Blockchain

Introduction

The idea of a block chain was first conceived in 1991 as an academic research project before it was later adapted for use as the foundation for Bitcoin in 2009. Today, numerous cryptocurrencies, decentralized finance (DeFi) applications, non-fungible tokens (NFTs), and smart contracts have led to an explosion in the use of blockchain technology.

Definition

A blockchain is a distributed, decentralized database that is shared among the nodes of a computer network. Node here refers to any computer that is running the core software of a particular cryptocurrency. Becoming a node is simple, all you need is a computer and a stable internet connection, then download and run the core software of a given cryptocurrency/blockchain application. As a database, it stores information in digital form and guarantees the integrity and security of that data without the need for a trusted third party. This ensures trust without intermediaries, such as banks and other payment processors, which makes it ideal for cryptocurrency systems such as Bitcoin, which rely on blockchains to maintain their record of transactions.

When to Use it

Blockchain technology is commonly used to store information about monetary transactions, with over 10,000 other cryptocurrency systems running on blockchain technology. There are a wide range of other applications that benefit from blockchain's utility to keep records of transactions, apart from monetary exchange. For example, IBM developed the Food Trust blockchain to track food goods' routes to their destinations. Large multinational companies like Walmart, Pfizer, AIG, Siemens, and Unilever are good examples of organisations that have incorporated blockchain into their operations. Local companies and startups that run on blockchain include ArabianChain, YalaCoins, Mirathi, and OQOD.

Details

Blockchain Working Principle
The core purpose of Blockchain is to enable sharing and recording of digital information without editing it. A blockchain serves as the basis for immutable ledgers, or records of transactions that cannot be changed, removed, or destroyed. Blockchains are also referred to as distributed ledger technologies (DLT) because of this.

A blockchain separates data into blocks and then uses the core software to add an extra layer of security that makes tampering with the records extremely difficult. In addition, this approach adds redundancy and ensures accuracy, as well as transparency. For example, if you try to change one record at one node in the chain, other nodes will not change and will quickly identify the individual (you) who tampered with Bitcoin's transaction history. This approach helps create a clear sequence of events, reducing the chances of data tampering to almost zero.
This emphasizes the fact that the data and history (such as those of cryptocurrency transactions) are irreversible. You can use blockchain to store a variety of data, including your legal contracts, state identifications, or your company's goods inventory. Such a record may be a list of transactions (as is the case with a cryptocurrency).

Example:

Example use cases for Blockchain technology:

Banking and finance
Banks can now transfer money between organizations more securely and swiftly than ever before thanks to blockchain technology. You can expect your bank transactions to be processed using blockchain in as little as 10 minutes, regardless of the day of the week or holidays.

Healthcare
Your medical records can be stored securely using blockchain, providing the assurance that those records cannot be altered. These records can be encrypted and kept on the blockchain with a secret key so that only specific people can access them, maintaining their privacy.

Property records
Using blockchain can help you avoid having to scan documents and locate actual files at your local public records office. You can have absolute confidence that your deed is correct and permanently recorded if property ownership info is kept and verified on the blockchain.

Smart contracts
Smart contracts are computer programs that run on blockchains and facilitate, verify, or negotiate a contract agreement. They operate under a set of conditions to which users agree. When those conditions are met, terms of the agreement are automatically carried out.

Supply chains
Blockchain can be used by companies to track the origins of materials they buy. This could allow businesses to validate not only their own products, but also common labels like "Organic," "Local," and "Fair Trade."

Voting
The use of blockchain technology in online voting could help to reduce election fraud while increasing voter turnout. If the system were implemented this way, tampering with votes would be difficult.

References:

https://www.investopedia.com/terms/b/blockchain.asp