BLOCKCHAIN

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WHAT IS BLOCKCHAIN?

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.

How does Blockchain Work?

When a block stores new data it is added to the blockchain. Blockchain, as its name suggests, consists of multiple blocks strung together.

1. A transaction must occur.
2. That transaction must be verified.
3. That transaction must be stored in a block.
4. That block must be given a hash. Once hashed, the block can be added to the blockchain.
   When that new block is added to the blockchain, it becomes publicly available for anyone to view—even you.

Types of blockchain
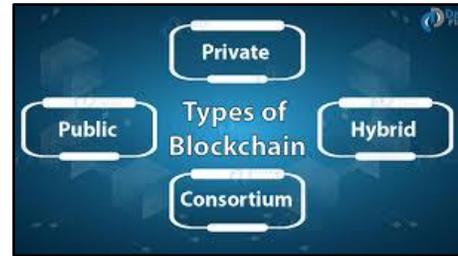
1. Public
   - A <u>public blockchain</u> is the permission-less distributed ledger technology
   - It is a non-restrictive version where anyone can access public blockchain if they have an internet connection.
   - It enables anyone connected to the internet to do transactions in a decentralized manner.
   - Examples : Bitcoin, <u>Ethereum</u>, Litecoin
   - Advantages: requires no intermediaries to work, brings transparency and trust among the community of users, fully secure and decentralized.
   - Disadvantages: less scalability and lack of transaction speed.
2. Private
   - A private blockchain is a blockchain that works in a closed network
   - It is a permissioned blockchain which is controlled by one entity.
   - This blockchain effectively allows only selected participants to access the environment – it doesn't have a decentralized environment.
   - Examples: Multichain, Hyperledger Sawtooth, Corda
   - Advantages: faster transactions, higher scalability as only a few nodes are authorized to validate transactions
   - Disadvantages: not truly centralized, lack of security, requires trust within members
3. Hybrid
   - Hybrid blockchain has a combination of centralized and decentralized blockchain features.
   - It is used when an organization wants to deploy the best features of both- private and public blockchain.
   - Examples: Dragonchain, XinFin's Hybrid blockchain

- Advantages: offers good amount of scalability, considerably secure, rules can be changed according to needs.
- Disadvantages: not completely transparent, upgrading the blockchain is difficult.

4. Federated
   - This blockchain is a combination of public and private blockchain in which some aspects of the organizations are made public, while others remain private.
   - This blockchain has a validator node which does two functions: validates transactions and initiates/receives transactions.
   - Examples: Marco Polo, Energy Web Foundation, IBM Food Trust.
   - Advantages: decentralized, better security, fast and efficient transactions
   - Disadvantages: less transparent and anonymous as compared to other blockchains

Blockchain Technology's Three Generations

1: Bitcoin and Digital Currencies

Blockchain technology began with the Bitcoin network. It was designed especially for this digital currency and for advancing the goals of digital currencies more broadly.

2: Smart Contracts

Founders of ethereum, for instance, had the idea that assets and trust agreements could also benefit from blockchain management. The major innovation brought about by ethereum was the advent of smart contracts. Smart contracts are those that are self-managing on a blockchain.

3: The Future

One of the major issues facing blockchain is scaling. Bitcoin remains troubled by transaction processing times and bottlenecking. In the future, one of the most important developments paving the way for blockchain technology going forward will likely have to do with scalability.

- It is not owned by a single entity, hence it is decentralized

- The data is cryptographically stored inside

- The blockchain is immutable, so no one can tamper with the data that is inside the blockchain

- The blockchain is transparent so one can track the data if they want to

Who controls the blockchain?

 An open blockchain network has no central authority — it is the very definition of a democratized system. Since it is a shared and immutable ledger, the information in it is open for anyone and everyone to see.

APPLICATION
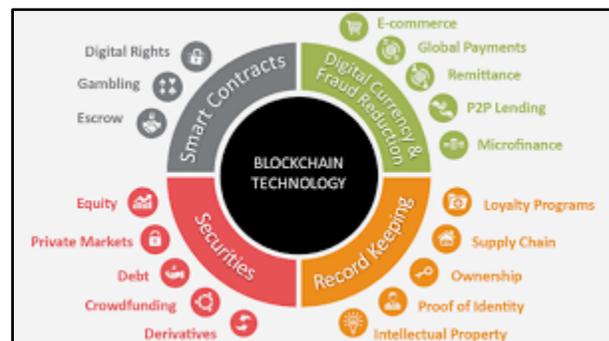
#1 Smart contracts
Smart Contracts can be programmed to perform simple functions.

#2 The sharing economy
With companies like Uber and Airbnb flourishing, the sharing economy is already a proven success.

#3 Crowdfunding

Crowdfunding initiatives like Kickstarter and Gofundme are doing the advance work for the emerging peer-to-peer economy. The popularity of these sites suggests people want to have a direct say in product development.

#4 Governance
By making the results fully transparent and publicly accessible, distributed database technology could bring full transparency to elections or any other kind of poll taking.

#5 File storage
Decentralizing file storage on the internet brings clear benefits. Distributing data throughout the network protects files from getting hacked or lost.

#6 Prediction markets

The crowdsourcing of predictions on event probability is proven to have a high degree of accuracy Prediction markets that payout according to event outcomes are already active. Blockchains are a "wisdom of the crowd" technology that will no doubt find other applications in the years to come.

#7 Internet of Things (IoT)
Smart contracts make the automation of remote systems management possible.

#8 Data management
Today, in exchange for their personal data people can use social media platforms like Facebook for free. In future, users will have the ability to manage and sell the data their online activity generates.