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BLOCK CHAIN TECHNOLOGY

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Abstract

Blockchain is a system of recording information in a way that it is not possible to change, hack, or cheat the system. Our data will be more secure using this technology. Blockchain is a type of DLT (Distributed Leger Technology) in which transactions are recorded with an immutable cryptographic signature called a hash. It helps to reduce risk, stamps out fraud and brings transparency in scalable ways. Block chain consists of three important concepts: blocks, nodes and miners. Blockchain concept is similar or in simple ways like google docs where all the users can use the same document in sharing and update the changes in real time transparently. Similarly, it provides distributed access. Blockchain technology has practical applications in financial industry, smart contracts, Digital IDs, Internet of things etc. also it is used to secure sharing of medical data, cross-border payments, cryptocurrency exchange real estate processing platform etc. So, blockchain is very useful and beneficial latest technology.

Keyword :*BlockChain, Cryptography, blocks, nodes, miner, hash etc.*

Introduction

Block chain consists of three important concepts: blocks, nodes and miners.

Blocks- Every chain consists of multiple blocks and every block has three basic elements:

The data within the block. A 32-bit number called a nonce. The nonce is randomly generated when a block is made, which then generates a block header hash. The hash could be a 256-bit number wedded to the nonce. It must start with an enormous number of zeroes (i.e., be extremely small). When the primary block of a series is formed, a nonce generates the cryptographic hash. the information within the block is taken into account signed and forever tied to the nonce and hash unless it's mined.

Nodes-Every node has its own copy of the blockchain and also the network must algorithmically approve any newly mined block for the chain to be updated, trusted and verified. Since blockchains are transparent, every action within the ledger may be easily checked and viewed. Each participant is given a singular alphanumeric positive identification that shows their transactions.

Miners: - Miners create new blocks on the chain through a process called mining. In a blockchain every block has its own unique nonce and hash, but also references the hash of the previous block in the chain, so mining a block isn't easy, especially on large chains.

A block chain is actually a digital ledger of transactions that's duplicated and distributed across the whole network of

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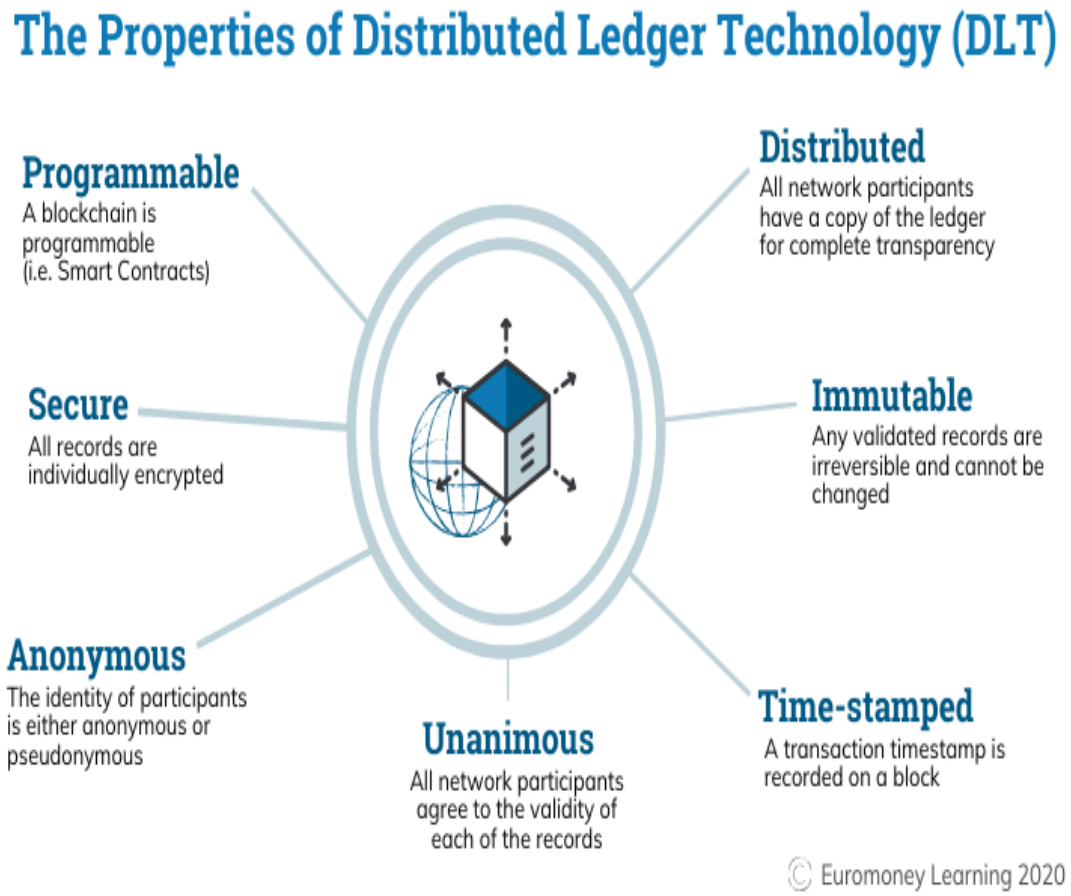
computer systems on the block chain. Each block within the chain contains variety of transactions, and each time a brand new transaction occurs on the blockchain, a record of that transaction is added to each participant's ledger. The decentralized database managed by multiple participants is thought as Distributed Ledger Technology (DLT).

• Blockchain could be a style of DLT within which transactions are recorded with an immutable cryptographic signature called a hash.



Instead of counting on a 3rd party, like a financial organization, to mediate transactions, member nodes in a very block chain network use a consensus protocol to agree on ledger content, and cryptographic hashes and digital signatures to make sure the integrity of transactions.

Bitcoin was designed to resolve this problem by employing a specific form of database called a blockchain. most conventional databases, like an SQL database, have someone responsible who can change the entries (e.g. giving themselves 1,000,000 X dollars). Blockchain is different because nobody is in charge; it's pass by the those who use it. What's more, bitcoins can't be faked, hacked or double spent – so people who own this money can trust that it's some value.

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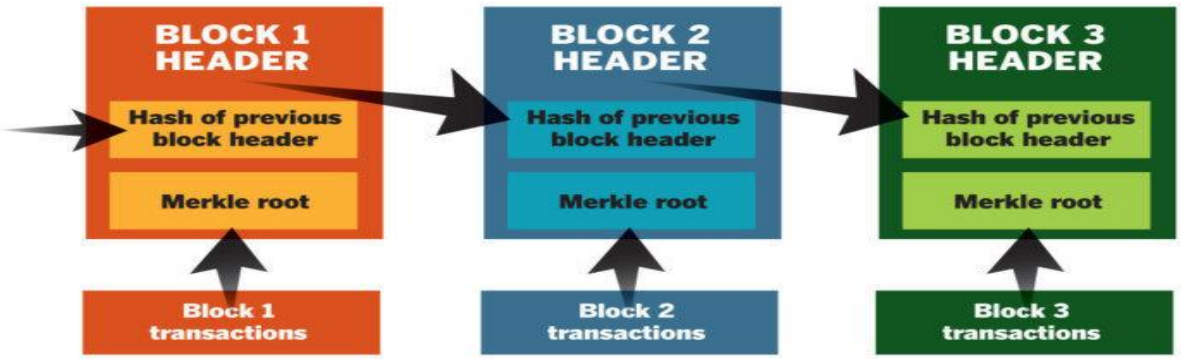
With blockchain technology, each page in a ledger of transactions forms a block. That block has an impact on the next block or page through cryptographic hashing. In other words, when a block is completed, it creates a unique secure code, which ties into the next page or block, creating a chain of blocks, or blockchain.



SIMPLIFIED BITCOIN BLOCK CHAIN

Literature Review

Cryptographer David Chaum first proposed a blockchain-like protocol in his 1982 dissertation "Computer Systems Established, Maintained, and Trusted by Mutually Suspicious Groups." Further work on a cryptographically secured chain of blocks was described in 1991 by Stuart Haber and W. Scott Stornetta. They wanted to implement a system where document timestamps couldn't be tampered with. In 1992, Haber, Stornetta, and Dave Bayer incorporated Merkle trees to the design, which improved its efficiency by allowing several document certificates to be collected into one block.

The first blockchain was conceptualized by a personal (or group of people) named as Satoshi Nakamoto in 2008. Nakamoto improved the planning in an exceedingly crucial way employing a Hashcash-like method to timestamp blocks without requiring them to be signed by a trusted party and introducing an issue parameter to stabilize rate with which blocks are added to the chain. the look was implemented the next year by Nakamoto as a core component of the cryptocurrency bitcoin, where it's the overall public ledger for all transactions on the network.

In August 2014, the bitcoin blockchain file size, containing records of all transactions that have occurred on the network, reached 20 GB (gigabytes). In January 2015, the scale had grown to almost 30 GB, and from January 2016 to January 2017, the bitcoin blockchain grew from 50 GB to 100 GB in size. The ledger size had exceeded 200 GiB by early 2020The words block and chain were used separately in Satoshi Nakamoto's original paper, but were eventually popularized joined word, blockchain, by 2016.

Objective

- A blockchain technology allows users to govern the ledger in a very secure way without the assistance of a 3rd party.
- It allows a free cryptocurrency through a decentralized environment and provides great transparency because it's a kind of distributed ledger and also the cost is reduced.
- This technology offers new tools for authentication and authorization within the digital world that fulfill the requirements of the many centralized administrators. As a result, it enables the creation of latest digital relationships.

Scope

- Initially blockchain technology was designed for its implementation in the fields of economics and cryptocurrency
- Blockchain technology has many applications in healthcare such as in biomedical field, neuroscience, HER medical, tele-monitoring, e-health, pharmaceuticals etc.
- Blockchain technology is used in Banking and finance for international payments, capital markets, trade finance, audits, Money Laundering Protection
- Blockchain technology can used in business for supply chain management, real estate, media etc.
- Blockchain technology can be used in government sectors for record management, identity management, voting, taxes also in education sectors, in IoT application etc.

Research Methodology

Primary Data- It is collected through questionnaires.

Secondary Data- It is collected through different websites, e-notes, research papers, journals etc.

Conclusion

- Blockchain technology provides greater security
- Greater trust and reliable methods
- It has more efficiency

References

International Journal of Latest Technology in Engineering, Management & Applied Science (IJLTEMAS)
Volume VII, Issue IV, April 2018 | ISSN 2278-2540

National Institute of Standards and Technology Internal Report 8202

MB Hoy, An introduction to the Blockchain and its implications for libraries and medicine. Med. Ref. Serv. Q. **36**(3), 273–279 (2017) https://doi.org/10.1080/02763869.2017.1332261

https://j2-capital.com/wp-content/uploads/2017/11/AIR-2016-Blockchain.pdf

Bus Inf Syst Eng 59(6):381–384 (2017) https://doi.org/10.1007/s12599-017-0505-1

http://ijrar.com/upload_issue/ijrar_issue_20542993.pdf

https://slejournal.springeropen.com/articles/10.1186/s40561-017-0050-x

https://www.emerald.com/insight/content/doi/10.1108/ITSE-07-2020-0102/full/html

https://jis-eurasipjournals.springeropen.com/articles/10.1186/s13635-019-0085-3

https://www.euromoney.com/learning/blockchain-explained/

https://developer.ibm.com/technologies

https://builtin.com/blockchain

https://www.computerworld.com/article/3191077/what-is-blockchain-the-complete-guide.html

https://www.ibm.com/in-en/blockchain/what-is-blockchain

https://www.businessinsider.in/finance/news/the-growing-list-of-applications-and-use-cases-of-blockchain-technology-in-business-and-life/articleshow/74447275.cms