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***Blockchain***

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* Blockchain technology is a decentralized, distributed ledger system that records transactions across multiple computers in a way that ensures transparency, security, and immutability. This term appeared for the first time in 2008 as a paper titled, “Bitcoin: A Peer-to-Peer Electronic Cash System” . The author(s) laid out the framework for blockchain and detailed methods of using a peer-to-peer network to generate a financial database. Since then, various programmers, cryptographers, and scientists have worked on this concept of blockchain to produce a cryptocurrency network called the bitcoin. The major design goal and the purpose of the blockchain were to solve two major problems. The first is to solve the double spending problem and second was to eliminate the need of central trusted third party. design and structure of a blockchain system, which consists of various components and elements that interact with each other to enable the functionality and features of the system. Blockchain architecture can vary depending on the type, purpose, and characteristics of the blockchain, but some common components are Node - user or computer within the blockchain architecture (each has an independent copy of the whole blockchain ledger) , Blocks These are the data structures that store a set of transactions that have been validated and verified by the nodes. Each block contains a header and a body. The header contains metadata, such as the hash of the previous block, the timestamp, the nonce, and the Merkle root. The body contains the actual transactions and their details, Transaction - smallest building block of a blockchain system (records, information, etc.) that serves as the purpose of blockchain, Chain - a sequence of blocks in a specific order ,Miners - specific nodes which perform the block verification process before adding anything to the blockchain structure, Consensus (consensus protocol) - a set of rules and arrangements to carry out blockchain operations

At the core of blockchain technology lies the concept of "blocks." Data is organized into these interconnected blocks, with each block containing a set of data and a unique identifier known as a hash. These blocks are then linked together in chronological order, forming what we call a "blockchain." ,The hash is dependent on the contents of a block. The slightest change of the contents can drastically change the hash. Because of this dependency property and the fact that the blockchain is distributed, it makes it difficult to hack. This is because if someone were to change the contents of a block for their own favor, it would change the hash and the block in front of it wouldn’t match the same hash. This way, the blockchain can easily recognize changes

Decentralization is one of the defining features of blockchain. Unlike traditional systems, there's no central authority controlling the network. Instead, transactions and data are validated and recorded by multiple participants, often referred to as nodes, within the network. This decentralized nature not only enhances security but also eliminates the need for intermediaries, thereby reducing the risk of fraud and manipulation.

The applications of blockchain extend far beyond cryptocurrencies like Bitcoin. It has the potential to revolutionize various industries such as finance, supply chain management, healthcare, and more. By streamlining processes, enhancing transparency, and ensuring the integrity of data transactions,

There are two type of blockchain: public blockchain network public

blockchains are not owned by anyone. They are open to the public, and anyone can participate as a node in the decision-making process. Users

may or may not be rewarded for their participation , private blockchain network Private blockchains operate on closed networks and have access restrictions, they tend to work well for private businesses and

organizations. Companies can use private blockchains to customize their accessibility and authorization preferences, and other important security options. Only one authority manages a private blockchain network.