (BT) promises benefits in trustability, collaboration, organization, identification, credibility, and transparency. In this project, we conduct an analysis in which we show how open science can benefit from this technology and its properties. For this, we determined the requirements of an open science ecosystem and compared them with the characteristics of BT to prove that the technology suits as an infrastructure. We will use Blockchain here for secure transactions of money between friends. Transaction between friends is secured by using blockchain technology. Here we will see how the transaction is secured and protected. Project is in python Programming. Blockchain is a system of recording information in a way that makes it difficult or impossible to change, hack, or cheat the system. A blockchain is essentially a digital ledger of transactions that is duplicated and distributed across the entire network of computer systems on the blockchain. Each block in the chain contains a number of transactions, and every time a new transaction occurs on the blockchain, a record of that transaction is added to every participant's ledger.

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ABSTRACT

Many sectors, like finance, medicine, manufacturing, and education, use blockchain applications to profit from the unique bundle of characteristics of this technology. Blockchain technology (BT) promises benefits in trustability, collaboration, organization, identification, credibility, and transparency. In this project, we conduct an analysis in which

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INTRODUCTION

Blockchain is a distributed database with decentralized, traceable, non-tamperable, secure and reliable features. It integrates P2P (Peer-to-Peer) protocol, digital encryption

technology, consensus mechanism, smart contract and other technologies together. Abandoning the maintenance mode of the traditional central node and adopting the method of mutual maintenance by multiple parties, thereby ensuring the credibility and integrity of the data. The blockchain platform can be divided into public chain, private chain and alliance chain. All nodes in the public chain can join or withdraw freely; the private chain strictly limits the qualification of participating nodes; the alliance chain is jointly managed by several participating institutions. Bitcoin was proposed by Satoshi Nakamoto in 2008, which is the most successful case of digital currency, and is also the most typical application of blockchain. In addition, the blockchain has expanded its unique application value in many aspects and has shown its potential to reshape society.

As a representative of distributed databases, blockchain stores all user transaction information on the blockchain, which has high requirements for the security performance of blockchain. Blockchain is a decentralized peer-to-peer network. Nodes do not need to trust each other and there is no central node. Therefore, transactions on the blockchain also need to ensure the security of transaction information on unsecured channels and to maintain the integrity of transactions. It can be seen that cryptography

Technology occupies the most central position in the blockchain. In blockchain, cryptography technology is mainly used to protect user privacy and transaction information, and ensure data consistency, etc. This paper briefly introduces the cryptographic techniques such as hash algorithm, asymmetric encryption algorithm and digital signature, also elaborates the blockchain infrastructure, the blockchain structure, bitcoin address, digital currency trading and other technologies of blockchain, and also explains how cryptography technology protects privacy and transaction maintenance in the blockchain in detail. In order to preserve the privacy for traceable encryption in blockchain, Wu et al. proposed a system in which authenticity and non-repudiation of digital content is guaranteed. The problem tackled by authors is the secret key of the user, which when shared with other entities does not hold the specific information of the user. In case the shared key is corrupted or abused, it makes it difficult to analyze the source of the secret key. Moreover, leakage of confidential

information in access control is a bottleneck for existing systems. Therefore, authors have integrated the privacy protection algorithm such as attribute based encryption (ABE) to secure the secret keys. However, the decryption mechanism does not show improved efficiency.

Management of digital data rights is a fundamental requirement to achieve protection of digital data. Existing techniques for data rights lack transparency, decentralization, and trust. In response to above mentioned problems, Zhang and Zhao proposed blockchain-based decentralized solutions. Information regarding the use of digital content, such as transaction and license information is transparent to everyone. Smart contract is designed for the automatic assignment of license. In this mechanism, the owner can set the prices for selling the license to other customers. However, peers of the network have to possess high computational power to perform key acquisition.

Ma et al. focus on digital rights management using blockchain to avoid the use of sensitive digital content for illegal purposes. For such concerns, a solution is proposed which is called DRMchain. This solution ensures the usage of digital content in the right way by authenticated users. Two separate blockchains are designed: one is to store the original content with its cipher summary, and the other stores the cipher summary of protected digital content. DRMchain provides the traceability record of a violation and high level trusted protection. From the proposed solution, protection of digital content, secure authorization of users, and use of multi signatures for usage control is achieved. However, the use of Ethereum coins could be a new research direction for protection of digital content.

Data sharing is a crucial step to gain maximum benefit from the strengths of research. A lot of data sharing mechanisms are proposed and discussed in literature. There is no sufficient work available that focuses on the incentive mechanism to promote data sharing. To cover these limitations, authors conducted a review on medical and health data to uncover the incentive mechanisms with the pre- and post- results after empirical analysis. According to a survey, a single incentive is tested for medical and health data to analyse the rate of data sharing. Therefore, it is concluded that more incentive based research needs to be performed to encourage data sharing.

Citations (0)

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A Review on Blockchain Technology and Blockchain Projects Fostering Open Science

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